The Boy Travellers in South America: Adventures of Two Youths in a Journey Through Ecuador, Peru, Bolivia, Brazil, Paraguay, Argentine Republic, and Chili, with Descriptions of Patagonia and Tierra Del Fuego, and Voyages Upon the Amazon and La Plata River - Primary Source Edition

Thomas Wallace Knox

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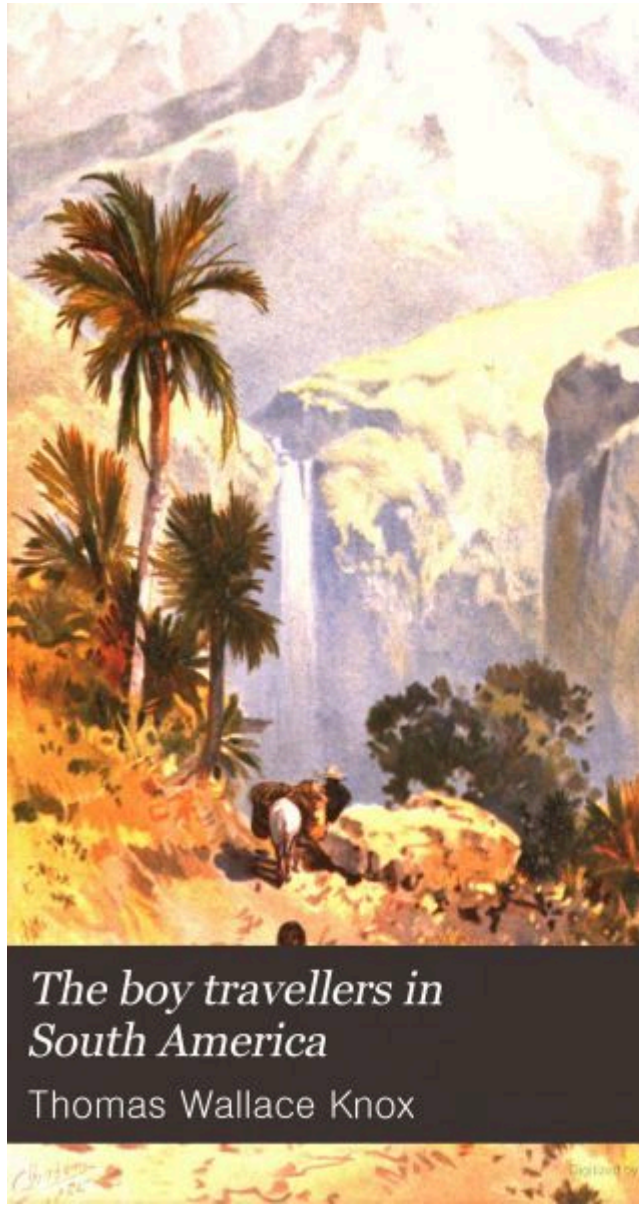
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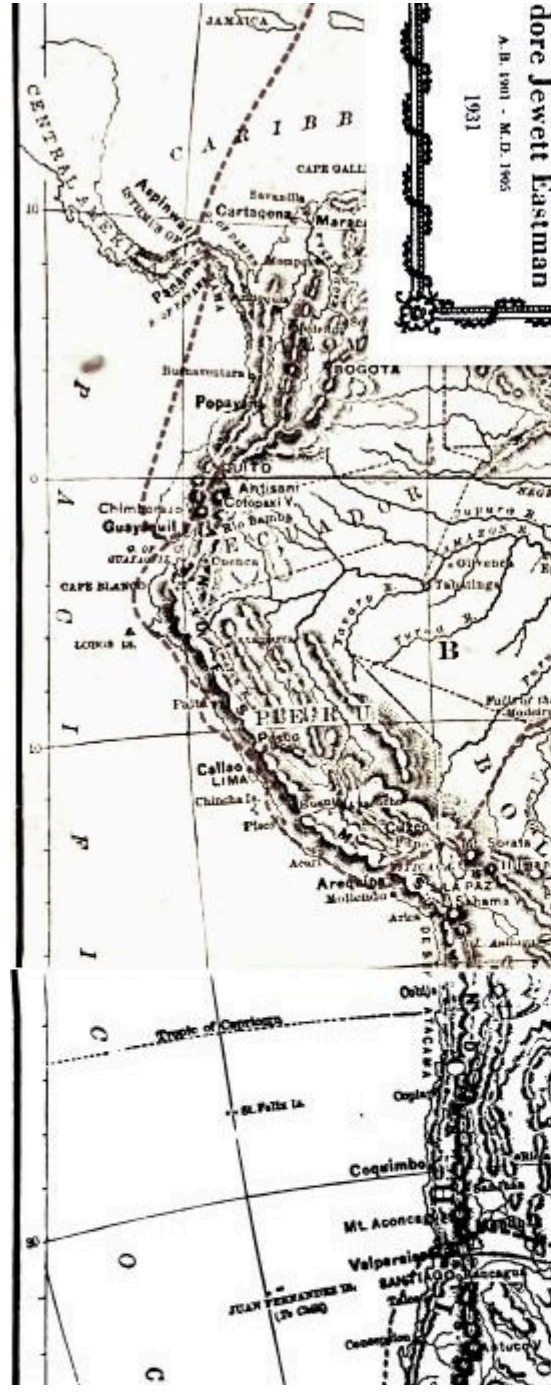
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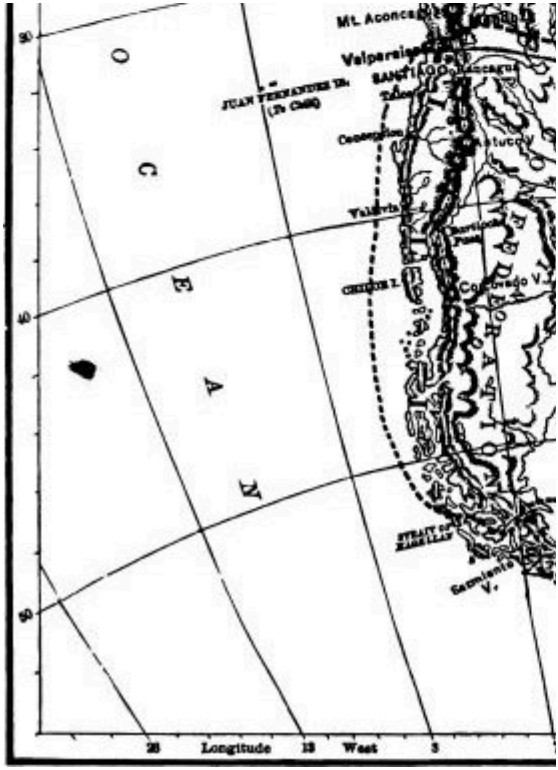
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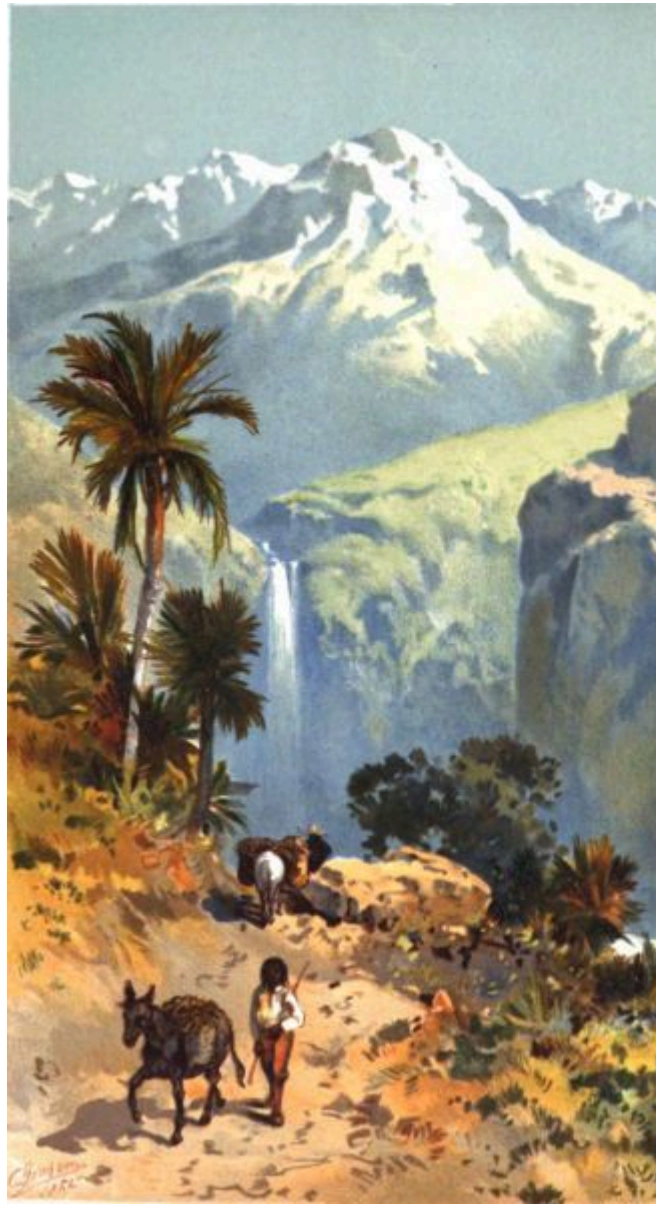
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*** START OF THE PROJECT GUTENBERG EBOOK THE BOY TRAVELLERS IN SOUTH AMERICA ***


The boy travellers in South America
Thomas Wallace Knox


dore Jewett Eastman
A.B. 1901 - M.D. 1905
1931
JAMAICA
CARIBB
CAPE GALL
Cartagena
Maracai
Aspinwall
Panama
BOGOTA
Buenaventura
Popayan
QUITO
Antisana
Cotopaxi V.
Chimborazo
Guayaquil
Cuenca
CAPE BLANCO
Tolima
PERU
Callao
LIMA
Arequipa
LA PAZ
Tropic of Capricorn
St. Felix Is.
Coquimbo
Mt. Aconcagua
Valparaiso
SANTIAGO
JUAN FERNANDEZ Is.
(To Chile)


Mt. Aconcagua
Valparaiso
SANTIAGO
Concepcion
Valdivia
CHILOE I.
Cordillera
Andes
Cordillera
Coast
Cordillera
Coast
STRAIT OF MAGELLAN
Gemini V.
Longitude
28
13
West
3



THE BOY TRAVELLERS IN

SOUTH AMERICA

ADVENTURES OF TWO YOUTHS IN A JOURNEY THROUGH

ECUADOR, PERU, BOLIVIA, BRAZIL, PARAGUAY, ARGENTINE REPUBLIC, AND CHILI

WITH DESCRIPTIONS OF PATAGONIA AND TIERRA DEL FUEGO, AND

VOYAGES UPON THE AMAZON AND LA PLATA RIVERS

BY

THOMAS W. KNOX

AUTHOR OF

"THE YOUNG NIMRODS IN NORTH AMERICA" "THE YOUNG NIMRODS AROUND THE WORLD"

"THE BOY TRAVELLERS IN THE FAR EAST: ADVENTURES OF TWO YOUTHS IN

A JOURNEY TO JAPAN AND CHINA—TO SIAM AND JAVA—TO CEYLON AND

INDIA—TO EGYPT AND THE HOLY LAND—TO CENTRAL AFRICA"

"THE VOYAGE OF THE VIVIAN" ETC., ETC.

Illustrated

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1886

By THOMAS W. KNOX.

THE BOY TRAVELLERS IN THE FAR EAST. Five Volumes. Copiously Illustrated. 8vo, Cloth, $3.00 each. The volumes sold separately. Each volume complete in itself.

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V. ADVENTURES OF TWO YOUTHS IN A JOURNEY THROUGH AFRICA.

THE BOY TRAVELLERS IN SOUTH AMERICA. Adventures of Two Youths in a Journey through Ecuador, Peru, Bolivia, Brazil, Paraguay, Argentine Republic, and Chili; with Descriptions of Patagonia and Tierra del Fuego, and Voyages upon the Amazon and La Plata Rivers. Copiously Illustrated. 8vo, Cloth.

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PREFACE.

The plan of this volume is almost identically that of "The Boy Travellers in the Far East." Frank Bassett and Fred Bronson, with their accomplished mentor,

Doctor Bronson, have traversed the length and breadth of the South American Continent from the Isthmus of Panama to the Strait of Magellan. Twice have they crossed the Andes; they have descended the Madeira and the Amazon rivers; navigated the La Plata and the Paraguay; visited the principal cities of the continent, and studied the manners and customs of the many people whom they encountered on their way. For the information of their friends and schoolmates at home they recorded the results of their travels and observations, and it is the author's pleasure to tell the story of their journey.

The characters of the story are fictitious, but the descriptions of everything coming under the observation of the Boy Travellers, or learned in their wanderings, are intended to be as nearly exact as possible. The author has not relied alone upon his personal knowledge of South America, but has drawn from the narratives of others who preceded or have followed him. It has been his earnest endeavor to present a realistic picture of South America; its lofty mountains, magnificent rivers, luxuriant forests, and fertile pampas, together with the many varieties of people that form its populations; their governments as we find them to-day, and an epitome of their history from ancient times. He earnestly hopes for the same kindly reception by press and public that was accorded to his volumes of a similar nature concerning Asia and Africa.

Many works of travel have been examined in the preparation of this book. Some of these are mentioned in the narrative, but it has not been practicable to refer to all. The author acknowledges his great indebtedness to that prince of travellers, Alexander Von Humboldt, whose graphic description

was the first adequate picture of the South American continent ever presented to the world. He is specially indebted to the admirable work of the Hon. E. George Squier, upon "Peru and the Land of the Incas," not alone for information about the country and people, but for several illustrations which have been kindly loaned for this volume. He is also under obligations to the following books: "The Andes and the Amazon," by Professor James Orton; "Brazil and the Brazilians," by J. C. Fletcher and D. P. Kidder; "Life in Brazil," by Thomas Ewbank; "Fifteen Thousand Miles on the Amazon," by Brown and Lidstone; "Brazil, Amazons, and Coast," by H. H. Smith; "Wanderings in Patagonia," by J. Beerbohm; "Across Patagonia," by Lady Florence Dixie; and, "The War between Peru and Chili," by Clements R. Markham. The reports of the surveys and explorations of the various proposed routes for an inter-oceanic canal have supplied important data, and the officers of the company engaged in cutting the Panama Canal have cheerfully answered the author's interrogatories concerning that enterprise.

The publishers have kindly allowed the use of illustrations from their previous publications on South America, in addition to those specially prepared for this work, or obtained from Mr. Squier's "Peru." As a consequence of their courtesy the author has been able to present a "copiously illustrated" book, which is always a delight to the youthful eye.

T. W. K. NEW YORK, *July*, 1885.

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THE BOY TRAVELLERS

IN

SOUTH AMERICA.

CHAPTER I.

FROM NEW YORK TO THE ISTHMUS OF PANAMA.—INCIDENTS OF THE VOYAGE.—OLD TIMES AND THE PRESENT.—ASPINWALL.—A TROPICAL CITY.—THE TEREDO.—ENTRANCE OF THE PANAMA CANAL.

"Is everything ready?"

"Yes," was the reply. "The trunks are packed and strapped, and the carriage will be at the door at ten o'clock."

"That is quite early enough. The steamer leaves the dock at noon, and we can easily be settled on board by eleven o'clock."

"Quite easily," was the response. "And here comes Frank, who has been to see the porter about the heavy baggage."

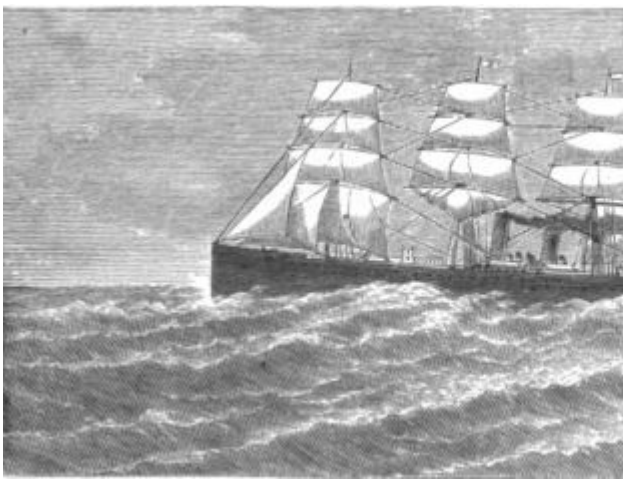
"It's all arranged," said the latter; "the baggage-wagon will take our trunks, chairs, and other heavy things, and have them ready at the pier, so that we shall have only our satchels and rugs for the carriage."

"An excellent plan," was the reply; "and the next business before us is to go to breakfast."

The conversation recorded above took place not many months ago in the corridor of the Fifth Avenue Hotel, in New York. The parties to the dialogue were Dr. Bronson, his nephew, Fred Bronson, and Frank

Bassett, a cousin of Fred. Some of our readers have met this trio of travellers, or, at all events, have read of their wanderings in Asia and Africa. When we last saw them they were on their homeward journey from Zanzibar, after making the ascent of the Nile, visiting the equatorial lakes of the Dark Continent, and reaching the Indian Ocean at Bagamoya. Those who have perused the narrative of the travels of Frank and Fred with the amiable doctor will need no further introduction.[1]

The Doctor and his young friends had planned a journey to South America, and at the time our present story begins they were just starting on their new adventure. With their experience in former travels they realized the wisdom of going to the steamer in ample season to take everything leisurely, and be comfortably settled before the hour of departure.



ON THE SEA AGAI

Promptly at the advertised time the steamer left the dock, followed by the cheers of the crowd that had come to witness her departure or say farewell to

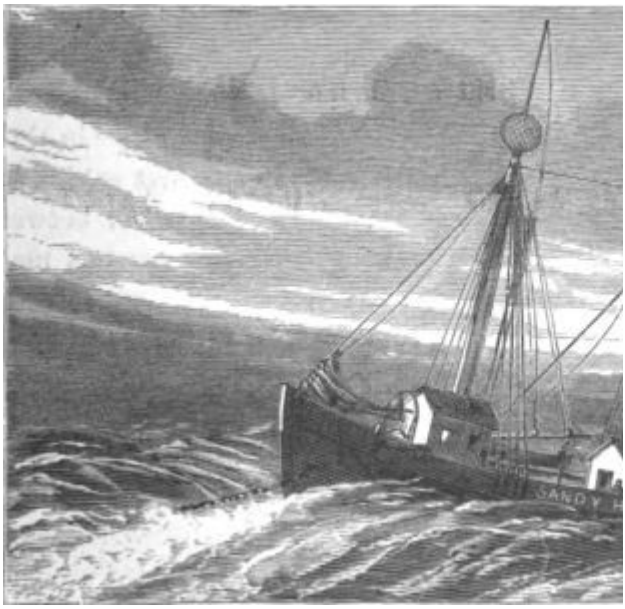
friends on board. As she moved slowly into the river there were dozens of handkerchiefs fluttering over her rail, and other dozens waving answer from the shore. Steadily the distance between ship and pier increased, and it soon became impossible to distinguish friends from one to the other, even with the aid of glasses. With her engines at half speed the great vessel moved majestically down the channel, passed the Narrows, and entered the lower bay. A fog blowing in from seaward compelled the pilot to order the anchor dropped, and the chain rattled through the hawse-hole with a vehemence that seemed to threaten the safety of the steamer's bows.



THE FOG CLEARING A

For two hours the fog continued; then it lifted, and the way to the ocean was revealed. Up came the anchor, round went the ponderous screw, the outer bar was passed, the pilot, his pocket filled with letters, the last messages to friends on shore,

descended to his boat and was safely deposited on the light-ship at Sandy Hook, and then the steamer took her course for more southern waters.



SANDY HOOK LIGHT-S

The flag of the Pacific Mail Steamship Company fluttered at the main-truck, and it needed little observation to show that the craft on which our friends had embarked belonged to that famous organization. When the project for visiting South America was first discussed, the Doctor told his young friends that their best plan would be to proceed from New York to Aspinwall by one of the Pacific Mail Steamers. "We will then," said he, "have the whole of the continent before us; we can go down the western coast to any point we choose to visit, or we can travel along the northern and eastern coast, and make our way westward by one of the overland routes, or through the Strait of Magellan.

We can ascend the Amazon, or descend it, or we may cross the Andes in the vicinity of Santiago. We will leave our plans incomplete till we reach Panama, and there be guided by circumstances."

As our friends were by no means novices in ocean travel they speedily dropped into the ways of the ship and made acquaintance with the passengers and officers. The passengers were a polyglot collection, numbering some fifty or more, and including about a dozen nationalities. There were Americans, on their way to California or Central America; Englishmen, with similar destinations, or bound for Callao and Valparaiso; Frenchmen, who were interested in the work on the Panama Canal; Peruvians, Chilians, Nicaraguans, and other natives of Central and South America; Germans, commercially engaged in the republics beyond the Equator; besides, as Fred expressed it in his note-book, "several districts to hear from." But in spite of their difference of nationality they were entirely harmonious, and the voyage proved a most agreeable one.

"Things are not now what they were before the overland railways were built," said one of the officers in conversation with Frank; "in those days we carried three or four hundred passengers in the first cabin, and twice or three times as many in the steerage. Now, the travel between the east and west goes by railway, and comparatively few persons make the sea trip between New York and San Francisco. But it's as pleasant as it ever was, and if people would only think they could spare the additional time there would be more of them going by steamer than by rail. There's no more delightful voyage in the world than from Panama to San Francisco. You are in sight of the coast nearly all the way; the ocean is so calm

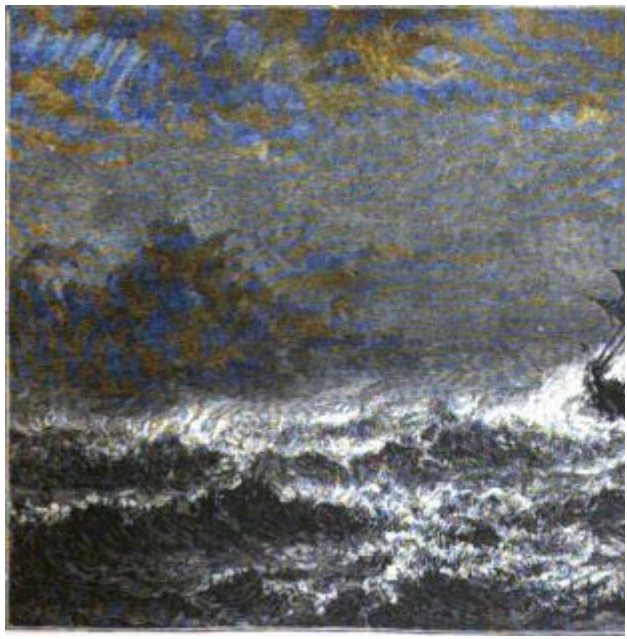
that you might suppose yourself on an inland lake, except on rare occasions; and before you begin to be weary of the trip you are entering the Golden Gate, and making fast to the dock, at your journey's end."

Dr. Bronson confirmed the assertion of this ancient mariner, as he had made the voyage to California in the manner described; "and we used to think," said he, "that we were getting along finely when we went from New York to San Francisco in twenty-three days. Now we can go in a week by the railway, and it is contrary to the American temperament to make the longer journey."

Frank and Fred were agreeably disappointed in the expectation of a storm before reaching the Caribbean Sea. In looking up the accounts of previous travellers they had found an old couplet:

"If the Bermudas let you pass,
You must beware of Hatteras."

They questioned the captain on the subject, and found that the poetical assertion was not without basis, as many a ship sailing on her course had encountered a gale in the neighborhood either of Cape Hatteras or the Bermuda Islands. "But in marine verses, as in every other sort," the captain continued, "you must allow for the poet's license, which often requires a very large margin to include it."

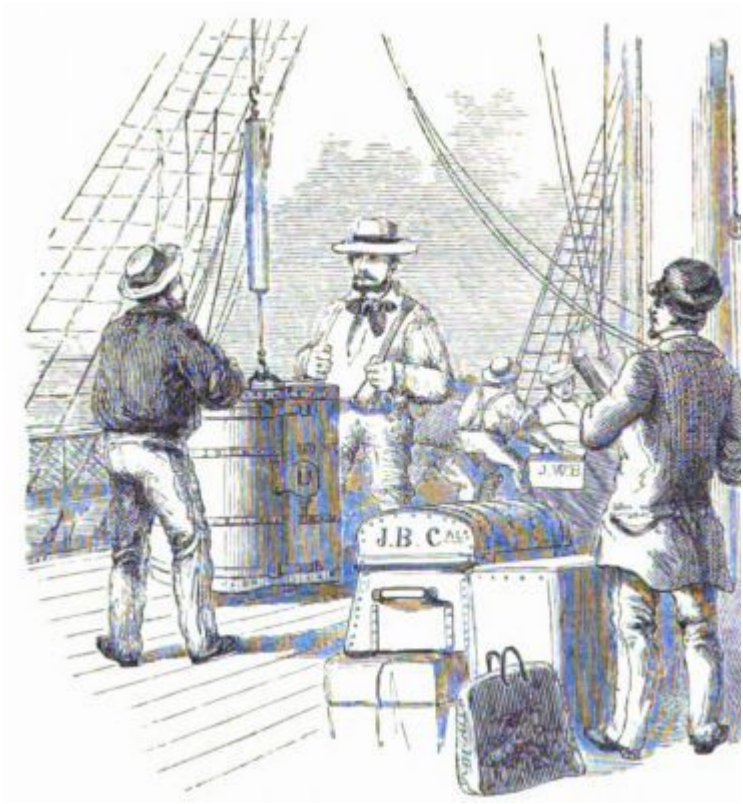


A STRANDED SHIP

Hatteras and "the vexed Bermoothes" permitted them to pass without a semblance of a gale. They sighted one of the islands of the Bahama group, and there was great excitement on board the steamer when it was discovered that a ship was stranded on the shore. Fred and Frank rushed below to tell the Doctor, and that worthy ran on deck as soon as he could don his hat and coat. The captain scanned with his glass the unfortunate craft, and relieved the general anxiety with the information that she had sent a line to the land, and there was no danger to the lives of her people, whatever might be the risk to the property. "If anybody was in peril," said he, "I would do all I could to save him; but when it comes to a mere question of ship and cargo, none of us care to take any risk, or even go out of our course for a minute. It is a serious matter to stop a great steamer

like this, and, besides, it is a peril to her passengers and crew. We will save life always, and the property of our own company, but when it comes to the ships of other people, who would, quite likely, refuse to pay anything for the service without a lawsuit, we mind our own business and keep on our way."

The correctness of his reasoning was apparent to all the listeners, and before the day was over the stranded ship was well-nigh forgotten.



BAGGAGE.

They passed the eastern end of Cuba, and then

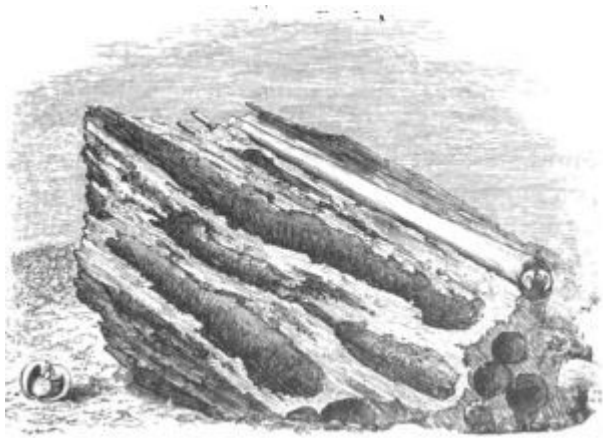
steered between that island and Jamaica. The sight of the palm-trees that fringed parts of the shores reminded the youths of their journeyings in Ceylon and the Malay Archipelago, and increased their eagerness to be once more in tropical lands. In the Caribbean Sea they renewed their acquaintance with the flying-fishes, that darted from wave to wave, and were sometimes so numerous that hundreds of them could be seen at once. On the seventh day of the voyage the heavy baggage was brought from below and piled on deck, each piece being carefully weighed, and checked off on the purser's books. The Doctor explained to the youths that each passenger was entitled to free transportation of one hundred pounds of baggage across the Isthmus, but all above that amount was subject to an extra charge.

At daybreak the next morning the steamer entered the harbor of Aspinwall and made fast to her dock. The city was named in honor of William H. Aspinwall, of New York, but the French persist in calling it Colon, which was its appellation before the Panama Railway was thought of. It was a place of little consequence until the discovery of gold in California, in 1848, called attention to the necessity for a route of speedy travel between the Atlantic and Pacific coasts of our continent.

Frank and Fred were up early on the morning of their arrival at Aspinwall, and as soon as the gang-plank was out they hurried on shore, accompanied by the Doctor. Tropical verdure greeted their eyes as they looked inland, and the open sheds and slightly built houses told very plainly that they had reached a region where frosts were unknown.

The wharf where the steamer lay was more than a thousand feet in length, and, on inquiry, they learned

that it was built on a coral reef, which formed an excellent foundation. "You observe," said Dr. Bronson, "that the piles resting in the water are covered with copper, to resist the teredo, a tropical worm which is very destructive to wood. Perhaps you would like to know something about him.

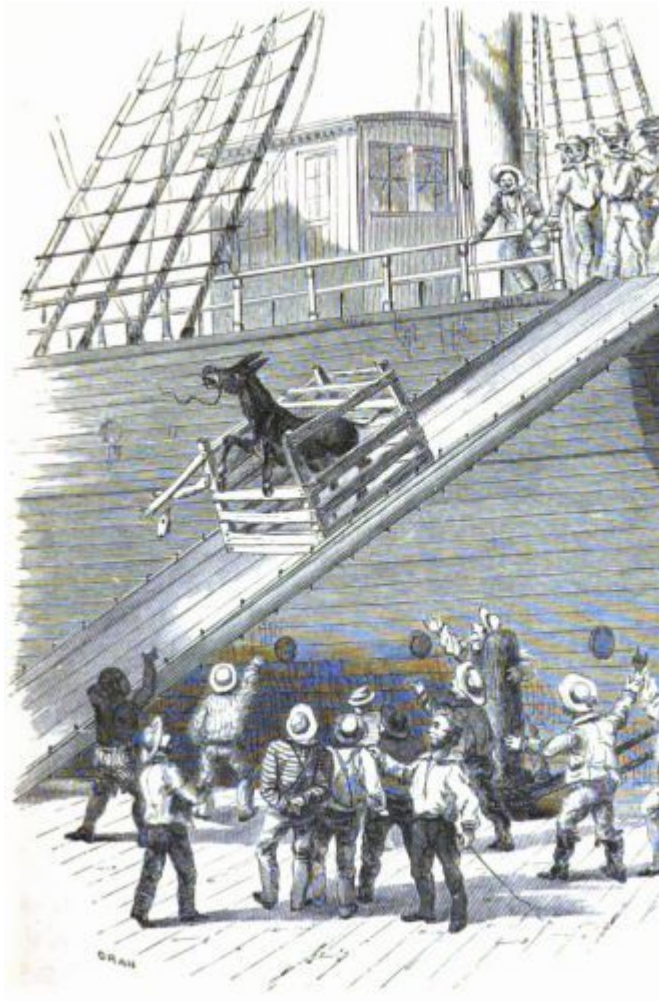


THE SHIPWORM AND HIS WORK.

"Well," the Doctor continued, "the teredo is better known as the ship-worm, a name he has obtained from his habits of attacking the timber of ships in tropical countries, and also in the warmer parts of the temperate zones. He is a long worm with a boring head; imagine an auger endowed with life, and you have a very good idea of what the teredo is. He enters the wood when young, and keeps on boring all his life; he goes in the direction of the grain of the wood, and only turns aside for hard knots or for a fellow-worm, whose presence he seems to detect by the sound of his work. The teredo attacks wood immersed in salt water, and hence his destructiveness to ships and to the piles that support docks and other marine structures. The timber is

perforated and riddled so much that it crumbles to pieces in the course of time, and not a very long time either. Millions of dollars have been lost in consequence of the worm's performance, and not a few human lives. Ships lying in tropical harbors have been ruined by the teredo, and the injury has remained unknown until the vessels went to sea and were lost in the first gale that blew.

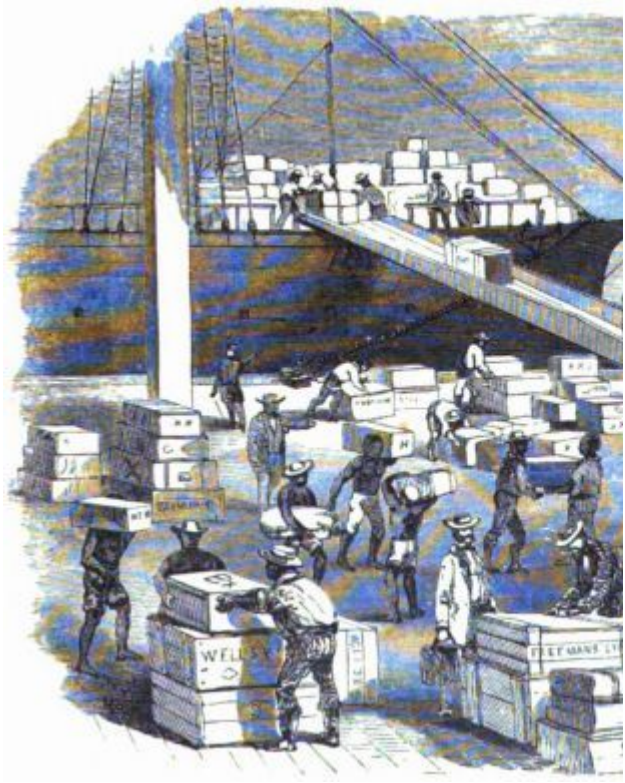
"But he has not been without his uses," said the Doctor, with a smile. "It was the teredo that gave Brunel his idea of a machine for tunnelling under the Thames River, and since his time most of the machines for tunnelling in soft earth have been made on the teredo principle. The head of the worm has a series of cutting disks that eat away the wood; Brunel made a gigantic worm with windows in front, and each window was occupied by a man who removed the earth before him and thus made way for the machine to be pushed forward. The progress of Brunel's worm under the bed of the Thames was exactly like that of the teredo in a piece of wood."



THE DONKEY'S DESCENT.

The Doctor delivered his improvised lecture amid the rattle of boxes that were sliding down the sloping gangway from the side of the steamer, as the process of unloading began almost immediately on her arrival. The lecture was suddenly terminated by the inattention of the audience, the antics of a donkey in

a portable stall having caught their eyes. The animal did not relish the rapid descent along the gangway, as his progress easily averaged a mile a minute, and the momentum acquired in the slide carried him far out upon the wharf. He reared and plunged as he was going downwards, and in his struggles one of the upper slats of his cage was torn off. But at this point he became discreet, and carried his protests no further than to lift up his voice in its loudest tones.



THE WHARF AT ASPIN

Threading their way through the mass of bales and boxes that covered the wharf, our friends were soon on solid earth at the end of the coral reef already

mentioned. Here the tropical forest was visible in all its luxuriance, and not very far away, as the city does not cover a large area, and the trees grow luxuriantly wherever they are not kept down by the hand of man. Dr. Bronson explained to the youths that Aspinwall is built upon the island of Manzanillo, which is about three miles long by a mile in width; the harbor was formerly known as Navy Bay, and is said to have been discovered by Columbus on his third voyage.

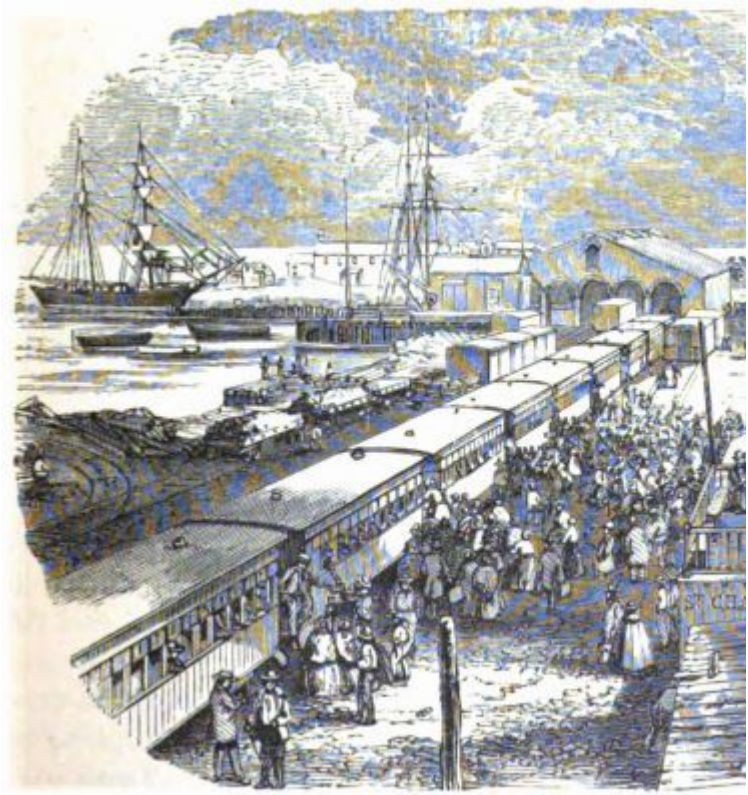
In spite of the commercial importance of the place, Aspinwall contains little to interest the ordinary sight-seer. "You observe," said the Doctor, "that everything is designed for use, and not for ornament; the buildings are of a practical character, and many of them are not even intended to be permanent. There are only a few hundred houses in the city, most of them of wood, and very loosely constructed. Some of the buildings of the railway company are of iron or brick, partly as a precaution against fire, and partly to secure immunity from tropical insects and the rapid deterioration of wood in the damp climate of the Isthmus. The canal company has followed the same plan in the construction of its shops and sheds, but as these structures will be of no further use when the canal is completed there is no attempt to make them ornamental. In the ordinary parlance of the tourist, Aspinwall can be 'done' in half an hour."

Following the Doctor's suggestion, they strolled along the street of hotels and shops near the head of the wharf, passed in front of the stone church, the first Protestant edifice ever erected in New Granada, gave a hasty glance at the iron buildings of the Panama Railway, and then returned to the steamer for breakfast. After that meal was concluded they went

on shore again, arranged for temporary quarters in one of the hotels, and immediately transferred their baggage to it.

As soon as they were settled at the hotel a carriage was ordered for a drive around the island by the "Paseo Coral," as the encircling road is termed. For much of the way the drive was through, or close upon, the tropical forest, and the youths were more than once reminded of their excursion in Singapore, and the ride in Ceylon from Point de Galle to Colombo. On one side of the island there was a view of the ocean, while on the other the scene included the dense swamp and series of islands lying between them and the mainland, with an occasional glimpse of the mountains that form the dividing ridge between the Atlantic and Pacific. The Doctor's scientific ardor was roused by the numerous shells with which the beach was strewn, and several times he stepped from the carriage to gather specimens for his cabinet of conchology. The youths looked longingly at the bananas and other fruits which grew in abundance, but they heeded the advice of their mentor, and abstained from indulging. Aspinwall is not a healthy place at best, and the dangers of a stay there are greatly increased by an intimate acquaintance with the products of its gardens, when one has freshly arrived from a sea-voyage.





PANAMA.

On returning from their excursion our friends went to deliver letters to one of the officials connected with the canal company's works, but, not finding him, they went to the railway terminus to witness the departure of the train for Panama. The passengers, mails, express matter, and "fast" freight had been loaded as expeditiously as possible into a train of eight or nine cars, and when all was ready the usual signals were given, and the locomotive moved off with its burden. One of the officers of the steamer had joined our friends, and explained that it was the custom of the company to despatch a special

train on the arrival of a steamer, whether from Europe or America, in addition to the regular trains that were sent each way daily. Sometimes five or six trains were sent off in a single day, but such occurrences were unusual.

"In the old times," he continued, "when this was the principal route of travel between New York and San Francisco, the arrival of a steamer made a busy scene. Several hundred passengers were to be transferred, together with a large amount of mail and express matter; the passengers were packed into the cars as closely as possible, and when there was an unusual rush it took two or perhaps three trains to carry them all. In such cases the steerage passengers were sent away ahead of the others, while the cabin passengers and mails followed an hour or two later. Most of the passengers were encumbered with several articles of hand-baggage, together with oranges, bananas, and other fruits bought from the natives that swarmed around the station; you would have thought they were setting out for a journey of a week or more, and provisioning themselves accordingly, instead of a continuous ride of three or four hours over a railway. There was often a contest for places in the carriages, and many an impromptu fight has occurred on the spot where we are so peacefully standing."

Soon after the departure of the train Dr. Bronson and the youths returned to the hotel, where they found the official from the canal company awaiting them. He was accompanied by Mr. Colné, the secretary of the American committee of the company, and after the formalities of introduction were completed the party set out for the Atlantic entrance to the promised waterway from the Caribbean Sea to the

Bay of Panama.

The entrance to the canal is on the mainland, just behind the island on which Aspinwall is situated. The island has been enlarged in this direction, and, when the great ditch is completed, Aspinwall will be its Atlantic terminus in much the same way that Suez is the Red Sea terminus of the Suez Canal.

Our friends were surprised at the magnitude of the works of the canal company, as they walked through the miniature city which has sprung up since the work of cutting the waterway was undertaken. There were acres and acres of warehouses and workshops, dwellings for the laborers, and residences of the officers, together with other edifices connected with the enormous enterprise. There was a scene of activity around the machine-shops, where engines and dredges were undergoing repairs, and it was difficult to believe that all this life had been infused into the tropical languor of the Isthmus in the past few years.

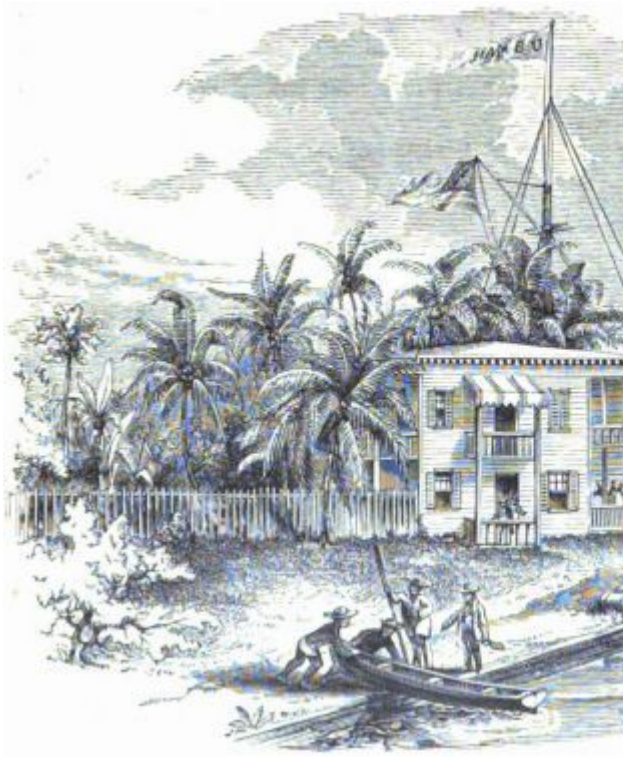


NATIVE MARKET, ASPIN

Mr. Colné told the strangers that the new town had received the name of Christopher Columbus, in honor of the great navigator, who was believed to have visited the spot on his third voyage, at the time he discovered the bay in which Aspinwall is situated. "And here," said he, as they reached a row of neat cottages, "is the street called Charles de Lesseps; these houses were made in New York and then brought here and put together, and we have houses at other places of the same character. Most of our dredges were made in the United States, and an American company has taken the contract for a large part of our excavating. Part of the land on which the city is built was reclaimed from the bay by filling in with the earth dredged out for the canal and its approaches. Before we get through with the work we

shall have changed the appearance of this part of the coast so that its friends will hardly know it.

"When we came here," he continued, "one of the first things we determined upon was the deepening of the harbor of Aspinwall up to the point where the canal is entered. As soon as the dredges were ready they went to work and made a channel that permits the largest ships to come up to the shore. We might have left it till the end of the enterprise, but it was better to have it done at the outset, as it facilitates the landing of our material."



PREPARING FOR A BOAT EX

At the suggestion of Mr. Colné the party entered a

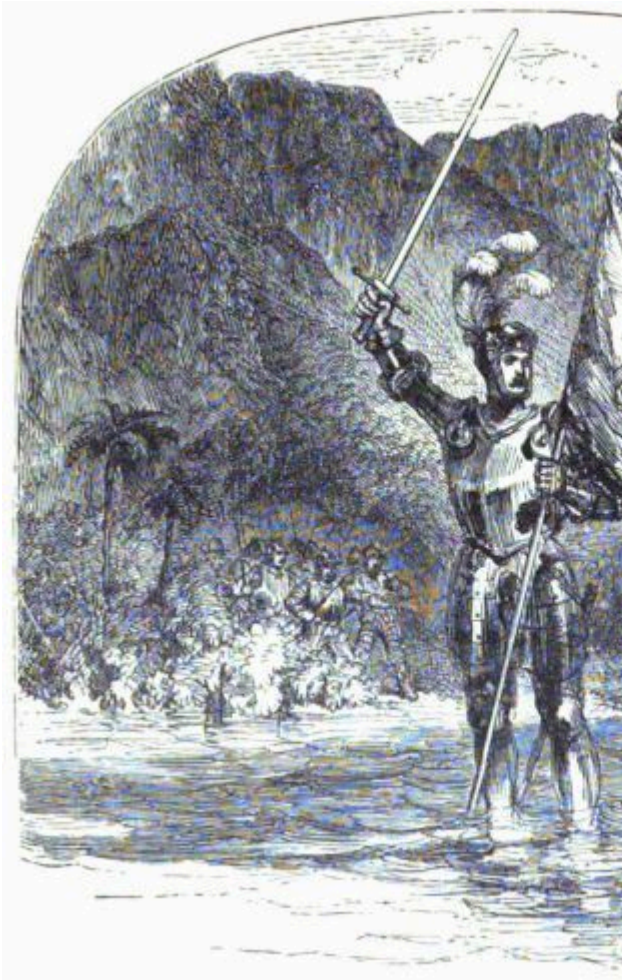
boat, and spent a half-hour or more in an excursion around the harbor. While they were being propelled by the strong arms of six negro boatmen from the West Indies, their entertainer told them about the history of the canal enterprise. Frank and Fred listened eagerly to the narration, and the former made notes of its most important points. With the aid of these memoranda we will endeavor to repeat the story.

> NOTE.—This book was written and in the hands of the publishers previous to the burning of Aspinwall by insurgents, in March, 1885.

CHAPTER II.

FIRST DAY ON THE ISTHMUS.—THE PANAMA CANAL.—HISTORY OF THE CANAL ENTERPRISE. —PLANS OF BALBOA AND OTHERS.—THE VARIOUS ROUTES PROPOSED.—STRAIN'S SURVEY OF DARIEN.—VISITING THE WORKS AT PANAMA.

"The idea of a waterway across the narrowest part of the American Continent, or, rather, of the isthmus connecting North and South America," said Dr. Bronson, "is almost as old as the discovery of the New World."



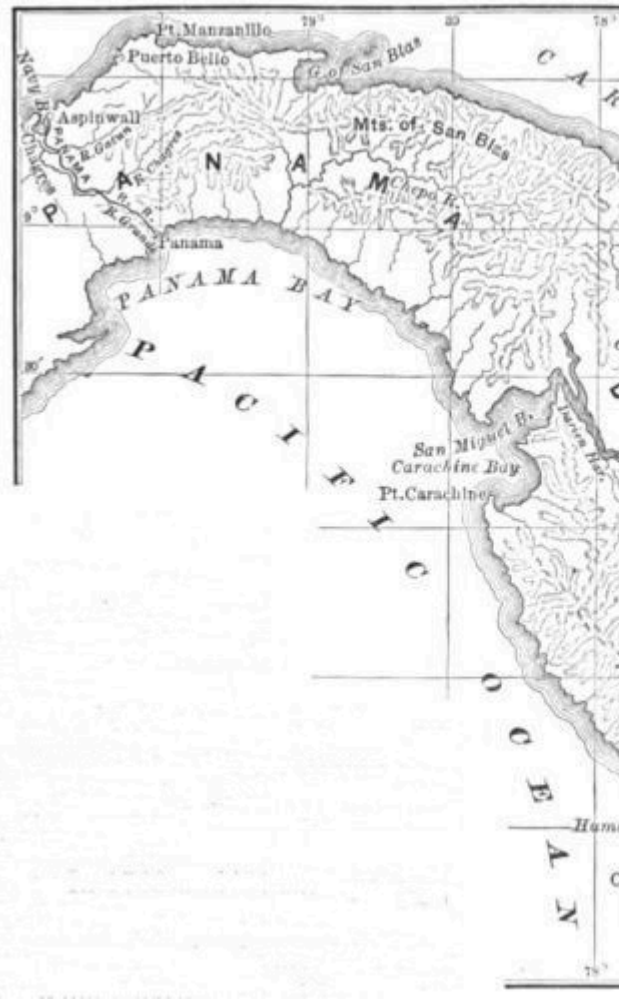
BALBOA TAKING POSSESSION O

"Quite right," replied their host. "In 1513, or twenty-one years after the discovery of America by Columbus, Vasco Nunez de Balboa, having taken possession of the Pacific Ocean, proposed making a passage through the rivers of Darien, but his death shortly afterwards caused the project to be dropped.

"Ten years afterwards, or in 1523, Fernando Cortez

had conquered Mexico, and proposed a waterway through the Isthmus of Tehuantepec. He employed Gonzalo Sandoval to make a very careful survey of the route, and continued to urge his proposition after the Emperor Charles V. had removed the government of Mexico from his control. But the emperor was not favorably impressed with the scheme, which contemplated the expenditure of a vast amount of money, and, besides, he was more interested in obtaining a revenue from Mexico than in doing exactly the reverse. The proposal of Cortez was rejected as emphatically as was that of Balboa, but it is a remarkable circumstance that these two routes are the northern and southern extremes of the lines proposed for inter-oceanic canals.

"By reference to a book by a celebrated Portuguese navigator of the sixteenth century, Antonio Galvao, it appears that, up to the year 1550, four routes had been discovered and examined, though none of them had been surveyed with care. Galvao states in his book that a maritime canal can be cut in four different places: First, between the Gulf of Uraba and the Gulf of San Juan; second, through the Isthmus of Panama; third, along the San Juan River, and through Lake Nicaragua; and, fourth, through the Mexican Isthmus. Several explorers were sent to examine these routes, but they encountered many difficulties, and none of them brought back any exact information. So, you perceive, the principal routes for an inter-oceanic canal were known to the geographical world three hundred years ago."



There was a pause to enable Frank and Fred to examine the map which was spread before them, showing the routes which Mr. Colné had mentioned. When the examination was completed their entertainer continued:

"Very little attention was given to the subject for about two hundred years from the time I have

mentioned. In the latter part of the eighteenth century the idea was revived again; England thought it would be of great value to her if she could obtain control of a passage from ocean to ocean, and in 1778 she sent an expedition against Nicaragua in order to obtain possession of the country. The enterprise was unsuccessful, and the commander, Lord Nelson, narrowly escaped with his life.

"In 1780 and '81 surveys were made of the Panama and Nicaragua routes, the former by order of King Charles III. of Spain, and the latter by Antonio de Bucareli, Viceroy of Mexico. These were the first technical surveys of the routes, all previous examinations having been made without the aid of engineering instruments, and unaccompanied by calculations as to the amount of earth to be removed, and the probable cost of the work.

"In 1804, Alexander Von Humboldt and Admiral Fitzroy, the former having made a personal examination of the Darien route, declared in its favor. This route has had many adherents, and a large amount of money has been expended in its examination. I will not weary you with the names of all the explorers and engineers who have examined the various Isthmus routes. The catalogue is a long one; many valuable lives have been sacrificed in this work, and the most of those who returned alive were able to present only unsatisfactory reports. The climate was fearfully unhealthy; the natives were either hostile to the enterprise or indifferent, and would rarely give assistance; and though the governments through whose territory the routes lay were generally well disposed, they could not always control their subjects."

"Probably the most thorough explorations," remarked

Dr. Bronson, "were those ordered by the government of the United States in 1870. Several ships were fitted out, and the Darien, Nicaragua, Tehuantepec, and Panama routes were examined. Commodore Shufeldt went to the Isthmus of Tehuantepec; Commanders Hatfield and Lull went to Nicaragua, the latter visiting Panama, to complete the exploration of that route. Commander Selfridge and Lieutenant Collins examined the Darien route, and also some of the rivers entering the ocean a little farther to the north. The whole exploration occupied about three years, and the reports are very voluminous. They are more interesting to the engineer than to the general reader, and I did not bring them along as part of my baggage."

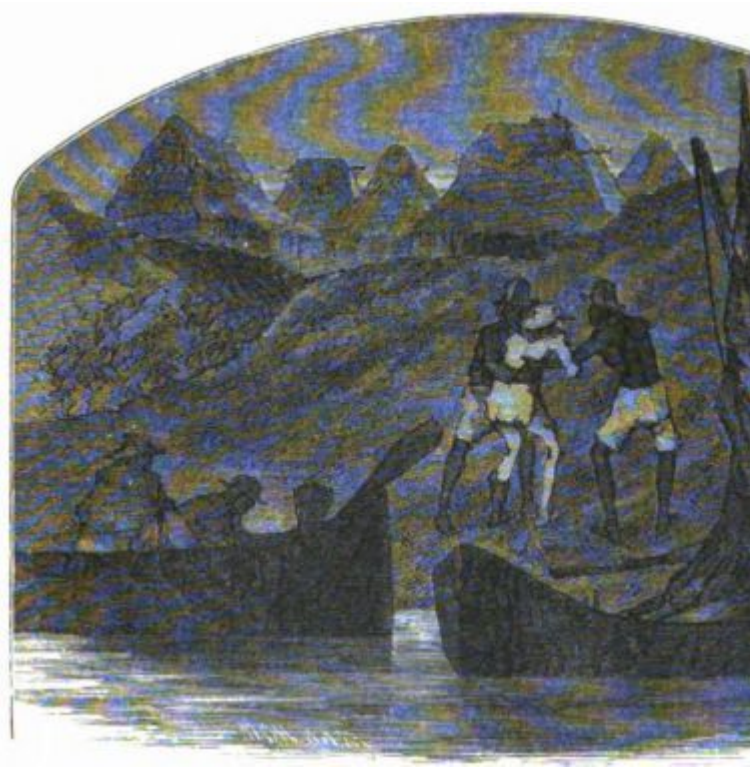
"I have read," said Fred, "about the expedition of Lieutenant Strain. Please tell us what route he examined."



RESCUE OF THE SURVIVORS OF STR

"Strain's expedition was to survey the Darien route," replied the Doctor. "It ended disastrously, as the party lost its way, and also its instruments and provisions, and wandered for many days in a dense forest where the men were obliged to cut their path at nearly every step. More than half the party perished in the wilderness, and Lieutenant Strain died soon after his return to the United States.





THE COAST.

"The misfortunes of Strain's expedition were due in great measure to information which proved to have been almost entirely false. An English engineer, named Gisborne, had published a book containing a pretended survey of the country, which he claimed to have surveyed; in consequence of this report the governments of England, France, New Granada, and the United States of America sent expeditions, all of which failed disastrously. Strain's was the only one of the number that succeeded in crossing from ocean to ocean, the rest having turned back on account of the many unexpected difficulties, and the hostility of the Indians, who attacked them repeatedly. It turned out

that Gisborne had never crossed the Isthmus, and his map of the Darien region was almost wholly imaginary.

"Several companies have been formed at different times," the Doctor continued, "for the construction of a canal from the Atlantic to the Pacific, but the most of them have existed only on paper. The first of these companies was based on Gisborne's imaginary surveys, and was organized in England, with a capital of seventy-five million dollars. Sir Charles Fox and other heavy capitalists were the promoters of this company, and they confidently expected to complete their work before the year 1860. The preliminary operations showed that the canal, if built at all, would cost several times that amount, and the enterprise was abandoned.

"Concessions have also been granted on other routes, but no serious work has been performed; the concessions were limited in the time of commencing and completing the work, and one after another the limit of time expired without anything having been accomplished. The Panama route is the only one on which there has been an attempt to make a canal; the government of the United States has made a treaty with Nicaragua for the construction of a canal through that country, but, up to the present time, the scheme has not gone beyond the surveys and the reports of the engineers."

"We are confident," said Mr. Colné, with a smile, "that our canal from Aspinwall to Panama will be completed, and that large ships will pass through it before the 1st of January, 1890. Indeed, some of our engineers promise it for the New Year of 1889. Thus far the work has progressed quite as fast as we expected at the outset, and if no unforeseen

difficulties arise, we shall have the canal completed before 1890."

One of the youths asked how much the canal was likely to cost, and how it would compare with the Suez Canal, which they had visited on their return from the Far East.

"Not to trouble you with details," replied the Doctor, "the estimate of the cost was originally six hundred millions of francs, or one hundred and twenty millions of dollars. Very few enterprises come within the original estimates, and it is probable that not less than thirty millions of dollars, and perhaps another hundred millions, must be added to these figures, and some engineers say three hundred millions will be required. The cost of the Suez Canal was about one hundred millions, and the work at Suez was very light compared with that at Panama."

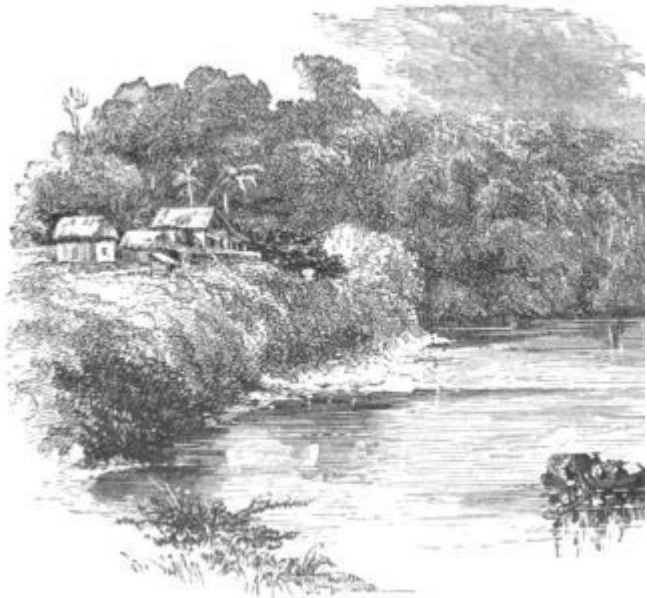
"I remember," said Fred, "that the Suez Canal is practically a great ditch through a sandy country, with no elevation of more than sixty feet, and but very little rock to be cut away. Nearly half the length of the canal was made by filling up depressions in the desert, which were turned into lakes by allowing the water to run into them. Is there anything of the kind here?"

"Not by any means," was the reply; "the Panama Canal is being cut through a region where the difficulties are enormous by comparison with those at Suez. Instead of a waste of sand, there is a tropical forest for the greater part of the way, and in place of the depressions which were converted into lakes to form part of the Suez Canal, we have a chain of hills which are nearly three hundred feet high at the lowest points. The summit level of the Panama Railway is two hundred and sixty-three feet above

the level of tide-water on the Atlantic coast, and the canal must have the enormous depth of three hundred feet, and at some points more than that."

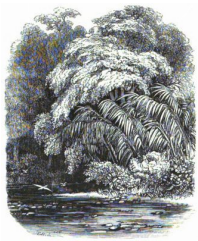
"That is quite correct," replied their host. "It will be the deepest canal cutting in the world when it is completed. On the section of Culebra, in a distance of little more than a mile, we must remove twenty-five million cubic metres of earth and pile it up elsewhere. Fortunately, our work is rendered easy in this respect, as there are many valleys close to the canal where the earth can be disposed of. Do you know how much is represented by twenty-five million cubic metres?"

Fred made a calculation on a slip of paper, roughly converting metres into yards by adding one fifth. Then he reduced the yards into cubic feet, and announced that, with the earth to be removed from the Culebra section of the canal they could build a wall nine feet thick and twenty feet high for a distance of twenty-eight miles, and have a good many car-loads to spare.



VIEW ON THE CHAGRES RIVER.

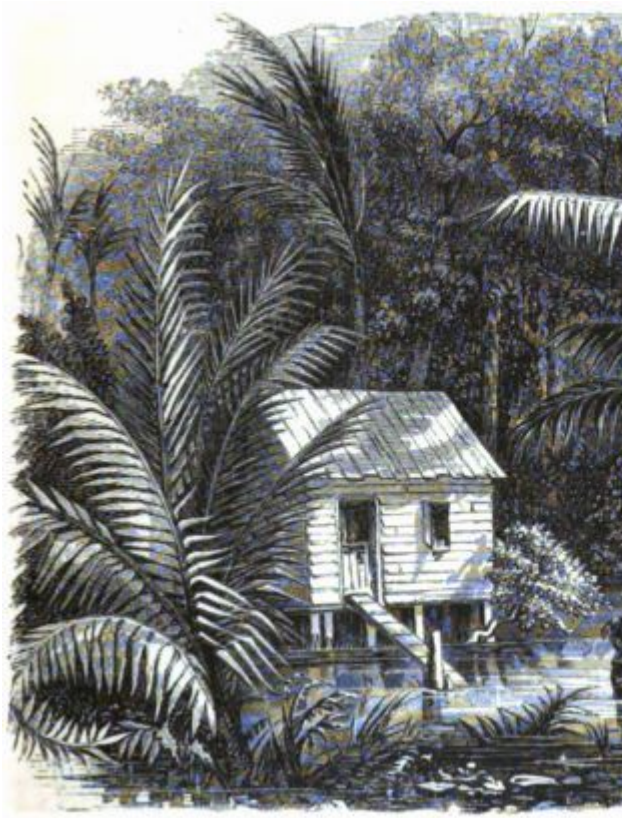
"This will give you an idea of the work to be performed here," replied Mr. Colné, "and you must remember that it is only one single section of the entire line. Then, too, there are great difficulties in the way on account of the rains, and the sudden overflows of the Chagres River, which crosses the line of the canal. Instead of being a depression to be filled with water, it is liable to pour out at any moment much more water than we want."



BEACH NEAR ASPINWALL.

"The average rainfall of this part of the Isthmus," said Dr. Bronson, "according to the official reports, is over twelve feet. This is not distributed through the year, but is confined to about seven months. During a single rain-storm six and a half inches of water have fallen.

"The consequence is that there are excessive floods in the rivers; the Chagres River, which you see represented on the map as crossing the canal, is, in the dry season, a stream about two hundred and fifty feet wide and two feet deep. During a heavy flood it is fifteen hundred feet wide, and over forty feet deep, and it has been known to rise thirty or forty feet in a few hours. In these floods it brings down trees, rocks, and earth, and sometimes houses, and the sides of hills. In one freshet, an iron tank, that stood seventeen feet above the railway track, was washed away, and on several occasions considerable portions of the road have been destroyed."

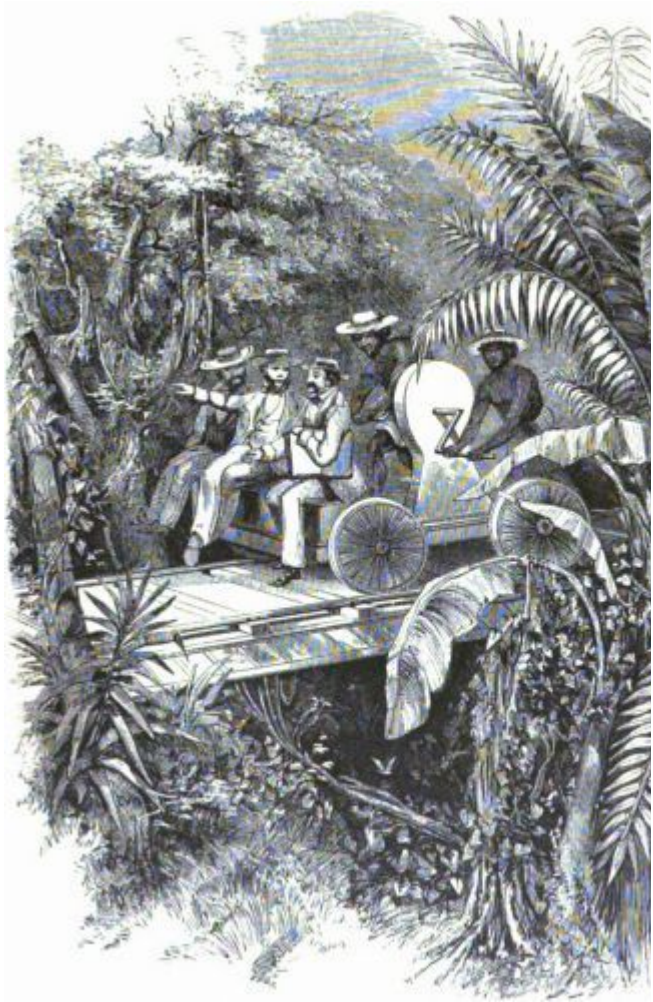


IN THE RAINY SEAS(

"We get over that difficulty," said Mr. Colné, "by making a *barrage*, or dam, across the river, and between two hills, to retain the waters during the freshets, and let them out gradually by lateral sluices. The capacity of the reservoir formed by the dam will be much more than enough to hold all the water coming down in the greatest rise that has ever been known since the railway was completed, in 1855. Mr. De Lesseps says that there are three reservoirs in the world of greater capacity than this: one is at St. Etienne, France; one at La Gillappe, Belgium; and one at Alicante, in Spain. They have

stood for three centuries, and are as good and strong as they ever were. Science has improved since the great retaining walls of Alicante were erected, and the dam of the Chagres River will be perfectly safe, and do justice to the science which constructs it."

By this time the boat had reached the line of the breakwater which was being constructed to protect the harbor from the strong "northers" that sometimes blow at Aspinwall, and make anchorage unsafe. The earth dredged from the canal and from the shallow portions of the bay was partly used for forming the ground already mentioned, and partly for constructing the breakwater. For the latter purpose it was piled between walls of rock, and it was expected that the work would be completed long before the canal was ready for use.

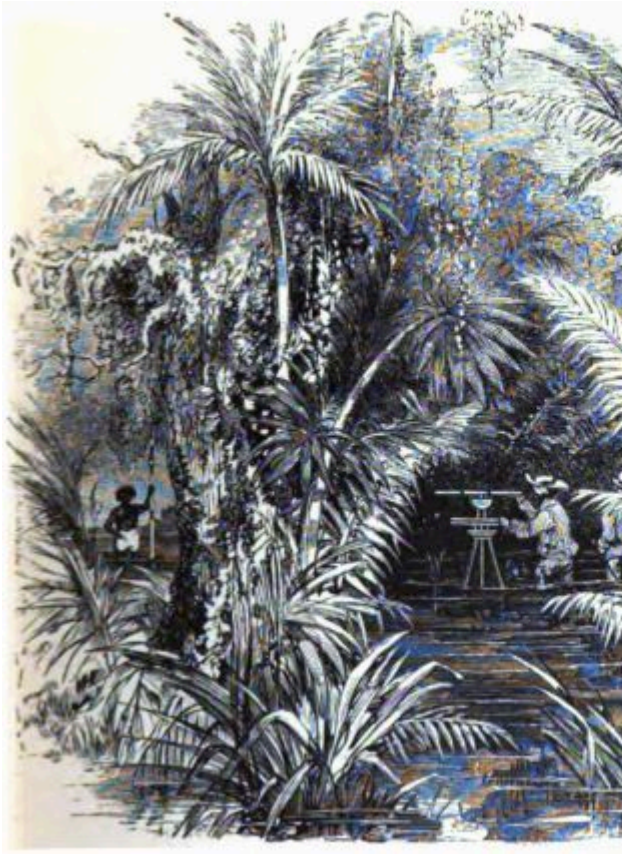


A HAND-CAR JOURNEY ON THE PANAMA

From the breakwater they were taken to the entrance of the channel opened by the dredges for the canal, and the location of the proposed new port was pointed out. Then they proceeded up the great ditch for two or three miles, and landed where the canal and railway were close together. Two hand-cars were

standing on the track and evidently waiting for them. The gentleman to whom they had brought the letter was there, and also one of the officials of the railway. At the invitation of the latter, the party was soon distributed on the vehicles, three on one and three on the other. Comfortably seated on the front of the hand-cars, which were propelled by natives in very scanty dress, our friends rolled easily over the level track, in the direction of the high ground, and also of Panama.

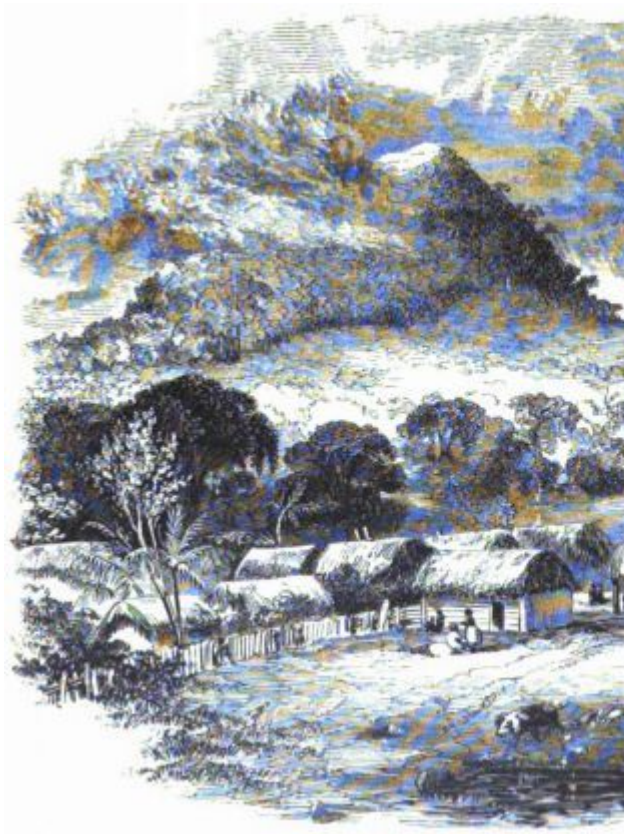
Frank and Fred thought they had never taken a more delightful ride. The air was delicious; there was the luxuriant vegetation of the tropics all around them; birds were abundant in the trees; monkeys occasionally chattered above them, or swung from the limbs, as if inviting the strangers to stop and visit their relatives; the speed was just enough for comfort; their vision was unimpeded, and there was no locomotive in front of them to poison the air with fumes of burning coal or shower them with cinders. Then, too, their guide was a cyclopædia of knowledge, as he had been for a long time connected with the railway and was thoroughly conversant with its history.



SURVEYING UNDER DIFFI

"It was one of the most difficult roads to build that I ever heard of," said he, "and three times the work was suspended on account of the impossibility of getting enough laborers or bringing forward the necessary material. Everything had to be brought from New York or some other American or European city, as there was no labor worth having to be found on the Isthmus itself. Between Aspinwall and Monkey Hill the engineers had sometimes to wade up to their waists while laying out the line, and after the road was completed the track repeatedly sank

down out of sight. It happened several times that two or three hundred feet of road would thus disappear in a single night, and then the whole force of the road was put to work to fill up the cavities. There are some places that were filled two or three times before the road-bed was solid enough to stay. Since the canal company began operations here it has built some new tracks, and occasionally meets with the same trouble, but the old part of the line is all right now.



NATIVE VILLAGE ON THE I

"There is a good story of how the natives of the

country around Gatun had their first view of a locomotive. The track was completed to that point, and a day was set for running an engine over it. People came for long distances; they had heard wonderful stories of the witchcraft of the strangers, and there was great curiosity to know about it. There was an immense crowd, and at the appointed time the locomotive came in sight, puffing vigorously, and emitting clouds of steam and smoke. There was great excitement, which reached the pitch of terror when the creature came into the midst of the crowd, and the whistle was blown. The whole crowd fled to the river, and many of them jumped in, expecting they would be pursued, and possibly devoured.



NATIVE IDEA OF THE LOCOMOTIVE.

"Finding the monster did not follow them, they gathered courage and reassembled, but stood at a safe distance, ready to run again if necessary. They

sent forward their priest to examine the animal; he surveyed it carefully, and then informed his followers that it was not an animal, but a machine, in which there was a veritable demon chained, and compelled to work the crank which propelled it. The explanation was sufficient; the good priest knew it was hopeless to attempt to enlighten them on the uses of steam, and found the demon story the shortest way out of the difficulty. It is just possible, though, that he was not versed in natural philosophy, and his explanation may have been the honest result of his observation."

At several points, as they passed along, Fred observed men cutting away the bushes by the roadside, and, in reply to a question, he learned that the growth of the tropical forest was so rapid that men were kept busy all along the route in keeping it down, so that it would not touch the passing trains. "But it is not without its advantages," said their informant; "what it costs to keep down the rapid vegetation is more than compensated by the interlacing of the roots through the road-bed so that it makes a powerful resistance to the water which rushes down the slopes after the heavy rains. Many a serious injury to the road has been prevented by this mass of roots."





THE ESPIRITU SANTO FLOWER.

Their attention was called to flowers that grew in the forest, and the eyes of the youths were constantly occupied with the varieties of trees and plants that they passed in their ride. There were palms and mangroves, canes, ferns, orchids, and creeping, climbing, and hanging plants almost without number. There was hardly a tree without a parasite, and many trees were covered from the base to the topmost limb with foliage that was not their own. In some cases the trees were actually killed by the parasites that clung to them, and reminded our friends of the picture of a deer strangled by a

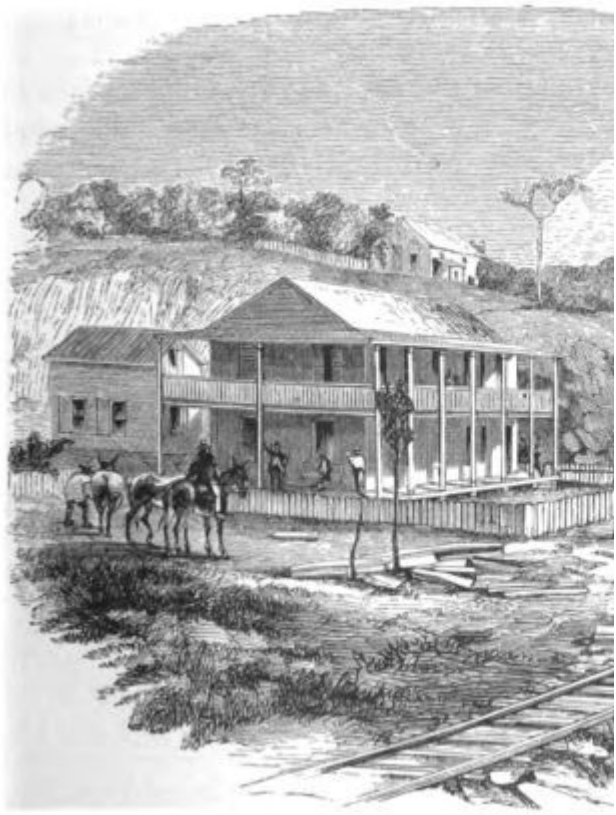
serpent.

Fred asked for the famous product of the Isthmus, a member of the orchid family, *Peristera Elata*, known as "Flor del Espiritu Santo," or "Flower of the Holy Spirit." It was pointed out to them, and, at the youth's request, they stopped long enough to gather a few specimens.

The youths greatly admired the flower, and when they saw it neither of them wondered at its name nor the reverence with which it is regarded in Central American countries. It has a white blossom resembling the tulip, and in the inside of the blossom is the figure of a dove. It needs no imagination to show the form of the bird; there it rests, with its wings drooping at its sides and its head bent forward so that the bill almost touches the breast; the body of the dove is of a snowy white, while the bill is tipped with red. The flower has a perfume resembling that of the magnolia, and it blooms in the latter part of the summer months.

Frank wanted to send home some of the plants, and was told that he could do so with ease, but the bulbs would not live unless they were procured in May or June, when the stalks had been sufficiently developed to produce the flower. It is said that the early Spanish explorers of the Isthmus bowed before this flower and worshipped it, and the reverence that was then developed has never been lost. Down to quite recently it was very difficult to procure specimens of the Espiritu Santo flower, owing to this reverential feeling, and it is only since the colonization of the Isthmus by Americans that the stranger has been able to obtain all he wants. The flower is now cultivated in hot-houses, and has been transported to other tropical countries, where it is

successfully grown.



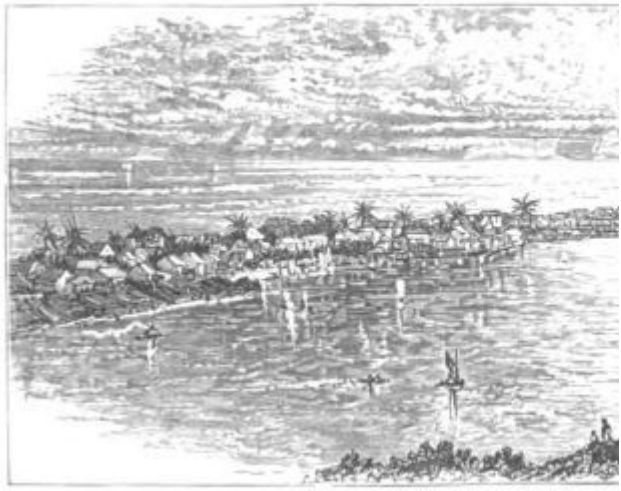
GATUN STATION.

Fred called attention to several trees resembling some they had seen in Java and Ceylon, and Frank picked out three or four varieties of mahogany which he could recognize. Occasionally there was a clearing devoted to bananas and other fruits, and at Gatun Station, where the road was close to the bank of the Chagres River, several natives offered the fruits for sale. The old village of Gatun was on the opposite shore of the river, and consisted of a group of huts half concealed by the foliage. In the old days of

California travel, before the construction of the railway, the inhabitants of Gatun drove a prosperous trade with the gold-seekers; according to one writer, "eggs were sold for twenty-five cents apiece, and the ground-rent for a hammock was two dollars a night."

An excavating machine was in operation not far from the railway, and huge mounds of earth had been thrown up on either side of the line of the canal. Hundreds of laborers were at work, and the scene was, in many respects, a repetition of what they had encountered at Aspinwall, or, rather, at the new city which has risen near it. "This is an American machine," said their guide, as he pointed to the excavator, "and it will interest you to know that the excavators and dredges from New York have proved more satisfactory than those of French construction. They are very effective, and rarely get out of order; the French machines were admirably adapted to the Suez Canal, but the soil here is much harder than that at Suez, and requires a more powerful engine for its removal."

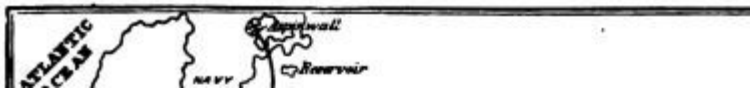
From Gatun the party returned to the canal entrance, and thence to their hotel in Aspinwall. Later they dined with their new friends, and when they retired for the night they felt that they had crowded a good deal of sight-seeing into their first day on the Isthmus.

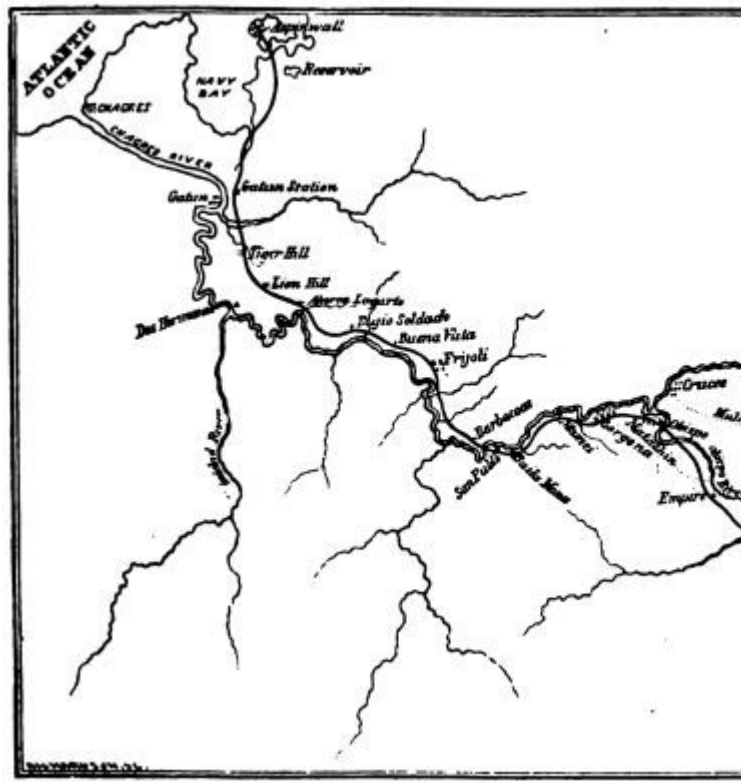


A TROPICAL HARBO

CHAPTER III.

OVER THE ISTHMUS.—A PROFITABLE RAILWAY.—ISTHMUS FEVER.—TROPICAL TREES, FLOWERS, AND ANIMALS.—SIGHTS IN PANAMA.—THE CATHEDRAL.—A STROLL ON THE BEACH.—THE PARADISE OF CONCHOLOGISTS.





RAILWAY.

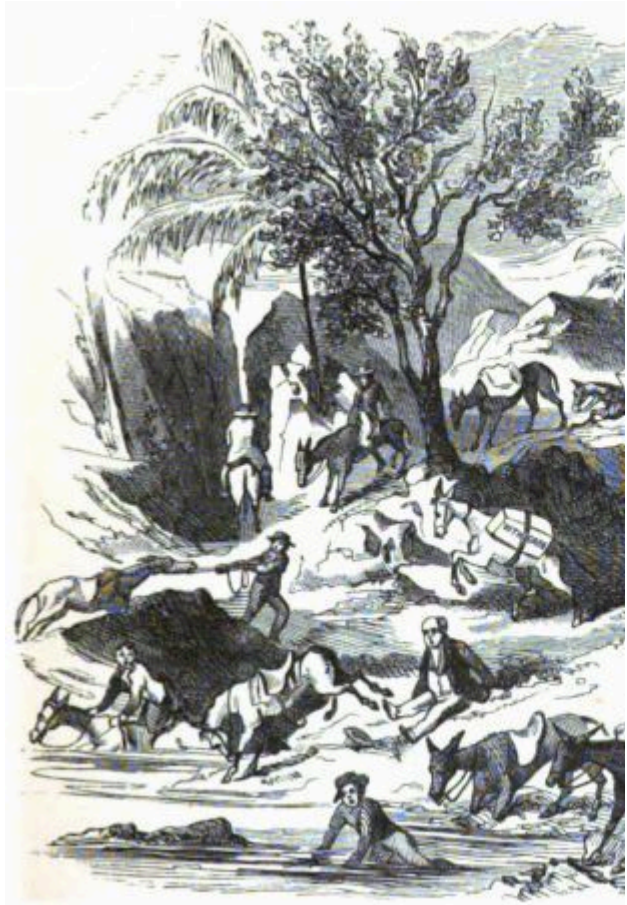
Next morning our friends arranged to leave for Panama by the regular train. Just as they were about starting from the hotel they were met by the manager of the railway, who invited them to occupy the directors' car, which was to be drawn by a special locomotive, and would follow the train an hour or more later. They accepted the invitation, sending their baggage by the train, with the assurance that it would be found at the station at Panama on their arrival. The directors' car afforded superior facilities for seeing the objects of interest along the route, and, besides, they were to be

accompanied by the manager, and also by the official who had been of such practical assistance on the previous day.

They were joined by some of the officials connected with the construction of the canal, and altogether the party was a most agreeable one. Dr. Bronson explained to the youths that when the canal company was organized it was deemed advisable to have command of the railway in order to facilitate the work. A controlling interest in the line was bought by the canal company, and it is fair to suppose that the owners of the shares received a good price for their property.

"The Panama Railway has been the most profitable thing of the kind in the world," said the Doctor, "or, at any rate, one of the most profitable I ever heard of. The managers have generally kept their affairs as much as possible to themselves, and would, doubtless, assure you that they had lost money by their investment, which is often the case with men who have a remunerative business of any kind. The local fare over the line between Aspinwall and Panama was established at twenty-five dollars, and remained at that figure for nearly twenty years. Twenty-five dollars for a ride of forty-eight miles, or more than fifty cents a mile! Thousands of passengers were carried over the road every month, and every thousand passengers meant twenty-five thousand dollars to the railway. At one time the steamships were carrying steerage passengers from New York to San Francisco for eighty dollars, including the transit of the Isthmus; the steamship company thus received fifty-five dollars for carrying a passenger five thousand five hundred miles, including his board and lodging for twenty-three

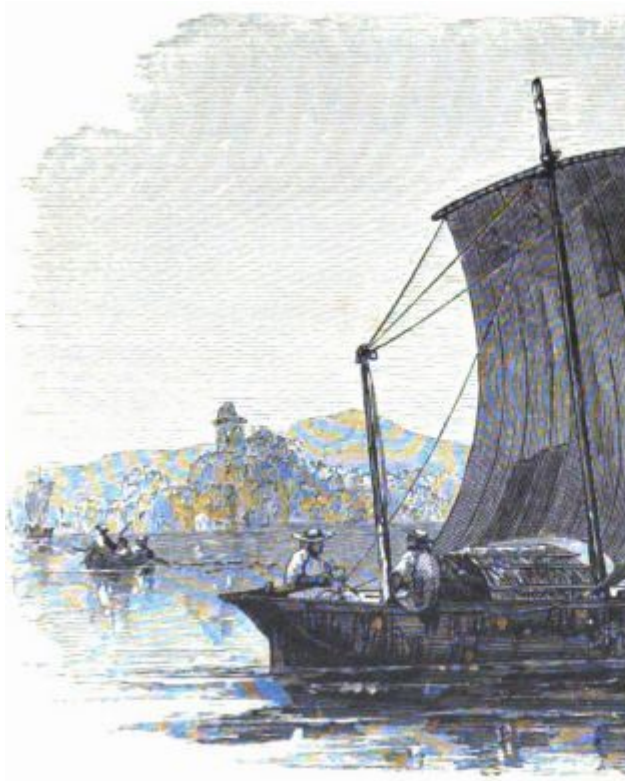
days, while the railway company received almost half as much for carrying him forty-eight miles, lodging him four hours in rickety cars, and giving him no board whatever.



CROSSING THE ISTHMUS

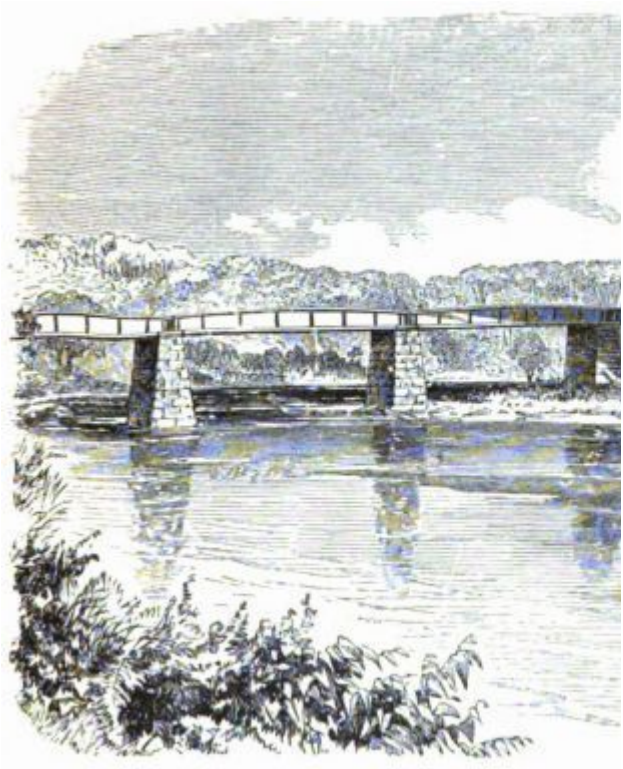
"But bygones are bygones," continued the Doctor, "and if any traveller disliked the price of the railway journey he had the privilege of going by the old route. This involved a tedious journey up the Chagres River by bongoes or native boats as far as

Gorgona, and a ride thence over the hills and through the mud to Panama. The riding was done on the backs of mules, as there was no wagon-road; travellers were often obliged to pass the night in the open air, as there were very scanty accommodations in the few villages along the road; a week or more was generally consumed in the trip; the prices of everything were exorbitant; and the tourist generally reached the end of his journey feeling very much as if he had been passed through a patent wringing-machine. Not a few fell ill and died on the way, and many a fevered sufferer in California, years afterwards, could trace the beginning of his ills to his exposure on the Isthmus. 'Isthmus fever' became known almost as a distinct malady, and it was often very difficult of cure. It is pretty well forgotten now, thanks to the rapid transit afforded by the railway. Under all the circumstances, the enterprising men who constructed this road deserve every cent they received from it; it has saved thousands of lives to the population of the United States and other countries, and has added materially to the commercial facilities of the world. It was built under many discouragements, and the energy displayed in its construction was worthy of a liberal reward."



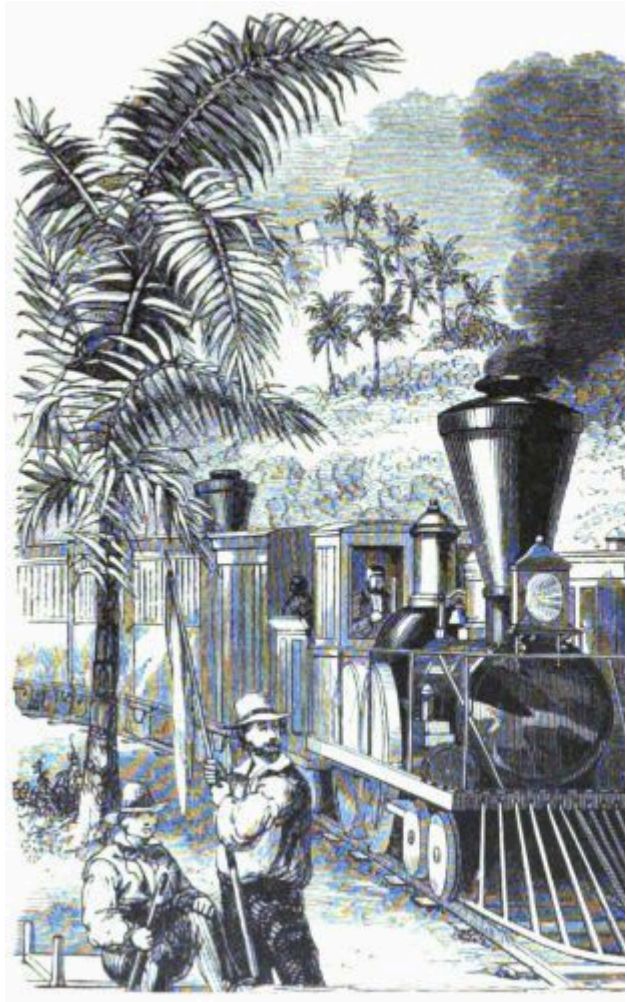
A BONGO.

They rolled merrily over the track and in a little while had passed Gatun Station, and the point they visited in their excursion to inspect the work on the canal. They wound among the low hills and along the bank of the Chagres River, catching pretty views here and there, and passing several unimportant stations without stopping. One of the officials pointed out the cottage which was the favorite residence of Mr. John L. Stephens during his connection with the railway, and also a gigantic tree which has long been known as "Stephens's tree." Other objects of interest were indicated, and there was not an idle moment in the whole journey.



BRIDGE ACROSS THE CHAGRES RIVI

The railway crosses the Chagres River at Barbacoas, where there is a fine bridge, which has withstood the shocks of that capricious stream in a manner that reflects creditably upon its builders. A little beyond Barbacoas they met a train bound eastward, and waited a short time on a siding to enable the locomotive and its burden to get out of the way. The delay gave an opportunity for a brief excursion into the tropical forest, which came close up to the railway, as it does for the greater part of the distance between Aspinwall and Panama.



MEETING A TRAIN

Frank and Fred were accompanied by one of their new friends, who seemed to be well versed in the botany of the country. The first tree to meet their gaze was a palm, and while they were noting its peculiarities their guide told them there was no place in the world where so many varieties of the palm

could be found together as on the Isthmus. "There are," said he, "twenty-one different species of palm-trees; I am informed that three or four more have been found in the vicinity, but I have not seen them. From one of the well-known varieties is extracted the palm-oil of commerce; another produces a sweet sap from which the natives distil a wine they use freely as a beverage; there is the 'sugar palm,' from which sugar is made; the 'sago palm,' which produces sago, but of a quality inferior to that of the Malay Archipelago; the 'ivory palm,' which supplies vegetable ivory; the 'cabbage palm,' whose stalks resemble the cabbage in appearance and taste; and the 'glove palm,' from which bags for holding grain or kindred things are readily obtained. Houses, weapons, domestic utensils, and many other things are made from the leaves, stalks, fruit, bark, or wood of the palm, and the tree is quite as necessary to the existence of the natives of the Isthmus as is the bamboo to the inhabitants of tropical Asia."



THE SINGING HUMMER.

It was impossible to penetrate far into the forest, owing to the network of hanging and creeping plants that blocked the way, and the youths were not long in realizing the difficulties encountered by the surveyor who laid out the line of the railway. Their guide described many of the vegetable growths that were visible, and the number was so great that Frank

was fairly bewildered with them. So he called attention to the birds darting among the thick foliage, and asked about the animal kingdom of the country.



THE HUMMING-BIRD AT WORK.

"There are birds, beasts, reptiles, and insects here in great number," was the reply. "There are parrots of several kinds, some of which will learn to talk while others will not; there are toucans, with enormous beaks especially designed for the disposal of fruits; humming-birds of gorgeous hues and hardly bigger than bees; and there are orioles, trogons, tanagers, and other birds whose names are only known locally or in scientific works. There are wild turkeys and grouse among the hills; the latter are shy and not easily taken, and the hunter is always at a disadvantage on account of the thickness of the shrubbery; the tapir abounds in the low ground and marshes near the rivers, and his flesh is not unlike pork in taste and appearance. You have already seen

monkeys, and if you could go into the forest a dozen miles from the settlements you might see hundreds of them in a single day. They go in large parties oftentimes, and whenever they make a raid on a banana plantation they destroy in a few hours the labor of a whole season. There is a tradition that in the old days the natives used to serve up monkey flesh to the California emigrants under the name of 'opossum.' The opossum is found here, but he is not easily taken, and a man from the States would have no hesitation in eating its flesh, though he might seriously object to dining on monkey.



THE IGUANA.

"Besides the animals I have mentioned," he continued, "we have the ant-eater, peccary, sloth,

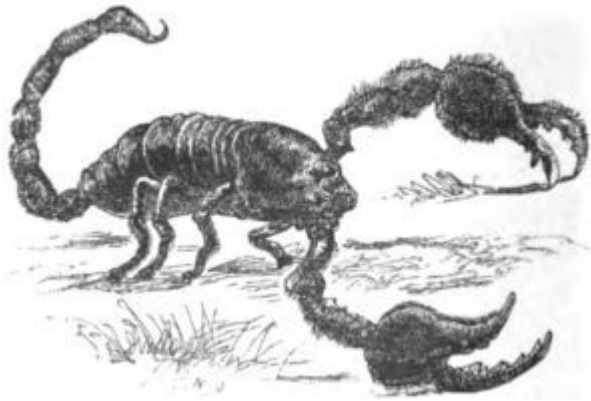
deer, cougar, bear, and tiger-cat; the peccary is also known as the 'wild hog,' and is closely allied to the tapir. There is a lizard called the *iguana*, which is sometimes five or six feet long, and is as delicious as lobster or chicken; its eggs are much prized by the natives, and frequently seen in the markets. Americans who come here are generally chary of eating iguana, because it is a lizard; we have got over this difficulty by naming it 'Panama lobster,' and thus silencing all objections. There's a great deal in a name."



A CENTIPEDE.

The youths admitted the evident truth of the

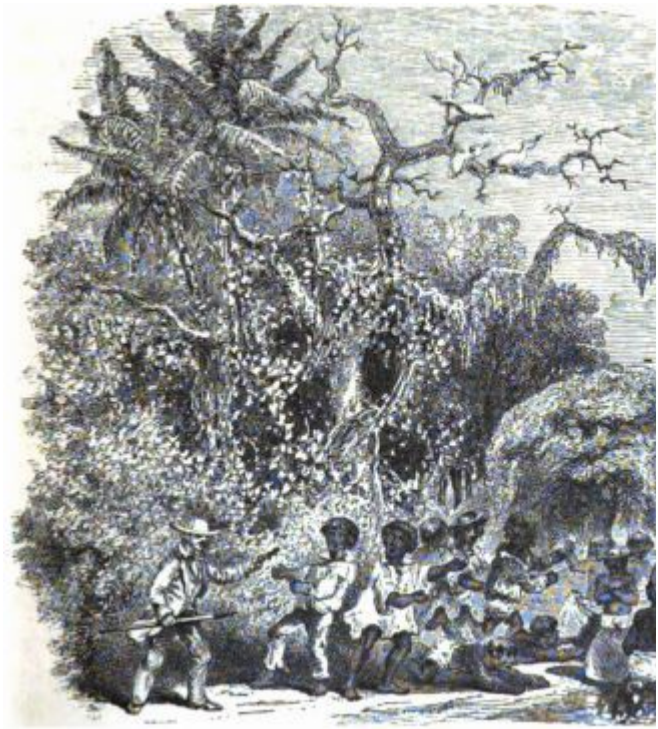
assertion. Suddenly, Frank espied almost under his feet a crab about the size of a half-grown chicken, and asked if it was a "Panama beetle."



A SCORPION.

"Not exactly," replied their guide, with a smile. "It is a land-crab, which is very abundant on the Isthmus, and considered an excellent article of food. It is rapacious, like the crab generally, and comes fearlessly into the presence of man in search of a breakfast. These crabs devour the flesh of animals, and will often reduce a horse or ox to a heap of polished bones in a few hours. It will be well for you to tread carefully on the ground in the vicinity, as you never know when you will encounter a scorpion, tarantula, or centipede, or even a venomous snake. Occasionally we find large serpents of the constrictor species, but they are not as dangerous as the smaller reptiles and insects. The tarantula is a sort of hairy spider, quite pretty to look at, but so venomous that his bite causes death in a few hours. The natives have a belief that if a tarantula simply walks over the flesh without biting there is left a poisonous trail which causes rheumatic and other pains, lasting for years or perhaps for a lifetime. Catch one of these

spiders and show it to a group of natives, and they will run shrieking away from you."



EXHIBITING A TARANTULA.

The whistle of the locomotive put an end to the conversation, and recalled the young naturalists to the train. Fred observed a native with one foot bandaged across the toes, and asked what was the matter with him.

"Probably jiggers," was the reply.

"And please tell us what jiggers are?"

"Its native name is *chigoe*," answered their guide, "and this has been anglicized into 'jigger.' Its scientific name is *Pulex penetrans*; it is a species of

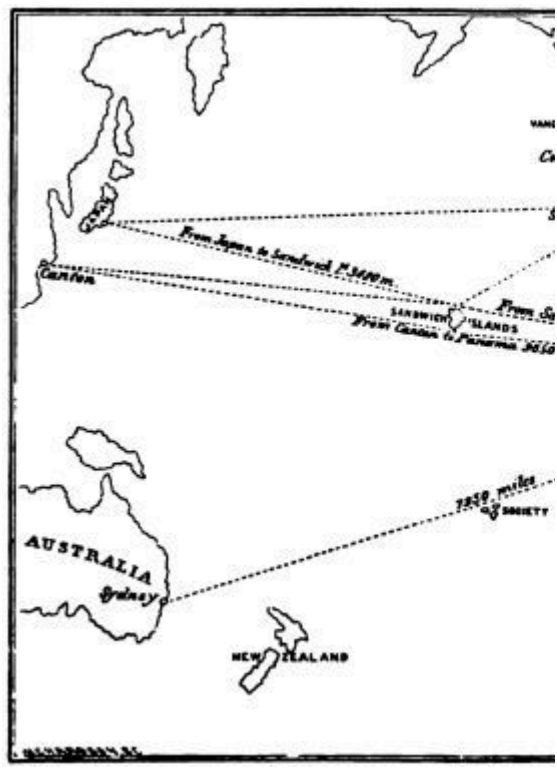
flea which deposits its eggs in the human body, especially under the skin of the foot or the nails of the toes. Its presence is indicated by a slight itching and subsequently by a membranous sac, like the head of a pin. This sac can be removed with a needle or by washing the feet with tobacco juice; if allowed to remain it causes an ulcer, and the victim will quite likely lose his toes. It is necessary to keep close watch to one's feet, and wash them frequently with strong soap or decoction of tobacco."



HILLS NEAR THE RAIL

Natural history gave place to more immediate matters as the train passed one of the points where excavations for the canal were going on. The scene was a repetition of that at Gatun, and needs no special description, but it naturally led to further conversation upon the great enterprise which was intended to unite the Atlantic and Pacific oceans.

Fred asked how it happened that a canal through the Isthmus connecting North and South America was being constructed by Frenchmen and with French capital?



MAP SHOWING HOW OCEAN F

"For the very simple reason," the Doctor answered, "that Americans were unwilling to risk their money in the work and the French were ready to do so. The final surveys were made by Lieutenant Bonaparte Wyse of the French navy, and the expense was paid by French capitalists. M. De Lesseps, whose name has become known throughout the world for his energy in making the Suez Canal, caused an international congress to be assembled at Paris in 1879; this congress decided in favor of the present location, and for a canal without locks. Under his leadership the company was formed, and the work is going on as you see it.

"It is quite likely that diplomatic questions will arise concerning the use of the canal by the great nations of the globe; meantime, we need not disturb ourselves about it, but wait patiently for the day when ships will be able to pass from ocean to ocean. To understand the advantages to commerce which will result from the construction of the canal you have only to look at this map and observe the difference between the proposed routes for ships and those which are at present followed."

The Doctor unfolded a map which we give on page 53. While Frank and Fred were glancing at the routes marked upon it, Dr. Bronson read the following array of figures:

	Miles.
The distance from New York to Sydney, Australia, *via* Cape Horn,	12,870
The distance from New York to Sydney, Australia, *via* Panama	9,950
In favor of Panama	2,920

The distance from New York to Honolulu, Sandwich Isl., *via* Cape Horn	13,560
The distance from New York to Honolulu, Sandwich Isl., *via* Panama	6,800
In favor of Panama	6,760
The distance from New York to Hong Kong, *via* Cape Horn	17,420
The distance from New York to Hong Kong, *via* Panama	11,850
In favor of Panama	5,570
The distance from New York to Yokohama, Japan, *via* Cape Horn	16,710
The distance from New York to Yokohama, Japan, *via* Panama	10,220
In favor of Panama	6,490
The distance from England to Sydney, Australia, *via* Cape of Good Hope	12,828
The distance from England to Sydney, Australia, *via* Panama	12,730
In favor of Panama	98

"Between England and Sydney they don't save much distance," Fred remarked; "but on all the other routes there is a great difference in the figures. We will all hope for the speedy completion of the canal, and on the opening day we'll fling our hats in the air and cheer as loudly as possible in honor of Ferdinand De Lesseps."

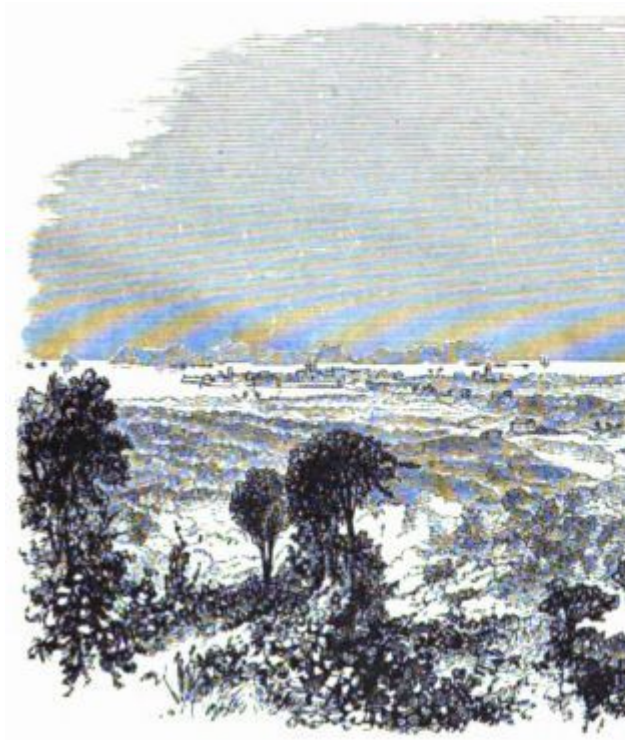


BASALTIC CLIFF.

Meantime the train had left the valley of the Chagres River and was ascending among the hills towards the summit level, two hundred and sixty-eight feet above the ocean. Many of the hills were sharply conical and showed that they were of volcanic origin; high embankments and heavy cuttings followed each other in rapid succession, and at one point the road wound round the side of a hill composed of basaltic crystals about twelve inches in diameter and eight or ten feet long. It was explained that this was one of the few instances in the world where basaltic columns were found in any but upright positions: at

Fingal's Cave, in Staffa, the Giant's Causeway, in Ireland, and the Palisades of the Hudson they are upright, but on this hill of the Panama Isthmus they are in all sorts of positions, and indicate very clearly that there has been a great convulsion of nature since their formation.

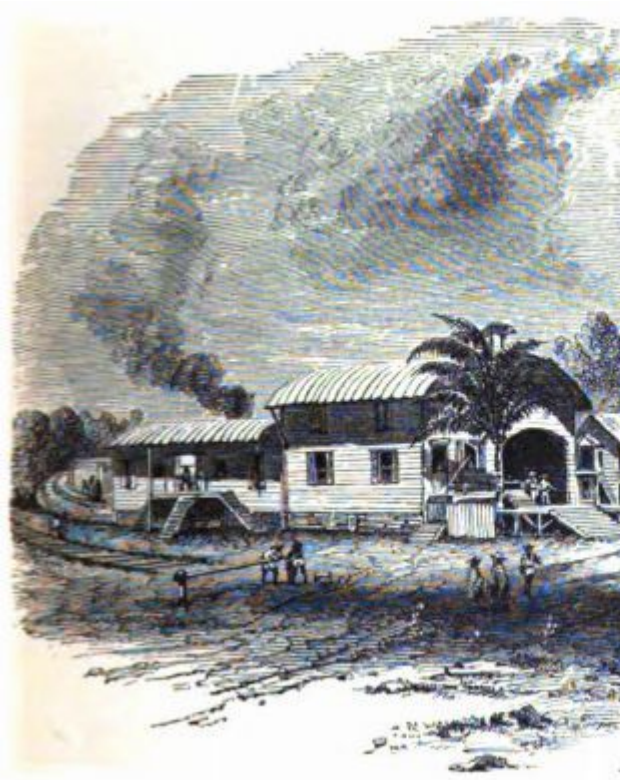
The *Cerro de Los Bucaneros*, or "Hill of The Buccaneers," was pointed out. It receives the name from the fact that from its summit the buccaneer, Morgan, had his first view of ancient Panama in 1668, and he encamped at the base of the hill on the night before his attack upon the city.



PANAMA IN THE DIST

Soon after passing this memorable hill the city of Panama was visible in the distance. Entering the railway station, they came to a halt, and in a few moments Frank and Fred were gazing on the waters breaking on the beach just outside the spacious building. A long pier jutted into the bay at the end of the station; a steamboat was being laden there with freight, intended for one of the large steamers grouped together two or three miles away. Dr. Bronson explained that the bay of Panama is quite shallow for a long way out, and only boats of light draft can come close to shore. The canal company is dredging a channel from the deep parts of the bay up to the shore, which will form an approach to the mouth of the canal, when that work is completed. The tide rises and falls about fifteen feet on the average, varying with the season and the phases of the moon; and consequently a lock will be necessary at Panama to prevent the formation of a current through the canal.

The mouth of the canal is at La Boca, some distance from the railway station. Engineering reasons caused the selection of this spot, as it possessed considerable advantages over the railway terminus. It is the intention of the company to dredge out a large basin near La Boca, where ships can lie in safety while waiting their turn to pass through to the Atlantic Ocean. Until this basin is completed, the anchorage for large ships will be in the vicinity of the islands where the Pacific Mail, and other large companies, have their docks and coaling-stations.



STATION AT PANAM

Our friends found their baggage at the station; they had telegraphed for accommodations in the principal hotel of Panama, and the runner of the house was waiting to meet them. Confiding their baggage to his care, they proceeded at once to the establishment; breakfast had been served in the directors' car during the ride from Aspinwall, and consequently they were ready to start at once to look through the city. We are permitted to make the following extract from Frank's note-book:



CATHEDRAL AT PANA

"Panama contains about eleven thousand inhabitants, and is very substantially built of stone. There is nothing particularly attractive about it, but it is quaint and interesting; the houses are built with court-yards, in the Spanish style, and you might easily imagine yourself in a part of Cordova or Cadiz, or even in Madrid. The cathedral is a fine building for this part of the world, though it would not be

regarded as of much account in any prominent city of Europe. The bells are old and not very tuneful; they are rung at frequent intervals, beginning at an early hour of the morning, and it is not advisable for a nervous traveller to take lodgings in the immediate vicinity of the venerable building.

"The city is in north latitude 8° 57', and received a royal charter from King Charles I. of Spain, in 1521. 'Panama' is an Indian word which means 'a place abounding in fish;' the old city was about six miles northeast of the present one, which dates from 1670. Old Panama was destroyed in 1668, by Morgan, the buccaneer, and for a long time the present city was known as 'New Panama,' to distinguish it from its predecessor.

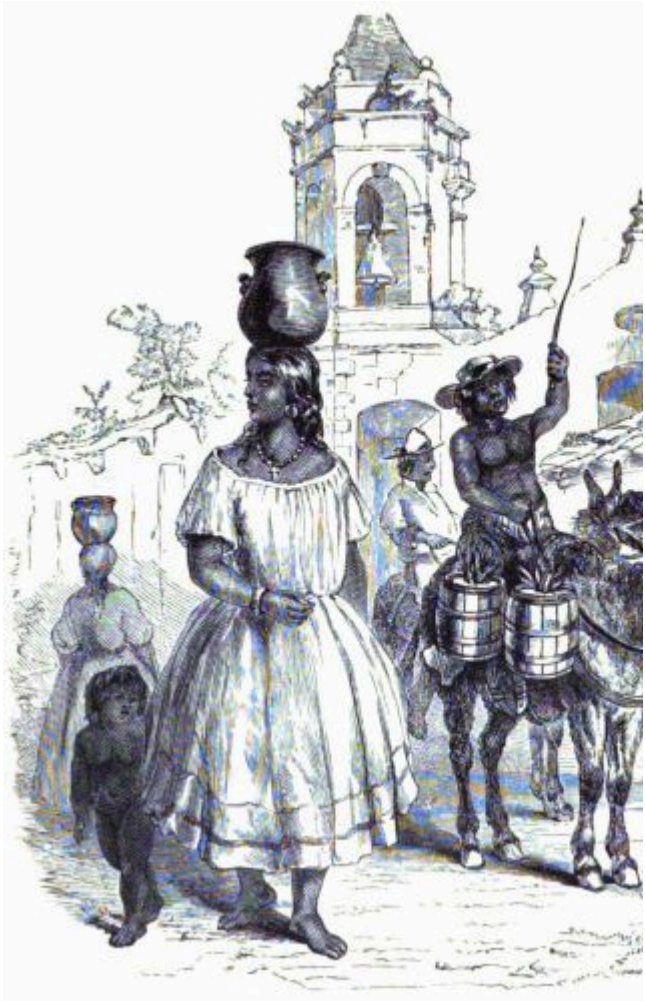


RAMPARTS, WITH OLD C

"The builders of the new city surrounded it with strong walls as a defence against invaders, but these walls have been allowed to go to ruin. They would be of no use against modern artillery, as a few cannon could batter them down in half a dozen hours. In many places, bushes and trees grow among the stones; at one time the inhabitants were allowed to help themselves to building material from the walls, but the practice was not long continued. Originally the walls were from twenty to forty feet high, with battlements and towers at frequent intervals; they cost so much that the Spanish government wrote to the commander of the city, and

wished to know 'whether the walls were builded of silver or of gold.' We saw some of the cannon that were sent from Spain for the defence of the walls; they have not been fired for many years, and would probably explode at the first attempt to use them.

"We went along the principal street, looking into the cathedral, which is probably two hundred feet long by a hundred and fifty in width, and is divided in the interior by four rows of massive columns which support the roof. It contains numerous shrines and altars; the floor is of brick, and when we entered it was being swept by half a dozen dark-skinned natives, one of whom offered to show us through the building. We declined the proposal, as there did not appear to be much worth seeing, and our time was limited.



WATER-CARRIER AND NATIVE WO

"In the plaza or square in front of the cathedral there were little groups of people, a few on horseback, but the most of them on foot. There were a few women whose veils of rich lace showed that they belonged to the upper classes, and others, more numerous, who wore the *reboza* or mantle of the descendants of the

aborigines. There were water-carriers mounted on mules, and on each side of every mule was a couple of kegs of water, with a sprig of grass or a bunch of leaves stuck into the opening on top. Panama has no system of public waterworks, and the inhabitants are supplied from house to house, in the manner of two hundred years ago. The occupation of a water-carrier is said to descend from father to son; nobody gets rich at the business, but it affords a living to a good many people.

"There were many natives riding, or leading mules laden with garden produce from the neighborhood, and also other natives who were their own beasts of burden, and carried baskets or bags on their heads. There were priests in flowing robes and shovel-shaped hats, some hurrying along as if on important business, while others were idling among the people, and evidently enjoying themselves. The cathedral is on the western side of the plaza, and on the southern side is the *cabildo* or Government House, corresponding to our City Hall. It is a plain building of stone, two stories high, and with wide porticoes or balconies on both stories. Here all the business of the city is conducted.

"On the other side of the square there were several plain-looking buildings, with dwellings on the upper stories and stores below; some of them were old, while others were new, and there were two or three gaps where nothing but ruins was visible. Panama has suffered severely from fires. It was almost entirely destroyed in 1737, but was quickly rebuilt, as its business was then prosperous. In 1784 there was another serious fire, and since 1864 there have been three extensive conflagrations whose traces are still visible. The gaps around the plaza are the result

of these later disasters.



GATE OF THE MONI

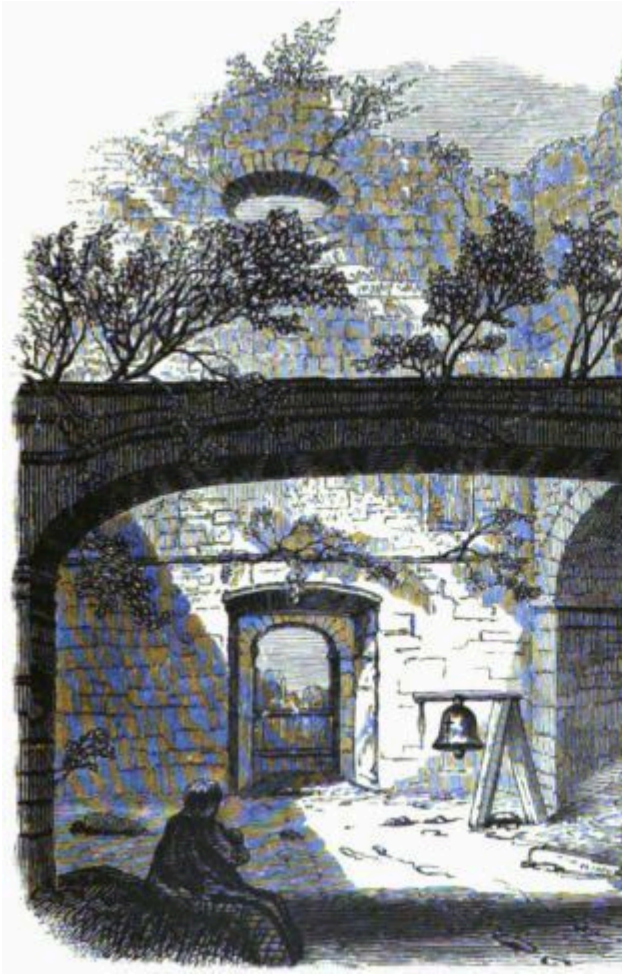
"We crossed the plaza and continued on to the *Postiga de las Monas,* or 'Gate of the Monks,' which is crowned by a watch-tower, and leads through the ruined wall to the beach. A woman and child were sitting under the shadow of the gateway, and people were coming and going, on foot or in the saddle. When we reached the beach the tide was out and there was a large expanse of coral reef visible; it was alive with crabs, shrimps, cuttle-fishes, and other marine products, and we picked up lots and lots of shells of curious form and color. It is a splendid place for conchologists, and if the sun had not been so hot

we would have stayed there an hour or two.



RUINS OF CHURCH OF SAN

"We came back through the gateway, and met one of our late companions of the train. He took us to see the ruins of the Church of San Domingo, which was built soon after the founding of the city, and burned more than a hundred years ago. In its time, it was the finest church in Panama, and was said to possess a great store of silver and gold images and other treasures.



REMARKABLE ARCHV

"Dr. Bronson was anxious to see a remarkable arch which was said to exist in the ruins of the church, and our friend offered to point it out. We passed among the walls, which were thickly overgrown with vines and bushes, and finally came to the archway. It is forty feet long, and has a perpendicular radius at the keystone of only two feet; it is made of brick, and

is said to be a wonderful piece of work. Our friend said he had never heard of anything like it, and that many architects passing through Panama in the last twenty years had seen and admired it.

"Some of the bells of the church were lying where they fell at the time of the fire, and others were hung upon timbers a few feet from the ground, where they could be rung as in the olden time. Our guide told us an interesting story about the way these bells were made and given to the church.

"Soon after Panama was founded, the Queen of Spain invited the ladies of her court to come and bring whatever money they could afford, for the founding of the Church of San Domingo. She gathered a large amount, which was used for building the church. When the time came to prepare the bells, people of all classes were invited to make donations, and witness the operation of casting. They came in great crowds; the queen threw in handfuls of gold, the ladies and gentlemen of the court did likewise; the poor contributed silver or copper, and so the amount of metal in the crucibles increased. Then the queen threw in the golden ornaments that she wore; her ladies did the same; the excitement became great; rings, bracelets, and other valuables—many of them precious relics or family heirlooms—were contributed to the pious work, and thus the bells for the church in the New World were made. Their tone was said to be of the purest, and they are held in great reverence by the priests who have them in charge. High prices have been offered for these bells, but invariably refused."



RUINED CHURCH.

CHAPTER IV.

"THE PLACE OF FISH."—AN EXCURSION TO OLD PANAMA.—VISITING A HERMIT.—DRINKING CHICHI.—RUINS OF THE CITY.—MORGAN THE BUCCANEER.—HIS HISTORY AND EXPLOITS.—HOW HE CAPTURED PANAMA.



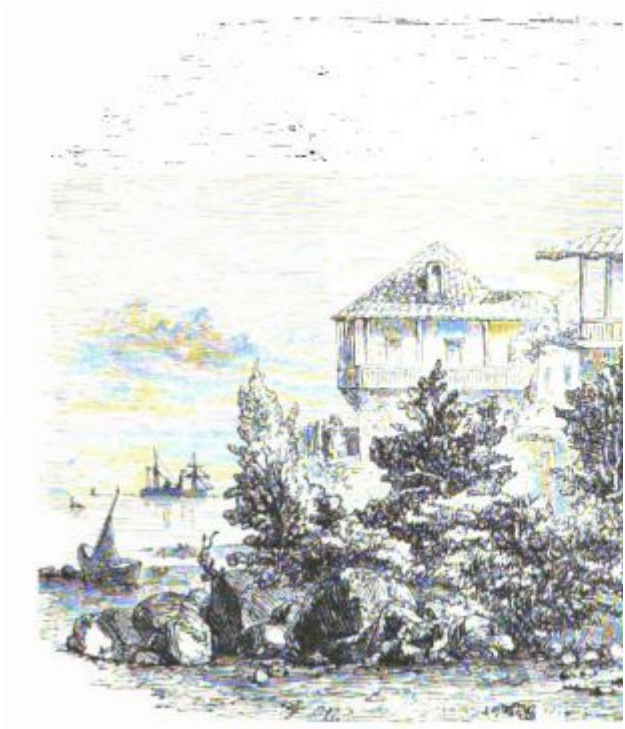
VIEW FROM THE RAMPARTS

From the ruins of the church the youths and their companions strolled to the ramparts of the city, where they watched the sunset gilding the distant hilltops and lighting up the waters of the beautiful Bay of Panama. The wall is here enlarged into a wide promenade, which overlooks a level space containing the arsenal, the military barracks, and the prisons of the city government. The Esplanade is the favorite lounging-place of the people at the close of the day, and our friends had an excellent opportunity to study the local dress and manners. Nobody appeared to be in a hurry, and there was a tendency to divide into groups and couples, very much as in other lands and

under other skies. Some sauntered slowly up and down the promenade, while others leaned over the parapet, or reclined on the grass which covered a considerable part of the Esplanade. Ships and steamers were anchored in the distance, while the foreground of the bay was dotted with native boats, which seemed to be drifting aimlessly in the gentle breeze. Altogether, the picture was delightful, and long to be remembered.

On the next morning our friends were up early for an excursion to Old Panama, which we have already mentioned. As we drew on Frank's note-book for the modern city, we will rely upon Fred for our information about the ancient one.

"We had a delightful ride on horseback," said Fred; "leaving Panama by the northwestern gate, which brought us to the fish-market on the beach. To judge by what we saw, Panama is justly named 'a place of fish,' as there seemed to be a supply three times as large as could possibly be wanted for the use of the inhabitants. There were Spanish mackerel, oysters, bonito, and a good many other fishes, and all of the very best quality, with the possible exception of the oysters. We asked if these oysters were the ones from which pearls are obtained, and they told us the pearl-fisheries were about a hundred miles down the bay, and the oysters not at all like those sold in the market. There was formerly a fine revenue from the pearl-fisheries, but the beds are practically exhausted, and of late years very little attention has been given to the business.



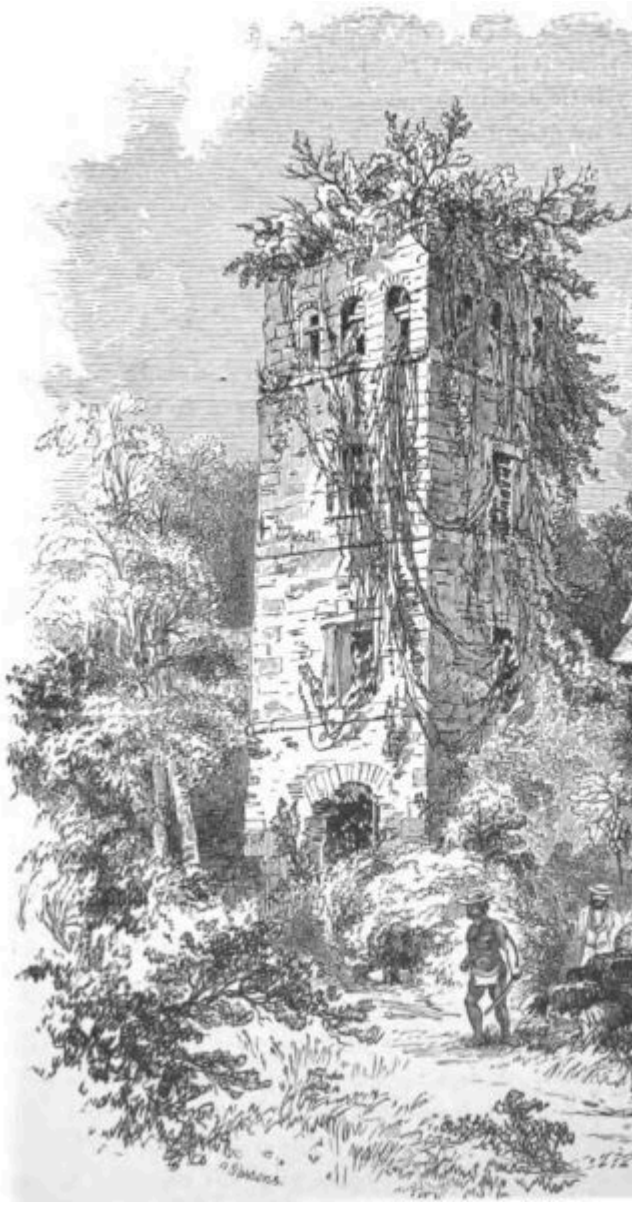
ON THE NORTHEASTERN

"From the market we galloped along the beach for a couple of miles, and then turned inland. We came out to the shore again, after winding among rocks and thick foliage, and followed along the bay till we reached the ancient city.

"Everything is in the most complete ruin; what was left by Morgan has been vigorously attacked by the tooth of time. And I remark, by the way, that the tooth of time is much more effective in its work in the tropics than in the colder north, where the vegetation is less rapid and aggressive. Walls and towers are so overgrown with mosses and creepers that, in many instances, the structures are completely hidden from sight, and their positions are only

indicated by their shape. Seeds carried by the birds, or wafted by the winds, fall into crevices between the stones; they are warmed into life by the temperature, and nourished by the moisture that prevails at all seasons of the year. They grow and flourish in spite of the inconveniences of their position, and after a time they force the stones apart, and the structure is weakened, and hastened to its overthrow.

"Everywhere in Old Panama you can see evidences of this great force of nature. Much of the stonework of the city has been thrown down by the roots of the trees and plants, and in several places we saw stones of great weight resting entirely upon the roots of the trees that had lifted them up. Evidently the city was built to last, and it is a sad commentary upon the work of its founders that it was so soon destroyed. The walls were massive, and the stones carefully cut. The old Spaniards came to America to plant colonies, and make a permanent home, if we may judge by the way they constructed this important city, which was intended to command the commerce of the Pacific seas.



WATCH-TOWER OF SAN JEROM

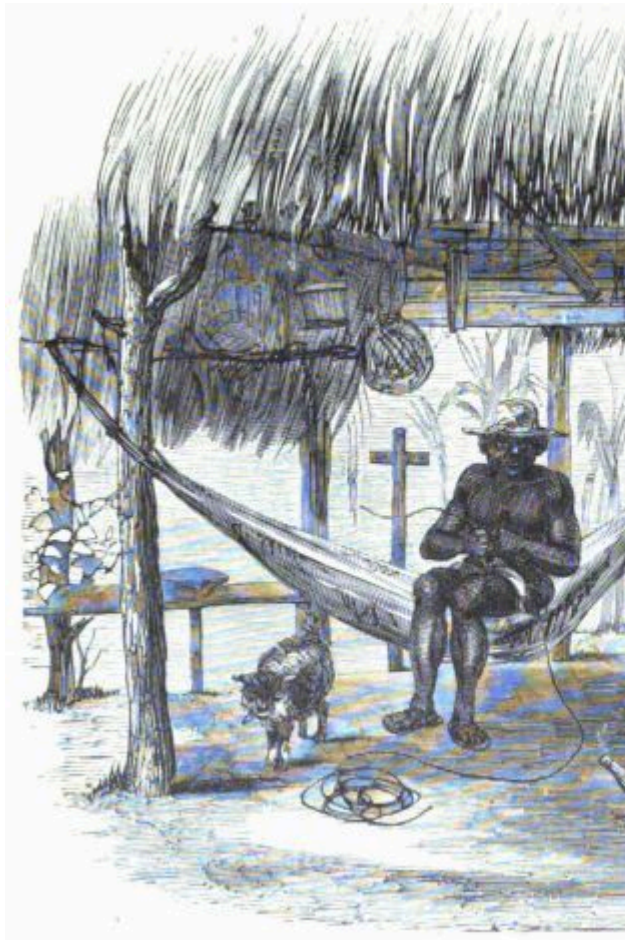
"One of the most interesting relics of Old Panama is

the watch-tower of San Jerome, which is said to have been built only six years before the city's capture and destruction. It is a square tower, and we estimated its height to be about eighty feet; it is covered with mosses and vines, and there are trees and bushes growing on its top. The staircase on the inside has been thrown down by the roots of the trees, as far as we could judge from the position of the stones, though it may have been destroyed by the famous buccaneer. The whole of the inside space was full of roots, and we could not have climbed to the top even if the stairs had remained.

"The tower was intended as a signal-station, from which vessels approaching Panama could be descried, and tradition says a light was burned there at night. It is now the only visible part of the old city as you look from the beach or from a boat on the water; everything else is covered up with the tropical forest, which has been undisturbed for two hundred years. The only way to see the ruins is by clambering through the mass of vegetation; we did so, and were thoroughly wearied with our exertions, though amply repaid for them.

"Not the least interesting part of the sights were the fantastic shapes which the trees and vines had taken; in some places the trees were on the tops of walls thirty or forty feet high, and had thrown down roots on each side reaching into the ground. At every crevice in the walls little twigs were thrown off to hold the roots in place, and it almost seemed as though these vegetable growths had been endowed with human intelligence. Two or three times we were deceived by the appearance of the roots, and mistook them for snakes. Even when assured of their harmless character, Frank paused and deliberated

before moving nearer, and I'm free to confess that I followed his example.



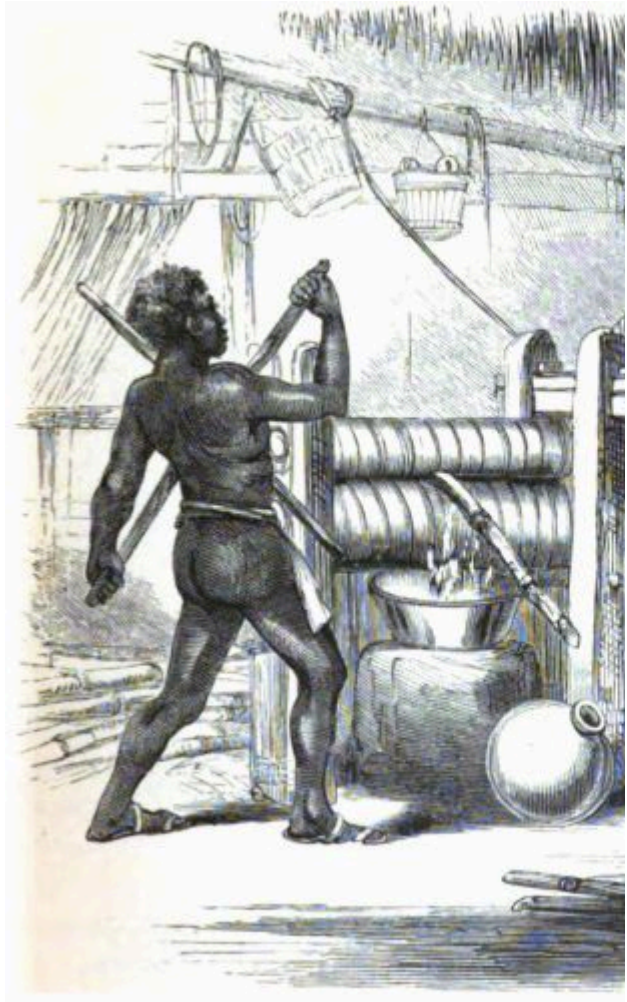
A HERMIT AT HOM

"We were accompanied on our excursion by a gentleman who lives in Panama, but had not been in the old city for two or three years. He said the place had two or three inhabitants, or, rather, there were that number of negroes who lived there, and acted as guides to visitors. With some difficulty he found the

hut of one of them, and luckily for us its owner was at home. His only clothing was a strip of cloth around the waist and a pair of sandals on his feet, and the entire furniture of the place would have been dear at ten dollars. He had a few baskets and earthen jars, an old hammock, a rough bench to sleep on, an iron pot for cooking purposes, and a pair of rollers for crushing sugar-cane. He had a small patch of sugar-cane, another of bananas; the bay supplied him with fish, the beach afforded plenty of oysters, shrimps, and mussels, and the money obtained from visitors was enough for buying his tobacco and a few other trifles which made up the sum of his necessities, and were procured in a semi-annual trip to Panama. He declared that he was perfectly satisfied with his way of life, and as he had been there for twenty years and more, I have no doubt he spoke the truth.

"A prince in his palace could not have been more polite than was this dark-skinned hermit. He had no chairs to offer, but asked us to sit down on his bench; we accepted the invitation, and after handing us a gourd of water, which we found very refreshing, he put on his hat in order to be more fully dressed. Then, with true Spanish politeness, he told us that the house and all it contained were ours, but we couldn't see that we should have been much richer if we had taken him and his belongings at his word. We rested perhaps a quarter of an hour, talking with him about his solitary life, and then asked him to guide us through the old city.

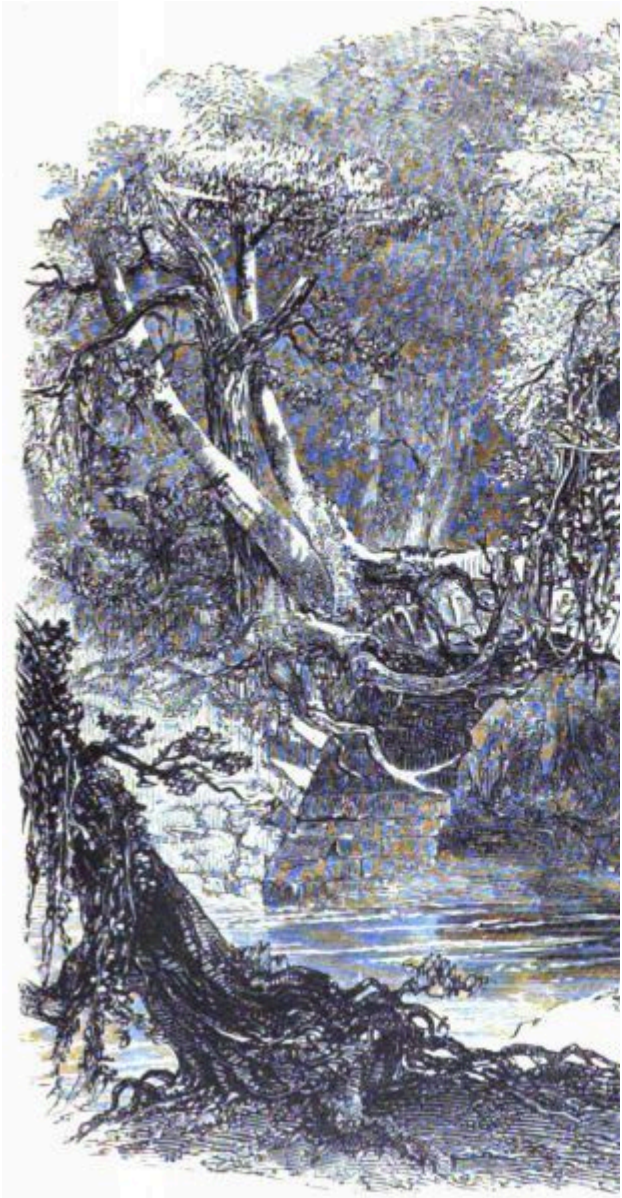
"'*Sí, Señores*,' he replied, touching his hat in a most dignified manner, 'but would we drink some *chichi* before starting.'



MAKING CHICHI.

"*Chichi* is the juice of the sugar-cane, and is a favorite beverage in this region; of course we consented, and he immediately picked up his *machete* (hatchet) and went out. In a little while he returned with an armful of sugar-cane, which he proceeded to pass through the rollers, after first bruising the canes with a mallet

to make the work of crushing easier. Our Panama friend took one end of the machine, and got himself into quite a perspiration before the job was finished; I fancy he did not relish it, but our entertainer did not seem to mind it in the least. The machine was a rude construction, and not to be compared with the polished rollers that are to be found in sugar-manufactories on a large scale, but it was entirely adequate to the wants of our sable host.



BRIDGE AT OLD PAN

"We drank the *chichi*, which was most refreshing, and

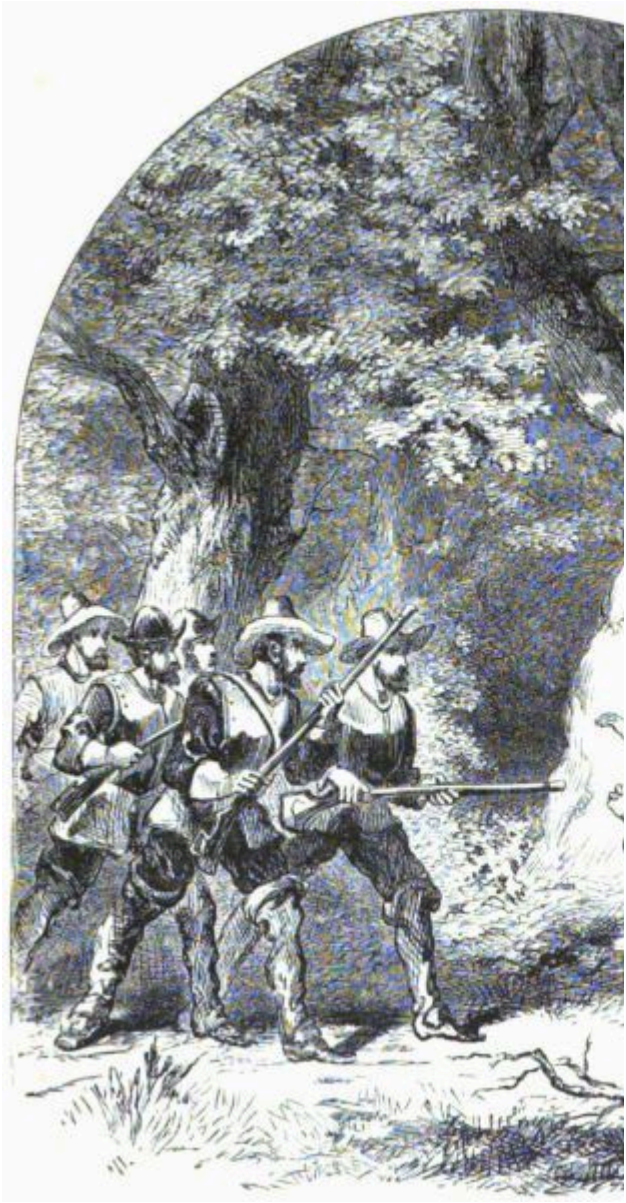
then were shown through what is left of the city. Here and there we found portions of paved streets, and it was only by following the lines of the streets that we were able to get around at all. Then there were two or three groves with very little undergrowth, which are thought to have been public squares; evidently they were not paved, but macadamized, and trodden so hard that the undergrowth has obtained no hold, though the trees have not been so easily restrained. Our guide showed us a bridge over a stream in the southern part of the city; it is called the *Punta de Embarcadero*, and is said to have been the point where boats came to discharge or receive their cargoes, and the stream it crosses is about thirty feet wide. It is full only at high tide, and is more an arm of the sea than a flowing river. The bridge is of hewn stone, and was constructed with a single arch.

"When we had finished our wanderings among the ruins we went back to the hut, drank some more *chichi*, then mounted our horses, and returned to modern Panama by the way we went. We were thoroughly tired, but we voted unanimously that the day was well spent."

The excursion to Old Panama naturally roused the curiosity of the youths to know something of Morgan the buccaneer, and his exploits. The readers of this narrative may have a similar interest in the events of two hundred years ago, and we will briefly give them.

The rumors of the abundance of gold in the New World, which reached Spain after the discovery of America by Columbus, led to the conquest and settlement of the islands of the West Indies, and also of the mainland for a considerable distance north

and south of the Isthmus. Within the fifty years following the first voyage of Columbus many colonies were planted, forts were built, soldiers were brought out in great numbers, and many ships laden with treasure were sent home from the New World. The stories grew with each repetition, and in a little while it was currently believed that there was sufficient gold in the cities of Mexico, Peru, and the other countries of South and Central America to enrich the entire population of Europe.



SLAUGHTER OF PRIESTS BY BU

The Spanish conquerors were relentlessly cruel, and

subjected the rulers and people of the conquered countries to all manner of tortures, in order to obtain their gold. The rumors of the vast treasures of the New World passed beyond Spain and reached England and France. Piracy was fashionable in those times, and it was not long after the Spanish treasure-ships began to traverse the ocean that the waters of the Caribbean Sea were thronged with piratical craft. Their crews were known as buccaneers, freebooters, pirates, or sea-robbers, and one name is as good as another. We will follow the example of the old historians and call them buccaneers, out of respect for their descendants, who dislike the word "pirate."

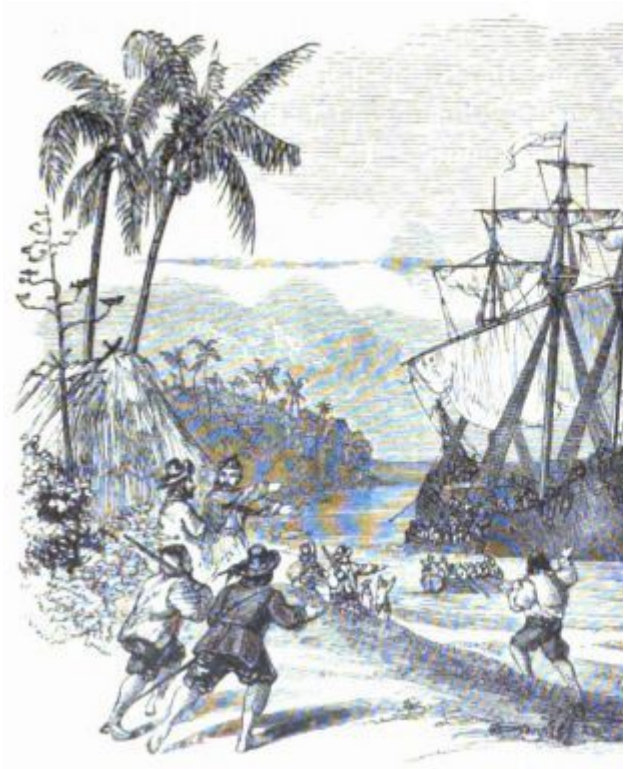


RENDEZVOUS.

They had plenty of hiding-places among the islands and along the coast of the mainland, and their numbers increased so rapidly that they formed colonies, tilled the soil, and in many cases established something like local government, though it was not always very orderly. In some of their colonies the more peaceably inclined buccaneers lived on shore, raised crops, hunted for wild cattle or other game, and not infrequently they brought their families from the Old World or found wives among the natives. The rest of the community roved the seas in search of plunder, returning occasionally to the colony to refit their vessels, and deliver their proper share to the settlers on land, from whom provisions were obtained.

Sometimes prisoners were brought to the colonies and kept as slaves, but this was not the general practice, as it was not altogether safe; an escaping slave might reveal the rendezvous of the buccaneers, and, in spite of the greatest vigilance, escape was possible. Consequently, it was the custom to release prisoners on payment of a heavy ransom, or to sell them to be carried into slavery, where they could do no harm to their captors. If they could not be disposed of in either of these ways, or made useful in some manner, they were generally put to death. Sometimes a chief released his prisoners unconditionally, and without obtaining anything for them, but such action was not favorably received by his followers, as they considered it a loss of property and an indication of weakness totally inappropriate to his proper character. Human life was held at little value in those days, not only by freebooters, but by kings and princes in all parts of the world.

After all, there was little difference between the buccaneers, or pirates, and the people against whom their exploits were directed. Cortez, Balboa, Pizarro, and other leaders in the Spanish conquest of the New World were simply the heads of legitimate marauding expeditions, directed against the inhabitants of the countries they invaded. The buccaneers endeavored to rob these legalized marauders; they stole what had been already stolen, and their thievery was directed against thieves. They adopted the same practices of torture and cruelties that had been used to extort gold from the rulers and people of the conquered countries; the buccaneers felt that the condemnation of their practices was unjust, and their sensibilities were wounded when they saw that the conquerors of the New World were sustained and honored by their king, whose treasury was enriched by their plunderings.



BUCCANEERS EMBARKING ON A

Sometimes there was a period of war between Spain and England, and then the king of the latter country would give commission to a well-known buccaneer, and exalt him to the dignity of a privateer. He was to fit out an expedition at his own expense, enlist his own men, and do pretty much as he pleased; in return for the royal protection he was to give a certain part of his gains into the king's treasury; though quite often this condition was not exacted, since the destruction of the enemy's commerce was considered a sufficient compensation for his commission. This was the character of Morgan's enterprise against Panama.

Morgan had obtained an excellent reputation as a buccaneer; he had captured several cities, murdered many people, often under circumstances of great cruelty, and had been almost universally successful in his expeditions. Priests, women, and children were indiscriminately slaughtered along with his other prisoners, when they could not find a market as slaves; and the stories of his barbarities would fill a volume. At one time he had two thousand men and a fleet of thirty-seven ships under his command. His piracies were directed against the Spaniards; the English looked upon his performances with a kindly eye; and when he organized his expedition which ended with the capture of Panama the governor of Jamaica ordered an English ship of thirty-six guns to assist him, and gave him authority to act in English interest. There was a French ship in the harbor of Jamaica, also carrying thirty-six guns, which Morgan desired; and he soon found reason enough, to his mind, for her capture.

A short time before, this French ship had stopped an English vessel at sea and taken provisions from her without paying for them. Morgan made this a pretext for seizing her; accordingly, he invited her officers on board the English ship and there made them prisoners. Then he seized their craft, but, unfortunately for his plans, she blew up a few hours afterwards and was totally destroyed. It was not known how the accident occurred, but Morgan said it was caused by the French prisoners, who set the ship on fire.



MORGAN'S RECEPTION AT

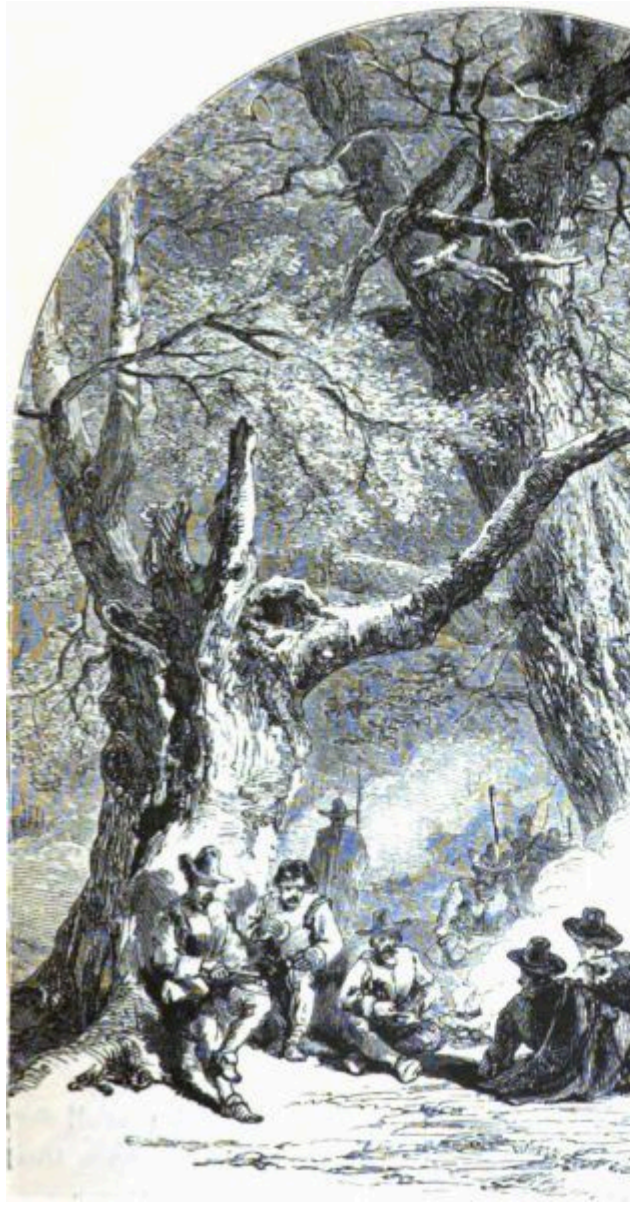
The fleet sailed away a week after this incident and proceeded to capture Maracaibo, Saint Catherine's, and one or two other places, before proceeding to Panama. From Saint Catherine's Morgan sent four ships to capture the fort at the mouth of the Chagres River; the expedition was successful, and when Morgan arrived and saw the English flag flying over

the fort he fired all his cannon in honor of the victory. When he landed he was carried into the fort on the shoulders of his fellows amid many demonstrations of delight.

An old nursery song has it that "Taffy was a Welshman, Taffy was a thief." Substitute "Morgan" for "Taffy" and the description is exact, as the hero of this story was born in Wales. Many of his followers were from that country or from other parts of the British Isles, and his second, who captured the fort at Chagres, was Captain Brodely, an officer of English birth.

Morgan repaired the fort, gave it a garrison of five hundred men, left a hundred and fifty to take care of the ships, and with twelve hundred men started across the Isthmus for Panama. They ascended the Chagres River in boats as far as they could go, and then marched overland through the forest. All the boats but one were sent back; a guard remained with this single boat, with orders never to leave it for a moment.

The journey to Panama was a terrible one, and showed the power of the commander over his men. They had expected to find plenty of provisions in the country, and consequently did not burden themselves with any on their departure from Chagres. At the first landing-place they found the people had fled, leaving nothing behind them, and this was the case at nearly every other point. For three entire days the men were without food, and many of them wanted to turn back; partly by persuasion and partly by threats Morgan kept them together, though they were so much reduced that they were forced to eat some leather sacks found at an abandoned plantation on the way.



MORGAN'S MEN DINING ON I

The manner of preparing this food is interesting, but

it is to be hoped none of our readers will ever be obliged to put it in practice. Some of the men devoured the leather raw, cutting it into small pieces, and swallowing it with water. Others, more fastidious, cut it into strips, moistened it with water, and then rubbed it between two stones until it was flexible. Then they scraped off the hair with their knives and broiled the strips over the fire. When the leather was thoroughly done it was cut into small pieces and washed down with water. After this frugal meal the men fasted two days, till they reached a plantation where they found a storehouse full of corn. All order and discipline were lost until the fellows had eaten all they wanted and loaded themselves with as much as they could carry. When they were assembled again they cheered their commander, and shouted "*To Panama*!"

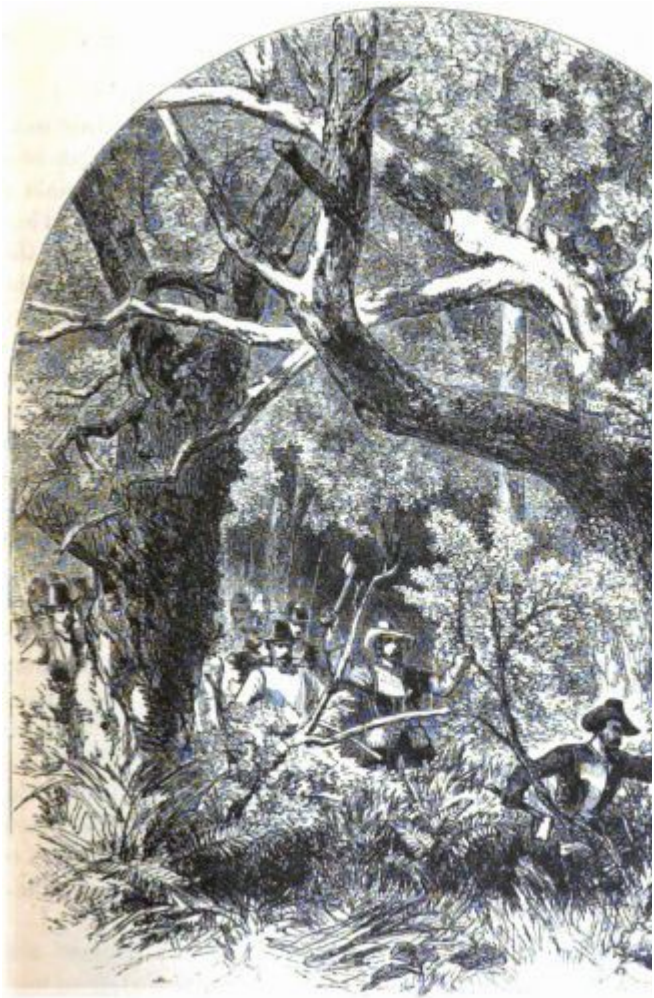


DEATH OF THE INDIAN

Their plenty did not last long, as they soon encountered a small force of Indians who had been sent out to intercept them. The men threw away their loads of corn and prepared to fight. The battle was a short one, as the Indians were overpowered by the superior weapons of the buccaneers, though the

latter lost several of their number. The chief of the Indians fought bravely, and thrust a spear through one of his assailants before they succeeded in conquering him.

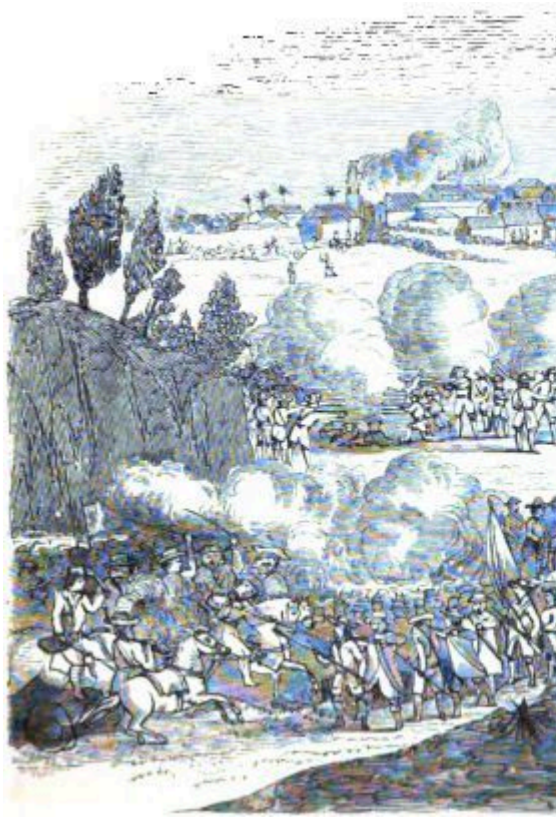
They were starving again, but as they came near Panama they found a herd of cattle, which supplied excellent material for food. Here Morgan ordered a halt till the men were fed, and their strength was restored; the camp was full of joy at the prospect of a speedy termination of their sufferings, and on the next morning the attack was ordered; the invaders had seen the city from the "Hill of the Buccaneers," and were now in front of it.



MOVING THROUGH THE FOREST.

Morgan captured some Indians, and forced them to act as guides, under the penalty, often exacted in war, of being shot if they gave false information. Morgan had ordered the march to be taken directly to the city, but his guides told him the road was lined with artillery, and the whole Spanish force was

concentrated there. Satisfied that the information was correct, he turned into the forest, and endeavored to move to the right without being discovered. The Spanish commander found out what the buccaneers were doing; he could not move his artillery, but he marched his soldiers, and drew them up on the open plain in front of the position for which his assailants were aiming.



CAPTURE OF OLD PANA

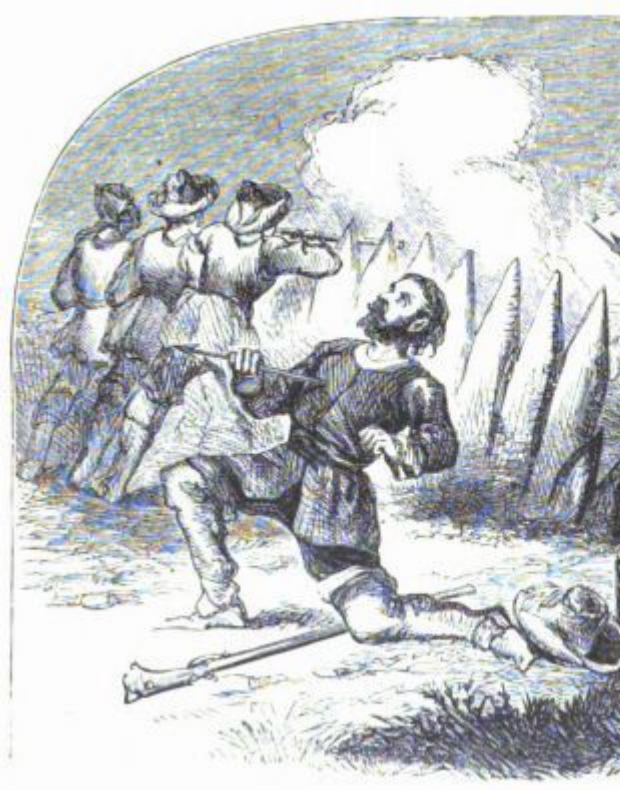
When the invaders came in view of the plain they found three thousand soldiers ready to meet them, while their own number was little over a thousand.

They were disheartened with the prospect, but Morgan told them it would be certain death in the wilderness to turn back, while a well-fought battle would give them the city with all its riches. Thus doubly induced, they determined to fight; the battle was begun by the buccaneers, and, certainly to the surprise of the Spaniards, it resulted in the dispersal of the defenders, and the possession of the city by Morgan and his followers, within three hours after firing the first shot.

The buccaneers plundered the churches and the houses of the merchants, and they tortured many of the priests, and other inhabitants, to compel them to tell where their treasures were concealed. In anticipation of disaster, much of the treasure of the churches, and also of the wealthiest merchants, had been sent on board a ship which sailed for Spain a few hours after the surrender of the city. It might have been captured with ease, but a party which Morgan had sent to intercept any departing vessel did not do their duty, and so the richest of all the prizes slipped through their hands.

Morgan and his party remained in Panama for three weeks, and then returned to Chagres. Before leaving they burned the city, and carried away six hundred prisoners, and one hundred and seventy-five beasts of burden laden with plunder. The division of the spoils was made at Chagres; it amounted to only two hundred dollars apiece, very much to the disappointment of the men. Morgan was openly accused of keeping very much more than belonged to him; the accusations became so serious as to threaten open revolt; and Morgan secretly embarked for Jamaica, and sailed away, with two ships besides his own.

He reached Jamaica in safety, and as the war between England and Spain was then over, his occupation as a legal freebooter was at an end. His services were promptly recognized by the British government, and he was appointed a marine commissary, and knighted by King Charles II. It is to be hoped that he led a less disreputable life as Sir Henry Morgan than when he was simply known as Morgan the buccaneer.



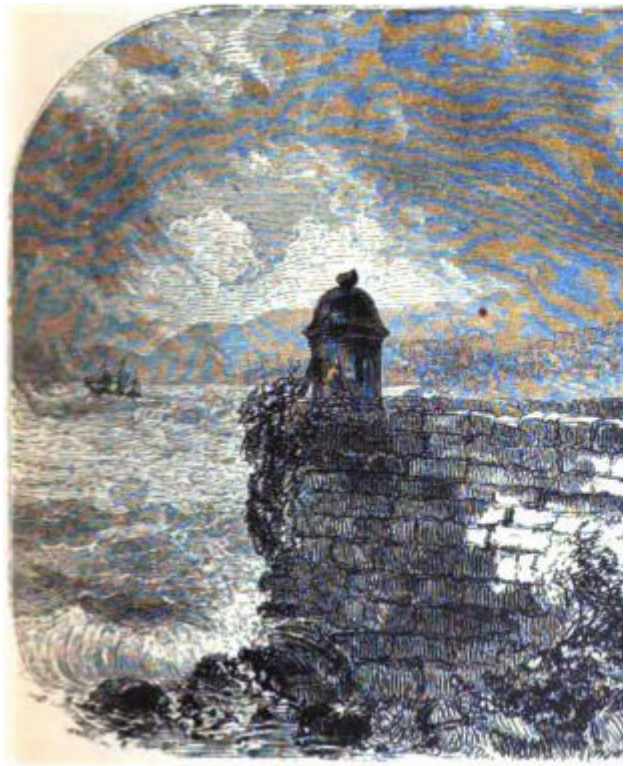
THE LUCKY ARROW

A curious incident is narrated by Morgan's biographer in the account of the capture of Chagres. The fort was surrounded by a palisade which the

assailants repeatedly tried to set on fire, but each time failed. Just as they were about to give up the attack and retire, an arrow from the fort passed completely through the body of one of their number and protruded from his breast. The man was mad with pain; he seized the arrow and pulled it through, then wrapped it with cotton, rammed it into his gun, and fired it back again at the fort. The powder ignited the cotton, and this in turn set fire to the leaves with which the fort was thatched. The Spaniards were so busy in beating back their assailants that they did not discover the fire until too late to stop it. The flames spread to a barrel of powder, which blew a great hole in the side of the fort, and made an entrance for the buccaneers; meantime they took advantage of the confusion to open the palisade, and soon had the fort in their possession.

CHAPTER V.

FROM PANAMA TO GUAYAQUIL.—VASCO NUNEZ DE BALBOA.—HIS ADVENTURES AND DEATH.—SCENES IN GUAYAQUIL.—FIRST EXPERIENCE WITH SOUTH AMERICAN EARTHQUAKES.



BAY OF PANAMA, FROM THE SOUTHI

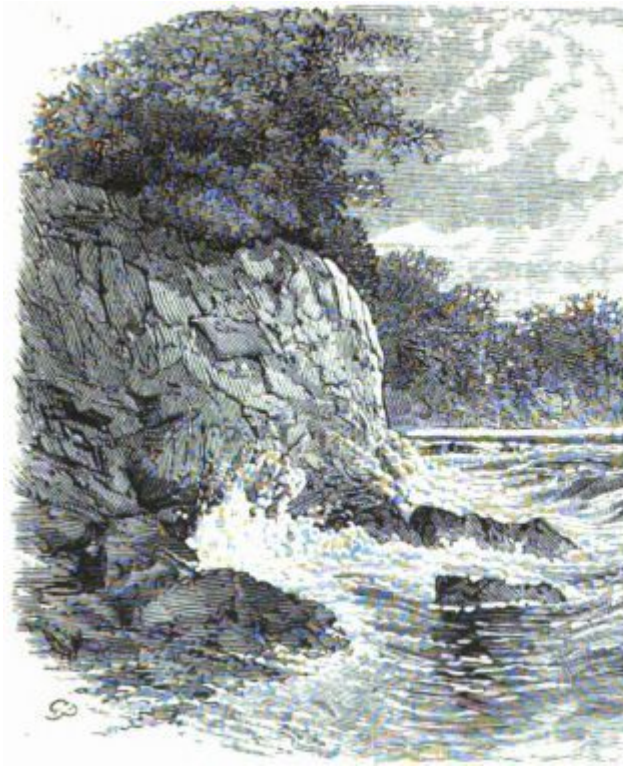
Our friends spent another day in Panama, devoting part of the time to arrangements for their departure, and the rest to strolling around the city, and taking a short sail on the bay. They visited the island where the Pacific Mail Steamship Company has its coaling-station, and its wharves for receiving and discharging freight, and saw the docks where ships needing repairs can be accommodated. Fred made the following notes concerning the steamship connections from Panama:

"There are two American lines of steamers running northward to California, and to Mexican and Central American ports, and there are English, French,

German, Chilian, and Peruvian lines reaching to all the ports of the west coast of South America. The most important of all these lines are the Pacific Mail (American), running northward, and the Pacific Steam Navigation Company (English), running to the south. When the Isthmus route was the favorite way of travel between the Atlantic and Pacific coasts of the United States there were sometimes two or three American lines between Panama and California, but at present there is only one.

"There was formerly a line between Panama and Australia, but it was discontinued long ago, and a line from here to the Sandwich Islands, Japan, and China has been talked of, but never established. When the Panama Canal is completed it is probable that the business of this port will be greatly increased, and the number of daily arrivals and departures will far exceed those of the most active times of the 'rush' for California."

Dr. Bronson and the youths left the hotel about two o'clock in the afternoon, and proceeded to the dock whence the tender was to carry them to their steamer. The ships of the Pacific Steam Navigation Company run in connection with the Royal Mail Line from England to Aspinwall; the arrival of the English steamer at Aspinwall had been announced by telegraph, and the train with the passengers and mails was due in Panama about half-past two. While they were seated on the tender, and engaged in studying the beautiful panorama of the bay, the whistle of the locomotive was heard, and soon the train rolled into the station, and its burden was transferred to the boat. The passage to the steamer was quickly made, and by four o'clock the great craft was on her southerly course.



COAST SCENE BELOW PA

As our friends leaned over the rail, Dr. Bronson gave the youths some reminiscences of the old days of California travel.

"On the voyage from New York to Aspinwall," said he, "passengers became pretty well acquainted with each other; and it generally happened that there were some practical jokers among them, who indulged in tricks for creating amusement. One of the standing jokes of the departure from Panama was, to create alarm among those who were making the voyage for the first time, by spreading a report that they had embarked on the wrong steamer, and were being carried to Callao."

"How could they do that?" Fred inquired.

"By looking at the map, you will see that the Bay of Panama is enclosed between the mainland and the Peninsula of Azuero, the latter extending to the southward about seventy-five miles; consequently a steamer going to California must proceed in that direction, until she can turn the point of the peninsula. Most of the novices were not aware of this; the rumor was started, and, if incredulous, they were told to look at the compass and be convinced. The compass corroborated the assertion of the jokers, and many a traveller was seriously disturbed in mind until the joke was explained."

"He was probably more careful in his study of geography after that experience," Frank remarked.

"Sometimes," continued the Doctor, "the California steamers sailed at the same time as the ships of the English line for South America, and occasionally there was an international race as long as their courses were nearly the same. The routes diverge very soon, so that the races were brief, but, with a large number of passengers on board of each steamer, there would be great excitement while the competition lasted, and much money was wagered on the result. On one occasion, owing to the carelessness of somebody, one steamer ran into another, but no serious damage was done; at another time a steamer hugged the shore too closely in order to shorten her running distance and get an advantage over her rival. These accidents called attention to the racing, and the managers of the different companies issued a very stringent order against any more trials of speed. I have not heard of a repetition of these affairs for a good many years, and there is rarely any opportunity for rivalry, if we may judge by the time-

tables of the various lines running from Panama. When steamers are to leave on the same day there is generally an hour or two between their departures, and the later one does not attempt to over-haul her predecessor."



CAVE NEAR LIMON RIVER.

As the great ship moved steadily through the blue water of the Bay of Panama our young friends regarded with close attention the beautiful panorama that passed before their eyes. The land was on both sides of their course, the peninsula on the right, and the mainland of South America on the left; the horizon to the eastward was filled with the chain of

the Cordilleras, which increase in height farther to the south, and form the lofty line of the Andes. One of the passengers who was familiar with the coast indicated to our friends the Gulf of San Blas, and other indentations which have come into prominence during the discussions about an inter-oceanic canal, and a good deal of geographical knowledge was imbibed in the first few hours of the voyage.

The Bay of Panama is about one hundred and ten miles long, and its width at the mouth is a little more than that distance. The course of the steamer carried her away from the peninsula, and before they had been long under way the latter was only dimly visible. It vanished with the sun, and by the following morning was far behind them. The placid waters of the Pacific Ocean filled the horizon, south, north, and west, but the mountains on the east were in full view. Smoke issuing from some of these mountains showed that they were volcanic, and the youths readily understood that they were approaching the region of eruptions and earthquakes.



VASCO NUNEZ DE BALBOA.

Guayaquil, in Ecuador, was the first stopping-place of the steamer, four days from Panama. Frank suggested that it was a good time to refresh their memories, or add to their knowledge, of the history of this part of the world; Fred agreed with him, and thought they would do well to begin with Vasco Nunez de Balboa, the discoverer of the Pacific Ocean. The Doctor gave his approval, and the principal part of the second day at sea was devoted to that enterprising explorer. While Frank read from Balboa's biography, Fred took notes of the most important parts of the story, which were as follows:

"Vasco Nunez de Balboa was a Spanish nobleman, who dissipated his fortune, and ran away from home

to avoid imprisonment for debt. He was born in 1475, and sailed for the New World soon after the return of Columbus from his fourth voyage.

"In 1510, Martin Fernandez De Enciso sailed for the colony of Carthagena, which had been established a few years earlier. He found in its harbor a brigantine which contained the remnants of a colony established farther down the coast, but abandoned in consequence of the hostility of the natives and the difficulty of procuring food. The leader of this party was Francisco Pizarro, whose name is known to every reader of South American history, in connection with the conquest of Peru.



BALBOA CARRIED ON SHI

"After a short delay in Carthagena, Enciso sailed for St. Sebastian, accompanied by Pizarro's brigantine. An hour or two before the vessel was to leave port

some men brought a cask on board, and it was lowered into the hold with the rest of the provisions. When the ship was fairly out at sea the end of the cask was pushed out, and, instead of edibles for the crew, there appeared the form and figure of a man!



BALBOA MAKES HIS APPEARANCE.

"The man was Balboa, who had been living in

Carthagena. He had so loaded himself with debts in his new home that his creditors were about to arrest him and he was closely watched to prevent his running away. He determined to sail with Enciso, and caused himself to be headed up in a cask and carried on board in the manner described."

Frank and Fred had a hearty laugh over this part of the story. One of them asked the Doctor if this mode of travel was in fashion at the present time.

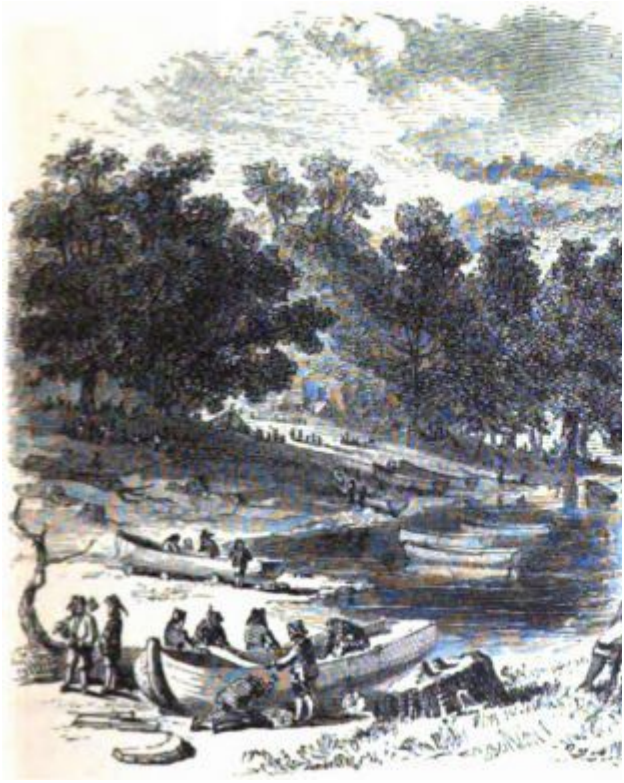
"Not often," was the reply, "but it is sometimes practised by those who wish to do exactly like Balboa, escape from their creditors. I have known of a man being carried on board a steamer at New York in a large trunk, which was ostensibly the baggage of his wife, and there have been instances of criminals escaping from prison by being shut up in boxes and carried out as merchandise.

"In the days of slavery the friends of freedom used to assist slaves to escape from bondage in a variety of ways. One of the favorite modes for a fugitive to cross the line from south to north was to be shut up in a box and sent as a freight or express package. I once knew a negro in Philadelphia who was sent in this way from Richmond to the Quaker City; he was about thirty hours on the way, and almost dead from suffocation when his prison was opened. Though his conveyance was conspicuously labelled, 'This side up with care!' he was twice left standing on his head for two or three hours. His name was Henry Brown; in memory of his adventures, and to distinguish him from other Henry Browns, he was ever afterwards known as Henry Box Brown.

"And now let us return to Balboa," said the Doctor. The hint was sufficient, and the narrative was resumed.

"Enciso was angry at the deception practised by Balboa in securing passage as a stowaway, but soon had reason to be glad he had such a bold adventurer on his ship. At first he threatened to leave Balboa on a desert island, but when the latter offered his services and promised to be a good soldier the leader relented. Expeditions like those of the Spaniards are not made up of the best materials of society, and events afterwards proved that Balboa was more than the average adventurer of the sixteenth century.

"On the way to St. Sebastian Enciso's ship ran upon the rocks and was lost, with all its cargo, only the crew escaping to the brigantine of Pizarro. Enciso did not know where to go; and while he was pondering upon the best course to pursue Balboa came before him and said he knew of an Indian village on the bank of a river called Darien; the country near the village was fertile, and the natives had plenty of gold.



VILLAGE ON A RIVER OF

"Enciso sailed for the village, which he captured with ease, and compelled the inhabitants to deliver up fifty thousand dollars' worth of gold ornaments. He established a colony there, and forbade any one to traffic with the natives for gold, under penalty of death. This arbitrary order was opposed by Balboa, who remembered the threat to leave him on a desert island; as the followers of Enciso were quite as covetous as their leader, the prohibition was easily made the basis of a revolt.

"Balboa managed matters so well that Enciso was forced to leave for Spain, while the former became

governor, with absolute authority over all the colony. He immediately sent Pizarro to explore a neighboring province, but the expedition was unsuccessful; Pizarro was driven back by the Indians, who attacked him in great force. Balboa then headed an expedition in person, and while sailing along the coast he picked up two Spaniards in the dress of natives. They were deserters from another colony, and had been living with Careta, the chief of the province of Coyba; they had been kindly treated by this chief, but promptly offered to pilot Balboa to his village, which was said to contain great quantities of the precious metal desired by the Spaniards.

"Balboa accepted their offer and started for Careta's capital, accompanied by the deserters and one hundred and fifty soldiers. Careta received him kindly, and after a short stay Balboa pretended to leave. In the night he attacked the village and made prisoners of the chief, together with his family, and many of his people. Careta made peace with the Spaniards by giving up a large amount of gold, and offering the hand of his daughter in marriage to Balboa. The historians say she had much influence over Balboa, and on one occasion saved his life.



BALBOA AND THE INDIAN I

"Balboa promised to help Careta against his enemies, and in compliance with his promise he took eighty men and went on an expedition against Ponca, who was an enemy of Careta, and, what was more to the point with Balboa, was said to have a great amount of treasure. Ponca was attacked and his village was burned, but the victors obtained very little gold.

Then they went to the neighboring province of Comagre, whose chief was friendly with Careta, and received them kindly. The chief came out to meet the strangers and escort them to the village, where he gave them food and comfortable lodgings, and did everything he could to make their stay agreeable.

"The people at this village were the most advanced in civilization that the Spaniards had thus far found in America. The chief's palace was a frame building, four hundred and fifty feet long and two hundred and forty wide, and it was divided into numerous apartments for the chief and his family and officers. Underneath it there was a cellar for storing provisions, and in one part of the building was a mausoleum, where the bodies of the chief's ancestors were preserved. Balboa examined this mausoleum, and found that the bodies were first dried by fire, to prevent decay, and then wrapped in great quantities of cloths which were interwoven with threads of gold. Pearls and pieces of gold were fastened around the wrappings, and then the bundles were hung against the walls of the room.

"It did not take long for the Spanish avarice to show itself, and to meet it the eldest son of the chief brought four thousand ounces of gold, which was distributed among the men, after a fifth of the whole had been reserved for the crown. During the division a quarrel arose between two of the men, about the weight of two pieces of gold.



QUARREL FOR THE G

"They drew their swords and were about to fight, when the young chief seized the scales and dashed their contents to the ground.

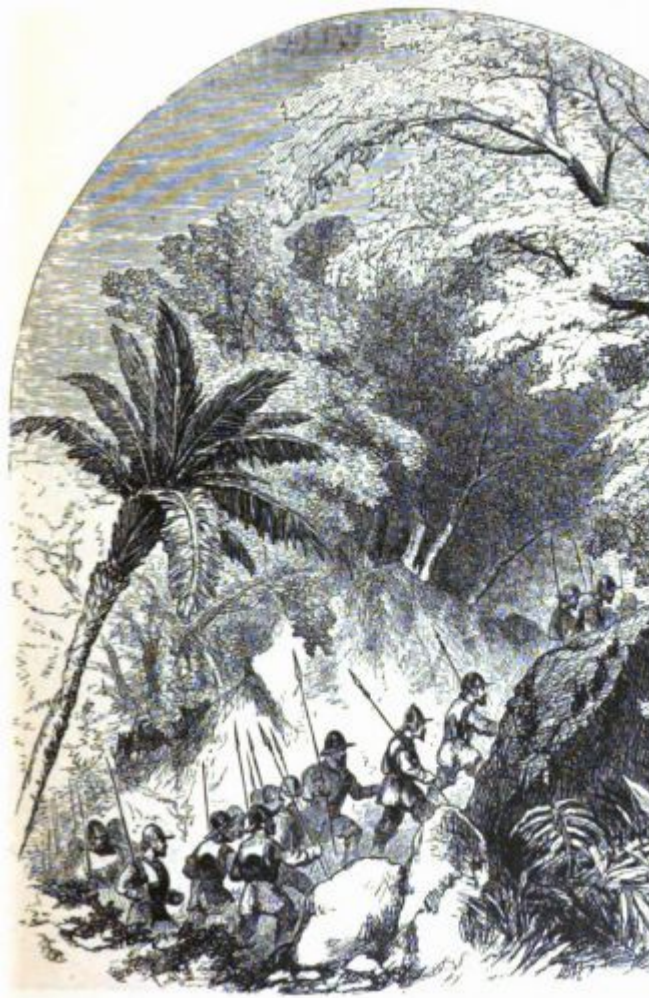
"'Why do you quarrel about such trash as this?' said he. 'If you come here for gold, go beyond those mountains, where there is a great sea on which sail vessels like your own. The streams that flow into it are filled with gold; the people who live on its coast eat and drink from vessels of gold.'"

Balboa was present at this incident; he had not interfered in the quarrel, but when the chief spoke he became interested. He talked long and earnestly with

the chief, who represented the dangers and difficulties of the way, but offered to show it to the adventurer, if he was determined to go there.

"Balboa returned to the colony at Darien to make preparations for an expedition to discover the great sea beyond the mountains, and obtain the gold of the people along its coast. He sent to Spain for the men he required for the journey, but after he had waited long and anxiously a ship arrived with news that his enemy Enciso had obtained a favorable hearing before the king, and was coming back to assume command, while Balboa was to be sent to Spain to answer a charge of treason.

"He determined to make a bold stroke, and called for volunteers to accompany him on the expedition, as he could not expect the men he had asked for from the king. One hundred and ninety men volunteered, and on the 1st of September, 1513, he sailed with a brigantine and ten canoes. He reached the dominions of his father-in-law, Careta, near the modern village of Careto, about twenty miles from the mouth of the Caledonia River, on the route taken by Lieutenant Strain.



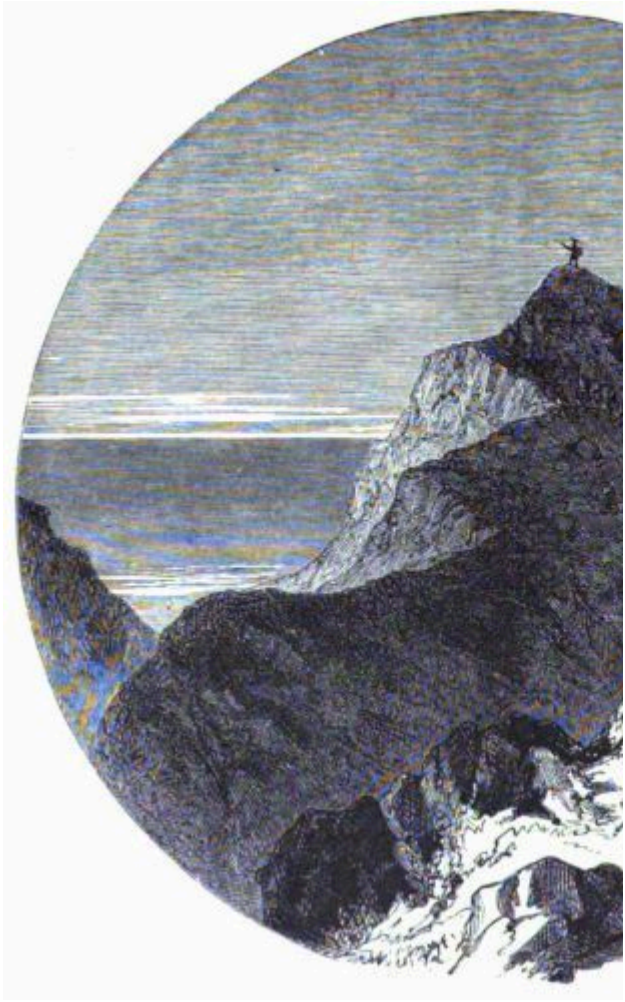
MARCHING THROUGH THE FORES

"Here the inland march began. The men toiled over rocks and among the thick undergrowth, and suffered from sickness and hunger and from the opposition of the Indians. They could not find the young chief who had offered to guide them over the mountains, but they captured some of the Indians

and forced them to show the way. At one village the chief called out his men to attack the strangers, but they were quickly dispersed by the guns of the Spaniards. The Indians had never heard the report of fire-arms, and were paralyzed at what they believed to be thunder and lightning in human hands.

"Beyond this village was a mountain, from whose top the guide assured Balboa the great ocean was visible. Halting a day for the benefit of his sick and wounded, he pushed on till he reached the foot of the mountain, and stood there with his faithful followers. There they rested until another morning; he ordered every man to be ready to move at daybreak and then he lay down to sleep. His example was followed by his men; they slept, but he did not, as his mind was too full of what the morrow might disclose to allow of slumber.

"At the first sign of day he roused his men, and prepared for the march. The sick and wounded were left in the camp, and with sixty-seven followers he pushed forward. It was nearly noon when they emerged from the forest, and stood at the foot of the stony peak from which the guide said the sea was visible. Here Balboa ordered his men to remain till he had reached the summit; he wished that his eyes should be the first to look upon the great ocean, of whose existence he still had lingering doubts.



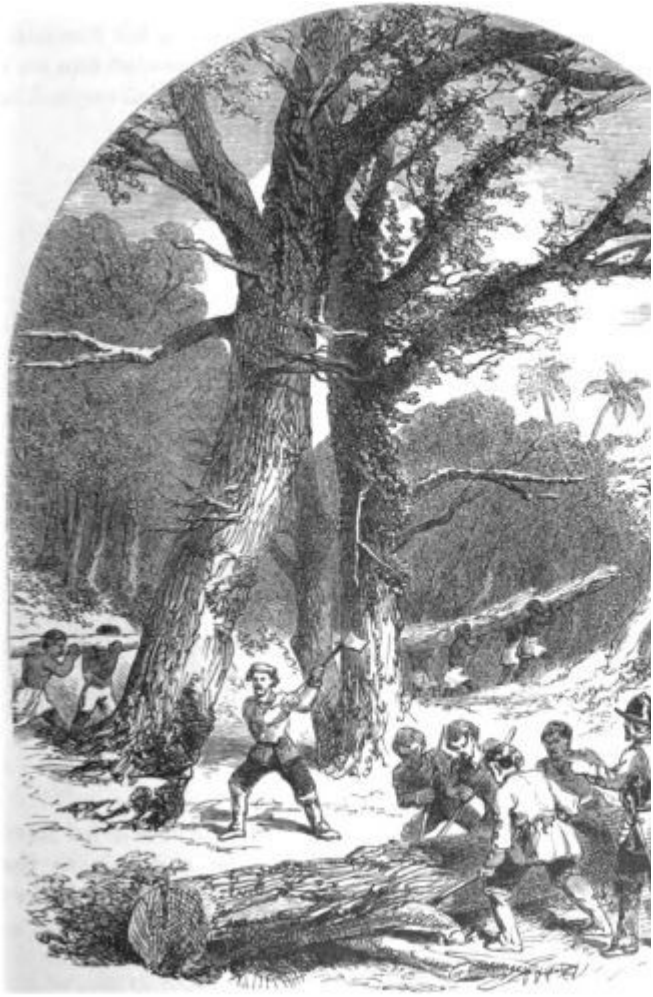
DISCOVERY OF THE PA

"He reached the summit, and there, spread before him and filling the horizon, were the blue waters of the Pacific. Balboa gazed for several minutes, in the enthusiasm of his discovery, and then beckoned for his followers to join him.

"The men dashed forward, Pizarro among them, and

soon were at the side of their chief. One of the party was a priest, and as they came to a halt he began to chant *Te Deum Laudamus!* The chant was taken up by the whole band of adventurers, and as soon as it was ended they proceeded to build a mound of stones on which they erected a cross, in honor of the discovery.

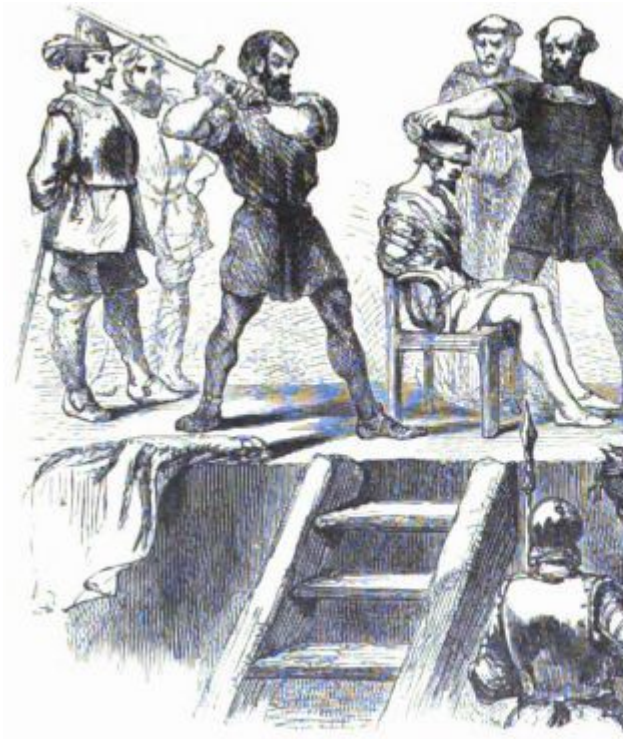
"Balboa then descended the mountain to the shores of the Pacific, where he took possession of the waters in the name of his king. He attempted to explore the country, but travelled only a short distance along the coast; passing through many hardships, he returned to Darien, whence he despatched a ship to Spain, bearing the news of his discovery, and the royal share of the gold he had taken.



CUTTING TIMBER FOR THE SHIPS.

"Already a new governor had been appointed, and shortly after Balboa's messenger had sailed the governor arrived. Balboa was tried on the old charges, and acquitted, and he then started to carry out his intention of exploring the Pacific. Crossing the mountains, he built vessels on the banks of the

Valsa River, visited the Pearl Islands in Panama Bay, and explored parts of the coast. It was reported that he intended to establish a colony on the Pacific Ocean, and set up in opposition to the newly appointed Governor of Darien—or, rather, independently of him.



DEATH OF BALBOA

"The governor summoned Balboa to Darien to meet him in friendly consultation, and the latter went, in spite of the advice of his comrades, who suspected that official's intentions. The governor arrested him on a charge of treason, and went through the form of a trial, which resulted in Balboa's conviction and condemnation to death. When he was led forth to

execution a crier preceded him, proclaiming him a traitor to the crown. 'It is false!' exclaimed Balboa with great indignation; 'I have sought to serve my king with truth and loyalty, and no such crime as treason has ever entered my mind.'

"Balboa was only forty-one years of age when he perished, the victim of the same jealousy and hatred which caused Columbus to be carried in chains to the prison where he died. There is no doubt that his career was marked by many acts of cruelty, but nothing in his history indicates other than the most devoted loyalty to his sovereign and to the country of his birth."

The study of the history of Balboa was followed by a careful inspection of the map of the Darien Isthmus, in the effort to determine the identity of the mountain from which the Pacific Ocean was first seen by the eyes of a European. The Doctor told the youths that the mountain had not been identified, but was thought to lie between the rivers which Strain attempted to follow in his explorations for a canal. All the peaks in this region are difficult of access, and few of them have been ascended by white men.

The steamer reached Guayaquil on the morning of the fourth day from Panama. Our friends secured a boat for themselves and their baggage, and went on shore immediately; it was their intention to spend a fortnight in Ecuador, and then take steamer again to Callao.

At the landing-place they were beset by beggars, pedlers, guides, and donkey-owners, all desirous of receiving tokens of remembrance in the shape of money, selling articles of use or uselessness, or otherwise rendering real or imaginary services. All

were shaken off in a little while, with the exception of the most prepossessing of the guides, who was engaged to take them to the hotel and show them around the city.

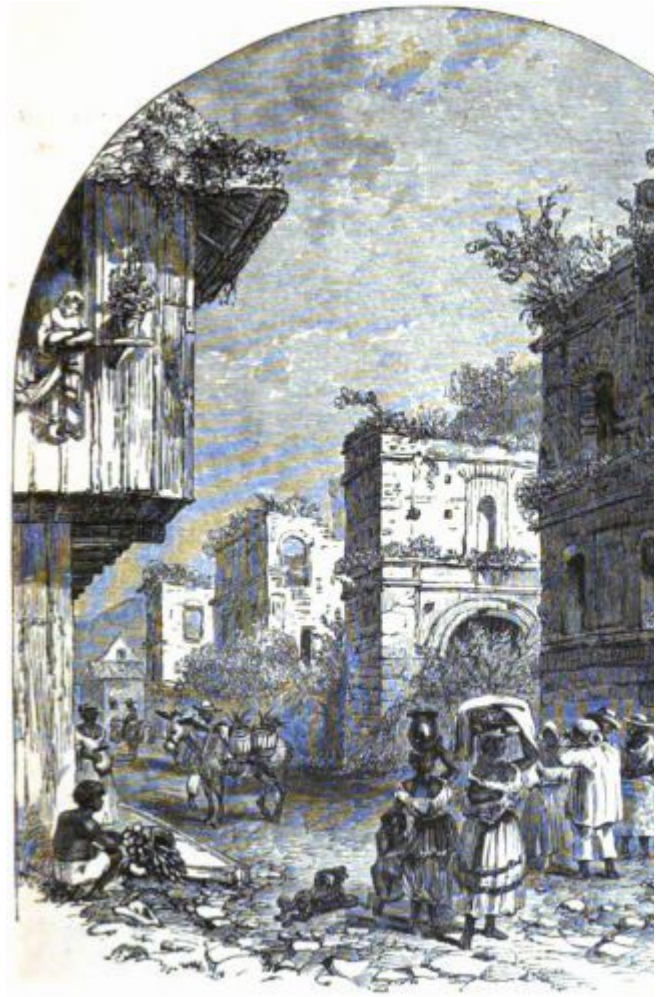
A rickety carriage was obtained, but, as it showed signs of weakness, it was exchanged at the hotel for one of a more substantial character. The streets and the buildings that lined them greatly resembled those of Panama, and indicated that the builders of both were of the same nationality. The cathedral was visited, but there was nothing remarkable in its appearance, and a very brief examination sufficed.

Frank said the most interesting part of the city was the river which ran through it; it is called the Guayaquil, and also the Guayas; its name has been given to the city, which is really "Santiago di Guayaquil." All the provisions for the city are brought in canoes and on *balsas* or rafts, and every morning the river is almost covered with these crafts. They were laden with all sorts of things produced in the country—bananas, plantains, pineapples, cocoanuts, guavas, melons, oranges, zapotes, mangoes, and kindred fruits that grow in the tropics, and there was also a goodly array of tropical vegetables. Poultry-dealers were numerous, and the fowls with which their cages were filled kept up a vigorous cackling; there were fish of many varieties, some of them quite new to our young friends, who regarded them with much interest. In their eagerness to get about the boatmen frequently ran their craft against those of their neighbors, but there was the utmost good-nature, with one or two exceptions. Probably the people find it does not pay to quarrel where the climate is so warm, and the effort of getting into a passion is too much for every-day life.



CATHEDRAL OF GUAYAQUIL.

The city has a population of twenty-five or thirty thousand, and is a little more than two degrees south of the equator, consequently it is very hot, and quite unhealthy, in spite of the sanitary precautions that have been taken by its authorities. The Bay, or Gulf, of Guayaquil has a tide of about twenty feet, so that any accumulation of impurities is prevented by the great flow of water in and out of the channel every day. It has one of the best harbors on the west coast of South America, and would have a considerable commerce were it not that the prosperity of the country is restricted by earthquakes.



STREET SCENE AND RUINS.

Our friends found that some of the streets were narrow and crooked, but the most of them were comparatively straight, and crossed at right angles. They drove past the principal buildings, the governor's residence, City Hall, and several churches, and then into the suburbs, where they saw some

pretty gardens full of tropical flowers.

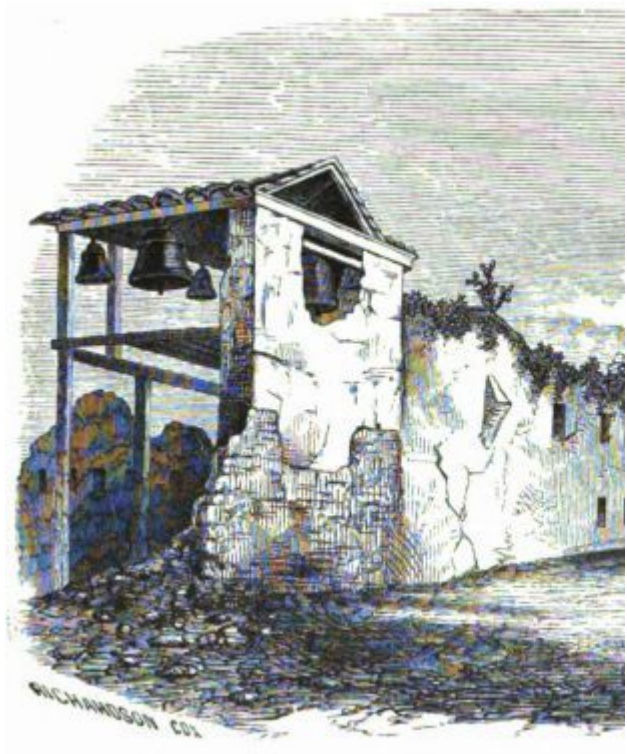
As the forenoon advanced the heat increased, and they returned to breakfast at their hotel. The table was set on the veranda, which afforded a fine view of the lofty peaks of the Andes. The manager of the establishment was a stout and dreamy Spaniard, who went to sleep if his attention was not wanted for a minute, but waked immediately when he was spoken to. The waiter was of aboriginal descent, and seemed to have copied the habits of his master in the matter of deliberation, as he paused after each step, as though uncertain about the next.

They had a breakfast of tortillas, or Spanish griddle-cakes, a chicken broiled over the coals, which were still adhering in places, and an omelette in which various peppery things were very apparent to the palate.

When they were nearing the end of their repast, and just as Fred was helping himself to more of the omelette, there was a trembling of the floor that brought the youths out of their chairs and caused the Doctor to assume an upright position. The movement lasted perhaps a quarter of a minute, and then ceased.

"Take your seats again," said Dr. Bronson, "and finish your breakfast. We are in the land of the earthquake, and this is an every-day occurrence."

He suited the action to his word, and sat down. The youths followed his example, and a moment's reflection told them that they ought not to be disturbed by such a trifling shake at the very beginning of their South American experience.

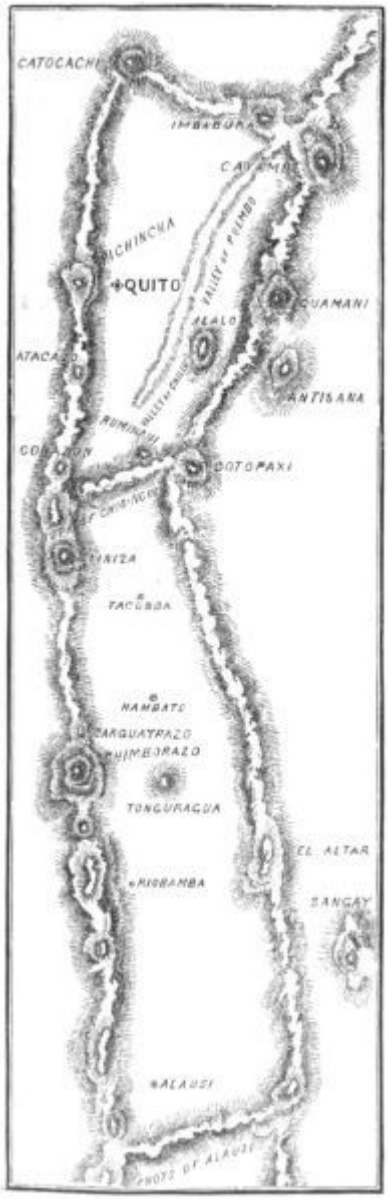


IN THE LAND OF THE EART

CHAPTER VI.

THE PARADISE OF EARTHQUAKES.—FROM GUAYAQUIL TO QUITO.—A RIDE OVER THE MOUNTAINS.—ALL CLIMATES UNITED IN ONE.—THE PLAINS OF ECUADOR.—CHIMBORAZO AND COTOPAXI.





THE CENTRAL PART OR ECUADOR.

The incident of the breakfast naturally drew their attention to the earthquakes that frequently shake the mountainous parts of South America, and render life and property more uncertain than in regions which are not subject to these disturbances.

"Ecuador may be considered the paradise of the earthquake," said the Doctor, "though it is not much ahead of Peru and Chili in that respect. To give a list of the earthquakes that have destroyed life and property in this country since it first became known to the Spaniards would be to recite a long series of dates; Guayaquil has been shaken up a great many times, but it has suffered less than the capital. Here, at the sea-coast, we are somewhat removed from the centre of the disturbance, but by no means out of its reach."

"We will hope," said Fred, "that the violent earthquakes will postpone themselves until our departure."

Dr. Bronson and Frank emphatically approved Fred's suggestion, and the Doctor proceeded with his comments.

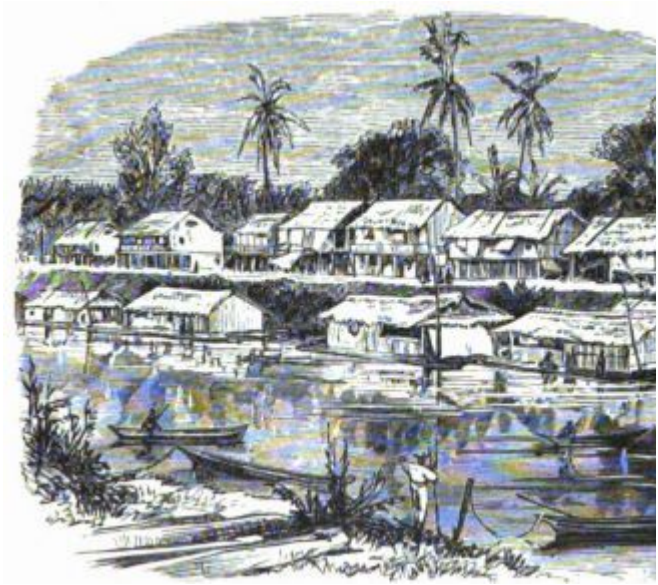
"The central portion of Ecuador," said he, "is at an elevation of several thousand feet, and contains many active volcanoes. The valleys in which are the cities and cultivated part of the country are rarely less than 6000 feet above the level of the sea, and some of them rise to 10,000 or 12,000. The highest of the mountains is Chimborazo, 21,422 feet high; it was for a long time supposed to be the highest mountain of America, but modern surveys have shown that it has several superiors. It is the sixth in elevation of the chain of the Andes, and these in turn are surpassed, in the Old World, by several of the Himalayas. The best known of the active volcanoes is

Cotopaxi, nearly 19,000 feet high, but there are others that rival it in destructive energy.

"We shall have opportunity to study these volcanoes quite nearly," continued the Doctor, "as we go to Quito and the region around it. There does not appear to be any danger of an eruption at present, and if we allow our minds to be constantly filled with dread of a catastrophe we shall not enjoy the journey. So we'll let the earthquakes take care of themselves, as they generally do."

In the afternoon they arranged for the storage of such baggage as they did not wish to take with them. Trunks were left behind, and the whole trio was reduced to light marching order, in accordance with their custom when making the excursions of which we have read in "The Boy Travellers in the Far East." Toilet bags, with a small stock of underclothing, an extra suit of clothes for a change in case of being drenched with rain, and overcoats, rugs, wraps, and blankets, for the cold weather at great elevations, comprised the equipment for the journey to Quito.

Travellers must carry their own bedding and provisions while journeying in the interior of Ecuador, and, in fact, in most of the South American countries. This was the custom adopted by the old Spaniards, and customs change here very slowly. Hotels are scarce, and the lodging-houses along the road give little more than a roof for shelter, and sometimes not even that. If a man ventures to travel without carrying his own supplies he will often go hungry; but, on the other hand, he may be sure of the most uniform kindness from the people of the country. They will give him the best they have, but very often they have literally nothing to offer.



LAS BODEGAS, GUAYAS RIVER.

The Guayas is navigable by small steamers from Guayaquil to Bodegas, a distance of seventy miles. Our friends took passage upon one of the steamers plying on the river, and were safely landed at Bodegas after a pleasant run of eight or nine hours. Frank recorded in his note-book that the river is not a swift one, and flows through a flat country in which there is not much of interest beyond the vegetation. "The banks," said he, "are lined with groves of bananas and plantains; the fruit of these trees forms an important article of food with the inhabitants, and it is no wonder they are not disposed to hard labor when they can supply themselves without it.

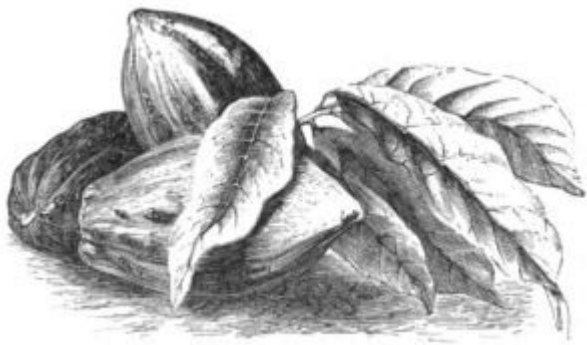
"The banana can be eaten raw, but the raw plantain is considered unhealthy. Both plantains and bananas are cooked in a variety of ways, baked, boiled, fried, or roasted; they can be formed into a paste after

cooking, and then dried, and in this condition the article can be kept for a long time. Humboldt estimated that four thousand pounds of bananas can be produced in the same area as thirty-three pounds of wheat or ninety-nine pounds of potatoes. They are cultivated with very little labor, and there is nothing which the soil produces that gives so great an amount of food from a given area of land. If a man will live only on bananas he can take things very easily.



A HOUSE IN THE TROPICS.

"In addition to the banana and plantain forests we saw many plantations where coffee and cacao are grown, and some of them were of great extent. Then there were orange and lemon groves, fields of pineapples, mango and bread-fruit trees, and great numbers of cocoa palms. There were many canoes and *balsas* on the river; the balsas are nothing but rafts made of the trunks of the balsa trees. Half a dozen logs are lashed together with withes and cords, and braced with cross-pieces of wood so that there is no danger of separation. On the top of the raft a flooring of bamboos or split palms is laid, and on this flooring they build a hut in which the people live, often for weeks at a time.



CACAO.

"Some of these balsas are larger than others, in consequence of the logs being longer and more numerous. The huts on the larger rafts contain several rooms, and are equipped with conveniences for living quite equal to those of huts on shore. There are places for cooking, coops for fowls, pens for pigs, and nooks among the rafters where edibles can be stored, out of the reach of the four-footed inhabitants. A whole family will live comfortably on

a balsa, and few of them are destitute of pets in the shape of monkeys and parrots. Some of the rafts carried such an abundance of monkeys and parrots that it was not easy to say if they were not the possessors of the establishment, carrying the men, women, and children to a market in Guayaquil. The monkeys and children appeared on the most familiar terms, and as the latter were unencumbered with clothing they were not to be readily distinguished from their tailed associates.

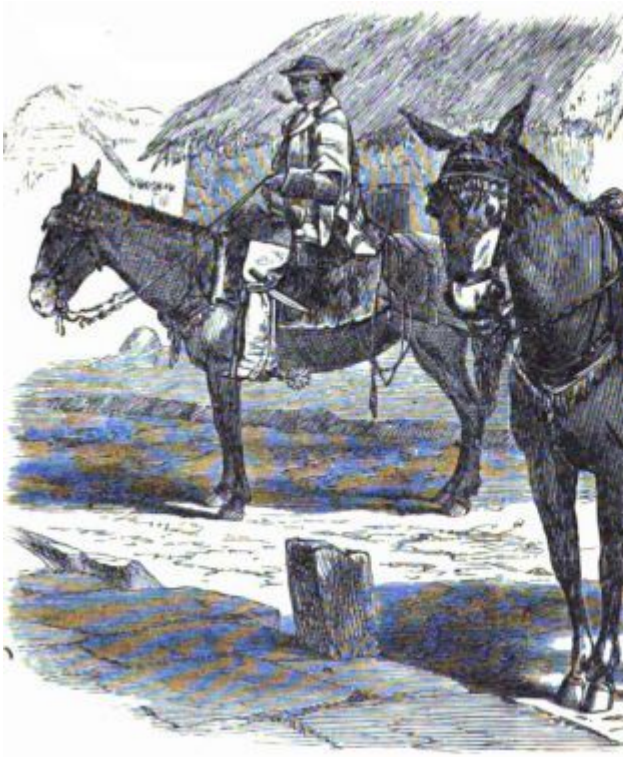
"Balsa wood is as light as cork, and remains a long time in the water without any tendency to absorption. The balsa raft was in use long before the visit of the Spaniards, and the craft we have seen are probably identical with those that met the eyes of Pizarro at the time of the conquest.

"Occasionally we saw monkeys among the trees on the shore, but they evidently did not like the steamer, and were careful to keep at a respectful distance. There were birds of brilliant plumage, but we did not hear a song from one of them; a gentleman who was our fellow-passenger says that most of the birds of this part of the world have no knowledge of music. There were plenty of alligators lying on the banks; we took several shots at them, but soon desisted, as we bagged no game, while the alligators seemed to enjoy the sport and the waste of our ammunition. Many of them were lying with their mouths open, waiting for the flies to settle in their throats; when they judged that a sufficient number had assembled they suddenly closed their jaws, swallowed the flies that were caught, and set themselves for more. They make splendid fly-traps, and Fred suggests that they should be introduced into New York and other cities to take the place of

the many patent machines that are now in use for catching flies."

Down to quite recently the route from Bodegas to Quito was simply a mule path; a wagon road has been completed for a part of the way, and is ultimately intended to reach the capital. A railway is projected from Guayaquil to Quito, but for the present the mule path must be the reliance of travellers. A wagon was obtained, for carrying our friends and their baggage to the end of the road which traverses the level country up to the foot of the mountains. It was a rickety affair, but served its purpose, which is all that can be expected of a wagon under ordinary circumstances.

At the end of the road our friends were deposited in a village which is chiefly inhabited by *arrieros*, or muleteers, and their families, together with a sprinkling of other natives more or less interested in the traffic passing between the capital and the seaport. The arrieros are a very important part of the mountain population of Ecuador, as there is no travel or transportation away from the rivers and wagon roads without them.



ARRIERO AND TRAVEI

Fred made the following note concerning the arrieros, and the journey towards Quito:

"The business is entirely in the hands of the natives or the half-breeds, as no genuine Spaniard would consider it high enough for his dignity. Some of the arrieros possess many mules, but the most of them have but half a dozen, or perhaps ten or twelve, and travel personally with their trains. The *peons*, or servants of the arrieros, are likewise of the native race, and accustomed all their lives to hardship and toil. Their wants are few, as they live on food that can be easily transported; their general outfit for the road is a cotton shirt and trousers, a straw hat, and a

poncho, or blanket with a hole in the centre, through which the head is thrust. This poncho is striped with gay colors, and is very often quite attractive to the eye. Each arriero or peon carries his own food, which usually consists of a few red peppers, a bag of parched corn, and another of barley meal. With this slender nourishment they pass their lives on the rough roads among the mountains, and immediately on arriving from one hard journey they are ready for another.

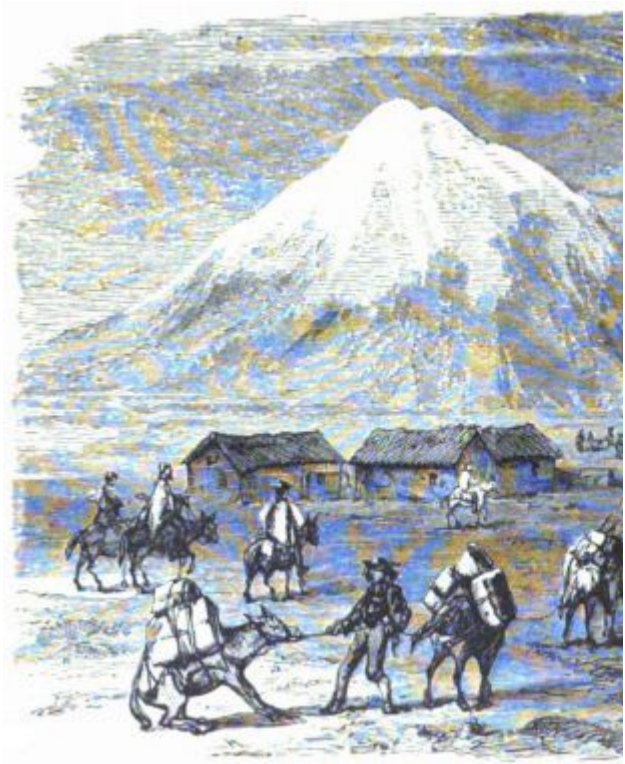


IN HOLIDAY COSTUME.

"We were surrounded by half a dozen arrieros at once, and there was no difficulty in making a bargain, as several trains had just arrived from the mountains, and were anxious to return. We engaged five mules, three for ourselves, and two for our

baggage; the owners endeavored to convince us that another animal was needed for the baggage, but as we had less than three hundred pounds of it altogether, we were not to be convinced. Our arriero promised to be ready to start early the next morning, but it was nearly noon before we got away. We tried to hurry him, but it was of no use; he was anxious enough before making the bargain, but now that it was settled, and competition was out of the way, his anxiety had ceased.

"The baggage was piled on the mules that were to carry it, and when all was ready we mounted our saddle animals. They were not very prepossessing in appearance, and looked as though the mountain journey would be too much for them, but they were the best in the train, and we concluded to be content with the situation. Mules are considered better than horses for this sort of work, as they are surer in their footing, and will venture in places where a horse refuses to go. Bulls and donkeys are also used here for carrying burdens along the mountain roads, but they are not equal to mules.



A PACK-TRAIN UNDER

"We filed out of the village, accompanied by several travellers who were going in the same direction, so that altogether we formed a long cavalcade. As we ascended the hills the road became very rough, and frequently the path was blocked by trains going in the opposite direction. In spite of all the good-nature that the arrieros displayed towards each other, there were several serious detentions; we found the donkeys more obstinate about holding the track to themselves than the other animals, though none of the latter were to be praised for their courtesy.

"Some of the trains we met were laden with coffee and cacao on its way to the seaport, while others

carried potatoes, barley, pease, fowls, and other produce intended for consumption in the country. The people were, without an exception, civil and obliging, but they could not always induce their beasts to follow their example. Many of the men were accompanied by their wives and daughters, but whether the latter were going for a pleasure-trip or formed a part of the working force I am unable to say.

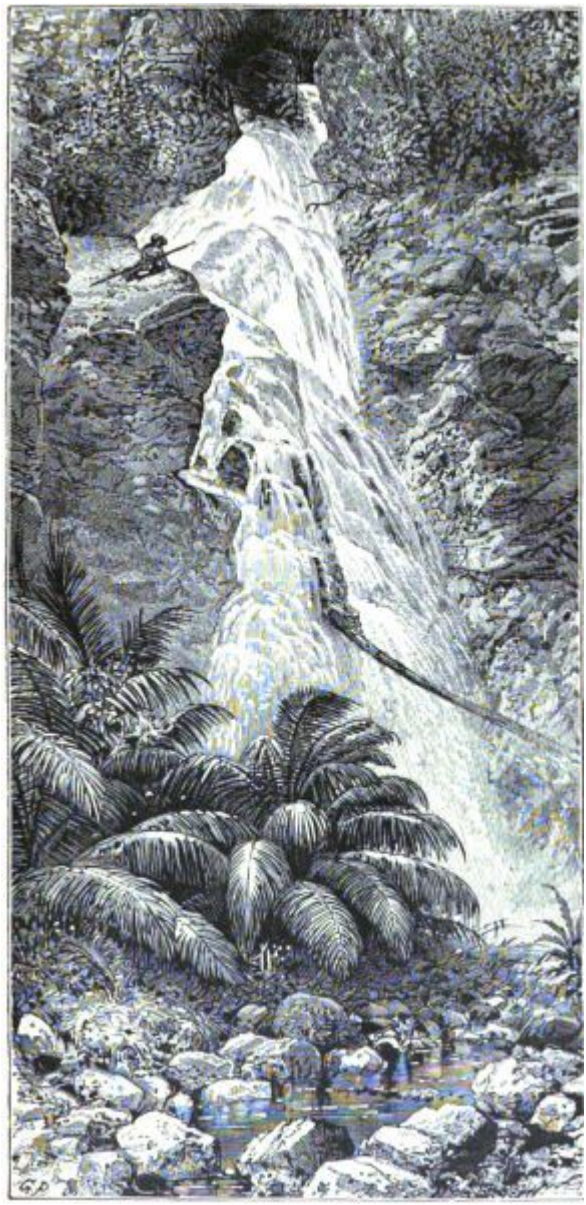
"The road increased in roughness as we advanced; properly speaking, it was not a road, but simply a track worn in the rocks by the feet of the animals that had travelled there for hundreds of years, and by the water that sweeps down in torrents during the rainy season. In some places the way was a sort of rocky staircase, and our mules placed their feet in steps which had been worn to a depth of five or six inches. It was often so steep that if we had not leaned well forward we should have been in danger of a backward somersault, and the consequences of such a fall, especially if the man should carry his mule with him, are fearful to think of.

"Accidents are frequent here, and the great wonder is that there are no more of them. Fortunately, we did not meet any of the descending trains in the most dangerous spots, where the path wound around precipices or through narrow defiles; there are many places where it does not seem possible for two animals to pass in safety, and I can well understand that there is a foundation for stories about men engaging in fights for the right of way. The unprogressiveness of the Spanish people in Ecuador is shown by their being content to get along with this kind of road between their seaport and their capital city during three centuries!

"Night came upon us while we were climbing the hills, and as it is very dangerous to travel after dark, we halted where there were a couple of rude huts, not sufficient for sheltering our party. The arrieros and their peons slept outside with their animals, while the travellers were made as comfortable as their blankets would permit on the floor of the huts. There was the solid earth to sleep on, and we were relieved from monotony by the presence of innumerable fleas. In the morning, each of us felt sure he had been bitten at least three thousand times, and Fred thought he could count not less than four thousand distinct and well-defined bites. Fleas are even cheaper than bananas to cultivate and much more abundant to the acre; it is certain they are not destructive to life, for if they were there would be no living thing in Ecuador.

"Before going to bed we supped from some of our provisions, aided by a dish of stewed potatoes prepared by the owner of the hut where we slept. A favorite dish among the mountaineers is potato stew or soup, which is known as *locro*; sometimes it is prepared plain, while at others it contains chicken, beef, or any other obtainable meat. The presence of meat adds materially to the dish for European palates, and when well prepared a dinner of locro is not to be despised.

"Our surroundings were not conducive to late sleeping, and we were off soon after daybreak. The morning was very cold, but as the sun ascended in the heavens the air grew warmer, and we ceased shivering. In a little while we reached the summit of a ridge several thousand feet above the level of the sea, and had a magnificent view.



A MOUNTAIN CASCADE.

"There was a mist when we started, but it rolled away when we came to the top of the sierra; on one side we had the lofty mountains far above us, and on the other the country dropped away at our feet till it was lost in the distant shore of the Pacific. The great snowy peak of Chimborazo was in full view, and we longed to ascend to its summit and look out upon the wide stretch of land it commands. One traveller says the view from its top would embrace an area of fully ten thousand square miles, and I can readily believe him. Nobody has yet been there, and the name of the man who first ascends it is destined to be remembered.



BARON V

HUMBOLDT IN 1802.

"Humboldt and his companions endeavored, in 1802, to ascend to the top of Chimborazo, but were obliged to stop short when they had yet two thousand and more feet above them.

"They were stopped by an immense chasm that stretched across the line they were ascending, and by the inconveniences that are generally experienced at high altitudes. Blood spurted from their eyes and lips, and they breathed with great difficulty. According to barometrical observations, Humboldt was within 2138 feet of the summit when he turned back.

"Boussingault and Hall have since ascended to within 1729 feet of the top of the giant mountain, by taking a route different from that followed by Humboldt. They experienced the same difficulties in breathing and in the rush of blood to the lips and eyes; both of them were enfeebled for some time after making the journey, and their experiences were altogether such as to deter any but the hardiest of men from attempting the ascent of Chimborazo.

"But though we cannot climb to the top of this kingly mountain, we may look at it as much as we please, and very beautiful it is in the contemplation. It is a sharp cone, sharper and more pointed than Fusiyama or Etna, sharper even than Tacoma or Ranier in our own country, and sharper again than magnificent Avatcha, the great landmark of Kamtchatka. Its summit is covered with perpetual snow; it stands within less than two degrees of the equator, and the palm groves of the tropics are spread almost at its feet. Eternal winter wraps its head, but eternal summer smiles below. Standing where Humboldt

stood, all the seasons of the year and all climates of the globe may be passed in review.

"But I'm stopping you on the sierra while telling you about Chimborazo. Well, the mules have had a chance to breathe, and we'll move on.

"From the top of the sierra we descended the slope to the valley of the Chimbo; the road is steep, and in many places slippery, and more than once we thought we would not get down without a serious accident. Here and there our mules put their feet together, and slid with a velocity that made our hair rise under our hats, and our teeth shut closely together; we shall hereafter have more respect for the intelligence of the mule than we ever had before. One of the baggage mules tumbled, and was pitched together in a heap, but he gathered himself together, and rose again as though nothing had happened.

"We passed many places that reminded us of the northern states of our own country; the valley is elevated eight or nine thousand feet above the sea, and the climate is quite unlike that of the region around Guayaquil. Wheat, barley, potatoes, and turnips are cultivated, instead of the tropical products which we saw along the banks of the Guayas; at a little distance the dwellings of the people have a substantial appearance, but a closer acquaintance shows that they are built of mud and are anything but attractive on the inside.





NEAR QUARANDA.

"We stopped for the night at Guaranda, which is on the west bank of the Chimbo River, and is said to be a healthy place of residence throughout the year. It has a population of about two thousand, but there is hardly a decent house in the place. The buildings are low huts of *adobe*, or sun-dried bricks; the streets are made lower in the centre than at the sides, and when the rains fall there is no danger that the foundations of the houses will be damaged by water.

"Dr. Bronson said that we were in the centre of the region which produces the celebrated *Chinchona*, or Peruvian bark, which has such a great reputation in curing fevers. It takes its name from the Countess of Chinchon, who was cured of intermittent fever by its use at Lima, about the middle of the seventeenth century. It was then taken to Europe, and the knowledge of it was spread through the civilized world."

"Quinine is produced from this bark, is it not?" Frank

inquired, when Fred read the note quoted above.

"Yes," replied the latter, "quinine is an alkaloid, made from Peruvian bark, and was discovered in 1820. There are several other alkaloids in the bark, but none are as important as the one you have just mentioned. Any doctor can tell you of its qualities, and a great many people who are not doctors are familiar with its uses.

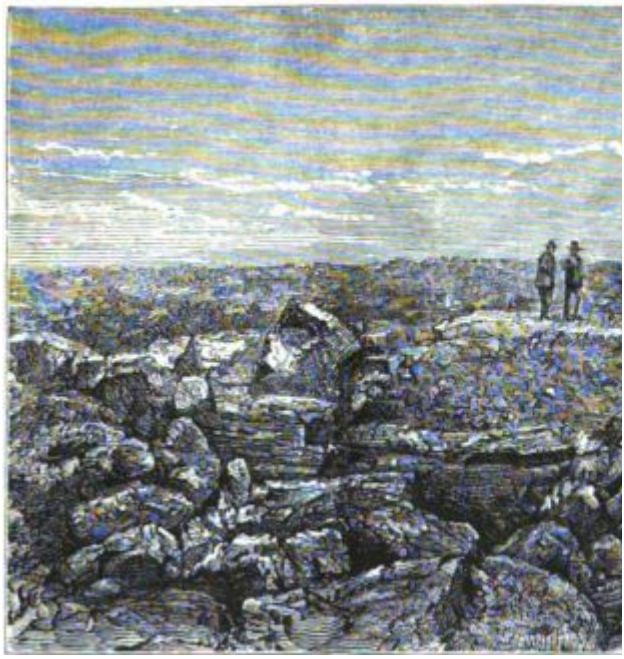
"No traveller will venture into a malarious region without a good supply of quinine, and in some countries it is almost as important to have it as to be provided with food."

Having answered Frank's interrogatory, Fred continued with his observations upon the trees that produce the valuable bark.

"There are no less than twenty-one varieties of trees producing the bark from which quinine is made," said Fred, "but some of the most valuable of them are extinct, owing to the reckless way in which they have been stripped. The trees grow on the slopes of the Andes, in Peru, Ecuador, and other countries; they have been successfully transplanted to India, Java, Algeria, and the United States; and the future supply of quinine for a feverish world will probably come from other countries than South America.

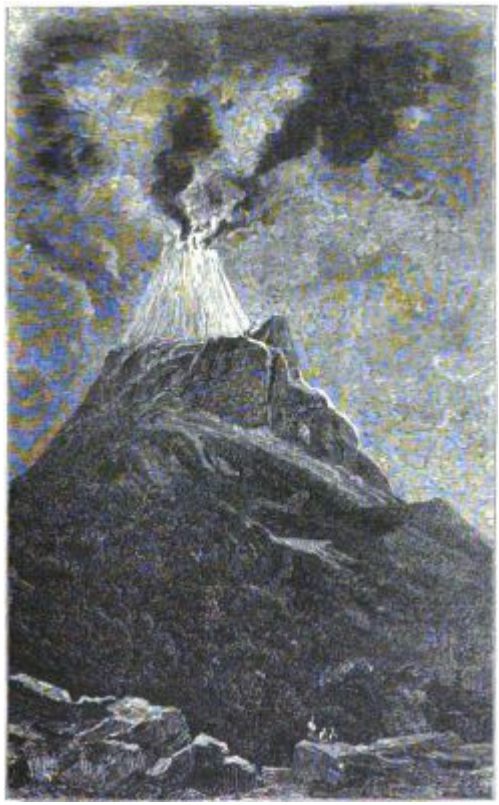
"The *cascarilleros*, or bark-collectors, are obliged to go far into the forests in search of trees, and they suffer many hardships and privations in pursuing their industry. The best of the trees have been destroyed; we asked if we could see one, and were told we must make a journey of several days to do so, as none now grow in the neighborhood of Guaranda. A gentleman who lives in Quito told us he had seen a chinchona tree sixty feet high, and six

feet in circumference; it yielded two thousand pounds of green bark, or about one thousand pounds when dry. Another tree that he saw gave three thousand dollars' worth of quinine; but such trees are rare.



AMONG THE LAVA BI

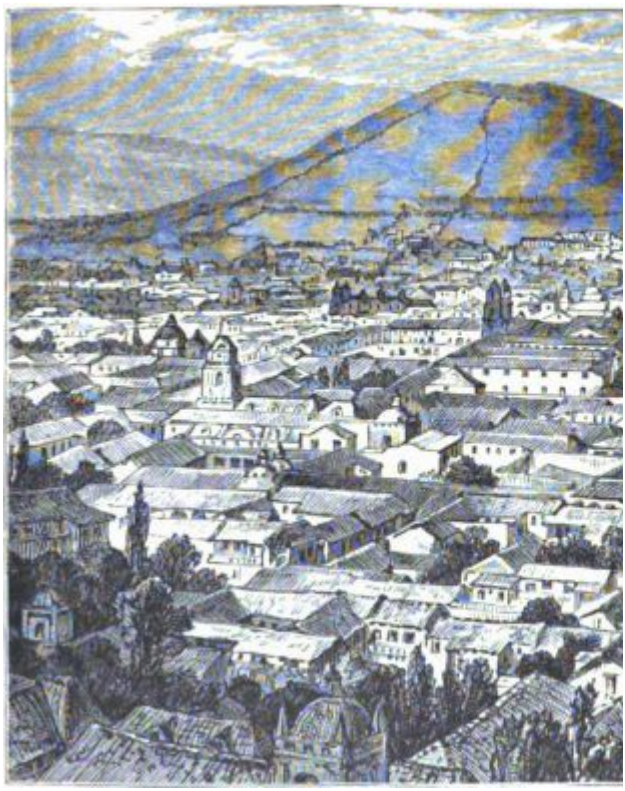
"We left Guaranda very early in the morning," Fred continued, "and when we jumped into our saddles we could hardly see where they were. There is a ridge to cross, after getting out of the valley of the Chimbo, which it is desirable to pass in the forenoon, as the wind blows violently there after the sun has passed the meridian, though it is quiet enough in the morning. We crossed the ridge, with the great mountain rising before us, and then descended to another valley to the city of Ambato, which has nothing in particular to recommend it.



VIEW OF COTOPAXI.

"To describe the dreary road from here to Quito would be tedious reading. It passes through a region of volcanic origin, where the rocks are piled everywhere in great confusion, vegetation is restricted, and the miserable villages of the natives are repulsive in every aspect. It winds over hills and ridges, or through valleys and along the banks of streams; it rises in some places ten or twelve thousand feet above the sea-level, and nowhere is it less than eight thousand feet in elevation. The latter part of the journey is over a wagon road, passing in full view of the volcano of Cotopaxi, and crossing a

ridge that suddenly brings us in sight of the capital city, nestling at the foot of Pichincha, the volcano which more than once has threatened to ingulf it in total ruin.



VIEW OF QUITO AND THE VOLCAN

"The country improves as we approach Quito. There are farms in great number, and the fertile slopes of the hills appear to be well cultivated. Before we reach the ridge which reveals it, we traverse a valley that might be made far more productive than it is, and when we come to the banks of the Machangara, the river that flows past Quito, we can hardly realize that we are nearly two miles up in the air. But it is

really so, as the elevation of the city is little less than ten thousand feet; and people afflicted with pulmonary complaints would do well to stay away from it."

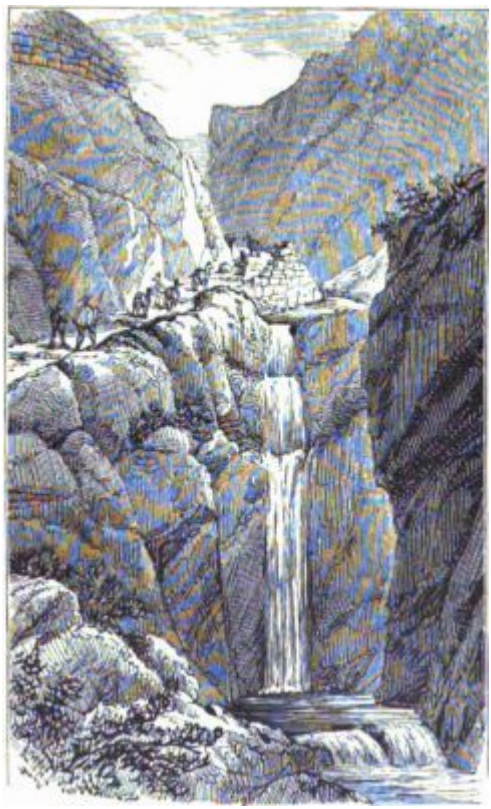


INCA GATEWAY AND FORTRESS

CHAPTER VII.

DESCRIPTION OF QUITO.—VISIT TO THE VOLCANO OF PICHINCHA.—THE DEEPEST CRATER IN THE WORLD.—ROUTE OVER THE

ANDES TO THE AMAZON.—RETURN TO THE COAST.



CROSSING THE MOUNTAINS.

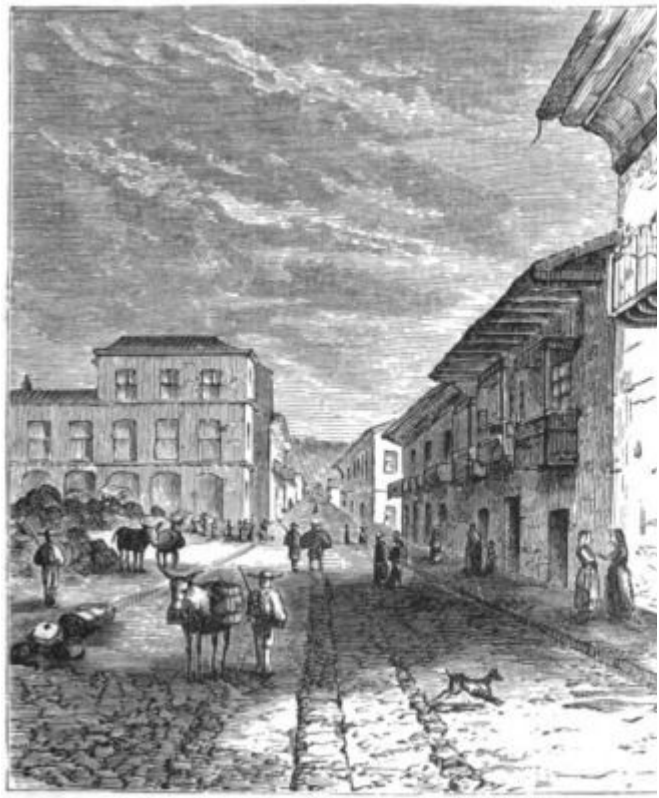
The journey from Bodegas to Quito had exhausted the strength of our friends, and they were quite willing to rest in the hotel during the first evening of their stay in the capital. The time was improved by a study of the history of the city, and when they started out the next morning they were well stocked with information.

"Nobody now living can tell how old Quito is," said the Doctor; "it was founded many centuries ago by

the Quitas or Quichas, and its early history is buried in obscurity. According to some traditions it is nearly two thousand years old. It is positively known to have existed about 1000 A.D., when it was captured by the Cara nation, who were more civilized than the Quitas.

"About the year 1475 it was conquered by Peru, and was made the capital; it retained that honor until captured by Pizarro in his famous conquest, and the glory of Atahnalpa, then its ruler, was extinguished forever. If you wish to know in detail of the romantic history and tragic fate of Atahualpa, the son of Huayna-Capac, you can find it in Prescott's 'Conquest of Peru.'"

"I remember, in my school history," said Fred, "it was said that Atahualpa was imprisoned by Pizarro, and offered to fill with gold the room where he was confined, on condition of receiving his liberty. He filled the room as agreed, but was afterwards put to death by order of Pizarro."



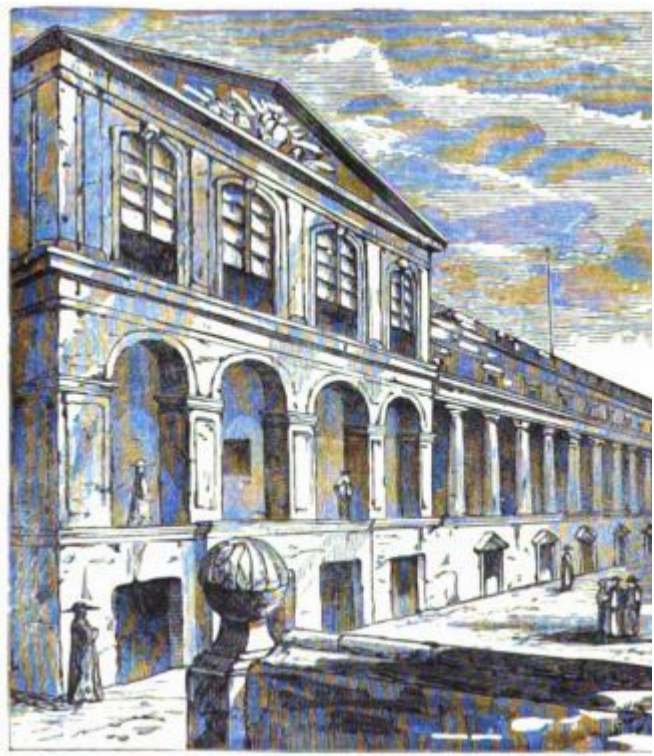
A STREET IN QUITO.

"The story does not rest on very good authority," said the Doctor; "but the conduct reported of Pizarro is quite in keeping with the character of the Spanish conquerors of the New World. Pizarro's biographer says he was guilty of the greatest cruelties and perfidies in the acquisition of gold, but he distributed it freely among his followers, and spent most of the vast treasures obtained from the Incas in the erection of public buildings and other improvements for the general benefit. That he was a brave man is shown by the fact that the conquest of Peru was undertaken, and successfully accomplished, with a force of three

vessels, one hundred and eighty men, and twenty-seven horses."

"And all this country was captured with such a mere 'handful of men!'" exclaimed Frank.

"Yes," replied Dr. Bronson, "that was the force with which Pizarro left Panama, though it was afterwards increased by the arrival of recruits. Pizarro received a royal commission from the King of Spain, with a title of nobility. His descendants may now be found at Truxillo, in Spain, and they point with pride to their great ancestor, whose education was so neglected that he was unable to read or write.



PALACIO DE GOBIERNO (GOVERNMENT HOUS

"Quito was a more magnificent city under the Incas of Peru than it has ever been since the Spanish conquest. The extent of its population is not known, but it was certainly larger than to-day. The palace of Atahualpa was one of the finest in South America, and its roof is said to have been covered with gold. All the gold of the city was seized by the Spaniards, and the palace was destroyed. A convent now occupies its site, and we will look at its gloomy walls to-morrow. The magnificent Temple of the Sun is reduced to a few stones which mark the spot where it stood."

With a running conversation concerning the history of Ecuador the evening went on until it was time to go to bed. All retired early, and were up betimes to inspect the wonderful city they had toiled so hard to see.

"We are not in the highest city of the globe," said Fred in his note-book, "but we are two thousand feet farther above the sea than is the Hospice of St. Bernard, the most elevated spot in Europe which is inhabited all the year round. According to our barometers, and those of other travellers, we are 9520 feet above the beach of the Pacific Ocean at its nearest point, or only 1040 feet less than two miles.

"Cooking is performed under difficulties, as water boils at 194° Fahrenheit; potatoes, beans, and similar things require much longer time for cooking than in the lowlands, and somebody says it is an excellent provision of nature that the potatoes are small. Frank suggests that when a traveller among mountains has no thermometer or barometer he can ascertain his elevation by observing how long it takes to boil a potato of a given size.



WATER-CARRIERS.

"We started out of the hotel escorted by a guide who was to show us the sights of Quito. The streets are not crowded, and nobody seems to be in a hurry; there are many beggars, and some of them were very persistent, as is generally the case with beggars all over the world when strangers come within their reach. The water-carriers seem to form quite a class, and we were forcibly reminded of the same professionals of Cairo. There was this difference, however, that the latter transport their merchandise in skins, while those of Quito carry enormous jars on their shoulders or backs. They fill these jars at the

public fountains, and then start off at a slow trot to supply the houses that employ them. We met a great many monks and priests, whose calling could be recognized at a considerable distance by their peculiar robes and the enormous hats which covered their heads. Quito is eminently a city of priests, and is liberally provided with churches and convents for its population of forty or fifty thousand.



PRIESTS AND MONI

"Donkeys and mules are the beasts of burden, and occasionally some of them brushed against us with their loads, that projected far on each side. But they do not have a monopoly of the carrying trade, as we saw a good many Indians laden with baskets of vegetables and fruit from the neighboring country, and they appear to be as strong as the donkeys, if we may judge by their great loads. Many of these porters

are women, and in some instances we saw men, without burdens, walking by the side of women carrying baskets large enough to be a load for two persons. Evidently the aborigines of Ecuador are no believers in the exemption of women from hard work.

"There is probably little resemblance between the Quito of to-day and that of Atahualpa and the Spanish conquest. The city had suffered much from earthquakes, and was partially destroyed by fire; the Spanish conquerors founded a new Quito in 1534, and laid out the streets on lines of their own, and, since their advent, the earthquakes have again shaken it to its foundations. There were severe and destructive shocks in 1797 and 1859, and another in 1868. In the one last mentioned many lives were lost, numerous buildings were thrown down, and, according to the official report, every house in the city was so shaken and weakened that not one was fit to live in. Half a dozen churches, the government buildings, and the archbishop's palace were wholly or partially demolished, such of them as were not thrown down being so weakened as to render their removal necessary.

"In almost every street there are piles of ruins, and it is a wonder people will continue to live here with the effects of the earthquake so constantly before them. Nearly all the houses are of but a single story, and the most ambitious of the edifices rarely exceeds two stories. Most of the streets are narrow and have channels in the centre, through which streams of water flow during and after a rain. We observed a great variety in the costumes of the people, and were told that every district had its distinct way of coloring its garments, so that its inhabitants could be

distinguished from others. Occasionally we saw people with hardly any clothing whatever; but the absence of wardrobe was made up by a free use of paint. The natives thus decorated were from the eastern slopes of the Andes, but they did not appear to be numerous.

"The common houses have no fireplaces or chimneys; fires are built almost anywhere on the earthern floor, and the smoke is allowed to get out the best way it can. Even in our hotel the kitchen is little more than a dark hole, where the pots and kettles are so indiscriminately assembled that the cooks are liable to mix things up fearfully, while preparing a meal. Neatness is not fashionable, and there is no country in the world where the appetite would suffer more discouragement than here by a revelation of the culinary mysteries.

"Our guide called attention to the distinction among the men on the streets, some of them wearing cloaks and others *ponchos*. No gentleman would wear a poncho in public any more than a Frenchman of the middle or upper classes would don a blouse for a promenade. The poncho is far the more picturesque of the two garments, and I am inclined to think its wearers are more comfortable than the genteel part of the population. Ladies wear the *panuelon*, which corresponds to the Spanish mantilla, and they eschew hats and bonnets altogether. The only head-covering beyond the hair is a lace veil or a fold of the panuelon; but its use is by no means obligatory. It is said that when the daughter of an American minister-resident wore a bonnet in the cathedral on the Sunday following her arrival, she was criticised as severely as she would be for wearing a masculine 'stove-pipe' in a New York church.

"A gentleman who has lived here for some time says there are about eight thousand people of Spanish origin in Quito, ten or twelve thousand Indians of pure blood, and perhaps twenty thousand *cholos* or mixed races. Then there are a few foreigners and negroes, and other few who cannot be readily classified. The whites are the aristocracy or ruling race, and, owing to the numerous revolutions which have reduced the male population, women outnumber the men. For a white man to work would be degrading, and many a gentleman will not hesitate to beg for a dinner or a cup of coffee, though he would scorn to earn the money to pay for it. The poverty-stricken hidalgo of Spain is no more proud of his lineage than is the Spanish-descended resident of Quito, who wraps his tattered cloak around him, and comforts himself with reflections upon the past glories of his family.





LAUNDRESSES OF QUITO.

"In the course of our wanderings we came to the bank of the river which flows past Quito. It is an insignificant stream, ordinarily, but swells to a torrent at certain seasons of the year, when the rains fall in the neighboring mountains. Laundresses were at work at their trade, and from the way the linen of Quito is washed, it is certain to need frequent renewal. The garments are dipped in the river, and then spread on the rocks, where they are pounded with mallets or bowlders until the desired condition of cleanliness is attained. It reminded us of the way the Bengalee *dhobies* at Madras washed our clothing, and accounts for the large importation of cotton goods into Ecuador in proportion to the population.

"While we were passing a potato-field Dr. Bronson reminded us that we might consider ourselves near the birthplace of an intimate friend.

"We tried to think what friend of ours was born in Quito, but could not remember any. We said so to the Doctor, and he then explained that the one he referred to was the potato.

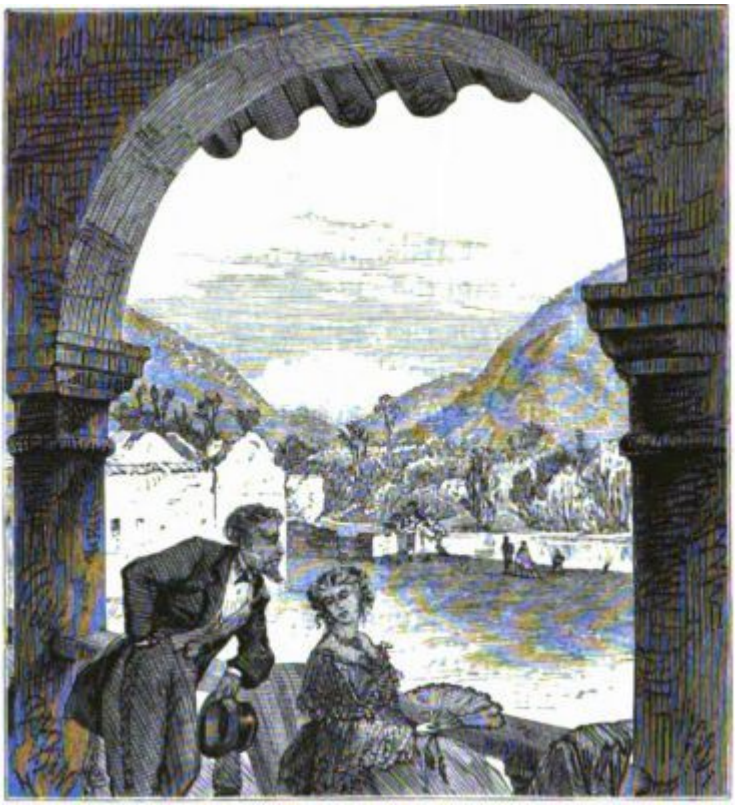
"'Certainly,' exclaimed Frank, 'I remember, now you mention it, that the potato was found at Quito by the Spaniards and taken by them to Europe early in the sixteenth century. From Spain it was carried to Germany, France, Belgium, and Italy, and last of all to Ireland, where it was introduced by Sir Walter Raleigh on his estate near Cork.'

"'You are quite right,' said the Doctor. 'The so-called "Irish potato" is really a native of South America.'

"'The descendant is worthier than the parent,' Frank remarked, as he pointed to the potato-field we were passing. 'The potato of Ireland and of the United States is much larger and finer than that of Ecuador. Cultivation in a foreign land has done a great deal for this vegetable.'

"We both agreed with him, as we had already remarked the diminutive size of the potatoes of Quito. The same comment applies to the cherries, pears, peaches, strawberries, and tomatoes, which do not seem to enjoy the climate, but there are other fruits and vegetables that get along better. The finest fruit here is the *chirimoya*; its name comes from *chiri* (cold), and *moya* (seed). It grows in Peru and other parts of South America as well as in Ecuador; the fruit often reaches a weight of sixteen pounds, and has a thick green skin enclosing a snow-white pulp, in which about seventy black seeds are imbedded.

Professor Orton says its taste is a happy admixture of sweetness and acidity; Hamke calls it 'a masterwork of nature;' and another traveller describes it as 'a spiritualized strawberry.' We have tried to find a description of it, but must fall back upon that of our predecessors. Dr. Holmes says all the pens in the world cannot tell how the birds sing and the lilacs swell; no more can we give in words a satisfactory account of this prince among fruits.



OF THE ANDES.

"But all the time, during our walk through and around Quito, we find ourselves every few minutes

fixing our eyes on the great peaks of the Andes and Cordilleras that rise around us. We are in the centre of the most volcanic region of the globe; there are fifty-one volcanoes in the chain of the Andes, and out of this number no less than twenty surround the valley where Quito stands. Three of the twenty are active, five are dormant, and twelve are extinct; they are all in a space two hundred miles long and thirty wide, and in addition to these volcanoes there are many other peaks not strictly volcanic. There are twenty-two mountains whose tops are covered with perpetual snow, and fifty that are each more than ten thousand feet high. Do you wonder that while looking at the city our thoughts are drawn towards the mountains in whose midst it is built?"

In the evening our friends arranged to visit the summit of Pichincha, the volcano which towers above Quito, and is easily reached. Mules can be ridden to the very edge of the crater, but there are not a dozen gentlemen of Quito who have ever made the journey to it; they are intending to do so at some future time, and this future never comes. Apart from the guides, it is probable that the mountain has been ascended more frequently by strangers than by native-born residents of the city.

Our party started from Quito in the afternoon, accompanied by two guides, and rode to a Jesuit monastery in the valley of Lloa, where they passed the night. Rising at daybreak the next morning, they rode through the forest which surrounds the mountain, up to the timber line, twelve thousand feet above the sea; the path was intricate and very difficult, as it was frequently blocked by fallen trees and obstructed by huge stones, which it was necessary to pass around. From the timber line they

passed into a belt of stunted bushes, and then reached the point where vegetation ceases.

Here it was less laborious travelling, but by no means easy. By nine in the forenoon they were at the foot of the cone, where they left the mules in the care of one of the guides and finished the ascent on foot.



THE

Frank and Fred were of different opinions; the former declared the cone easier of ascent than that of Vesuvius, while the latter thought it was not. But they agreed that there was less of it than of the cone of Vesuvius, and therefore it was preferable; it was

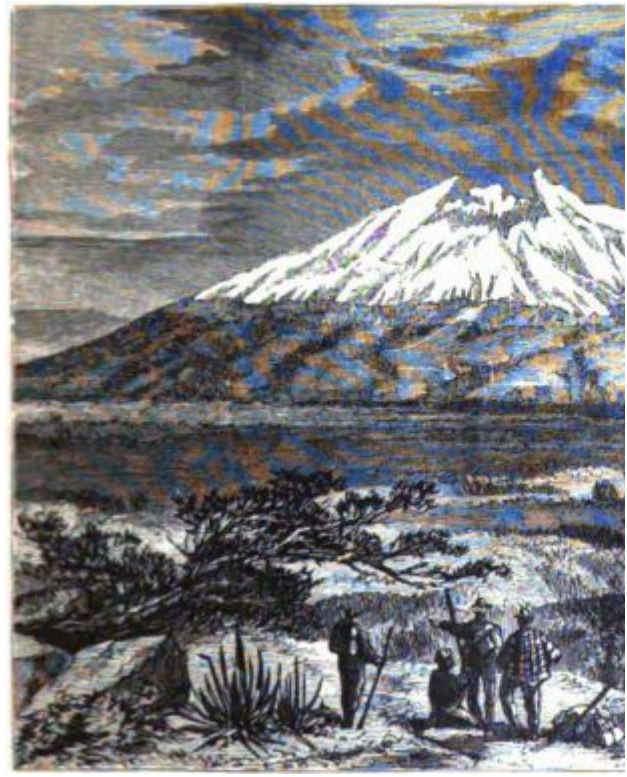
little more than two hundred feet high, and covered with sand and cinders at an incline of about thirty-five degrees. They had many slips and falls, but nothing of consequence; Frank was a few feet in advance of Fred when they reached the edge of the crater, and both gave a loud hurrah by way of encouragement to the Doctor, who was lagging behind.

They wanted to descend into the crater, but the guide refused to accompany them, and the Doctor counselled prudence, as the crater of Pichincha is the deepest in the world, and the descent is dangerous. Humboldt pronounced it inaccessible, from its great depth and precipitous descent, but since his time it has been explored. The first who ventured there were Garcia Moreno and Sebastian Wisse, in 1844; and next after them was Professor Orton, in 1867. The latter says he was obliged to use the greatest caution, and a single misstep would have sent him tumbling to the bottom of the abyss. At times he was almost paralyzed with fear, and felt that death was staring him in the face.

"To give you an idea of the crater of Pichincha," said the Doctor, as they stood on its edge and watched the clouds of smoke and steam curling upwards, "let me give you some figures. This crater is 2500 feet deep; that of Kilauea, in the Sandwich Islands, is 600; Orizaba is 500; Etna is 300; and Hecla 100. Professor Orton says Vesuvius is a portable furnace by comparison with this crater, which is a mile wide and half a mile deep. We are standing nearly 16,000 feet above the level of the sea, 5000 feet higher than Etna, almost four times the height of Vesuvius, and five times that of Stromboli, the 'lighthouse of the Mediterranean.'"

"I cannot do better," said Fred, afterwards, in describing the view from the summit of Pichincha, "than quote the words of Professor Orton in 'The Andes and the Amazon.' Here they are:

"'Below us are the smouldering fires, which may any moment spring forth into a conflagration; around us are the black, ragged cliffs—fit boundary for this gateway to the infernal regions. They look as if they had just been dragged up from the central furnace of the earth. Life seems to have fled in terror from the vicinity; even lichens, the children of the bare rocks, refuse to clothe the scathed and beetling crags. For some moments, made mute by the dreadful sight, we stood like statues on the rim of the mighty caldron, with our eyes riveted on the abyss below, lost in contemplating that which cannot be described.



EL ALTAR, VOLCANO, EC

'"The panorama from this lofty summit is more pleasing, but equally sublime. Towards the rising sun is the long range of the Eastern Cordilleras, hiding from our view the great valley of the Amazon. To right and left are the peaks of another procession of august mountains, from Cotocachi to Chimborazo. We are surrounded by the great patriarchs of the Andes, and their speaker, Cotopaxi, ever and anon sends his muttering voice over the land. The view westward is like looking down from a balloon. Those parallel ridges of the mountain chain, dropping one behind the other, are the gigantic staircase by which the ice-crowned Chimborazo steps down to the sea. A

white sea of clouds covers the peaceful Pacific, and the lower parts of the coast. But the vapory ocean, curling into the ravines, beautifully represents little coves and bays, leaving islands and promontories like a true ocean on a broken shore. We seem raised above the earth, which lies like an opened map below us; we can look down on the upper surface of the clouds, and, were it night, down too upon the lightnings.'"

After an hour had been passed in contemplation of the awful crater, and the grand view from the summit of the mountain, the Doctor suggested that it was time to descend. Finding a place where the cinders were unbroken from top to bottom of the cone the youths slid quickly downward, as they had done at Vesuvius, years before. They were followed by the Doctor, and then the trio sat down to a dinner, which had been left in care of the guide who remained with the mules. It was seasoned with the best of sauces, hunger, which had been developed by the exertions of the morning, and the pauses in the progress of the meal were brief indeed.

Dinner over, they mounted, and returned by the road which they followed in the ascent. Evening found them again in Quito, and in the wretched *posada* which is the only hotel of the capital of Ecuador.

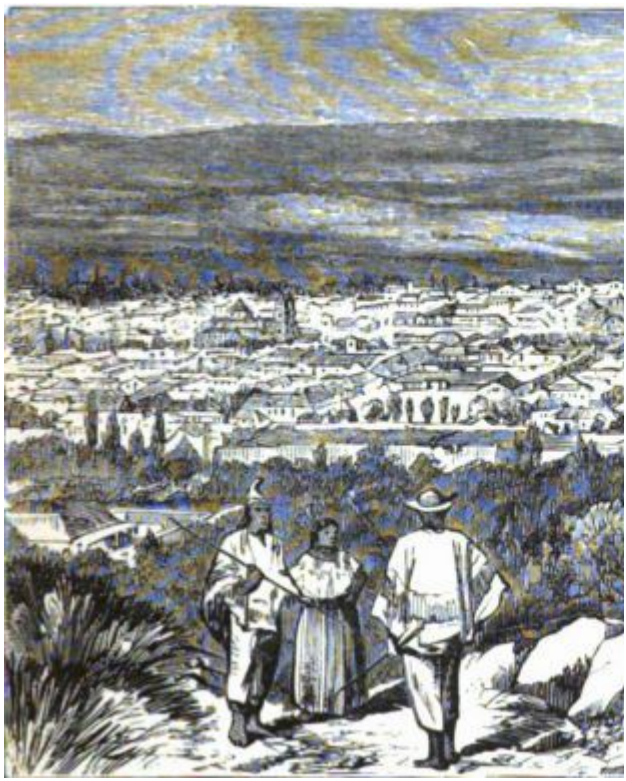
During the evening conversation naturally turned to volcanoes and earthquakes; one writer has said facetiously that earthquakes are the principal productions of Ecuador, and he certainly is not far out of the way. Most of the South American earthquakes appear to have their origin in Ecuador, as the shocks are generally felt there first, and with the greatest severity. The great disturbance of 1868 was an exceptional occurrence, as it had its

commencement in Peru, on the 13th of August, causing great loss of life and destruction of property. The shock in Ecuador was three days later; it was more fatal to life than in Peru, but less destructive to property. The Peruvian earthquake occurred in the afternoon, and was preceded by premonitory shocks, while the Ecuadorian one was in the night, and gave no warning of its approach.

"According to the accounts," said the Doctor, "the first shock of the earthquake in Quito was felt a little after midnight on the 16th of August, another at four in the morning, and two others in the course of the day. One, in the afternoon, was accompanied by a shower of rain and hail, which fell with great violence; there had been a similar shower on the afternoon of the 15th. It was noticeable that for two months before the earthquakes there were serious disturbances of the atmosphere, and a catarrhal fever had prevailed, which swept off thousands of people. The whole country was in mourning for those who had died of the pestilence, when the earthquake came, to cause additional sorrow.

"The amount of the destruction in Quito has been mentioned already. The earthquake was more severe in the northern provinces of Ecuador, where the ground sank, cliffs were thrown down, lakes appeared, great chasms opened in the earth, and the whole face of the country was changed. The province of Imbaburu, which was the most fertile and productive in the republic, as well as the most populous and prosperous, suffered more than any other. It contained several towns and small cities, and the rural districts were in an excellent state of cultivation for this part of the world. The earthquake totally destroyed several of these places, as it came

in the night, when most of the inhabitants were asleep in their houses. Two towns in the canton of Catuchi were completely wiped out of existence, and no sign was left to show where they stood. Not five per cent. of the people escaped with their lives!



VIEW OF IBARRA, ECU

"In another town seven tenths of the inhabitants were killed by the falling of the buildings, and the sinking of the earth into a great chasm, which opened beneath the place. The city of Ibarra, the capital of the province, was beautifully situated in the centre of a fertile plain; it was surrounded by orchards, gardens, and fields, so that the place only

became visible on a very near approach, or from the distant hills. It had a population of about ten thousand, though generally estimated at a higher figure. Nearly one half of its inhabitants lost their lives in the earthquake, and it was said that hardly a dozen houses remained standing after the shocks were ended.

"The subject is an unpleasant one," continued the Doctor, after a pause. "Let us turn to something else.

"To-morrow we will prepare for our return to the coast. The guide has been trying to persuade me to go over the Andes to the head-waters of the Amazon, whence we can descend to the Atlantic. I have told him our plans would not permit our doing so, but he desires to talk further on the subject. Let us call him, and hear what he has to say; at any rate, we can learn something about the country to the east of us."

Francisco, the guide, was waiting in the court-yard of the hotel, and came promptly when told that he was wanted. He was an intelligent native of a village near Quito, and had been several times over the mountains, between the capital and the Napo River, one of the tributaries of the Amazon. He spoke Spanish fluently, and told his story without a moment's hesitation. We will render it into English, and give it as it was remembered by our friends.

"The journey from here to the Napo will take about fifteen days," said Francisco, "and down the Napo to where the steamers come on the Maranon, or Upper Amazon, will take fifteen or twenty more. You will need to carry the most of your provisions, as game cannot be relied on, and the people are scattered, and have very little to sell. Professor Orton had three persons in his party, the same number that you have, and he calculated his provisions so closely, that

when he reached the first village on the Maranon he had just enough left for one grand farewell dinner."

Fred asked what the Professor carried in the way of provisions. Francisco drew from his pocket a faded and crumpled paper, and read as follows:

"One hundred pounds each of flour and crackers; ninety pounds of sugar; fifty pounds each of rice and dried beef; thirty each of corn-meal, pea-flour, and chocolate; fifty of *mashka* (roasted barley-meal); ten each of salt, lard, and ham; one hundred and seventy eggs; and one or two pounds each of tea, *maté*, soda, and cream of tartar. They bought eggs, chickens, rice, syrup, and other things from the Indians, whenever they had the opportunity, and when they reached the river they occasionally obtained fish, game, and turtles' eggs.



NAPO INDIAN PORTER.

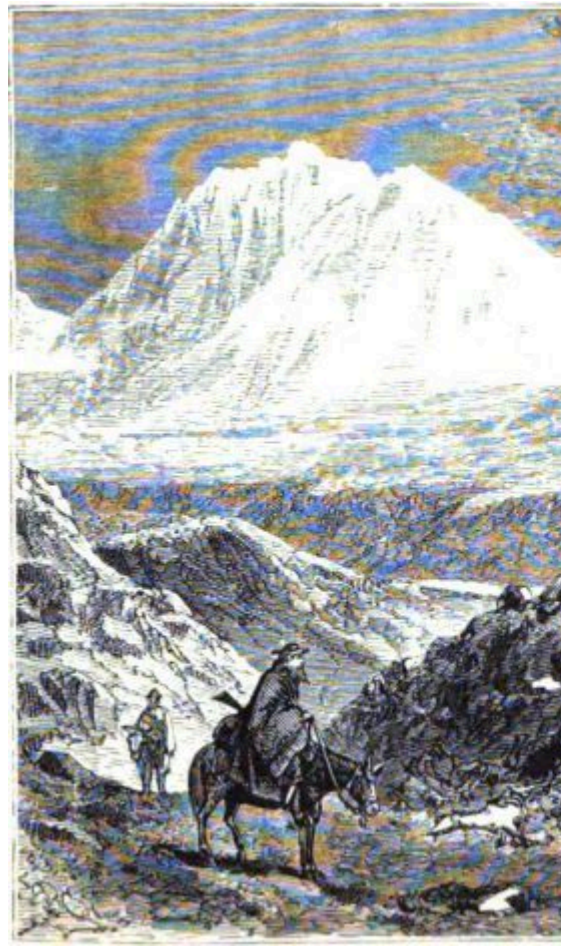
"All these things were sealed up in tin cans," continued the guide; "partly as a precaution against injury from the dampness of the climate, and partly to save them from theft by the Indian porters. The atmosphere of the Napo is like a steam bath, and keeps everything wet, and the Indians have a fondness for helping themselves when they have a chance. You can't get along without the Indians, as they are your only porters. From here to the foot of

the mountains you can go on horseback, but the rest of the way to the Napo you must travel on foot, and the Indians carry your baggage."



DESCENDING THE NA

This announcement caused a shake of the head on the part of the trio of listeners, and it became very evident that they were not inclined to make the journey from Quito to the Amazon in that way.



MOUN

"You will cross the Andes at an elevation of fifteen thousand feet," said Francisco, not noticing the sign of disapproval; "and, therefore, must carry thick clothing to shield you from the cold, and rubber ponchos to keep off the rain in the day and spread on the ground at night as a foundation for your beds. You want two suits of clothes; one to wear in the daytime, and the other to put on dry at night. When

you go into camp you must remove the suit you have worn since morning, as it will generally be wet through by the rain, or by fording streams and passing through marshy ground."

"How many pairs of boots will be wanted for each of us?" inquired Fred. "It seems to me there will be a fearful destruction of foot-gear."

"Yes," replied the guide, "but your American boots will not answer for the journey. Buy plenty of *alpargates*, or native sandals made from the fibre of the aloe plant, and be sure and have enough of them, as a pair will not last more than two days. They are better than boots, as they do not keep the feet uncomfortably warm, and no leather boots can keep out the moisture through which you will constantly travel.

"Then you want a stock of *lienzo*, or cotton cloth, which is the currency of the Indians, just as it is of the wild people of Africa. Then add knives, fish-hooks, thread, beads, looking-glasses, and some other trifles, and you will have an outfit for the trip. Of course you will suit yourselves about guns, pistols, cooking utensils, scientific apparatus, and the like, and remember to have no package weighing more than seventy-five pounds, which is the load of an Indian porter. Professor Orton had thirteen horses to carry himself and party as far as the horses could go, and from there to the Napo he had twenty Indian porters, which is probably what you would need. The whole expense for horses and porters will be about one hundred and fifty dollars; at Napo you will hire canoes to descend the river, and the hardships of your journey will be over.



RAPIDS IN A MOUNTAIN STREAM OI

"There are many rapids in the Napo River, and the voyage will be an exciting one; the rapids look very dangerous, but the Indians are excellent boatmen, and, if you let them alone, they will carry you safely along with the current. At Pebas, on the Maranon, it may be necessary to wait a few days for a steamboat, as the navigation is not regular, but you can be reasonably sure of no further trouble on your way down the Maranon and Amazon to the Atlantic."

The Doctor thanked Francisco for his information, and told him they would think the subject over, and have a further talk with him the next morning.

When he appeared again before them Dr. Bronson

reiterated his previous assertion, that they could not change their plans, but the guide was rewarded for his information by a present of money that put him immediately in good-humor. He assisted them in their preparations for the return to the coast, and accompanied them as far as Guaranda, where new animals were engaged to Bodegas.

We will now seat our friends on the enchanted carpet of the Arabian Nights' Entertainment, and with the swiftness of thought place them on board a steamer leaving Guayaquil for Callao.

CHAPTER VIII.

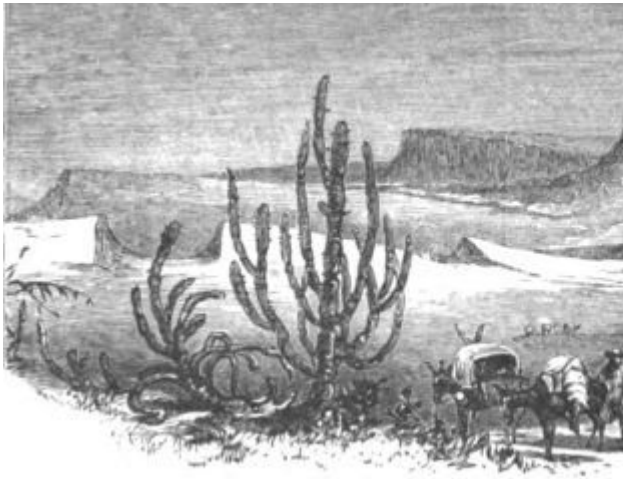
FROM GUAYAQUIL TO CALLAO.—LANDING AT PAITA.—THE SITE OF OLD CALLAO.—ARRIVAL AT LIMA.—SIGHTS OF THE PERUVIAN CAPITAL. —GENERAL DESCRIPTION OF THE CITY AND ITS INHABITANTS.

Paita, in Peru, was the first stopping-place of the steamer, but the delay was only for a few hours, and our friends had no opportunity for a lengthened visit to the shore. But they voted unanimously that they had seen all that was worth seeing, as the place contained very few attractions.



WATER-CARRIER AND DONKEYS.

Paita is on a bay affording good anchorage for ships; it is the seaport of the city of Piura, which lies at the foot of the mountains, on the other side of the desert of Sechura. There is no sign of vegetation in and around Paita, and the water which supplies the wants of the residents is brought from a point thirty miles inland. Formerly it was transported on the backs of donkeys, but recently a pipe has been laid for the entire distance, and the inhabitants are no longer dependent upon the vagaries of the long-eared animal for their aqueous supply.



DESERT SCENE.

As soon as the steamer dropped her anchor the Doctor and the youths went on shore. They landed at an iron pier in front of a beach of gray sand, where there was a single street of houses, mostly very frail in construction. Some of the shops and dwellings were solidly built, but the majority were of a sort of basket-work covered with plastered mud, presenting many impromptu loop-holes through which the occupants could gaze on the outer world. Back of the town is a cliff of volcanic stone, rising rather steeply; Frank and Fred climbed to the top of the cliff, while the Doctor remained in conversation with one of the English residents. The youths could hardly say if they had been repaid for their exertions, as they saw only the distant range of mountains beyond the desert, which was said to be about fifty miles across. The desert was of the same color as the beach and the cliffs behind it, and the landscape of Paita may be set down as monotonous.

"Whether you are repaid or not," said the Doctor, when they returned, "may be an open question, but

you have had a view of Peru, and certainly that is worth something."

"I hope the rest of Peru is different from what we have just seen," replied Frank, with a laugh.

"You have had a fair sample of it here," answered the Doctor. "From this point to the southern boundary of Peru there is little else than a strip of desert between the Andes and the sea. In some parts of it rain never falls, and the whole expanse is barren of vegetation. Here and there rivers come down to the ocean, but none of them are large, and the majority are dry for the greater part of the year. The Guayas, which we ascended from Guayaquil to Bodegas, is the largest river on the whole Pacific coast of South America."

"I understand," said Fred, "that the strip between the mountains and the ocean on the western side of South America is very narrow, and therefore the rivers cannot be large; but how does it happen that there is so little rain, and, in some places, none at all?"

"I will endeavor to explain it," replied Dr. Bronson, "and in doing so will call your attention to the fertile regions of the Amazon, Orinoco, and La Plata, on the eastern side of the Andes, in contrast with the arid desert on the west. The tropical winds from the Atlantic Ocean are laden with moisture; they blow with great regularity from east to west, and thus sweep over the country drained by the rivers I have mentioned. Rain is frequent and copious all through that region; it varies with the seasons of the year, but is always sufficient to keep the channels of the streams well filled.

"The rains continue up to the foot of the Andes and along their eastern slopes. The mountains condense

the moisture from the warm winds, and up to the very crest of the dividing ridge there is an abundance of rain. But by the time the winds have crossed the Andes all the water they carried has been wrung from them, and when they reach the Pacific slope they have no more to give out. Thus it happens that the eastern slopes of the Andes and the great plains intervening to the Atlantic have an abundance of water, while there is little or none at all for the west.



A WOLF EMIGRATING.

"There is a part of Peru and Bolivia where rain never falls," continued the Doctor. "It is known as the '*Despoblado*' or 'The Uninhabited,' in consequence of the severity of its climate, and the great difficulty of existing there. In the language of a once-famous statesman of America, it is 'so poor that a wolf couldn't make a decent living there.'"

"Does this condition of dryness extend all along the western coast to the end of the continent?" one of the youths inquired.

"No," was the reply. "As we go south through Chili we encounter more moisture in the climate, and on reaching Patagonia we find the western slopes of the Andes drenched by frequent rains, and the tops of the mountains almost constantly covered with clouds. This condition is due to the trade-winds, which blow from the south Pacific Ocean to the land; the plains east of the Andes in Patagonia are comparatively dry, and swept by cold winds from the snow-tipped summits of the mountains. Remember, we are south of the equator, and the farther south we go the more cold do we find."

In conversations like this, and in the examination of books relating to Peru and other parts of South America, the time passed during the voyage from Paita to Callao. Frank was busy with Prescott's "Conquest of Peru," while Fred carefully conned the pages of "Peru, or Travel and Exploration in the Land of the Incas," by Hon. E. G. Squier. Frank declared that the work of Prescott "read like a romance," while Fred was equally enthusiastic over the book which claimed his attention. It is quite likely that they will rely upon these volumes for much of their information concerning the antiquities of Peru, and the story of its occupation by the Spanish conquerors.

The steamer kept far out to sea, and very little of the coast between Paita and Callao was visible. Finally, on a misty morning, her head was turned towards the land; passing a high, rocky island on the right, and leaving a low shore on the left, she entered the harbor of Callao, and dropped anchor among a miscellaneous assemblage of steamers and sailing-ships, bearing the flags of at least a dozen foreign nations, together with a liberal array of Peruvian and

Chilian craft. The Doctor explained that there is generally a mist hanging over the harbor of Callao in the morning, owing to the condensation of the tropical moisture by the cold current of air sweeping northward from the Antarctic regions. The ships at anchor were revealed through this mist, and so were the towers of the castle that commands the harbor and the town at its base. Beyond the shore was a line of hills backed against the snowy mountains in the distance. The shore formed a pleasing contrast to the one they left at Paita, as it was covered with trees, and indicated a break in the desert that the Doctor had described.

The steamer was immediately surrounded by boats, and the boatmen hailed the passengers in a perfect polyglot of languages; they endeavored to make bargains previous to the arrival of the captain of the port, without whose authority the ship could not hold communication with the shore. That official took his time, and made everybody impatient; he was visiting a steamer that had just arrived from the south, and was not disposed to hurry.

Frank and Fred relieved the monotony of waiting by studying the outlines of the shore, taking note of the heterogeneous array of boatmen, listening to their appeals for patronage, and attempting a sketch of the fort which defended the city and harbor. But their artistic efforts were so frequently interrupted that the sketches were unsatisfactory, and we are not permitted to reproduce them.

"The harbor of Callao is nothing to boast of," said the Doctor, "but it is better than most others on the Pacific coast. The prevailing winds are from the south and southwest, and protection is afforded from those winds by the island of San Lorenzo and the

tongue of land where Old Callao stood."

"Why was the city moved from its former position?" Fred asked. "What was the difference between Old Callao and the present one?"

"It was an earthquake that moved it," replied Dr. Bronson. "Callao was submerged, with all its inhabitants, in 1746, and when the water is calm you can row over it in a boat, and see the ruins down below you. At half-past ten o'clock one night the sea receded to a great distance, and then rolled back with such violence as to sweep the town and its fortifications out of existence. Five thousand persons perished; nineteen ships were foundered, and four others, including a Spanish man-of-war, were carried far up on the land. Modern Callao had a narrow escape from a similar fate in 1825 and again in 1868, and at any moment it is liable to be engulfed like its predecessor."



SHIPS IN A FOG.

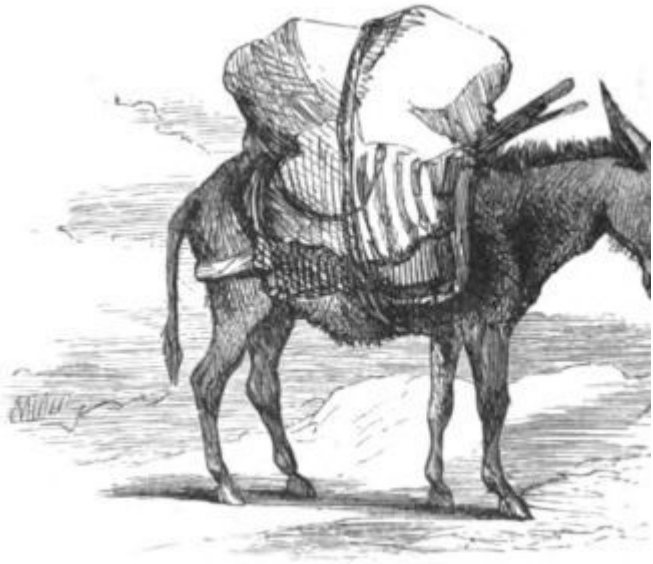
The captain of the port came, and then the passengers were at liberty to land. The landing-place is at the side of a mole which protects the harbor on its northern side from the swell of the Pacific. Frank and Fred were surprised to see large piles of grain in the open air, together with other merchandise, but their wonder ceased when they were told that it never rains at Callao, the only moisture being from the mists and fogs already mentioned. The absence of rain renders the place unhealthy, as the drainage is not good, and the heat is great. Frank thought Callao was an excellent rival to Cologne in the way of bad odors, and both the youths were disinclined to make a prolonged stay.

The party went immediately to the railway station, followed by porters with their baggage, and in less than half an hour were on their way to Lima, six miles distant. There is nothing worth seeing in Callao, which has a population of some twenty-five or thirty thousand, and is important only from a commercial point of view. The railway skirts the shore for a short distance, then passes through a suburb of the town, and ascends an acclivity of about five hundred feet, which lies between the ocean and the capital city. For nearly the whole distance it is close to the *Camino Real* or Royal Road, the old route established by the Spaniards to connect Lima with its seaport. The train toiled slowly up the incline, and accomplished the journey in little less than half an hour. This travelling would be considered slow in other countries, but it is satisfactory to the inhabitants, as nobody in Lima ever thinks of hurrying.



A GARDEN ON THE RI

Much of the country between Callao and Lima is under cultivation, by means of irrigating canals brought from the Rimac River. The Rimac dwindles to a small brook in the dry season, but in the period of rains it swells into quite a river, and furnishes more water than is needed. In the absence of rain it is the sole reliance for the gardens and fields around Lima; it is as necessary to this region as is the Nile to Lower Egypt. Without the Rimac, Lima would dry up and disappear; with it the city stands in a surrounding of luxuriant gardens and smiling fields.

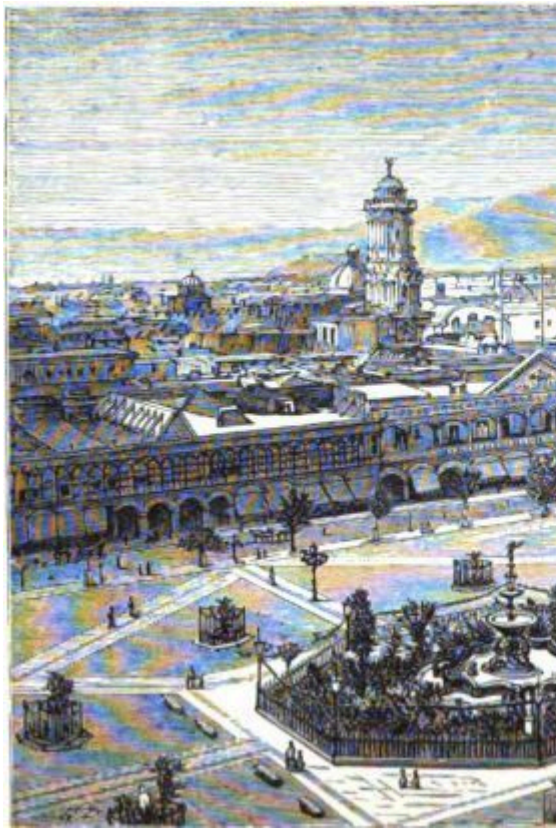


A CLAIMANT FOR THE SIDEWALK.

The baggage was intrusted to an employé of the hotel, who had been telegraphed for, and met our friends at the station; guided by a servant from the same establishment, they walked the short distance intervening between the station and their lodging-place, narrowly escaping collisions with troops of laden donkeys, that rushed along the streets as though they possessed the sole right of occupation. They seemed to prefer the sidewalks to the middle of the street, probably because the latter was less smooth than the sidewalks, and their drivers didn't care where they went as long as they kept moving in the right direction. Few carriages were visible, and these few were not attractive in appearance.

For a description of Lima we will quote from Frank's letter to his mother, which was sent by the next steamer northward from Callao:

"Here we are, in the 'City of the Kings,' as it was named by Pizarro. According to the histories, it was on the 6th of January, 1535, Old Style, that the Spanish conqueror designated it as the capital of his dominions. That day happened to be the festival of the Magi, or Three Wise Men of the East, who came to Bethlehem to adore the Saviour; in old chronicles they are styled 'The Three Kings,' and hence Pizarro called his capital *Ciudad de los Reyes*, or 'City of the Kings.' Charles V. designated the arms of the city to be three golden crowns on a blue field, with a rayed star to indicate the Star of Bethlehem, which guided the kings. The name Lima is a modification or adaptation of the native word *Rimac*, which formerly belonged to the plain or valley where the city is built, and is still borne by the river which supplies it with water.



VIEW OF LIMA F

"In many respects Lima is one of the most interesting cities of South America; certainly we have found it full of attractions, and have not had an idle minute since our arrival. We have been trying to imagine what it must have been when surrounded by the walls which the Spaniards built at great expense. These walls have proved useless in modern times; they have been completely destroyed, and the space they occupied is converted into promenades, or laid out in gardens or building-lots. The walls enclosed an area about three miles long by one and a half broad,

on the left bank of the Rimac; they were twenty feet thick, and somewhat more in height, and were made of *adobes*, the favorite building-material of this part of the world. The city is about ten miles in circumference, but a large part of its area is laid out in gardens and public squares, so that the whole is by no means occupied.



LIMA AND THE SURROUNDING COUN'

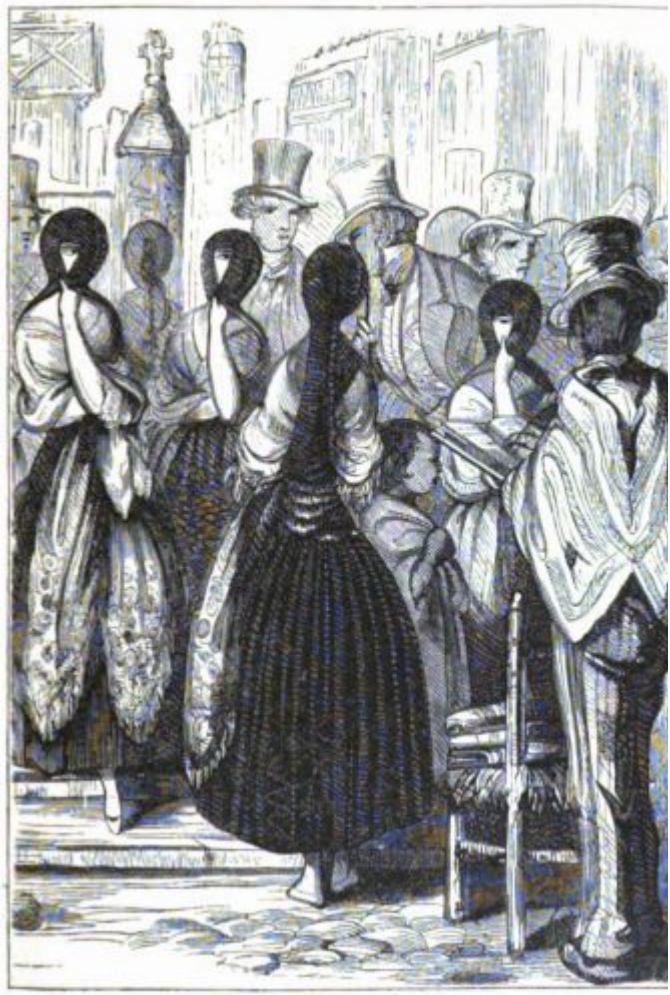
"I send you a map of Lima and the surrounding country, which will give you an excellent idea of its position. Unhappily for Peru, much of the beautiful region around its capital was laid waste by the invading army during the late war between Chili and Peru; Chili was completely victorious, and also unmerciful, and in the battle which decided the fate of Lima many of the country-houses and villages in the neighborhood were burned. This was the sad lot of Chorillos, the Long Branch or Coney Island of Lima, and also of Miraflores, which lies between Chorillos and the great city.

"There is a railway from Chorillos to Lima, passing through Miraflores; the invading army landed at Chorillos, and marched along the line of railway to Lima. They destroyed nearly everything on the route, and were only prevented from burning and plundering the city by the energy of the British minister and other members of the diplomatic corps, backed by the English and French admirals, with their ships of war in the harbor of Callao.

"So much for the horrors of war, which this country will long remember. The population of Lima is variously placed at from one hundred thousand to one hundred and twenty thousand; there are about fifteen thousand foreigners and six thousand priests among them, so that you cannot go far on the streets without meeting either a foreigner or a priest. In all the cities we have ever seen there does not appear to be a more mixed lot of inhabitants than here; Constantinople and Cairo are not more kaleidoscopic than Lima, and I think the American city is somewhat ahead of them.

"There are English, French, German, Spanish,

Belgian, and North American residents here; there are Chinese and Negroes, white, black, yellow, and all other complexions among the natives of the country, besides, as Fred says, 'several wards to hear from.' Professor Orton says there are at least twenty-five varieties of people in Lima; the upper classes are educated and polite, while the lowest of the population are among the most dangerous in the world. During the night before the occupation of Lima by the Chilian army the dangerous class had possession of the city for some hours, and committed many depredations. The foreigners organized a temporary police, and stopped the disorder; if they had not done so the whole city would have been plundered.



WEARING THE "SAYA Y MANTO."

"We used to read in our school-books that the ladies of Lima covered their faces with the *saya y manto*, or veil, when out walking, so that only one eye could be seen. We saw a few veils worn in this way, and the Doctor said the wearers were probably old, and not pretty; the most of the ladies have dropped the old

fashion, and permit their faces to be seen, using the veil only as a covering for the top of the head. I enclose a photograph of a lady of Lima to-day, and a sketch which shows the old style of wearing the *saya y manto*.



A LADY OF LIMA.

"We spent the first evening of our visit in strolling through the Plaza Mayor, or Great Square, which covers nine acres of ground, and listening to a band of music which played several national and other airs. There is a bronze fountain in the centre of the square, and a garden around the fountain where tropical plants and trees seemed to flourish. The cathedral is on one side of the square; it is a fine building, and its corner-stone was laid by Pizarro twelve days after the city was founded. Our guide

took us from the cathedral to an alley leading from the south side of the square, and pointed out the house where the great conqueror was assassinated. 'But he killed three of his assailants before they could overpower him,' said the guide, proudly, as if in reverence of the memory of Pizarro. We thought he might claim to be a descendant of one of the Spanish conquerors, and make his noble blood an excuse for demanding increased pay for his services, but he did not.

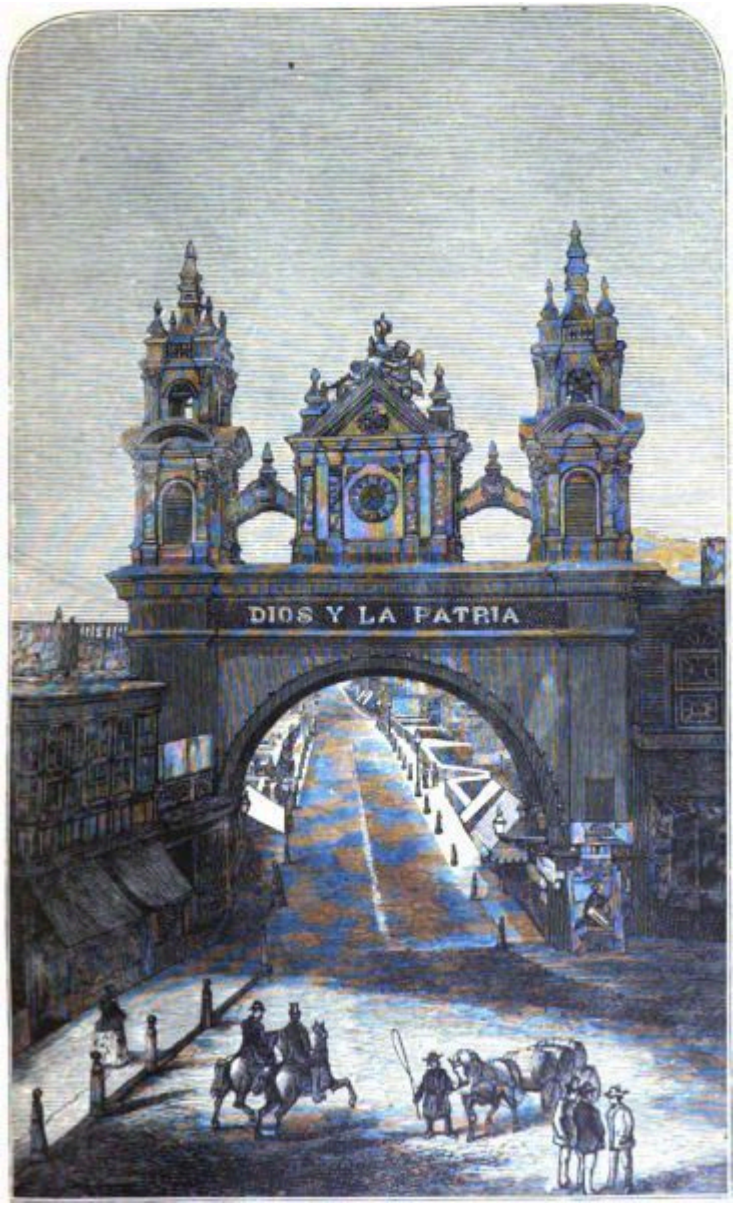


INTERIOR COURT, LIMA.

"The government palace fronts on the plaza, and the rest of the space surrounding the square is occupied by shops, principally filled with European goods; American products may be seen here, but not as often as we wished to find them. In two of the shops we observed that the weighing was done on

Fairbanks' Scales, and our guide said the same apparatus could be found all through Lima, and elsewhere in Peru. Of the agricultural machinery used in Peru the greater part is said to be of American manufacture.





THE RIMAC, LIMA.

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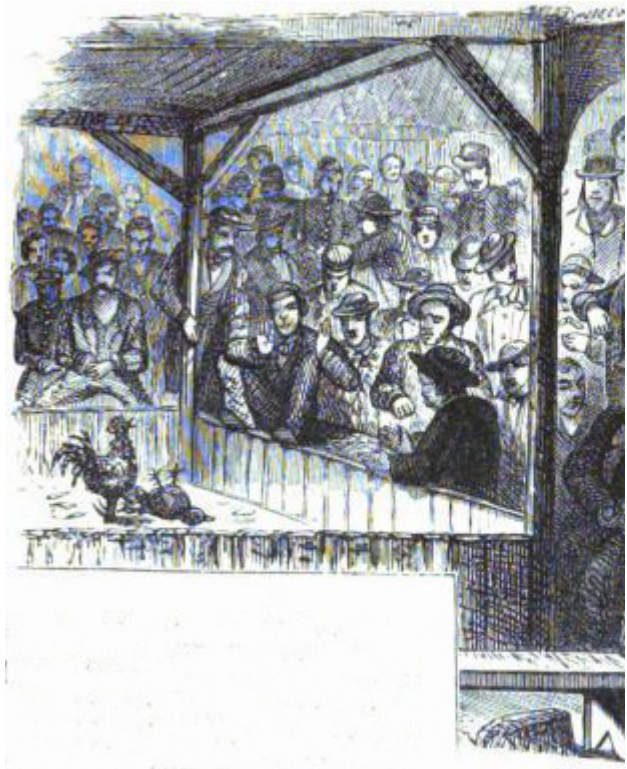
"One of the sights of Lima is the stone bridge over the Rimac; it was built by the old Spaniards, and has stood bravely against all the earthquakes that have shaken the city for the last three centuries. The bridge is five hundred and thirty feet long, and rests on stone arches; at the entrance there is a splendid arch bearing the inscription 'Dios y La Patria' ('God and Country'). We walked over the bridge, and from its parapet looked upon the river, which was not over two feet deep in its principal channel, while a large part of its bed was bare. The Rimac resembles the Manzanares at Madrid, and some of the foreign residents say the bottom has to be sprinkled at times to keep it from flying away. When the rain falls in the mountains the Rimac swells to a considerable stream, and rushes along with great violence.

"Speaking of the stone bridge reminds me that the founders of the city used stone for the construction of the public buildings, and their example has been followed to some extent in modern times. But the common buildings are of *adobe*, which does very well in a climate where there is so little rain, and lasts a long time. The roofs are nearly all flat; it never snows here, and it never rains more than a few drops at a time. Consequently the chief use of a roof is to exclude the sun. The temperature ranges from 60° to 88°, stoves and other heating apparatus are unknown, and the only fires are for cooking purposes. From November to March the weather is dry and delightful, but from March to November it is damp and unhealthy, owing to the continuous fogs that roll in from the ocean.

"But in spite of its even climate the deaths exceed the births in Lima, and if the city were not constantly recruited from other parts of the country and the

world it would be depopulated. I am told that the mortality among infants is three times as great as in London or New York. It is attributed to the dampness of the climate for a part of the year, and the bad drainage consequent upon the absence of rain. Regions where rain never falls may be pleasant for those who do not like umbrellas and rubber clothing, but there are disadvantages which more than outweigh the comforts.

"The buildings cover a large area, and are nearly always constructed with central court-yards. They are rarely of more than two stories, and the roofs would be of little use in Boston or New York. The roofs are generally of a single thickness of boards, or of poles covered with matting, supporting a layer of sand or ashes, to absorb the moisture of the fogs. A summer shower such as we are familiar with on the banks of the Hudson or Connecticut would soak the whole of Lima so that hardly a house would be inhabitable.



ONE USE FOR CHICKI

"We were roused early in the morning by the crowing of chickens above our heads, and on looking around to find the cause of the disturbance we found that the roofs of the houses in Lima are the favorite places for keeping poultry. The flat surface and the absence of rain adapt the roof to this purpose, and the people are evidently too lazy to maintain their fowls elsewhere. You would think chickens might be cheap, when there are such facilities for rearing them; but they are not, and the same is the case with beef, mutton, and other animal food. A good many of the chickens are kept for fighting purposes, and not to be eaten; cock-fights are a common amusement

among the people, and a great deal of money changes hands at one of these performances.

"We had a pleasant walk through the central market, which is in a large building covering an entire square; or, rather, built around the square with a court in the centre.

"On the sides of the square there are stalls for the larger dealers; the galleries and the open space in the centre are occupied by women who sit beside the articles they have to sell, and keep up a perpetual conversation with each other, like market-women all over the world. Lying only 12° south of the equator, Lima has a tropical climate; with the outlying range of the Andes sixty miles away, she is within a short railway ride of a temperate region. The result is that you can find in the market the vegetable products of two zones; those of the torrid, from the neighborhood of Lima, and those of the temperate, from the mountains.

"Here are tomatoes, green corn, cucumbers, radishes, parsnips, and other growths of New England or New York, side by side with oranges, peaches, chirimoyas, grapes, mangoes, and other tropical things whose names are not familiar to you. Flowers are in great abundance, and roses are everywhere grown in the gardens. You see them in great variety and profusion, and it is claimed for Lima that she can show more kinds of roses than any other city in the world. There are vases of growing flowers in nearly all the court-yards and on the balconies, and the women of all classes use the flowers for decorating their hair. At one time there was almost a craze for the cultivation of roses, and many a man spent a large part of his income in the experiment.

"We cannot say much for the cookery of Lima, if we

are to judge by what we have seen. The hotel is managed by a Frenchman; his table is mainly French, but he has adopted some of the native dishes and customs. One article that may be called the national dish of Peru is a part of his bill of fare, and known as *puchero*. I have obtained the recipe for it, and here it is:

"'Have a kettle according to the size of your puchero; put in this kettle a large piece of beef or mutton, some cabbage, sweet potatoes, salt pork, sausage-meat, pigs' feet, *yucas*, bananas, quinces, pease, and rice, with spices, salt, and plenty of red pepper for seasoning. Add sufficient water, and stew the whole gently for five or six hours; then serve in a tureen or deep dish.'

"Puchero is patterned somewhat after the *olla podrida* of Spain, the chowder of New England, and the *bouillabiasse* of southern France, but it has more ingredients and more flavors than all of them; I cannot say I dislike it, but could get along better if they would make it with less red pepper. They seem to think that the more pepper they put in the better; our taste has become hardened to hot things in our experience with Oriental curries and African stews, but it is not yet quite up to the mark with these Spanish American preparations.



LADIES OF LIMA AT H

"Another stew, simpler than puchero, is called *chupe*; it is a favorite dish for breakfast, but not often served at dinner. The lower classes are fond of *picantes*, compounded of meat, fish, crabs, meal, potatoes, bananas, and red peppers, mixed with the juice of bitter oranges, and stewed with water. We have tasted of this wonderful mixture, but could not get to the second spoonful in consequence of the fiery nature of the peppers. Fred says they use a pound of peppers to a pound of all the other ingredients, water included, and I can believe it. Swallowing a torchlight procession would be preferable to a dinner

of picantes. Around the landing-place at Callao we saw women, with little braziers of charcoal, ladling out the steaming picantes to the idlers and laborers of the port, and we are told it is their only article of food. In the poorer parts of Lima there is a *picanteria* every few yards, and each establishment has its patrons among the porters, water-carriers, and negro laborers of the neighborhood. The many varieties of picantes have distinct names, but all are flavored with red pepper in abundance.



PERUVIAN INFANTRY AND CAVALRY

"There was formerly a custom in Peru, on occasions of formality, for the host and hostess to eat by

themselves, beforehand, and take nothing during the progress of the ceremonious meal. They sat at opposite ends of the table, and were supposed to be attending to the wants of their guests. The same custom prevails in some parts of Russia, but is passing away there as it is here.

"Another bit of table etiquette formerly prevailing in Peru, and not yet entirely unknown, was to select some delicate morsel from the dish before you, and hand it on your fork to a lady of the party. She would return the compliment, and sometimes it was made rather surprising to the stranger when she took the morsel in her fingers, and placed it in the mouth of the one who had paid her the compliment. I am told that this latter part of the ceremonial, based on the correctness of the adage that fingers were made before forks, was confined to the interior provinces, and was not fashionable in Lima."



A PASSAGE OF POLITENESS.

CHAPTER IX.

EQUESTRIANS AND THEIR COSTUMES.—LADIES OF LIMA.—EXCURSIONS AMONG RUINS.—PACHACAMAC, A HOLY CITY.—THE ANCIENT PERUVIANS.—ORIGIN OF THE INCA GOVERNMENT.

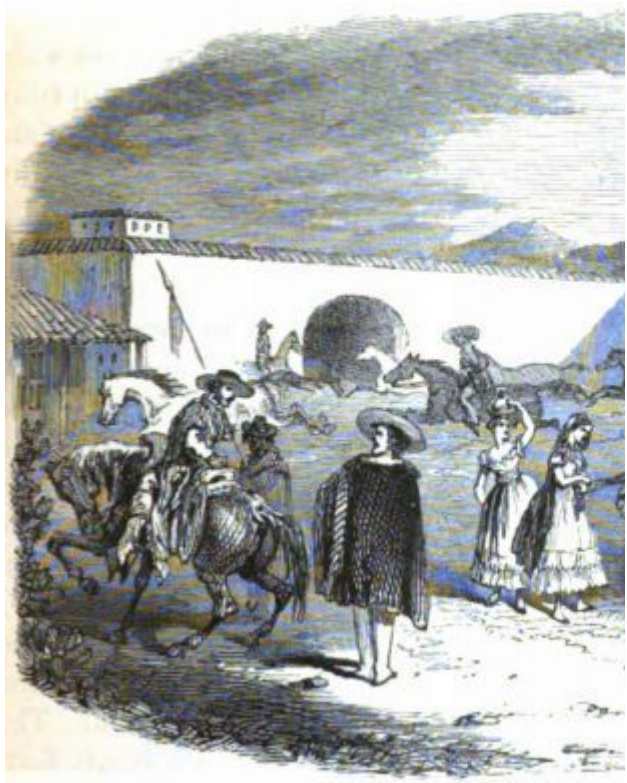


A PERUVIAN CAVALIER.

Horseback riding is a fashionable amusement in Lima, to judge by the number of mounted men that

are seen in the streets and in the surrounding country. Our friends learned, somewhat to their disappointment, that it has declined a good deal in the past twenty years, and the gentlemen of Lima are now less renowned than formerly for their equestrianism. Still, there are many excellent riders in Lima, and occasionally one can be seen dressed in the costume that was once universally worn by the Peruvian cavaliers. The fashions of Paris have been adopted by society people in Lima, and the picturesqueness of the old style of dress is fast disappearing.

Lima contains many professional horse-breakers, and they are among the best of their class. Peruvian horses are easily instructed, and many of them perform surprising tricks; one of their feats is to turn around rapidly on the hind-legs when going at full gallop, and another is to jump over a wall, and immediately back again, with their riders on their backs. It is said that an English circus company once came to Lima, but the proprietor and performers were disgusted, and made haste to leave the country, when they found there were many horsemen in the city who could fully equal all the equestrian feats of the ring.



HORSE-BREAKERS AT V

One of the performances of the horse-breakers is to make a horse jump to the top of a broad wall, and describe a segment of a circle while standing on his hind-feet, and holding his fore-feet over the edge of the wall. He will do this repeatedly, and thus convince the spectator that it was not accidental.

Fred made the following note of the costume of the Peruvian cavalier, uncontaminated by foreign influences:

"He wears a *poncho*, smaller than that of the country muleteer, and more gaudy in its appearance; it is a fringed shawl reaching to the hips when the wearer

is standing upright, and just covering the knees when he is in the saddle. A hole in the centre admits the head, and the shawl hangs gracefully over the shoulders of its wearer; it is more convenient than a jacket, or any other riding-garment, as it leaves the arms perfectly free to move in any direction, and there are no buttons to get loose.

"The colors of the poncho are as varied as the tastes of the owners. Sometimes they are pure white, without any ornamentation, but much oftener they are richly embroidered, or made in varieties of stripes, embracing all the colors of the rainbow. The trousers are close-fitting; they have a stripe on the outside of the leg, and are held by a strap beneath the foot. No horseman would consider himself properly equipped without a pair of enormous spurs, the rowels standing out three or four inches from the heel, and the spurs containing altogether fully a pound of silver. A broad-brimmed hat and a riding-whip complete the cavalier's costume, and he is rarely without a cigar between his lips. In mounting, he generally scorns to put his feet in the stirrups, but springs on the horse without their aid. The stirrups are huge blocks of wood, shielded with fully a square foot of leather. The saddle and other trappings of the horse are richly ornamented with silver, and sometimes with gold, and occasionally the bridle, head-gear, and crupper are made of silver rings linked closely together."

The decline of Peruvian horsemanship was shown in the late war between Chili and Peru. The Chilian cavalry was admirably managed, and in several battles it performed a large share of the work; the cavalrymen were well mounted, and understood their business thoroughly, while the Peruvians were

inefficiently drilled, and their horses were far inferior to those of the Chilians. One of the mounted detachments of the Peruvian army was surprised and captured during the advance upon Lima, and the whole available force of cavalry for the defence of the capital did not exceed six hundred men.

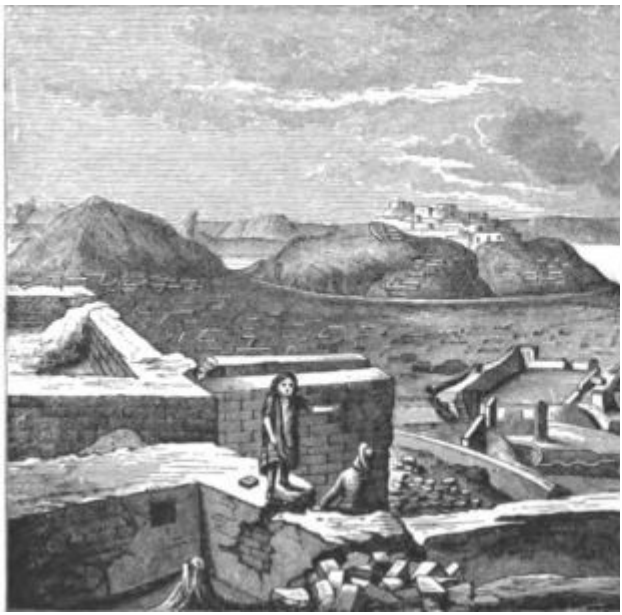


NATIVE WOMEN OF LIMA.

Frank and Fred were quick to remark the difference between the feminine part of the population descended from the Spanish conquerors, and those whose ancestry were the native possessors of the land. The complexion was as distinctive as the dress; the Spanish race is fair in feature, while the women of Peruvian descent have a tinge of copper or bronze in their faces. The latter wear short skirts, and leave the hair uncovered by a veil; sometimes the hair is braided in long tresses, and it is frequently topped with a hat of almost gigantic proportions. Many of these native women are excellent riders; they use the ordinary saddle of the cavalier instead of the side-saddle of more northern lands, and wear the Peruvian spur.

Our friends passed a fortnight in Lima very pleasantly, making excursions in the neighborhood, and trying the baths at Chorillos, where the fashionable population goes for its seaside sports. Two days were devoted to a visit to Pachacamac, which is in the valley of the Lurin River, about twenty miles south of Lima, and overlooking the sea. What they saw and did is best told in Fred's account of the journey.

"We went from Chorillos," said Fred, "and had a ride that was not particularly pleasant, over the dusty road leading to the seaport of Pisco, farther down the coast. Between Chorillos and the valley of the Lurin is a stretch of desert, and the sun beat pitilessly on our heads as we toiled along. Reaching the valley, we turned up the banks of the stream, and a short ride near its welcome waters brought us to the place we sought.



RUINS OF PACHACAM

"Pachacamac is a famous spot in Peru, or, rather, it was so in ancient times. Its ruins cover a considerable space along a line of hills on the edge of the desert. The sand has drifted over some of the buildings and completely buried them, and we were forcibly reminded of the ruins at Thebes, and other places in Egypt, not forgetting the grand temples that stood near the pyramids of Gizeh.

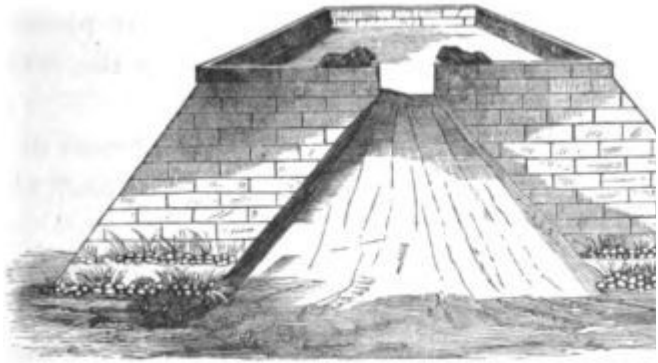


HEAD OF PERUVIAN STATUE.

"Pachacamac was the sacred city of the inhabitants of this part of the coast before they were conquered by the Incas; their chief divinity, whose name is preserved in the city, had his shrine here, and when the Incas conquered the place they built a Temple of the Sun, and a House of the Virgins of the Sun, quite near the shrine of Pachacamac. It was their object to destroy the worship of the old divinity by building a grander temple to the new, but they were not altogether successful. There was an enormous amount of gold and silver used in the construction and adornment of the temples; the Spaniards took away twenty-seven *cargas* of gold (a carga weighs sixty-two and a half pounds), and sixteen thousand ounces of silver, but they were unable to discover the place where four hundred cargas of these metals had been concealed just previous to their arrival.

"We had quite a scramble among the ruins, as the

walls are considerably broken, and the footing is often very insecure. We visited the shrine of Pachacamac, or, rather, the temple which contained it, and then went to the temple near it, erected by the Incas. The first is called 'El Castillo,' or The Temple, and the other is known as Mamacuna. The temple is on a hill, or headland, five hundred feet above the ocean, and the front of it extends down to the shore. It has been considerably shaken by the earthquakes, of which there must have been many since the time of its erection, and the wonder is that it is so well preserved.

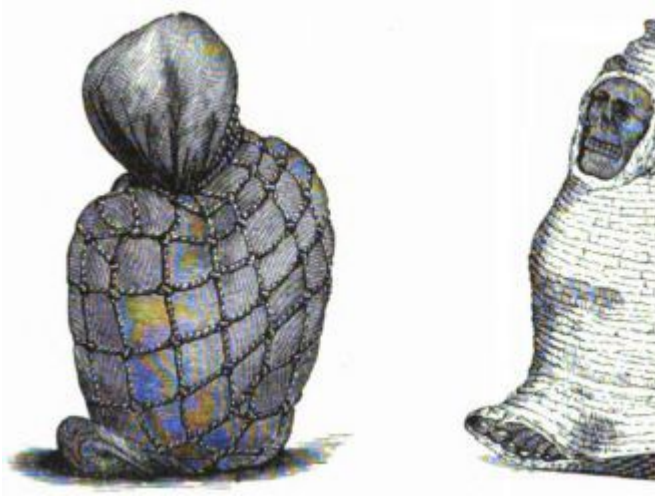


TERRACED SPACE ON A HILL-TOP.

"There was evidently a wall around the base of the hill; the slope of the hill was formed into terraces, and its upper part is supported by a terrace thirty-two feet high. In the centre of this upper part was the shrine of the deity, enclosed in a sanctuary which had a door of gold set with precious stones. But if the outside was beautiful, the inside was the reverse, as the Spaniards found only an idol of wood there, together with a flat stone where the priests performed their sacrifices. The old historians say that only the priests were allowed to go inside the sanctuary; when the Spaniards arrived there was no

objection to their entering, as it was believed the deity would strike them dead for their sacrilege. The fact that they were not harmed, but proceeded without hesitation to plunder the place of its wealth, was a serious shock to the faith of these confiding natives.

"Mr. Squier's book contains an excellent description of the place, and we sat down on the top of the hill and read his account of his visit to Pachacamac. He says that in ancient times it was the Mecca of South America, and pilgrims came here from all parts of the country to worship at the shrine of the divinity who was called 'The Creator of the World.' So great was the reverence in which it was held, that these pilgrims were allowed to pass unharmed through tribes and people with whom their own might be at war; the sacredness of their mission was an ample protection.



PERUVIAN MUMMIES.

"The natural result of this pilgrimage was that there was a large town around the temple, and in course of

time many thousands of people died here, and were buried on the consecrated spot. The whole ground, for many acres around the temple, seems to have been one vast cemetery; the soil is dry, and contains a good deal of nitre, which possesses excellent preservative qualities. There are thousands and thousands of what are generally called mummies now lying in this soil, where they have lain for centuries; they were not submitted to any mummifying process, like the bodies of the ancient Egyptians, but are preserved by the action of the salts of the earth and the aridity of the atmosphere.

"Some men who came with us from a sugar plantation in the valley offered to find a grave, and reveal its contents. We assented, and they selected a spot, and began to dig.

"We had a suspicion that they had dug in the same place before, and the grave they discovered had been opened many times previously for the benefit of visitors like ourselves. We remember that the same trick is practised in Egypt, especially at the temple in the neighborhood of the Great Pyramids, and saw no reason why it should not be adopted here. With this belief we had less compunction at disturbing the resting-place of the dead than we might have had otherwise.



SEPULCHRAL TOWER.

"The men dug four or five feet through the dry soil, and then came to a flat stone which they uncovered with great pretence of not knowing how large it was. It was about three feet square, and, perhaps, four inches thick, so that two of them had no difficulty in turning it over. Under the stone was a cavity measuring a trifle over a yard each way, and containing two bundles that had little resemblance to the human form. These were lifted out so that we might examine them; the outside wrappings were removed from one of them, and we then found that they covered a human figure, doubled so that the hands were clasped around the knees, and the head rested upon them. Our guide said this is invariably the position in which the mummies are found, and they are generally contained in a wrapping of coarse matting made of rushes, and bound with ropes or cords of the same material.



GOLDEN VASE FOUND IN A TOMB.

"It was the custom of the ancient Peruvians to bury with their dead the implements to which they were accustomed in life, and this may be taken to indicate their belief in a resurrection. Household utensils, combs, needles, wallets, spindles for spinning, knives, fishing-hooks and lines, spools of thread, knitting-needles, toilet articles, spoons, pottery, and many other things are found here, and the same is the case in excavations in other parts of Peru. We discovered only a few pieces of pottery and two knives of copper, and then we left the grave to be re-filled, or treated according to the taste of the inhabitants of the place.

"The character of the wrappings, and the articles found in the graves, indicate the condition in life of the occupants of this Peruvian cemetery. Mr. Squier says the burial-place at Pachacamac contains three

series of graves one above the other, indicating that the spot was for a very long while dedicated to sepulture. He opened one of the second series of tombs, which evidently belonged to a family in middle circumstances, neither rich nor poor.

"The bodies were all wrapped as I have described, but underneath the covering of coarse rushes were many yards of fine cloth, similar to that which the Egyptians placed around their mummies. The tomb contained the bodies of a man, his wife, and two children; the play-things of the children were buried with them, and between the feet of the girl was a dried parrot, which was doubtless her pet. Near the bodies were several pieces of pottery, and every pot contained something. One was filled with maize or corn, another with ground-nuts, and the rest with edibles of different kinds. The collection of pots and pans was quite interesting, and revealed some of the domestic ways of the people.



SILVER VASE.

"You will naturally ask how long these bodies have been lying here where we find them.

"The question is easier asked than answered. Unfortunately for us, the Peruvians had no system of writing, like the ancient Egyptians, and therefore there are no records by which we can learn their history. To get at the antiquity of the people we must judge by the traditions that have come down to us and by the effect of time upon the monuments they have left. This enables us to guess at the date of the construction of their temples, and it is proper to remark that the guesses of archæologists who have studied the subject have been very far apart.



PERUVIAN IDOL.

"The government of the Incas, which the Spaniards found and destroyed, is supposed to have existed not less than five hundred years, though some writers give it twice or three times that duration. When the Spaniards came here they found nearly all of what is now Peru, Ecuador, Bolivia, and a part of Chili united under one form of government, under three great tribes or families: the *Aymaraes*, the *Chinchas*, and the *Huancas*. The first of these, the Aymaraes, was the ruling race, and from it came the Incas or emperors. They occupied the high lands of Peru and Bolivia, and were said to have been more advanced in civilization than either of the others; the Chinchas dwelt mostly along the coast, while the Huancas were scattered through the mountain region between the Aymaraes and the Chinchas.

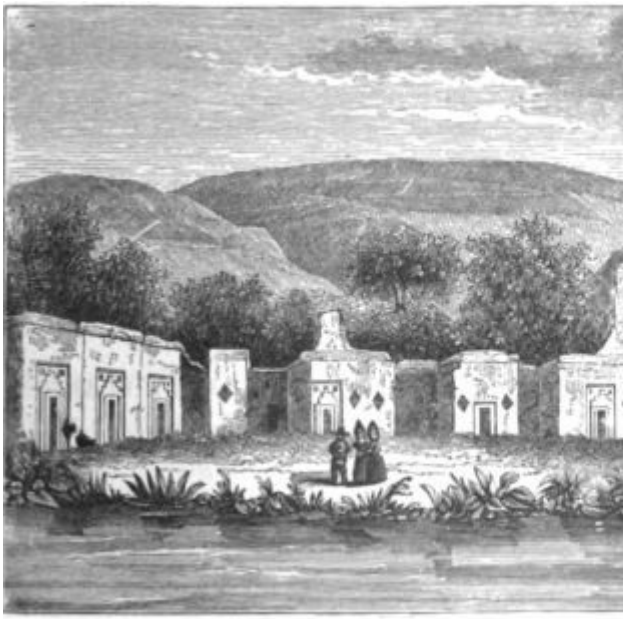


PERUVIAN COPPER KNIVES.

"Gradually the Aymaraes conquered the other great tribes, and their system of conquest and colonization is an interesting study.

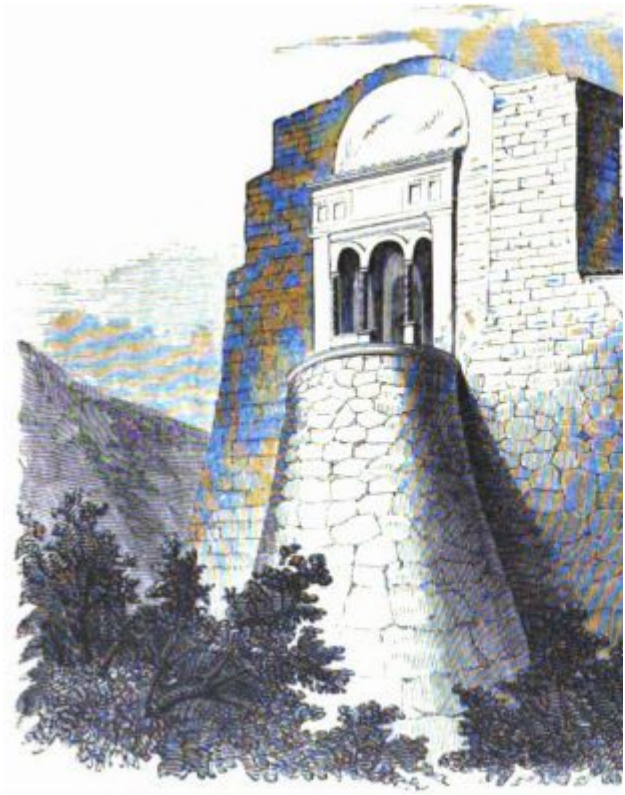
"The tradition is that the tutelary divinity, the sun, sent his own children to instruct and govern the people, who were at war with each other, and had sunk into a condition of barbarism. These children of the sun were Manco Capac and his sister and wife, Mama Oello; they appeared first on an island in Lake Titicaca, and the island was ever afterwards regarded as holy. There are many temples around the lake and on the island to which they descended from heaven;

we shall have more to say about these temples at another time.



RUINS ON TITICACA IS

"From Lake Titicaca, Manco Capac travelled northward, carrying a golden staff; during his travels his staff sank into the ground at a certain spot, and there he founded the city of Cuzco. Manco Capac was the first of a long line of powerful kings, who gradually subdued the surrounding people and replaced the old religions with the worship of the sun. They built magnificent temples, forts, and palaces, and the ruins of these works, as they are seen to-day, excite the admiration of every traveller.



PART OF TEMPLE OF THE SU

"To appreciate the wisdom of the Incas, let us consider their manner of ruling a conquered province.

"From Cuzco, the capital, there were roads leading to the four cardinal points, and the city was divided into four quarters, which were respectively named, 'North,' 'South,' 'East,' and 'West.' When their armies had reduced a nation or a province, they brought the idols of the conquered people to Cuzco, and treated them with every mark of respect. Then they summoned the chiefs and their families to the capital, where they showed them every kindness and

distinction. When these chiefs had been thoroughly instructed concerning the power of the Inca and the spirit of his government, they were sent to their homes, and very often they were restored to their official positions as representatives of the government of Cuzco.



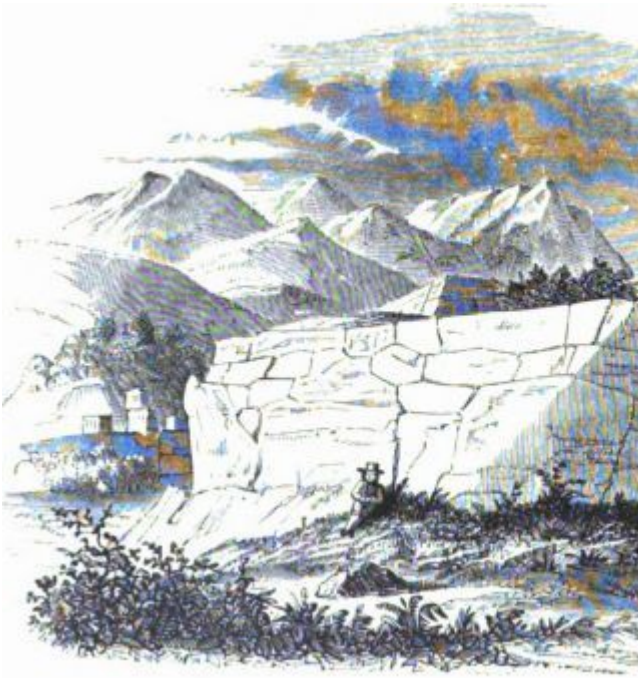
OUTER WALL OF FORTRESS

"In the conquered region the taxes were reduced, the poor were cared for, and the language of the empire was taught to the children. They were instructed in the religion of the Incas in place of their own, but always with the greatest respect for the old form of worship.



STONES IN THE WALL OF

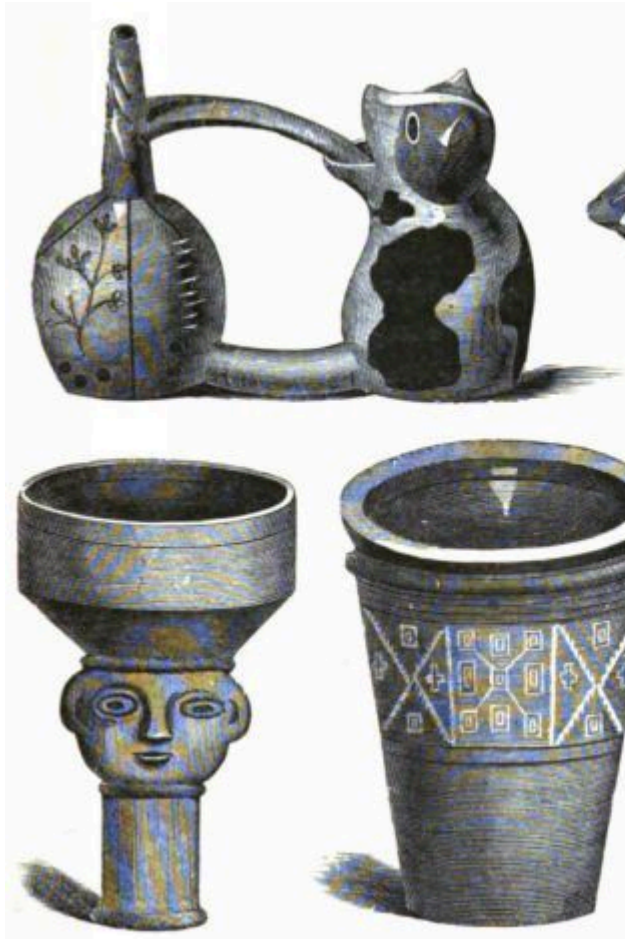
"To make sure that there would be no rebellion of the conquered people a colony of eight or ten thousand Aymaraes was sent there to live, while a similar number of the subjugated nation was brought to the towns whence these colonists were taken. Both of the transferred colonies were given great advantages; they had many privileges of exemption from taxation, received large grants of land, and were made to feel in every way that the transfer had been for their benefit. But while the Inca government was liberal it was severe; it was the iron hand under the velvet glove, and when its kindness was refused or the conquered people rebelled they were made to understand, in the most practical manner, that disobedience and rebellion were useless.



PART OF WALL OF FORTRES

"The four great divisions of the empire were each governed by a viceroy, appointed by the central power at Cuzco; the inhabitants were divided into groups of ten thousand, under a native chief and an Inca governor, acting together, and these were again subdivided into groups of one thousand, one hundred, and ten, each having an official who was responsible to the one above him. Every man received an allotment of land for the support of himself and family, children were obliged to follow the occupations of their fathers, no one could change his residence without permission, idleness was severely punished, robbers were put to death, those who sinned against religion or the majesty of the Inca were burned or buried alive with their families, while their houses were destroyed and their fields

devastated. When a province rebelled all the men and boys in it were put to death, and the remainder of the population was scattered.



PERUVIAN VASES

"There; I've given you quite a lecture on the ancient Peruvians, and hope you've not found it dull. Of course I realize that a large part of our enthusiasm on the subject comes from our having seen the monuments of this wonderful people, and read and

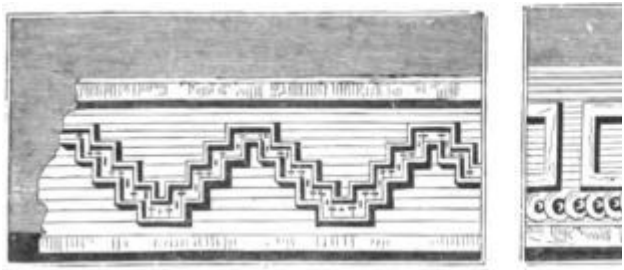
heard of the way they built their nation and extended its power."

"'History repeats itself,'" said Dr. Bronson, as our young friend read the account we have just quoted. "In the descent of the children of the sun we have a repetition of the story of divine origin which has existed in many countries and lands since the beginning of governments. Manco Capac bears an exceedingly close resemblance to the Egyptian Osiris, the Chinese Fohi, the Hindoo Buddha, and the Scandinavian Odin. The same idea is preserved to-day in the 'divine right of kings,' which is so often quoted, and in which millions of people have implicit faith."

"History is repeated, too, in another way," said Frank. "The system of colonization and government under the Incas reminds me of what we saw in Java, the most successful European colony in the eastern hemisphere. The government of the people by their own chiefs, supervised by an official of the ruling power, the punishment of idleness, and the distribution of land so that everybody can earn a living for himself and family, might almost have been borrowed from the ancient Peruvians by the Dutch possessors of Java and the islands of the Malay Archipelago."

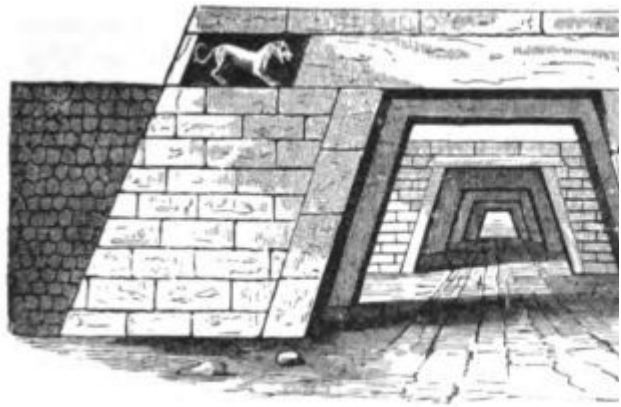
"It is not very likely the Dutch troubled themselves about ancient Peru," replied the Doctor; "they probably formed their system to suit the character of the people they were to govern; and when we remember the natural shrewdness with which their nation is credited we need not wonder that they established such an excellent government. It has its features of severity, like that of the Incas, but it has been decidedly beneficial to the subject race."

"Is the tradition correct that the people were sunk in barbarism when Manco Capac came on earth?" Frank inquired.



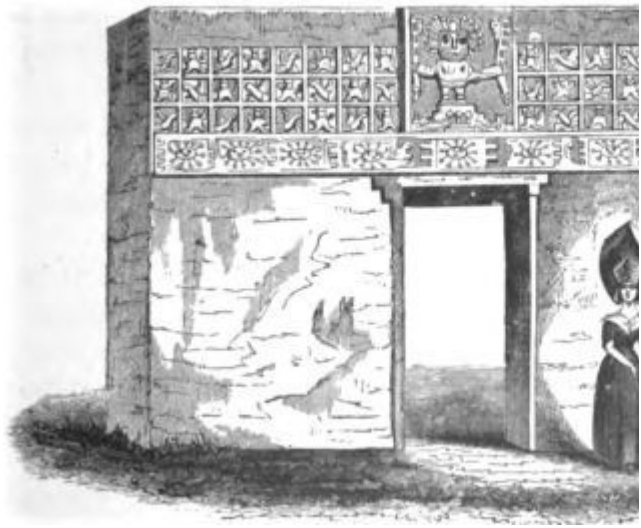
ORNAMENTS OF PERUVIA

"It is a pleasant fiction," replied the Doctor, "invented by the Incas as an excuse for their subjugation of the neighboring provinces and kingdoms. The evidences are that some of the finest monuments of Peru are older than the Inca empire, and several of the conquered nations were well advanced in civilization, and understood many useful arts and occupations. Manco Capac began with Cuzco, and then with the country a few leagues around it; his rule and that of his descendants was gradually extended until, at the coming of the Spaniards, it embraced forty degrees of latitude and a population of ten millions of people. Since the Spanish conquest the native population has diminished, and there are now little over four millions of inhabitants in the old dominions of the Incas."



ANCIENT PALACE AT HU

Our friends passed the night at a sugar plantation about two miles from the ruins of Pachacamac, and returned the next day to Lima. There is now only a small village where once was a large city; the inhabitants are employed on the sugar plantations and in the cultivation of their gardens, which are watered by careful irrigation from the Lurin River. The village was burned by the Chilians during the late war, and the traces of their devastations will long remain. The inhabitants fled for safety, and some of them never found their way back again to their birth-places.



DOORWAY CUT THROUGH A SINGL

Pachacamac does not contain the only ruins in the neighborhood of Lima. At Magdalena, not far from the railway between Callao and the capital, is an extensive ruin which was in good condition at the time of the Spanish conquest; the material has been taken for building purposes, so that the spot is hardly worth visiting at present. The temple contained an idol known as Rimac, whose name is preserved in the river. The idol used to speak, after the manner of the oracles of the Egyptian and Greek temples, and in exactly the same way; a priest was concealed in the statue, which was hollow, and thus the confiding populace was deceived. The deceptions of paganism were as well known in the New World as in the Old.



CENTRAL FIGURE OVER DOORWAY.

There are ruins near Chorillos which have also undergone demolition for the sake of their brick and stone, and in the valley of the River Chillon, ten miles northwest of Lima, is a fortification enclosing a hill about five hundred feet high. There is a wall at the base of the hill, another about half-way up, and a third around a level space at the top, where there is a watch-tower, with several ruined buildings. The upper wall is fourteen feet high and made of stones set in tough mortar. As the ancient Peruvians had no knowledge of gunpowder, a fortress of this sort was an excellent protection for a garrison.

Following up the valley of the Rimac, twelve or fifteen miles from Lima we come to a side valley which contains the ruins of Cajamarquilla. It was a city about three miles square, laid out into streets and blocks and containing many massive walls which

the earthquakes have not been able to destroy. The history of this city is not even known in tradition, and the natives shake their heads when inquiry is made concerning it. The ruins were there when the Spaniards came to Peru.

The buildings of this American Baalbec were extensive and connected by narrow passages and subterranean vaults, that seem to have been used for storage purposes. The doorways were low and curiously shaped, and there are no signs of windows in the houses.

Frank and Fred desired to visit the place, but as it was said to be the haunt of robbers, and not particularly safe, the idea of an excursion was abandoned. Mr. Squier had an encounter with a noted robber while inspecting these ruins, but a display of his commission from the government of the United States secured the good-will of the brigand, and the stranger was saved from harm.

CHAPTER X.

RAILWAYS OVER THE ANDES.—FROM LIMA TO MOLLENDO, AREQUIPA, AND LAKE TITICACA.—THE CHINCHA ISLANDS AND THE SODA DESERTS.—UP THE ANDES BY STEAM.—IN A RAILWAY CARRIAGE FOURTEEN THOUSAND FEET ABOVE THE SEA.

Within the last twenty years Peru has made earnest efforts to connect her inland cities with the Pacific Ocean by means of railways. There are several private lines, the oldest being the short one

connecting Lima with Callao; it was completed in 1851, and has paid handsomely to its projectors. Of the lines built by government there are seven in all; five of them are finished and the remainder are in course of construction (or suspension), with considerable uncertainty as to the date of their completion.

One of the unfinished lines, the Oroya Railway, starts from Callao, and is intended to connect that seaport with the silver mines of Cerro de Pasco, by a branch from Oroya, and to extend to Fort San Ramon, or Mairo, where it will connect with steamboats on the Amazon. It was undertaken by an American contractor under government guarantee; it has cost many millions of dollars, and many other millions will be required before the locomotive can make the journey from Callao to Mairo and Cerro de Pasco.

At the time our friends were in Lima the work was suspended, and Dr. Bronson learned, in answer to his inquiries, that the terminus was at an insignificant town among the mountains. Trains did not run regularly, as there was no business to pay the expenses of running them; the government was waiting for the country to recover from the effects of the war before proceeding with the work.

One day there was an opportunity to make an excursion to the terminus, about ninety miles from Lima, and the Doctor at once arranged for the trip. They were to leave the capital about nine in the morning, spend the night at the terminus, and return early the next day. The programme was carried out to the satisfaction of the wandering trio, as we shall see by referring to Fred's note-book.





ON A RAILWAY.

"We ascended the valley of the Rimac," said Fred, "and in the first forty-six miles gained an elevation of five thousand feet. We had only two carriages in the train, but the locomotive puffed and tugged as though it was drawing three or four times that number. At every mile of our advance the route became more and more intricate; we passed through narrow gorges and along the brink of fearful precipices, and time and time again we seemed to be in danger of toppling over and falling into the abysses below. We were reminded of the passage of the Sierra Nevadas by the Central Pacific Railway, in

our own country, and of the line between Colombo and Kandy, in Ceylon.

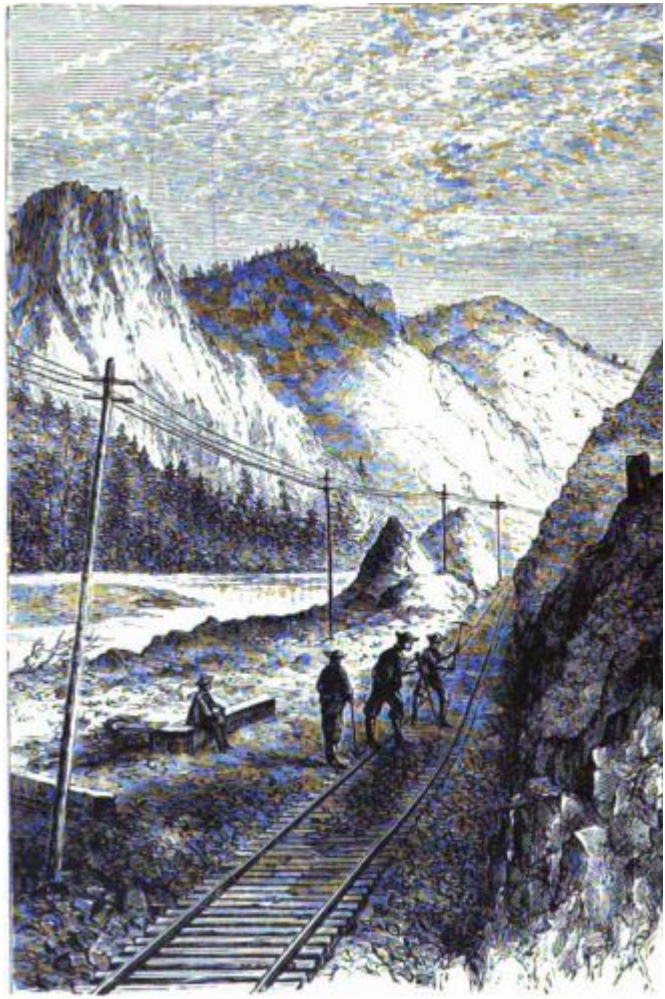
"The engineering difficulties here are greater than on either of the routes I have mentioned, and greater than anything we have seen in the European Alps. The Oroya line is certainly one of the railway wonders of the world, and every visitor to Lima should make a point of seeing this enormous work. It is doubtful if the government will ever find it profitable, owing to the great cost of construction and the expense of running the trains.

"Here are a few figures about this railway. I take some of them from Professor Orton's book,'The Andes and Amazon,' and others have been given me by the conductor who accompanies us.

"Eighty-seven miles of the road had been finished when the war between Chili and Peru caused a suspension of work. There are sixty-three tunnels, with an aggregate length of twenty-one thousand feet, and there are thirty bridges of iron or stone. Some of the bridges are of French or English manufacture, and others, considered the best, were made in America. The Verrugas bridge spans a chasm five hundred and eighty feet wide, and rests on three piers of hollow columns of wrought iron. It was made at Phenixville, Pennsylvania, at a cost of $63,000; the middle pier is two hundred and fifty-two feet high and fifty feet square at its base, and the deflection of the bridge is five-eighths of an inch.

"The sharpest curve of the road is 395 feet radius, and the maximum grade is four per cent. While the work was going on they used two hundred and fifty tons of powder every month for blasting the rock! The tunnel to carry the line through the Andes is at an elevation of 15,645 feet above the sea, the highest

railway tunnel in the world, and some say the highest point where a piston-rod is moved by steam.



AMONG THE FOOT-HILLS.

"To describe our ride would be to give a long succession of exclamations of wonder, admiration, and enthusiasm, with an occasional sigh of relief when dangerous points were passed without

accident. It is quite possible that our cheeks may have paled at times and flushed at others, but of course we could not admit anything of the sort. We were glad when the terminus was reached, and the sensation of the journey was over.

"We crawled slowly upward on our eastward way and found it exciting enough; what shall I say of the return ride, when we had the downward grade to take us along, and the only use of the steam in the locomotive was to hold us back? The brakes were screwed tightly down, and so great is the pressure upon them that their shoes must be renewed at the end of every second round trip from Callao and back again. In four hours from the terminus we were on the shores of the Pacific, and at the end of a journey we shall long remember."

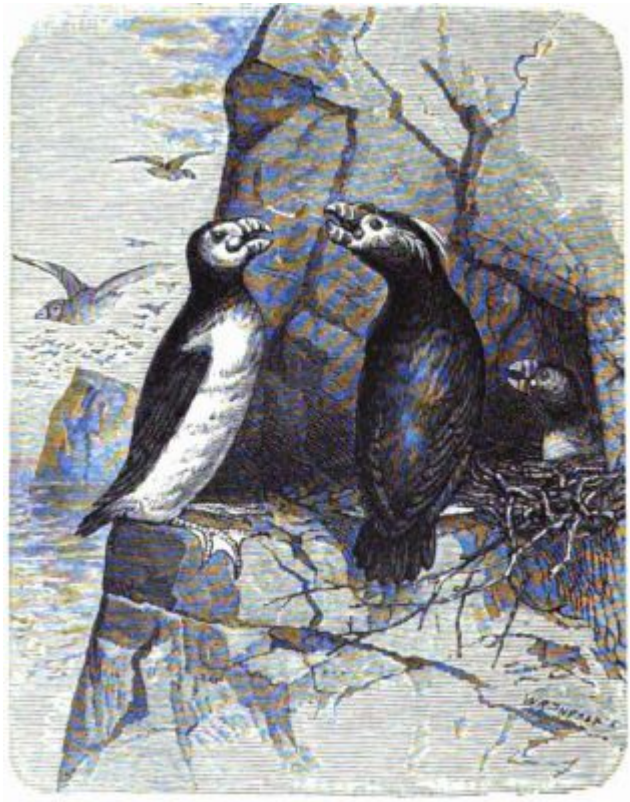
Two weeks from the time our friends landed at Callao they embarked on the southern-bound steamer from that port, having taken their tickets for Mollendo.



GUANO ISLANDS.

The first landing was at Pisco, about one hundred miles south of Callao, and connected by a short line of railway with the cotton regions of Içа. As they approached the port they passed the Chincha Islands, which have become famous as the place whence millions of tons of guano have been brought to Europe and America. Frank and Fred wished to know something about the guano trade, and the Doctor kindly informed them.





SEA-BIRDS HOME.

"The guano was deposited here," said Dr. Bronson, "by the sea-birds, and the accumulations have been going on for thousands of years. No rain falls here, and consequently there was no water to wash the substance away. Mixed with the deposits of the birds were their decomposed bodies and eggs, and the bodies of seals; the seals climb to the highest places on the rocks when they are about to die, and as they were very abundant here, it is safe to say that millions of them have died on the Chincha Islands. Guano is of great value as a manure; the ancient Peruvians were well aware of its qualities, and by the

laws of the Incas everybody was forbidden, under pain of death, to land on the islands during the breeding season, and the same penalty was affixed to killing the birds at any time.

"The guano deposits were first made known to Europe in 1804," the Doctor continued, "through a description by Baron von Humboldt. He said the islands were covered to a depth of fifty or sixty feet with pure guano; the long ages that had been consumed in the accumulation may be understood when he says that during the three centuries since the coming of the Spaniards the growth had been only a small fraction of an inch!"

"Was it brought to Europe in Humboldt's time?" one of the youths inquired.

"No," was the reply; "the first shipment was made in 1840, and consisted of twenty barrels, which were taken to Liverpool. It was tried on a farm near that city, and resulted so favorably that large orders were immediately sent for more. In the following year several cargoes were sent from the islands, and from that time the trade increased rapidly. Farmers in Europe and America learned the value of guano in making a wonderful increase of the producing power of their fields, and the demand for it became general.

"From 1851 to 1860 nearly three million tons were shipped from the Chincha Islands, and between 1853 and 1872 it is estimated that eight millions tons were sent away. In that year the Chincha Islands were practically exhausted. The Peruvians had acted as though they were to last forever as a source of revenue, and the discovery of the great value of the deposits may be considered the cause of the present bankruptcy of the country. They had abolished the taxes and relied upon the Chincha Islands for all

money needed by government, including the immense sums expended in the construction of railways. They appointed agents in London and New York for the sale of the guano, and as long as the business was prosperous, a great many men grew rich out of the transactions.

"As the Chincha Islands gave out other deposits were worked, some on the Lobos Islands, others on the Guanape Islands, and others in Tarapaca, but none of them are as rich or extensive as was the original source of supply."

The youths looked carefully at the islands with their glasses as the steamer proceeded on her course. Dr. Bronson called their attention to a solitary ship that was lying close to the cliff of one of the islands, and said that in the days of the prosperity of the guano trade there were sometimes a hundred ships receiving cargoes or waiting their turns to be laden.

"You observe," said he, "that the sides of the islands are quite bold, and in some places precipitous; ships used to lie close to the shore and receive their cargoes through long chutes or spouts through which the guano was poured from the top of the cliff. The air was full of guano dust, and the men engaged in the work suffered greatly from the dust entering the throat and lungs. Ammonia (hartshorn) is an important ingredient of guano; imagine yourselves breathing an atmosphere heavily charged with ammonia, and you can realize the disagreeable features of working on a guano island.



SCENE ON A COOLIE S

"Convicts were employed here, and also coolies from China; the horrors of the coolie trade with Peru have never been fully told, and the narration would be most sickening. Thousands of the coolies threw themselves into the sea to escape the terrible life on these islands; other thousands died here as a result of their toil, and the number was only kept up by frequent arrivals of ships from Macao, the seat of the coolie trade in China."

"There are three islands," said Fred, "but they do not seem to be large ones. I should judge that the most northerly is the largest, and it is not more than half a mile long by a third in width."

"You have estimated very well," was the reply. "The northern island is called Chincha, and gives the name to the group, and it is about the length and width you mention. The other two are smaller, but are of the same formation as Chincha, a bright red granite composed of red feldspar, white quartz, and a little mica. The group is evidently of volcanic origin, and perhaps it may one day disappear beneath the waves as other volcanic islands have done.

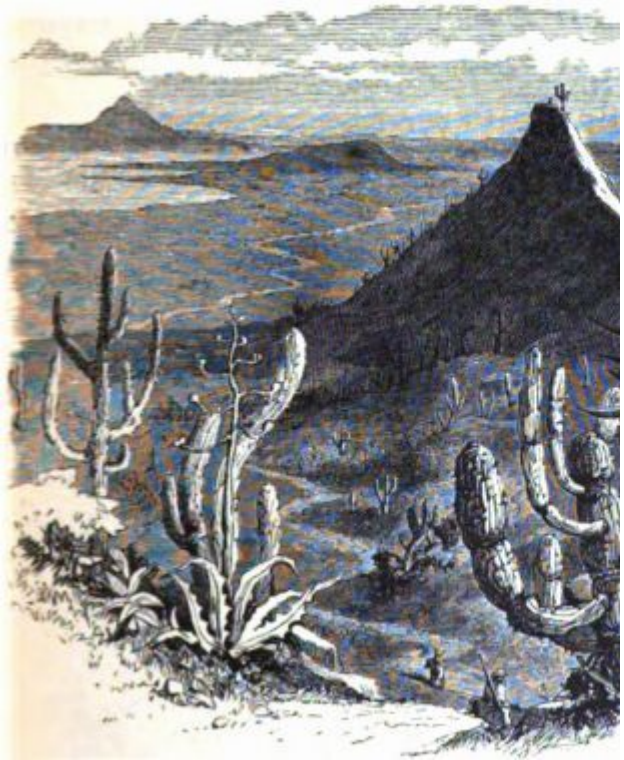
"Guano can only accumulate where there is no rain," continued their mentor, "and there is another source of wealth here that comes from the rainless district."

"What is that?"

"It is the nitrate of soda," answered the Doctor, "which comes from several desert regions in the southern part of Peru, chiefly in the province of Tarapaca, which has been annexed to Chili since the war, and is Peruvian territory no longer. It has many uses in industrial arts, and is largely employed as a fertilizer; the deposits have been worked since 1830, and the chief points of export are Iquique and Pisagua. In twenty years from 1830 the exports were 240,000 tons, and in 1875 no less than 326,000 tons were exported. In 1877 there were 253 ships that cleared from Iquique alone with cargoes of nitrates. Several of the railways constructed by the Peruvian government, or on private account, were built partly or wholly for the transportation of this article."

The steamer stopped very briefly at Pisco, and there was not time to go on shore. From Pisco to Mollendo they were almost constantly in sight of the coast, and sometimes hugging it closely; the mountains of the western cordillera of the Andes filled the eastern horizon, and occasionally the snowy peaks of the great central chain were visible. The principal chain

of mountains in South America is called the Andes, and sometimes the *Nevadas* (white), to distinguish it from the cordillera (cor-de-*yer*-ra), by which the lateral and lower chains, generally parallel to the Andes, are designated. *Sierra* (from the Spanish word for saw) is a spur, or irregular line, of mountains stretching from the Andes to the cordillera, or pushing out from the latter into the flat *Parama*, or desert.



ON THE EDGE OF THE D

Mollendo is the ocean terminus of the railway to Arequipa and Lake Titicaca, the present destination of the boy travellers and their elder companion. The town is on the edge of the desert, and the harbor is

an open roadstead, like most of the ports of the western coast. An old captain sarcastically remarked, "the harbor of Mollendo is entered as soon as the ship turns Cape Horn." The town is supplied with water by an iron pipe eighty-five miles long, which starts from near Arequipa, and is capable of discharging 430,000 gallons of water every twenty-four hours. Enormous tanks have been constructed, to maintain a supply for several days, in case of accident to the aqueduct, and these tanks are the principal sights of the place.

The surf was breaking on the rocky shore, and our friends had a narrow escape from a drenching in going from the ship to the land. Fortunately they arrived in the morning, about an hour before the time for the departure of the train for Arequipa, and had not long to wait.

The railway followed the coast for a short distance, and then turned northeastwardly, and began climbing the hills which formed the outward barrier of the lofty Andes. Up and onward zigzagged the train, through the barren hills that lead to the desert of Islay, and then out upon the dusty stretch of the desert, which it crossed in a line whose directness was in marked contrast to its tortuous course among the hills. At regular intervals there were tanks which supply the locomotives with water; they are fed from the aqueduct already mentioned, and wherever they have leaked, and moistened the dust, the grass grows luxuriantly. It is sixty miles across the desert; before the railway was constructed the journey was made on the backs of donkeys, and it was customary to cross it in the night, in consequence of the great heat and glare when the sun is shining.

Frank copied into his note-book the following

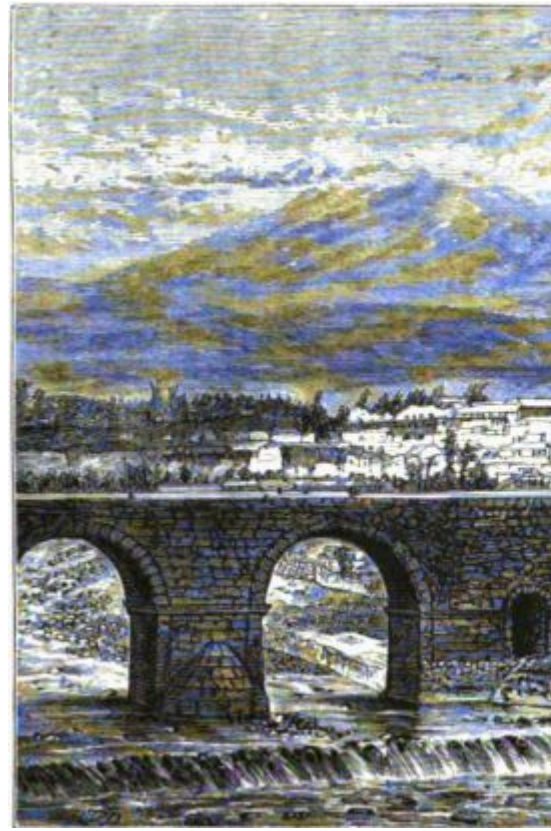
account of a traveller who crossed the desert from the coast to Arequipa, which he failed to reach before sunrise:

"About five o'clock a clear whiteness appeared in the sky, the stars paled their lustre, and the day began to break. Soon a ruddy orange tint spread over the soil of the pampa, now become firm and compact. In a few minutes the disk of the sun appeared above the horizon; and as we marched full in the front of the god of day, we found ourselves in the midst of a luminous torrent, which so dazzled and incommoded us that to escape from this new torture we doubled ourselves up like hedgehogs. This anomalous and inconvenient posture rendered us unjust to the claims of the rising sun. Instead of welcoming his appearance we were inclined to wish he had remained out of sight, and it was not till eight o'clock that the sun, now high above the horizon, permitted us to raise our heads."



INDIANS OF AREQUI

"We did not suffer any of this inconvenience," said Frank, in his description of the journey, "as we were protected by the carriages, and could take any position we liked. When the sun passed the meridian we could look ahead without receiving the glare in our eyes; it was a great relief when we saw the peaks of the snow-clad mountains, and in a little while the eastern horizon was filled with them. Back of Arequipa was the lofty summit of Misti, one of the grandest of the South American volcanoes, then came Chichani, with its precipitous sides, and beyond it, farther to the north, was Coropuno.



AREQUIPA

"As we entered Arequipa ('Place of Rest') we thought of Damascus, to which it has been compared by more than one traveller. Like Damascus, it stands on the edge of the desert, and, also like that Oriental city, it is watered by a river which nourishes its gardens, and creates a spot of living green in the midst of an arid waste. It stands in a valley ten miles long by five in width, but all around the valley is a desert. There is not sufficient water for purposes of irrigation; land that is well irrigated is worth a thousand dollars an acre, as it is wonderfully fertile and produces

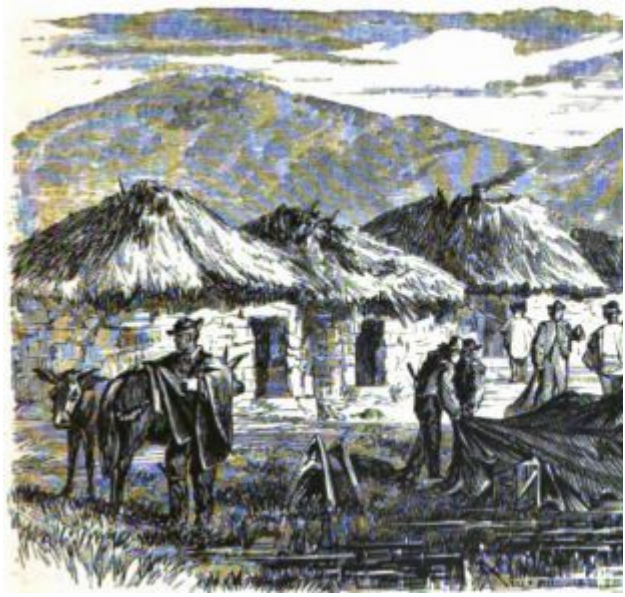
abundantly.

"We spent a day in Arequipa, which was a station under the Inca government before the city was founded by Pizarro, in 1540. At every step we saw traces of the terrible havoc wrought by the earthquake of 1868; there was not a block without its pile of ruins, and some of the streets reminded us of Pompeii, or of Old Delhi. Churches were reduced to a mass of rubbish, the towers of the cathedral were demolished, the university was a heap of ruins, and hundreds of the houses were still unoccupied.

"According to the accounts written at the time, the first shock of the earthquake was felt about five o'clock in the afternoon. There was a slight tremor of the ground, which increased at intervals of fifteen or twenty seconds; it was not until fully a minute after the first shock that the buildings began to fall, and consequently the inhabitants had time to escape to the streets. Compared with Ibarra and other cities, the loss of life was small. The sick in the hospital and prisoners in the *carcel* were unable to flee, and were buried in the falling ruins, and it was estimated that about three hundred others were killed. Before the earthquake the city had a population of not far from fifty thousand; it is now estimated at forty thousand, with the probability of an increase to the old figure in consequence of the revival of commerce by the opening of the railway.

"Our attention was drawn to the use of galvanized iron for the domes of the buildings in place of stone, which was the material formerly employed. It is thought the next earthquake will have less effect than former ones, since iron can withstand what stone cannot. There is a great scarcity of wood here, or it would be popular in the construction of houses.

Wooden houses can hold out against earthquakes better than those of more solid materials, as they can be twisted a great deal before falling. The best material I have ever seen for this purpose is a network of bamboo, plastered on both sides to fill the chinks between the poles and withes.



THE OLD WAY OF TRA

"We asked for the manufactures of Arequipa, but we asked in vain. There was formerly a considerable commerce with the interior, but at present there are no industries beyond the trade in alpaca wool which is the support of the city. There are only a few mercantile houses, and these are mostly German or English, and the chief occupation of the inhabitants is to do nothing. We saw only two men displaying anything like activity; they had quarrelled, and one was pursuing the other with a knife in his hand, but though he ran fast he did not overtake his intended victim.

"The altitude of Arequipa is 7650 feet above the sea; the summit of Misti, a most picturesque volcano, rises behind the city to a height of 18,500 feet, very much as Etna rises behind Catania. It is now silent, but it was fearfully active in 1868, and is liable again to burst forth as the accompaniment of another earthquake.

"The population is as uncertain, politically and socially, as the ground on which their city stands, if we may judge by the frequency with which they indulge in revolutions and insurrections. In three hundred years there have been ten or twelve severe earthquakes and innumerable smaller shocks; in the same time there have been at least a dozen revolts, while plots against the peace and dignity of the state are said to be constantly going on. In 1867 the city was bombarded for three days by the president of the republic, who failed to capture it, and it has several times been shaken by war as well as by earthquakes."



VIEW OF LAKE TITICA

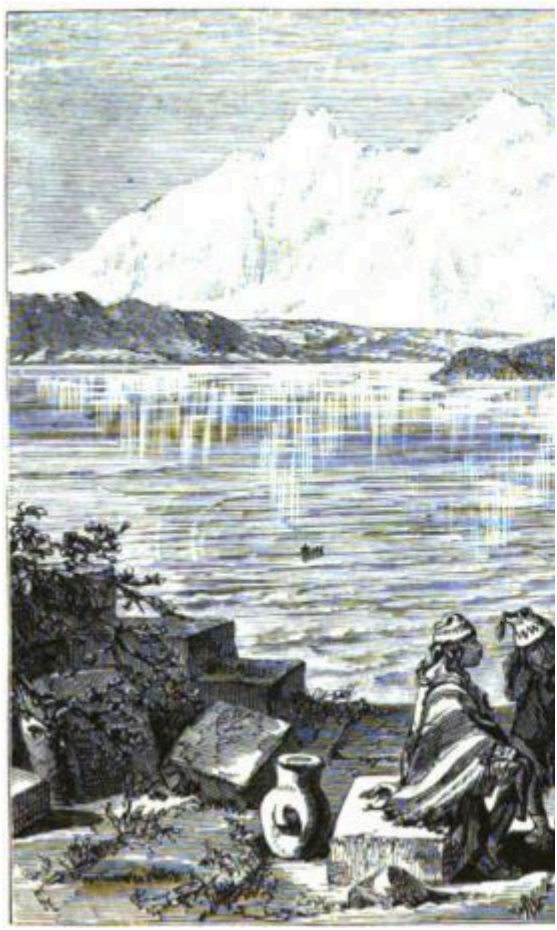
After their day in this famous city our friends started by railway for Punno, on the shore of Lake Titicaca, two hundred and eighteen miles away. Crossing an iron bridge as it left the city, the train soon began to ascend among the desert hills, and through masses of volcanic rock and cinders which gave plain proof that the mighty Chichani had not always been as quiet as at present. Dr. Bronson called the attention of the youths to the magnificent engineering, and the conductor informed them that on this one division of the road the excavations and fillings amounted to ten millions of cubic yards. "They are said to be the deepest cuttings and fillings in the world," said he, "and I certainly have never heard any one say they were not. The deepest cutting is one hundred and twenty-seven feet, and the deepest filling one hundred and forty-one."

"And bear in mind," said the Doctor, "that this work was performed far up in the mountains, where exertion is very fatiguing, and water boils before it is much more than scalding hot. Beans and other articles of food can only be cooked in closed cans to increase the pressure, and consequently the temperature."

On and up they went among the mountains, and over the dreary pampas stretching between them, crossing deep ravines, winding around precipices, threading the valleys, darting through tunnels, now on a level with the banks of snow on the sides of the giant mountains, or looking down upon the clouds that rolled at their feet. Ten, twelve, thirteen, and fourteen thousand feet of elevation were reached, and at length they halted at Vincamayo, 14,443 feet above the level of the sea. It is the creation of the railway, with an American hotel, and all the adjuncts of a relay and repairing station. It is the highest village in the world, higher than famous Potosi, and higher, too, than Cerro de Pasco. Place another Mount Washington on the top of the present one, and its summit would be nearly two thousand feet lower than Vincamayo.

Professor Orton passed a night at Vincamayo; he says he did not sleep, but spent the time in panting for breath. Our friends had the same experience with the rarefied air; the least movement caused them to breathe with difficulty, and they wisely refrained from stirring from their places. In a little while the train reached Alto del Crucero, the highest point of the line, and 14,660 feet above the Pacific at Mollendo. The surrounding land was simply a bog covered with short grass, and sprinkled in places with snow. It affords pasture for alpacas and vicunas,

and as they looked from the windows of the carriage and shivered in the chilly atmosphere they saw numerous herds of these animals feeding on the plain.



THE NEVADA D

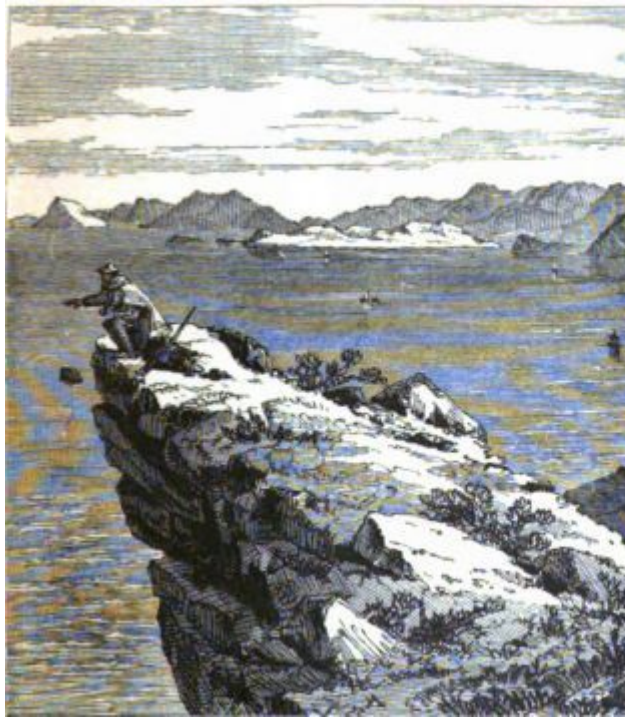
From the summit the descent was gradual, among hills and over desert plains, passing between two lakes of brackish water, and along the banks of a river that had its source among the clouds. By and by

the waters of Lake Titicaca were in sight, and beyond them rose the grand old peak of the Nevada de Sorata, sometimes called "the crown of the Andes."

The train ended its journey at Puno, on the shore of the lake, and the three travellers stepped again to the earth, with more than twelve thousand feet of perpendicular distance below them to the level of the sea!

CHAPTER XI.

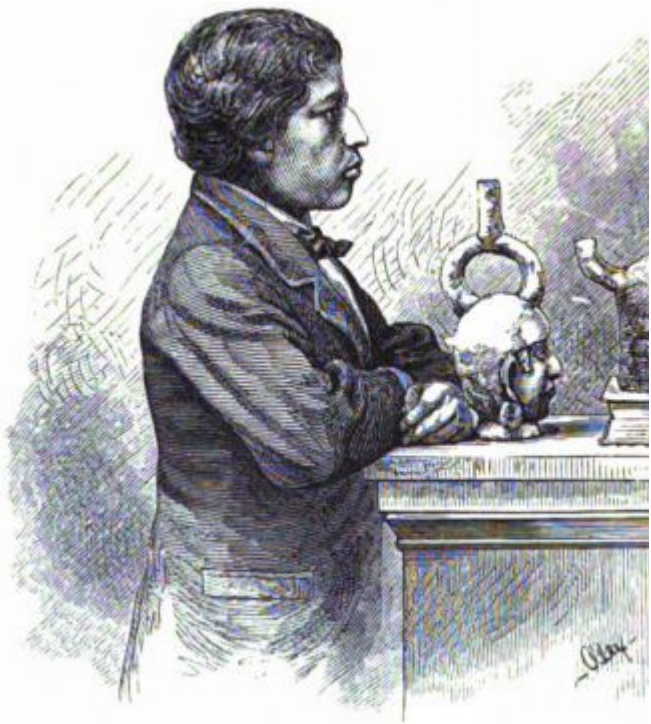
PUNO AND LAKE TITICACA.—COCA AND ITS PROPERTIES.—THE LLAMA AND HIS KINDRED.—EXCURSION TO THE SACRED ISLAND OF THE INCAS.



VIEW ON LAKE TITICA

Puno is not an attractive spot. Lying at a great elevation, it has a cool climate, and its inhabitants pass a good part of the time in trying to keep warm. There are no trees in the neighborhood; before the opening of the railway the only fuel was the dried dung of llamas and other animals, and a small shrub known as tola. The nights are always cold, the thermometer sometimes descending fifteen degrees below the freezing-point, and even touching zero; people retire to bed very early, and remain there till after sunrise, as the best means of escaping the cold. Frank and Fred were obliged to follow the local custom, in spite of their overcoats and rugs. Notwithstanding the severe temperature of the place,

the means of warming the houses do not receive much attention. Since the railway came, and rendered it possible to have coal, a few stoves have been set up, but they are not in general use.



PERUVIAN HEADS, ANCIENT AND MODE

Nine tenths of the five thousand inhabitants of Puno are of the native races; the Aymaraes occupy the southern part of the town, and the Quichuas the northern, the former being the most numerous. The rest, which includes the wealthier and more intelligent fraction of the population, is made up of people of Spanish descent, a few German and English merchants, and two or three American *attachés* of the railway. Puno owed its origin to the rich silver mines in the neighborhood, which were discovered and

operated about two hundred years ago. A romantic story is told concerning these mines, and the romance is by no means free from tragedy.

Jose de Salcedo, a Spaniard, was in love with an Indian girl, and was beloved in return. She revealed to him the secret of the mines, and he worked them with enormous profit; his wealth attracted the attention of the royal officers, who found a pretext for arresting him, and taking him to Lima. He was condemned to death, and his property was confiscated to the government, which meant that the officials expected to transfer his wealth to their own pockets. Salcedo offered to pay a thousand marks of silver a day if they would wait until he could appeal to the king, but his offer was refused.

He was executed in the public square at Lima, and the governors proceeded to take possession of his property. He was well liked by the tribe to which his Indian maiden belonged, and as soon as the natives heard what had been done they stopped the drains of the mines, and flooded them with water. There is now a small lake over the entrance of the mine, and the Indians have ever since refused to give any information concerning the extent of the deposit, or the direction of the veins. These people will keep a secret with the utmost fidelity; torture cannot wring it from them, and they are indifferent to bribes or any other inducement. At the present time they know of rich deposits of silver in various parts of the country, but absolutely refuse to give any information concerning them.



CATHEDRAL OF PUNO.

"The Cathedral of Puno," said Fred, in his note-book, "is the most elevated building of its size in the world. It was begun in 1757, and is an imposing structure, with a specially handsome front; it is at one side of the grand plaza, where every morning is held the market for the sale of provisions. We visited the market the morning after our arrival, and were greatly interested in what we saw and learned there.



QUICHUA WOMAN (FROM A PHOTOGRAPH).

"Most of the sales are managed by women, who sit on the ground in rows stretching away from the fountain in the centre of the plaza, each with little heaps of dried potatoes, fish, *charqui* (dried beef), peppers, beans, pease, maize, barley, and similar things for sale. Each heap has a price fixed for it, and the rise and fall of the market are regulated by the size of the heap, the price remaining the same. Pease, beans, and pepper come from the coast, as they do not grow at the altitude of Puno; flour is too dear to be used by the lower classes, though it has fallen somewhat since the opening of the railway. Beans

and pease must be reduced to powder before cooking, at this altitude, and potatoes are frozen, and then dried and pulverized, like the beans and pease.



COCA PLANT.

"We were guided through the market by one of the English-speaking residents, who called our attention to coca, which was sold as an article of food, in the form of dried leaves. We had already seen the leaves, and heard of their qualities, but this was the first time we had seen them for sale at the side of the usual articles for supplying the table. Our informant said that coca possessed wonderful properties; I will

give his words as nearly as I can remember them:

"'Coca is the dried leaf of the shrub *erythroxylon*, and is called *cuca* by the natives. It grows in the mountainous parts of Peru and Bolivia, at elevations varying from two to six thousand feet, and is a shrub or small tree about six feet high. Its leaves are gathered, and dried in the sun, and are chewed with a little quicklime, in much the same way that the natives of India and the Malay regions chew the leaf of the betel or areca palm, and certain Americans chew tobacco. Its effect is narcotic and stimulating, and the most remarkable stories are told of the endurance of the people who use it.

"A Peruvian or Bolivian Indian will travel for days without any sign of weariness, with only a small supply of coca and some dried maize; he chews the coca while walking, and it really seems to be his chief reliance. He will work or travel for twenty or thirty hours continuously, without sleep or rest, if he is allowed plenty of coca; Indians have been known to travel seventy miles a day for three days with no other sustenance than this article. In the silver mines, where the employers feed their laborers, they limit the quantity of other supplies, but give the Indians all the coca they want.'

"I asked if there were no unpleasant after-effects from the use of this drug, as in the case of opium and other narcotics.

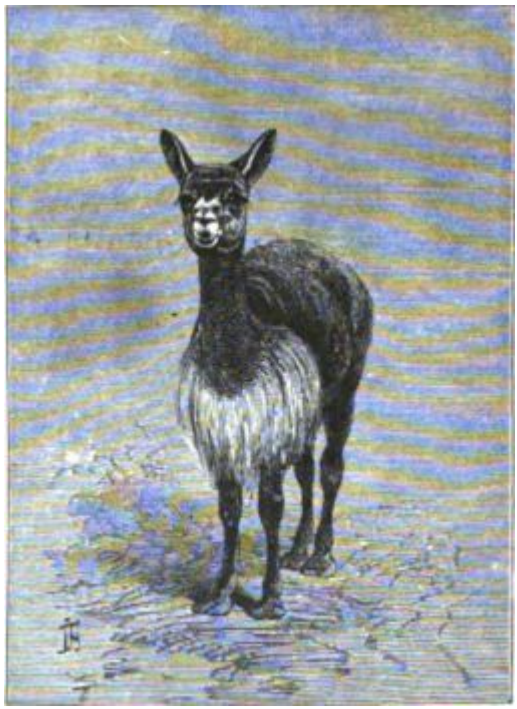
"'Unhappily there are,' was the reply, 'but they are usually less serious than in the case of opium. Sometimes the habit increases to such a degree that the stomach cannot retain other food, and there is a constant craving for coca. The system cannot be sustained by this stimulant alone; the victim is reduced to a skeleton, becomes feverish and restless,

and ultimately dies in consequence of his passion. But, as far as I have been able to learn since my residence in the country, the deaths from coca are not near as numerous, in proportion to those who use it, as those from opium, in China and other parts of the far East?

"Dr. Bronson said that an extract or alkaloid of coca, called cocaine, had recently come into use in Europe and America as an anæsthetic, for operations on the eye, and other sensitive parts of the human organization. The patient is fully conscious of what is going on, but does not experience the least pain. Its properties as a local anæsthetic were discovered in 1884, by Dr. Koller, of Vienna; and it is freely used by oculists in New York and elsewhere. It is a very costly substance, being worth some hundreds of dollars an ounce, but the quantity used for paralyzing the nerves of the eye during an operation is surprisingly small. One or two drops of a solution containing from two to four per cent. of cocaine are generally sufficient for a short operation, and twice or three times that quantity, at intervals of five or ten minutes, for a longer one.

"Thirty million pounds of coca are annually consumed in South America. The finest is grown in the Yungas district, in Bolivia, where it is cultivated somewhat as tea is cultivated in China. Its properties were known to the ancient Peruvians, and it was used in their religious ceremonies; it received divine honors, and under some of the Incas its use was reserved for the nobility. Even at this day the Indians sometimes put coca in the mouths of their dead, just as the ancient Greeks placed an obolus in the mouth of a corpse to insure its ferriage over the Styx. The miners of Peru throw quids of coca against the veins

of silver, under the belief that it causes them to be more easily worked.



LLAMA.

"So much for coca. Another curiosity of Puno is the large number of llamas we see in the streets, either running at large or used as beasts of burden. The llama, guanaco, alpaca, and vicuna were 'the four sheep of the Incas,' according to Professor Orton; the first clothing the common people, the second the nobles, the third the royal governors, and the fourth the Incas. Llamas and alpacas are domesticated; guanacos and vicunas are wild. They all go in flocks, and, in their wild state, one of their number always keeps watch; if danger threatens he stamps his feet, and gives the alarm, and it must be a very swift pursuer that can overtake them.

"The four animals belong to the same family, and some naturalists say the llama is nothing more than the domesticated guanaco. The llama is found all through South America, from northern Peru to the Strait of Magellan; it has been well described as having the head of a camel, the body of a deer, the wool of a sheep, and the neigh of a horse. It prefers a cold climate to a warm one; in the torrid zone it lives at a high elevation, while on the cool plains of Patagonia, near the level of the sea, it is found in great numbers. In Patagonia it is not domesticated, but in Peru, Bolivia, and Chili it is used as a beast of burden; it is about three feet high at the shoulder, and its head five feet when the animal stands erect. It can carry a burden of not more than a hundred pounds, lives on very scanty food, endures cold without suffering, and requires no drink as long as it can find succulent herbage. The pens where the animals are shut up at night have no shelter against the cold winds, which they do not mind in the least, and they are said to require very little care from one year's end to another.



ANCIENT GATEWAY NEAR PUNO.

"Those that we saw in the streets seemed to have things their own way, and to be indifferent to the presence of men; but when we tried to approach one he refused our acquaintance and walked away. When angry the llama stamps his feet, and ejects a saliva that causes a burning sensation if it falls on the unprotected skin; we did not care to make the experiment, and therefore refrained from irritating one of the animals.

"The alpaca is not used as a beast of burden, but is reared for its wool flesh, and skin, especially the former. You know that the alpaca wool is fine; so is that of the vicuna, which closely resembles the alpaca. The wool of the llama is about six inches long, and its fleece often weighs ten pounds. The llama is interesting from being the only native domesticated animal in South America. The horse, ox, sheep, hog, and all other animals useful to man, came from other countries.

"The principal sport of some parts of South America, especially of Patagonia, is the chase of the llama or guanaco. The hunters go on horseback or on foot, and 'stalk' their game by moving slowly towards them, being always careful not to alarm the animals. In this way they may get near enough for a shot with their rifles, but very often the guanacos are wary, and decline close acquaintance. Every hunter who can afford it keeps a lot of dogs trained to the chase, and it is interesting to see how well they understand their work.

"If the guanacos are grazing singly on the plains the chances of overtaking them are doubtful, even for the swiftest and strongest dogs. But when a herd is being chased each animal tries to crowd into the centre of it, and so much confusion is caused that the aggregate speed is considerably diminished. Knowing this, the dogs are always eager to pursue a herd, while they look with indifference upon a solitary guanaco."



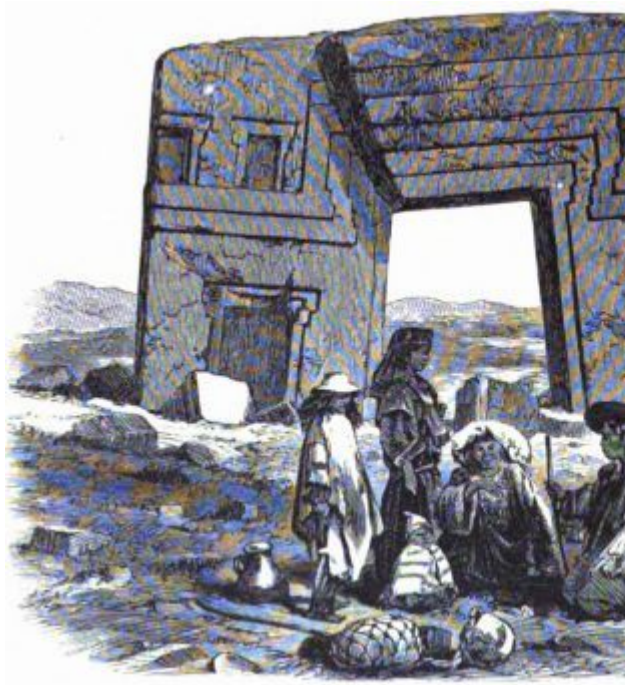
THE VICUNA.

When the subject of llamas and their kindred was under discussion, Frank suggested that it would be a good plan to introduce the llama into the United States, and wondered why it had not been done. Visions of a Llama Stock Company filled his mind, but they were dispelled by Dr. Bronson, who said the experiment had been tried, and was a failure.

"When was it made?" the youth inquired.

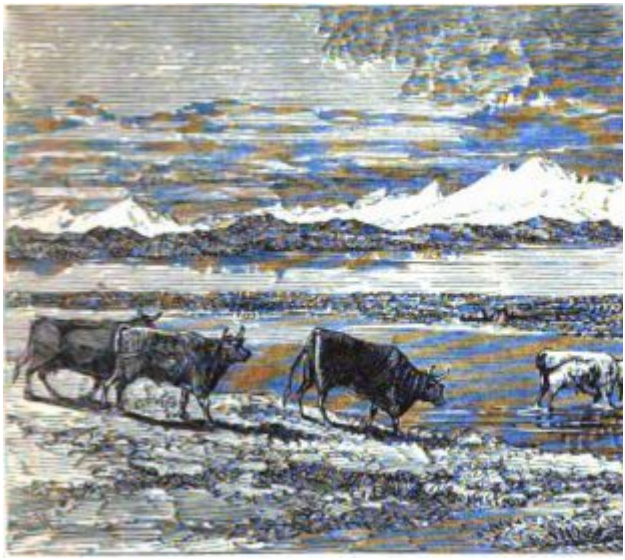
"In 1857," was the reply; "and the singular fact is that the difficulty in adapting the llama to our country is that the food he obtains is too good for him. What we give to our cattle and sheep does not seem to

agree with him; he prefers inferior grasses, together with pea-vines, bean-stalks, straw, and such things, which our cattle would starve upon; and where he has been turned out to graze in low regions he invariably suffers from disease of the skin. In 1857 somebody shipped seventy-two of these animals from Peru to New York; only thirty-eight lived to reach the city, and were wintered on a farm on Long Island. In the spring those that remained were sold for museums and menageries, and some of them were sent to Australia. It is quite possible that the llama would thrive on the great plains between the Missouri River and the Rocky Mountains; the only difficulty would be in protecting the herds from the lawless hunters until they had become sufficiently numerous and wild to take care of themselves as the antelopes do."



INDIANS AND LLAMA AMONG

After a glance at the town, with its open market and massive cathedral, our friends strolled to the shore of the bay on which Puno is built. It is a sluggish body of water, fringed all around with *tortora* or rushes, which grow profusely, and serve many purposes. They are used for making baskets, lining the walls of houses, filling beds, thatching roofs, and in other ways are of material advantage to the inhabitants of the region bordering the lake. They are an important item of fuel, though they burn too quickly to give off much heat; cattle feed upon these rushes, and as our friends stood on the shore of the bay they saw cows and oxen in the water nearly up to their backs, making their breakfasts on tortora.

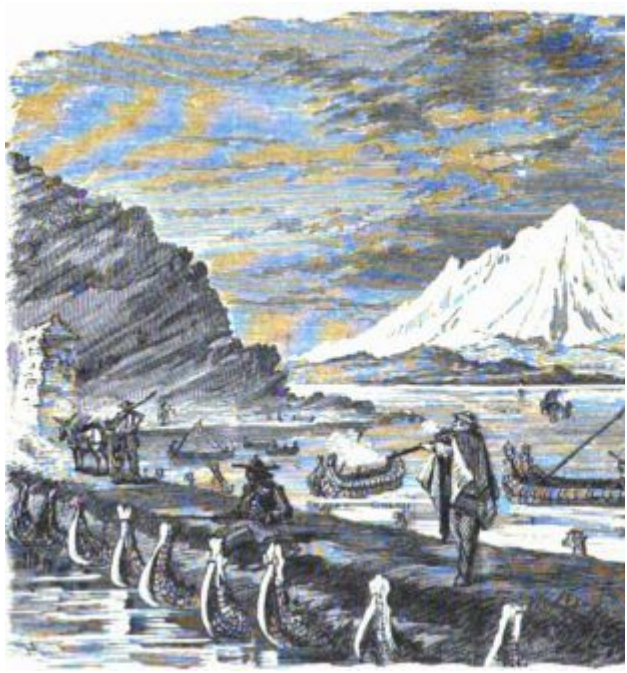


CATTLE FEEDING ON RUSHES, L

Some distance out from the shore a steamboat was lying at anchor. The guide said there were two steamboats on the lake, but the shallowness of the water prevented their coming up to Puno; they were obliged to communicate with the land by means of small boats, which were rowed or pushed along the narrow channel through the bed of reeds. These steamboats were placed on the lake before the construction of the railway; they were brought in pieces on the backs of mules, and put together on the shore. Other steamboats were promised, and it was expected that the railway would lead to a considerable commercial development which might require a dozen boats in the next decade.

Lake Titicaca is about one hundred and twenty miles long by fifty or sixty in breadth, and its greatest measurement is nearly north and south. It stands in an immense basin, roughly estimated to be six hundred miles long by two hundred broad, or three

times the area of the State of New York. It receives several large streams, and discharges into Lake Aullagas; the latter lake has not been carefully surveyed, and though our friends made diligent inquiry they could learn very little about its size, or the nature and direction of its outlet. The lake is very deep in places; it never freezes over, but ice forms sometimes in the bays and shallow places.



TORTORA BRIDGE OVER THE OUTLET

Arrangements were made for a trip on the lake to visit Titicaca and Coati islands, for an inspection of the monuments of the Incas and their predecessors. Through the influence of the officials to whom he brought letters of introduction, Dr. Bronson engaged the steamboat for a moderate compensation, which included the wages and board of the crew, but left

the passengers to take care of themselves. A supply of canned and other provisions was readily obtained from a merchant of Puno, and in a few hours the party was under way. The captain wanted to wait until the next morning, but the Doctor realized that one delay would be an excuse for another, and wisely insisted upon leaving the same afternoon.



HEAD-DRESS OF AYMARA WOMEN.

While they were waiting for the small boat to carry them to the steamer Frank made a sketch of the head-dress of one of the Aymara women who was looking on at their proceedings. It had a cap fitting close to the head, and held in place by strings under

the chin; near the top of the cap was a horizontal piece of stiff pasteboard, oval in shape, and extending far out from the head on every side. Around the edge was a valance of black silk, or some similar material, which partially protected the face of the wearer from the sun and wind. It was not unlike a small parasol in appearance, and has been worn here from time immemorial.

The rest of the dress of the Aymara women includes a gown of blue, brown, or black material, and a shawl which is fastened at the neck with a large pin, shaped somewhat like a spoon. Sometimes a handkerchief is fastened around the neck, but it is rarely worn except on gala days.



AYMARA MEN, PUNO.

The Aymara men wear short trousers, very broad in the legs, and incase their feet in sandals, or shoes of rawhide. They wear ponchos over their shoulders,

and on their heads they constantly have skull-caps, which are covered, when out of doors, with broad hats of braided grass. Men and women keep the hair long; it is invariably black, except in extreme age, when it assumes the frost that never melts, like the hair of people in other parts of the world.



AYMARA WOMAN, PUNO.

Though living side by side for centuries the Aymaraes and Quichuas preserve their distinctness, rarely associating, and never uniting in marriage. The Aymaraes hold their market at Puno in the plaza in front of the cathedral, as already described, but the Quichua market is held in another square. A

Quichua woman can be distinguished from an Aymara one at a glance, as she is without the remarkable head-covering, but the dress of the men has only some slight points of difference, that cannot be observed by a stranger. The Aymaraes are thought to represent an older race than the Quichuas; the men are larger and more powerful, but the women are less inclined to good looks.

Though the two people remain distinct they are perfectly friendly, and their huts are often quite near each other. In their resistance to the Spanish conquest they made common cause, and in every revolt against their oppressors they have fought side by side. Both are grave, dignified, silent, and sad, and as we look at them they seem to be musing over the misfortunes of the last three centuries, and the degradation that has followed the occupation of their land by the avaricious invaders.

These musings of Frank and Fred were cut short by the announcement that the boat was ready. Pushing along the tortuous channel through the reeds they made slow progress; but all journeys have an end, and in due time they reached the steamboat. Steam was already up, and as soon as the party was on board, with its belongings, the paddles were put in motion, and the prow turned in the direction of Titicaca Island.



A RIDE ON A BALSA, LAKE TITICACA

Lake Titicaca is the largest body of water on the surface of the globe at an elevation exceeding twelve thousand feet, and probably the most elevated lake navigated by steam. Before the introduction of steamboats the only mode of water transit was upon balsas, or rafts, made of the tortora or rushes already mentioned; the lake is liable to be swept by sudden winds, and the party who ventures upon it in one of these frail craft runs a good chance of a wetting. The steamboats have not by any means driven the balsa from the lake, but they have rendered it less obligatory on strangers to trust themselves to its limited accommodations and its certainty of discomfort.

It was after dark when the steamer reached Titicaca Island, and ran into a little bay where there was a shelter from the wind. As nothing could be seen on the land, during the night, it was decided to sleep on board, and make an early visit to the shore in the

morning. The Doctor and the youths made a hearty supper from their provisions and some hot tea, and then spread their beds on the floor of the cabin, which had no berths or other sleeping accommodations.

Several balsas came from shore in the morning, and afforded means for landing on the sacred island of Peru. Titicaca Island is about six miles long by four in width; it is high and rugged, and the shores are deeply indented in many places. It contains the ruins of a Temple of the Sun, a palace of the Incas, and several other buildings, which have sadly gone to decay. Frank and Fred ascended the steep acclivity at the landing-place, closely followed by the Doctor, and were soon at a little village near by, where they obtained a guide to show them through the ruins.



CLOSED DOORWAY, TITICACA ISLANI

Near the village there were the remains of a building; tradition says it was the place where pilgrims to the sacred islands were required to

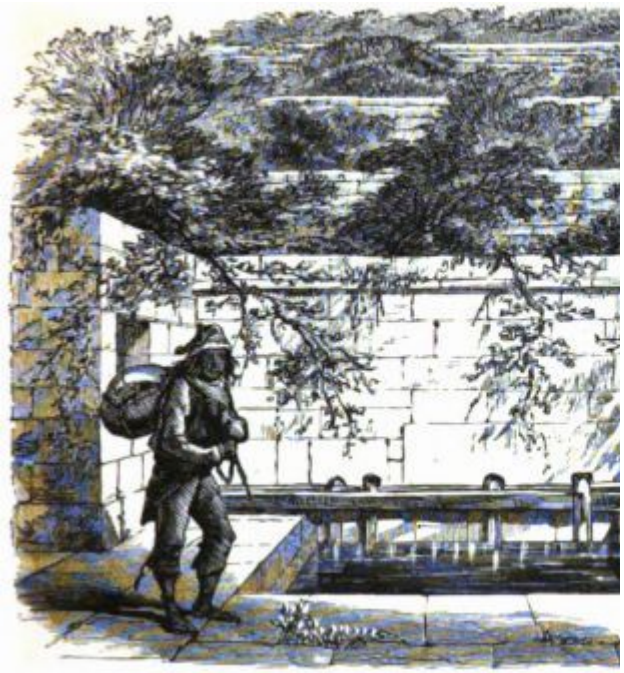
remain for several days after their arrival in order to go through certain ceremonies of purification. There was a broad platform in front of the building, the latter being divided into two parts, measuring thirty-five feet one way by twenty-seven the other. The upper part of the walls had fallen, but the lower portion was well preserved. The walls were of limestone, carefully cut, and set in tough clay, which seems able to resist the ravages of the climate.



PALACE OF THE INC

About half a mile from the landing-place is "the Palace of the Inca" on a cliff overlooking the lake. Its walls are broken at the top, but enough remains to show the style of the ancient architecture, and the forms of the windows and doorways. Frank

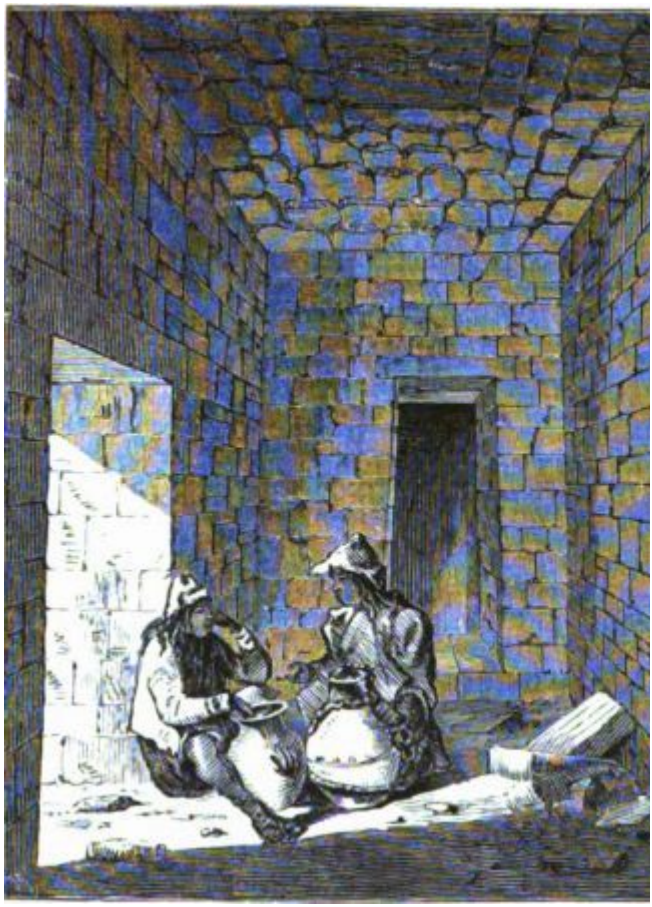
wondered that the earthquakes had not destroyed the palace long ago; the Doctor said this part of Bolivia is rarely visited by disturbances of the earth, the whole basin of Titicaca being singularly free from them. The home of the South American earthquake is practically confined to the western side of the Andes.



BATH OF THE INCA

Near the palace they were shown "the Bath of the Inca," at the base of a hill which was evidently terraced at great expense. The walls of the terraces were made of cut stone, and the whole work was laid out with the skill of a surveyor. Here the Incas had their gardens, but the ground is not now cultivated, and little more than the terraces remain to show what it once was. The bath is a tank or basin of stone about five feet deep, and measuring twenty feet by

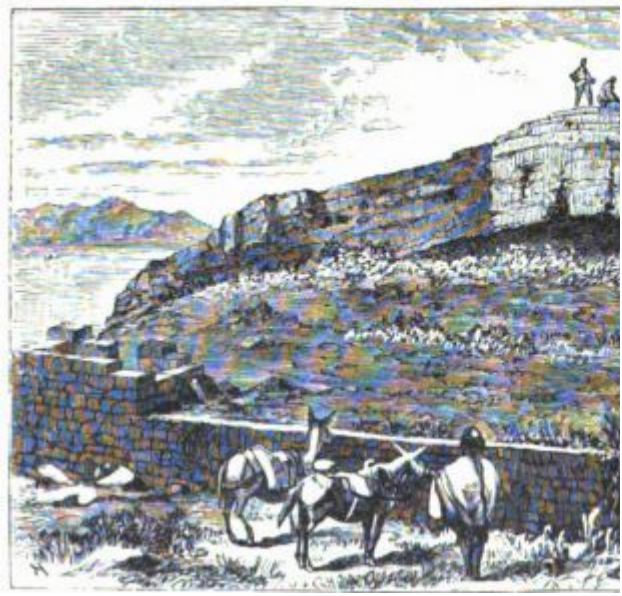
forty on its surface. Vines and other plants grow over the walls, and at one end of the tank there are three streams of water each about two inches in diameter. The sources of these streams is unknown; they come through subterranean channels, and are flowing to-day exactly as they flowed during the time of the Incas and their imperial splendor.



ROOM IN THE INCA'S PALACE.

At the farther end of the island is the sacred rock of Manco Capac, but there is little to be seen there

except a high wall surrounding a natural dome of sandstone. The Doctor did not think the sight would compensate for the time and fatigue of the journey, and the stone was left to take care of itself. The youths consoled themselves by studying the engraving in Mr. Squier's work and reading the tradition concerning the rock.



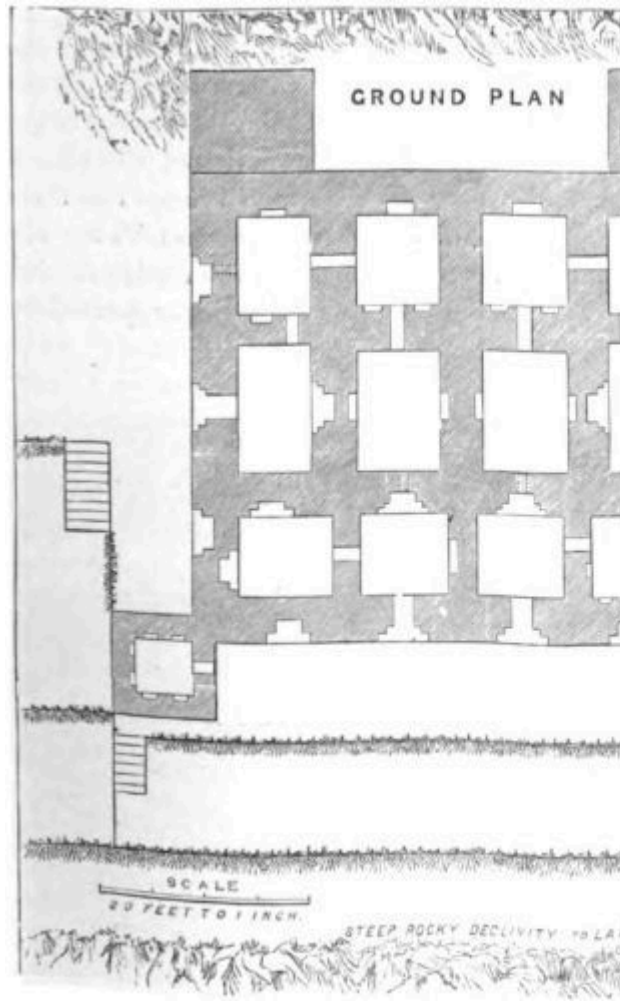
THE SACRED ROCK OF MAN

It was here that Manco Capac is said to have descended to earth, and down to this day the natives approach the place with great reverence. It was formerly believed that no bird would alight upon it, and no animal would dare to set his foot there. The presence of mortal man was forbidden. It was here that the sun rose to dispel the mists around the mountains and over the land, and for many years none but the priests could even come within sight of the rock. At one time it was plated with gold and silver and covered with a veil, which was never

removed except on the occasion of religious festivals.

The sloping sides of the hill crowned by the rock are terraced and walled off into platforms; these platforms contain the remains of small buildings, which are supposed to have been the residences of the priests and attendants upon the worship of the founder of the line of Incas. There was formerly a garden on the terraces, and the earth for its construction was said to have been brought on the backs of men a distance of four hundred miles!

Doubtless the work of the Incas was performed under the same oppression as that of the rulers of ancient Egypt. The latter built the Pyramids by the unpaid labor of their subjects; the former terraced the rugged sides of Titicaca Island, and erected their temples and palaces with little thought of the lives that were lost in the toil. The history of the Old World is repeated in the New.



GROUND-PLAN OF "PALACE OF THE INCA

CHAPTER XII.

COATI ISLAND AND THE RUINS OF

TIAHUANACO.—RETURN TO PUNO.—CUZCO, AND THE TEMPLES, PALACES, AND FORTRESSES OF THE INCAS.—PLANS FOR DEPARTURE.



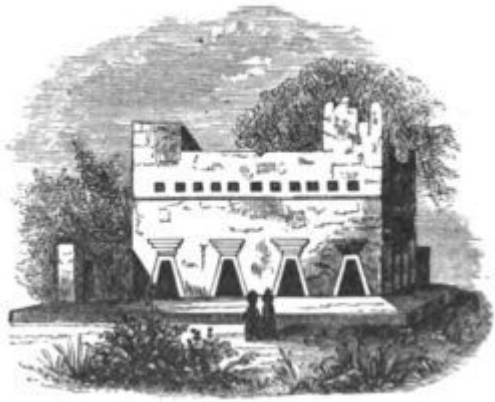
BRIDGE AND CUSTOM-HOUSE AT

The party spent the day on Titicaca Island, examining the ruins which attested the power of the Incas and their predecessors, and studying the magnificent views that were presented in almost every direction. In the east lay the Andes of Bolivia, while to the west was the chain of the cordillera they had crossed on their way from the coast to Puno. Lake Titicaca lies between Peru and Bolivia, the western shore belonging to the former country, and the eastern to the latter. The outlet of the lake is the dividing-line, and at each end of the bridge which crosses the river there is a custom-house, where officials of the respective countries are stationed. The

bridge is built on rafts, or balsas, made of the reeds growing in the lake; the footway is composed of these reeds, and supported by the balsas beneath it.

They returned to the steamboat at nightfall, and gave orders for the captain to move to Coati Island, about six miles distant, as soon as daylight permitted. Weary with their tramp, they slept soundly; when they waked in the morning the steamer was at anchor at its destination, and as soon as breakfast was over they went on shore.

Titicaca Island was specially consecrated to the sun, while Coati was dedicated to the moon. The former is steep and rugged; the latter is only moderately elevated, and capable of cultivation from one end to the other. It is about half as large as Titicaca Island, and is occupied by a few families of Indians, who cultivate potatoes and other things, and look after a flock of sheep which is pastured there. Judging by the appearance of the sheep, Frank and Fred were of opinion that the pasture was a good one.



RUINS ON COATI ISLAND.

Coati contains a Temple of the Moon and a Palace of

the Virgins; both are greatly ruined, but sufficiently preserved to indicate their original extent and character. Near the ancient landing-place there are gates, and temples of purification similar to those on Titicaca Island, and doubtless used for the same purposes. About midway of the island is the principal group of ruins, and our friends spent several hours in examining the walls and terraces, and studying what is left of the architecture of the buildings. Only the lower story of the edifice remains; the upper part appears to have been made of wood, and disappeared long ago.

An inner court of the building is now used by the Indian shepherds as an enclosure for their sheep at night, and when Frank and Fred entered it one of the guardians of the flock was driving his charges out to pasture. According to tradition, this court-yard was the corral where the sacred llamas and vicunas were kept in the days of the Incas; from their wool the royal garments and the hangings of the temple were made, by the women who inhabited the palace near by.

The temple is elevated some distance above the lake; between the temple and the edge of the water the ground slopes off in a series of terraces carefully built of stone. Each terrace has a wall about breast-high around its edge, and a person walking there ran no risk of falling down the declivity. From one terrace to another there is a series of stone steps, so that the ascent and descent were easy.

Sitting on the front of the upper terrace the travellers mused upon the scenes of the past, and endeavored to picture the appearance of the island in the days when the Incas were in the height of their power, and the temples were crowded with pilgrims from all

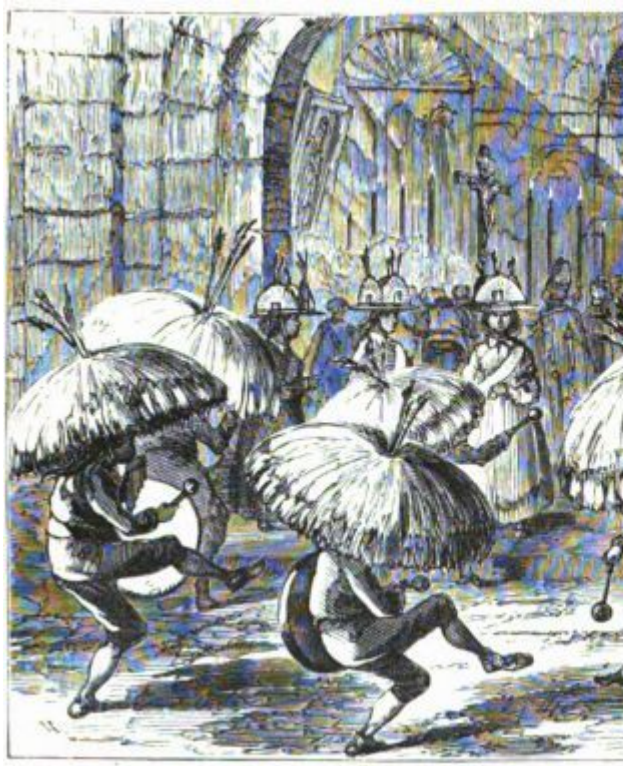
parts of the empire.

"These temples and palaces," said the Doctor, "are by no means the finest monuments of the ancient Peruvians in the Titicaca basin. A little beyond the southern extremity of the lake is the village of Tiahuanaco, where the ruins are far more extensive than on either of the islands."

"Mr. Squier calls Tiahuanaco the Baalbec of America," said Fred. "To judge by his description of the remains he found there, the name is well merited."

Frank had not yet read the account which Mr. Squier gives of his visit to the spot. At his request Fred made a brief synopsis of the story.

"On his arrival," said Fred, "he was impressed with the great number of finely cut stones that were built into the rudest edifices, or were used for pavements. The church is mainly constructed of them, and the cross in front of it stands on an ancient stone pedestal, which far surpasses it in the excellence of its workmanship. On all sides are the relics of antiquity adapted to the uses of the present time; Tiahuanaco has been used as a quarry, from whence have been taken the finely cut and polished stones for building all the churches and villages of the valley, and even for the roads and bridges.



INDIANS CELEBRATING THE CHUNO, C

"He happened to arrive at the time the Indians were engaged in celebrating the *chuno*, or potato festival; they were dancing in the public square, beating on drums or tambourines, and wearing head-coverings that resembled enormous umbrellas. Each group of men was accompanied by several female dancers, the latter wearing hats with broad, stiff brims, and ornamented above the brims with semicircular representations of the rays of the rising sun, that closely resembled an open fan. There were three of these semicircular pieces above the brim of the hat, and each of the dancers wore a scarf over the left shoulder; the scarf was of variegated colors, but the

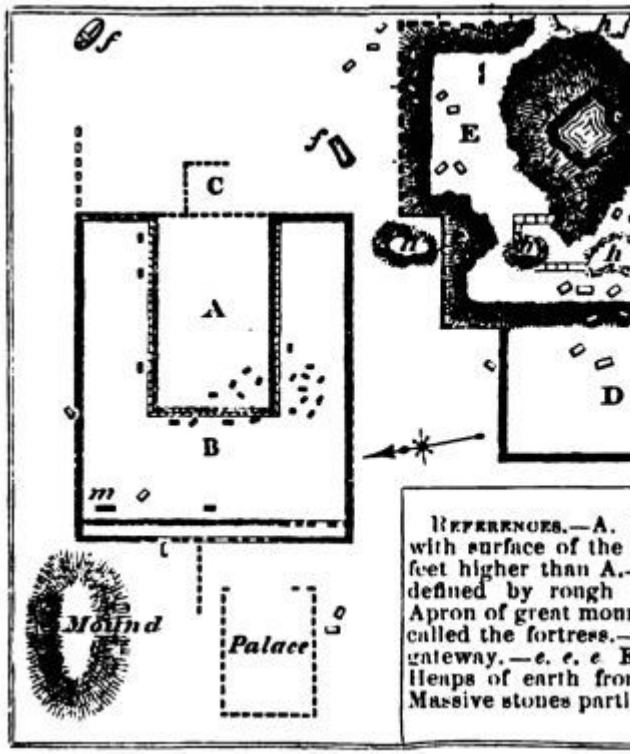
rest of the costume was blue.



HEAD-DRESS OF INDIAN FEMALE DANCERS.

"The dance was kept up all day and all night, and, as the whole population took part in the festival, it was impossible for Mr. Squier to hire the laborers he desired to assist in making his explorations. The festival is a curious mingling of the customs of the ancient Peruvians and of the modern church; it was under the control of the priests of Tiahuanaco, and the ceremonials were so closely blended that it was impossible to draw a dividing-line between them. The chuno dates far back before the conquest by the Spaniards, and it is probable that the early settlers found it to their advantage to combine it with some of their own ceremonials.

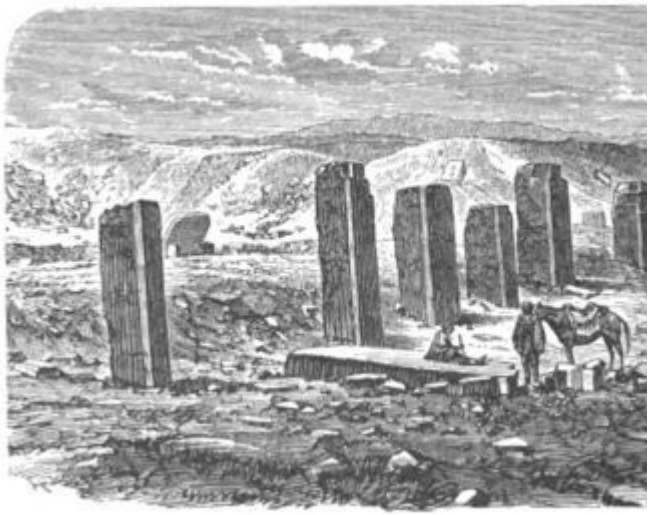
"The ruins are about fifteen minutes walk from the village, and cover an area of two or three miles. They are on a level plain, and consist of several mounds of earth, one of them larger than any of the others, and the remains of numerous buildings and enclosures. The most conspicuous part of the ruins is about a mile square, and includes the large mound just mentioned.



PLAN OF PART OF RUINS OF TIAHU

"This mound is generally called 'The Fortress,' and was originally terraced, each terrace being supported by a massive wall of cut stones, and the top of the mound covered with stone structures of which considerable portions are in their original places.

Close by the mound are the ruins of a building or enclosure known as 'The Temple,' which was 445 feet long by 388 feet wide. The stones composing it are sunk into the ground like gate-posts; the part that appears above the earth varies from nine to fourteen feet in height, and the blocks are about thirty inches thick. Mr. Squier calls this enclosure 'The American Stonehenge,' from its resemblance to Stonehenge, one of the famous monuments of England.



THE AMERICAN STONEHENGE.

"Scattered in the vicinity are many highly finished stones, which seem never to have been placed in the walls for which they were intended."

"How much like Baalbec!" exclaimed Frank. "You remember we found the people using the stone from the temple for constructing their buildings, and the greatest stone of all was in the quarries, and not quite detached from the bed where it was hewn."

"Yes," chimed in the Doctor, "and we may compare this Peruvian Tiahuanaco to the Egyptian Thebes and

Karnak. What we find here is very much like what we found in those old cities of the East."

"But I'm coming to a still closer comparison to Thebes and Baalbec," said Fred. "You remember the great stones of Baalbec, and how much we wondered at them?"

Frank nodded assent.

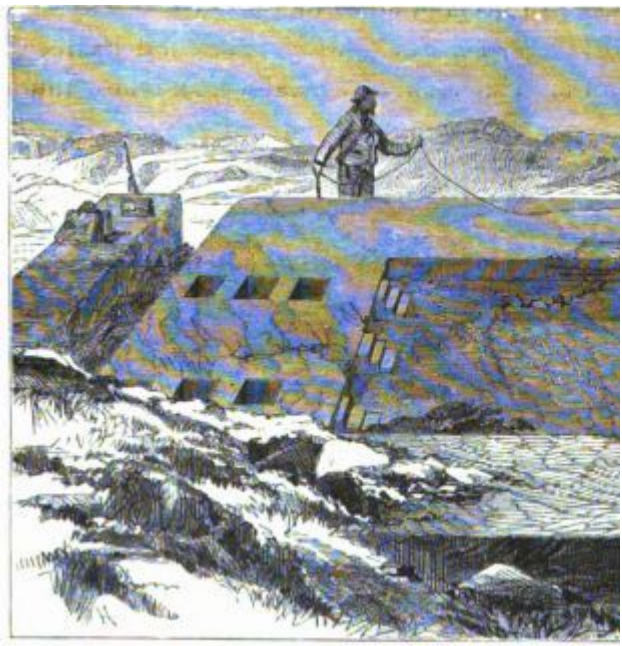


FRONT VIEW OF MONOLITHIC

"Well, here in Peru," was the reply, "we find there was a doorway made of a single stone, which is still standing, though it has been broken by an earthquake, or by lightning—the natives say by the latter. Here are the figures of its measurement, as given by Mr. Squier:

"Thirteen feet five inches long, seven feet two inches high above the ground, and eighteen inches thick.

Through the centre is a doorway, four feet six inches high, and two feet nine inches wide. The upper part is carved with figures in low relief, much like the sculpture we saw in Egypt, and Mr. Squier says he does not believe there is a finer piece of cutting in the same kind of stone on this or any other continent.



SYMBOLICAL SLAI

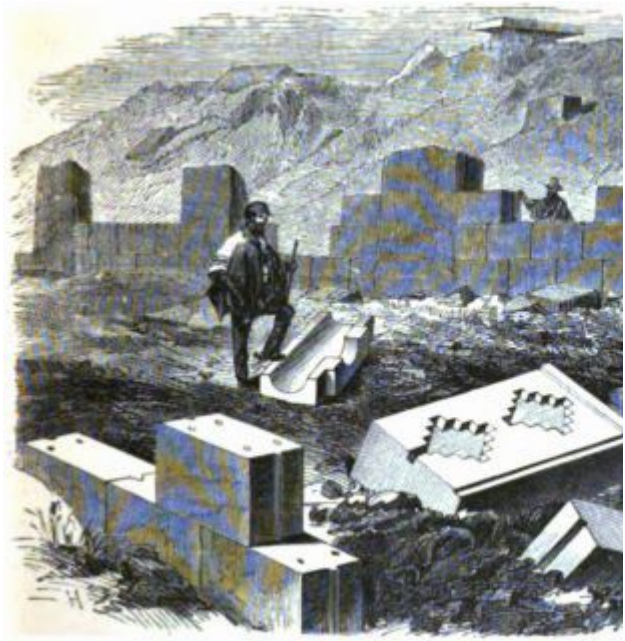
"In another enclosure is a horizontal slab of stone about fourteen feet square, with a deep cutting in the centre, which is supposed to have something to do with the religious observance of the people who made it. The building that contained it was constructed of blocks of stone fourteen feet long, and of corresponding depth and thickness, and all the work was performed with great care."

Frank asked what the Peruvians used for hewing the

stone of which these buildings were made.

"As far as we can learn," replied the Doctor, "they were unacquainted with iron or steel; they were familiar with bronze, and some implements of this metal have been found. They had no knowledge of gunpowder, or other explosives, and it is not at all probable that they had any other power than that of men. The blocks found at Tiahuanaco must have been brought a considerable distance; they are of red sandstone, slate-colored trachyte, and dark basalt, none of which are found in the vicinity. There are cliffs of red sandstone about fifteen miles away, while the other stones are not less than forty miles distant. The conclusion is inevitable that the huge blocks in the ruins were transported from the cliffs I have mentioned."

"Egypt again," said Frank. "The stone for the Great Pyramids was carried across the Nile from the present site of Cairo, and the red granite blocks at Thebes, Sakhara, and other places were floated down on boats or rafts from the first cataract of the Nile."



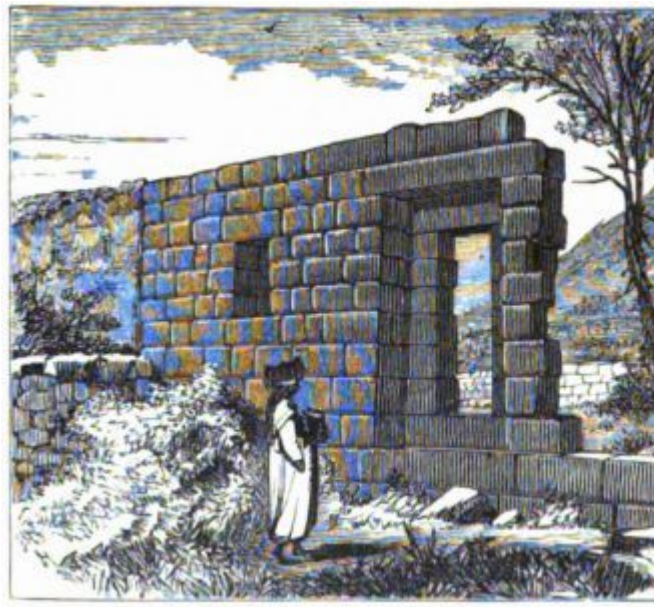
TERRACE WALLS AND SCATTERED I

The conversation was brought to an end by a proposal from the Doctor to descend the terraces to the shore of the lake, and return to the steamer. With a few slips and falls they made their way down the broken stairways, and were soon at the edge of the water. A balsa was obtained from one of the Indians, and as there was no wind blowing they made the trip over the water without mishap. Just at sundown they anchored as near Puno as the steamer could go; the row-boat was waiting for them at the anchorage, and, after a tortuous passage among the reeds, as before, they were back again at their starting-point.

The morning after their arrival was naturally devoted to a discussion of plans for continuing their journey. Frank and Fred wished to visit Cuzco, the ancient capital of the Incas. Their journey to Titicaca Island

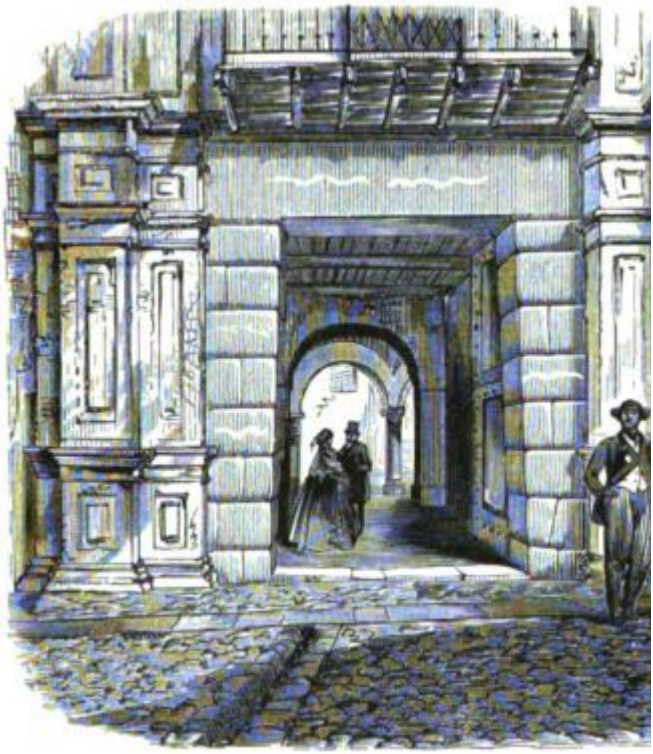
had roused their interest in the antiquities of Peru, and they wished to learn more about them. Dr. Bronson said it would not be feasible for them to go to that city in the time they had at their disposal, as the distance was long and the roads were primitive. "It is more than two hundred miles," said he, "from Puno to Cuzco; the route is not practicable for wheeled vehicles, and I think we are hardly enthusiastic enough to undertake the journey on mules or horses, for the sake of seeing the remains of the Inca Empire."

The youths agreed with him, but determined to inform themselves concerning the sights of the ancient capital of Peru. The Doctor went out to make arrangements for their departure from Puno, and was gone two or three hours. By reading the descriptions at hand, and from subsequent conversations with persons who had been at Cuzco, they prepared the following:



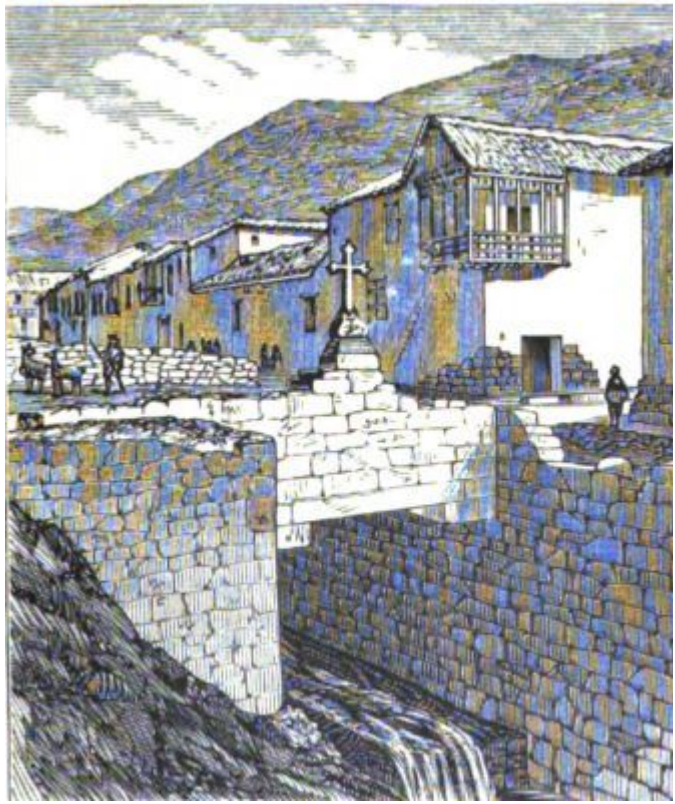
REMAINS OF PALACE AT CUZCO.

"After Manco Capac founded the temples on Titicaca Island he went north and founded the city of Cuzco. It is in a beautiful valley, elevated about eleven thousand feet above the level of the sea, and is said to have at the present time not far from fifty thousand inhabitants. It has a large square in the centre, and the streets cross each other at right angles. There are many fine buildings in Cuzco, but they are mostly of modern construction; the old dwellings of the people exist no longer, but some of the temples were converted into churches and convents. A few of the ancient gateways were kept by the conquerors, and occasionally a doorway and part of the wall of a house have been reserved for modern uses.



INCA DOORWAY, CUZCO.

"The great square of the ancient city was practically the *Plaza Mayor* of the modern one, though a portion of it has been built upon. Two small rivers running through ancient Cuzco were enclosed between high walls and crossed by bridges formed of projecting stones; some of these bridges are still in use, and the walls have not been displaced. Modern engineers say the walls could not easily be improved, and the fact that they have stood unharmed through centuries shows their substantial character. At intervals there are steps leading down to the water, and some of them have been deeply worn by the many thousands of feet that have trodden there.



OLD BRIDGE AT CUZCO.

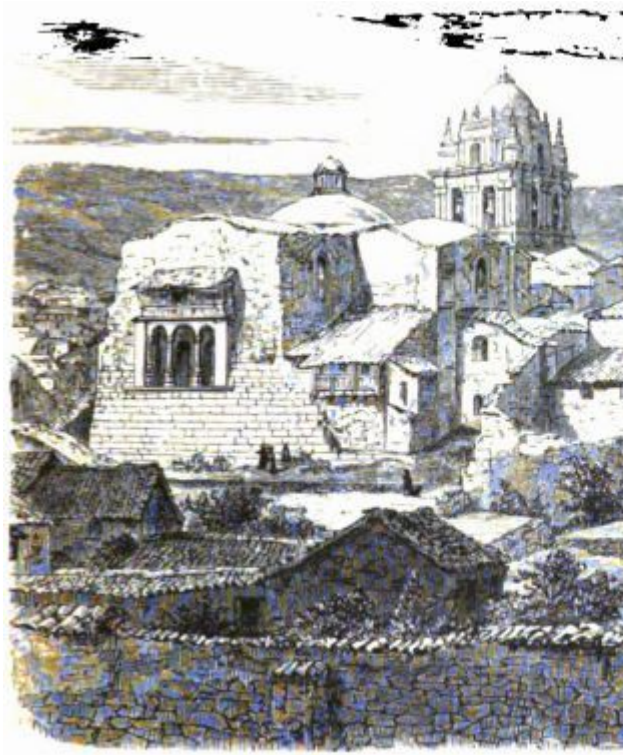
"The city was on rough ground, and its builders were obliged to make many terraces and remove inequalities in order to provide suitable sites for their structures. In building their terraces they constructed walls of the kind known as 'cyclopean,' and many of these walls form the lines of the streets of to-day. We will explain that a 'cyclopean' wall is made of stones of irregular shape and size, but all carefully fitted together, like the scraps that form the pattern of a so-called 'crazy-quilt.' The resemblance to the Inca architecture in these walls and in many other things is very noticeable, but there is no reason to suppose

that the two systems had a common origin.



COURT OF CONVENT, WITH ANCIENT FOU

"The Convent of Santa Catalina was established on the site of the Palace of the Virgins of the Sun; the nuns of the modern edifice may be said to replace the vestals of the old. Part of the walls of the old palace were retained, and enough remains of the building to indicate its character very distinctly. The church and convent of Santo Domingo occupy the Temple of the Sun, but the greater part of the walls have fallen, and the present structure is without shape or intelligible design. Inside the court-yard is preserved the fountain of the Incas, which ornamented the ancient temple, but in these latter times has been consecrated to baptismal purposes by the church.



CHURCH AND CONVENT OF SANTO

"And what do you suppose was once on the site of the great Cathedral of Cuzco?

"It was here that the eighth Inca of Peru erected a building dedicated to the festivals of the people; it was so large that the ancient chronicles say a whole regiment could exercise beneath its roof. In this building the troops of Gonzalez Pizarro barricaded themselves for a battle with the Peruvians, which was to decide the fate of their campaign; it was the last hope of the invaders, who had encountered unexpected resistance, and defeat was equivalent to death.

"The battle was won by the Spaniards, and the Inca power was broken forever. According to a legend sculptured over the doorway, St. James descended from heaven, on a milk-white horse, and took part in the contest for the overthrow of the heathen dominion and the establishment of Christianity in South America.



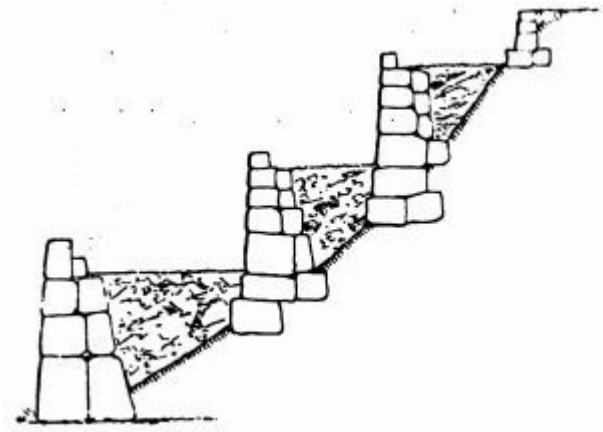
TERRA-COTTA FIGURES, CUZCO.

"A curious circumstance connected with the antiquities of Peru is the extreme rarity of statues of stone or other material. Some have been found, but not many; in Cuzco there are a few figures in terra cotta and also in stone, but probably not twenty in all. The few that exist are quite rude in character, and not at all comparable to the admirable works of art which abounded in ancient Egypt. Two stone figures representing animals in a sitting posture were taken from the ruins of the Garden of the Sun; they are each about twenty-four inches high, and the shape of the pedestals seems to indicate that they were originally placed on the coping of a wall. If the sculptor made a true representation of his model, it is easy to believe that the animal could walk down his own throat without difficulty.



ANCIENT STONE SCULPTURE, CUZCO.

"Cuzco was defended by a fortress on a high hill just in the rear of the city. The fortress was a remarkable piece of work, and is said to have been built in the twelfth century; it held the same relation to Cuzco that 'The Rock' does to Gibraltar, or the Acropolis did to Athens. It consists of terraces near the summit of the hill, seven hundred and sixty-four feet above the grand square of the city, and of zigzag roads leading from below. All the roads are made so that they can be easily defended; the terraces are three in number, and have a total height of sixty feet.



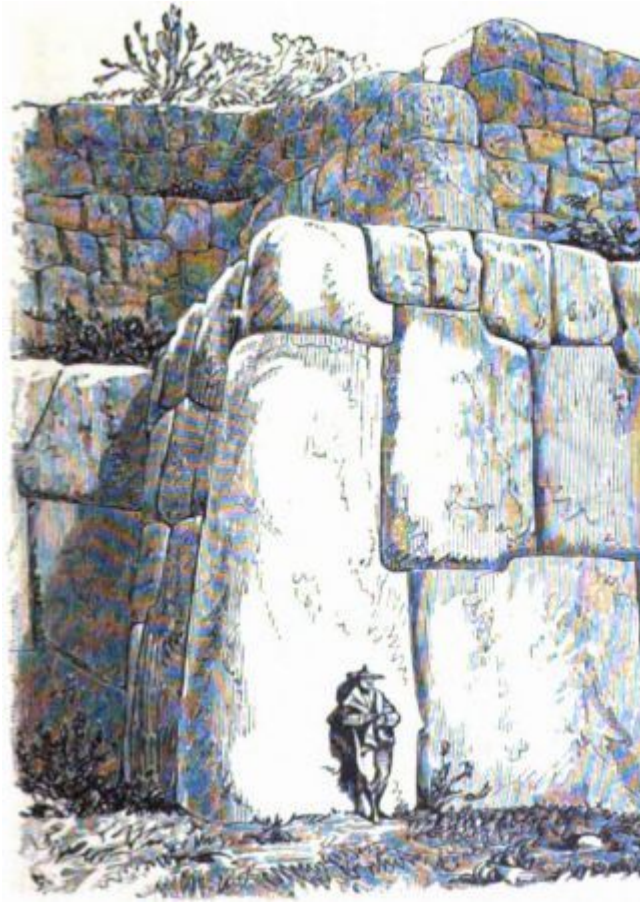
SECTION OF WALLS OF THE FORTRESS.

"Military men who have examined the fortress say that the walls were constructed quite in accordance with the best engineering science of modern times; on its only assailable side the walls are provided with salients, so that every point could be covered by a parallel fire from the weapons of the defenders. The walls are composed of immense blocks of blue limestone, and each salient has one of these at its end. In some places the great stones are piled one above the other; one stone, twenty-seven feet high, fourteen broad, and twelve in thickness, lies upon another of almost the same dimensions. Blocks measuring fifteen feet in length, twelve in width, and ten in thickness are common in the outer walls!

"Turn to the description of the Temple of the Sun, at Baalbec, and see how much the work of the Peruvians resembles that of the people of ancient Palestine.

"Some of these stones were hewn from the hill not far from where they are found, while others were brought from the cliffs three fourths of a mile away. In the quarries at the cliffs there are several stones

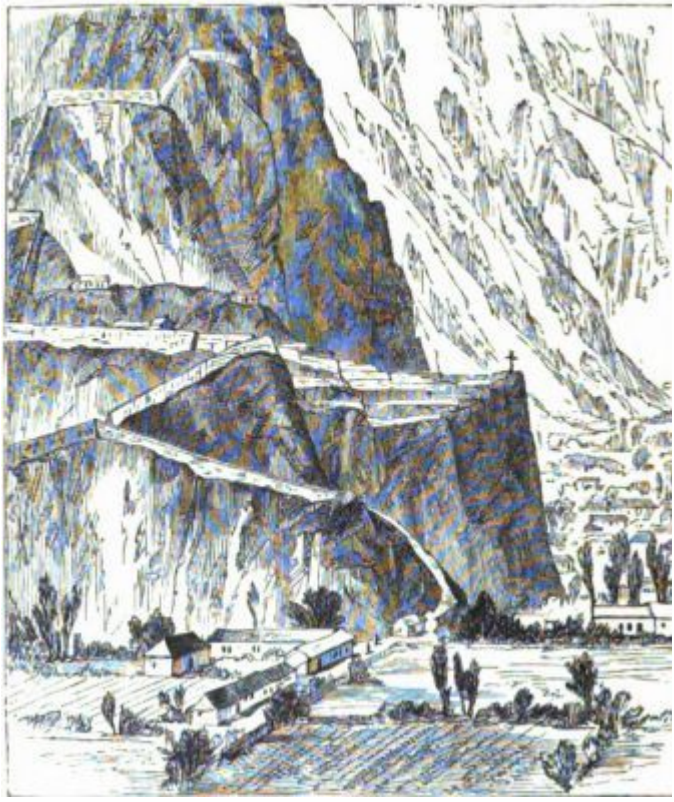
partly hewn, and there are two roads still to be traced, along which the blocks were drawn. The evidences are that the stones were roughly cut at the quarries, then drawn along the roads, and fitted in their places on arriving at the fortress.



SALIENT ANGLE OF FORTRES

"To have a realizing sense of the size of the stones used in building the fortress of Cuzco, look at the picture of one of the salient angles of the wall, and the figure of the man leaning against it. Consider the

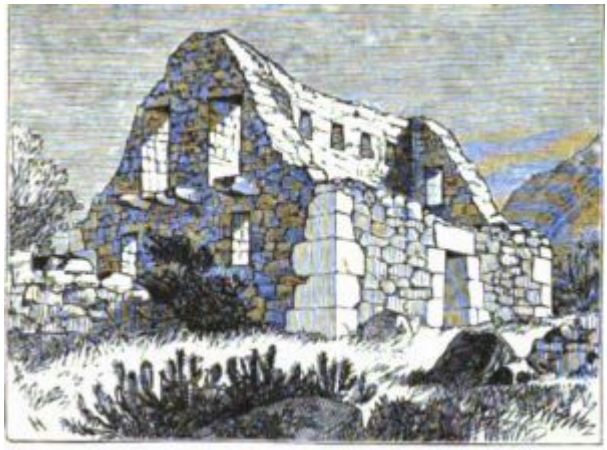
man to be of ordinary stature, and you can readily compute the height of the stone.



ROAD LEADING TO FORTIFIED HILL.

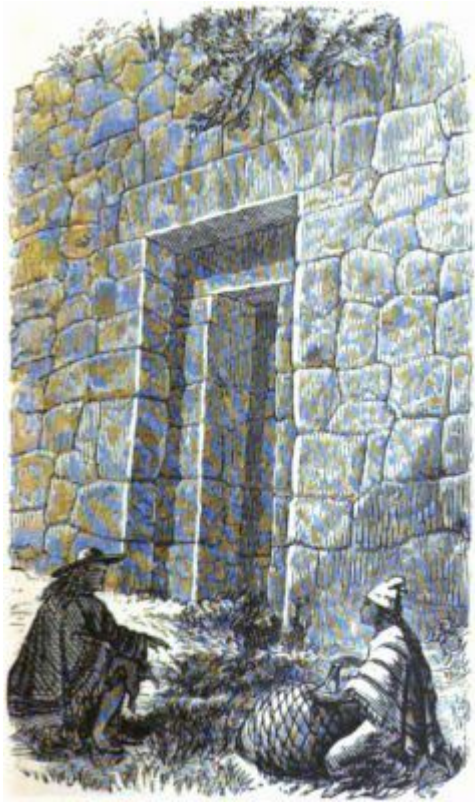
"In the neighborhood of Cuzco there are many other remains of palaces, temples, and fortresses, but we have said enough to give you an idea of what the ancient Peruvians left behind them. In some of the native villages the houses are the same that were inhabited four or five hundred years ago; the roofs have been renewed, but the walls remain unchanged. In many instances the natives have erected hovels by the side of the ancient houses, through their unwillingness to take the trouble to renew the roofs,

which had been destroyed by time and the elements.



ANCIENT DWELLING-HOUSE.

"The roads which the Incas built have been mostly allowed to go to decay, by their successors, though some parts of them are still in use. The new ones are far inferior to the old, and nothing better demonstrates the slovenly character of the invaders than a comparison of their wretched paths through the mountains with the paved tracks of the original possessors of the land. The Spaniards came in search of gold, and did not intend remaining; circumstances kept them here, but they were always looking for a speedy return to their native land, and made no effort to improve or even to preserve what they found on their arrival. Their descendants are still searching for treasures among the palaces of the Incas, and a visitor to the ruins in and around Cuzco can see, almost any day, men digging among the rubbish for the gold which is supposed to be concealed there."



SPECIMEN OF CYCLOPEAN WALL.

As the youths finished their account of the wonderful city of Cuzco and its surroundings, the Doctor returned from his walk. They read to him what they had written; he gave his approval, with an intimation that it might be dull reading to some of their schoolmates, but was a necessary part of a narrative of travels in Peru.

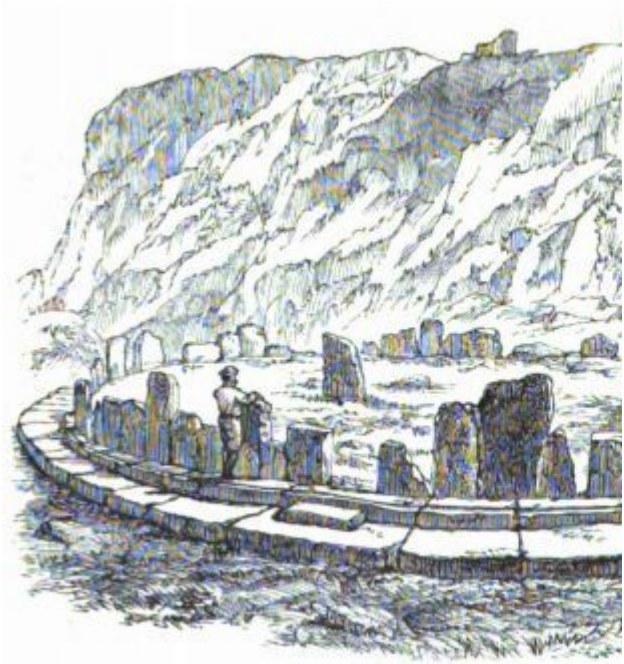
Fred suggested that anybody who did not like it was at liberty to skip a few pages, till he reached something more interesting. Frank was of the same opinion, and with this the manuscript was folded and laid away.

"I cannot obtain very definite information about the route we are to travel," said Dr. Bronson, "as I can find nobody who has been over it. Bolivia is without good roads, and though several plans have been proposed and undertaken for making them, they have not amounted to much. We shall have a rough journey, but I think we may get through without accident or detention.

"We are to cross Lake Titicaca," continued the Doctor, "and enter Bolivian territory. I have engaged a man to accompany us as far as we wish him to go; he knows a part of the region we are to traverse, though not all of it, but thinks he can learn enough as he goes along. Our route will be through northern Bolivia, past the base of Sorata, the grand mountain we have admired so much, and then down the eastern slope of the Andes till we reach the waters of the Beni River.

"The Beni is a tributary of the Madeira, and the Madeira flows into the Amazon. When we leave Puno to-morrow our watchword will be,

"TO THE AMAZON!"



ANCIENT SUN CIRCLE, SILLUS

CHAPTER XIII.

LEAVING PUNO.—CROSSING LAKE TITICACA.—RESOURCES OF BOLIVIA.—SILVER MINING.—PRIMITIVE LODGINGS.—BEGINNING THE JOURNEY TO THE EASTWARD.

It was the intention of our friends to leave Puno on the morning following the conversation recorded in the last chapter, but there was a slight hitch in their plans. Manuel, the guide who had been engaged to accompany them, said it was advisable to purchase

provisions and other necessaries before starting, as there was doubt about finding them along the road. Acting under his advice, a day was spent in the shops, and another in putting the articles into packages suitable for mountain travel. When all was completed it was found that the steamboat was absent on a trip up the lake, and another day was lost in waiting for her.

On the fourth morning everything was ready, and the baggage was sent on board in charge of Manuel. The travellers said good-bye to their American acquaintance, who regretted he could not accompany them; they were equally sorry he could not do so, as they had found him a most agreeable and intelligent companion during their stay. A foreigner in an interior town of South America has a dreary existence, and welcomes with delight the advent of a countryman.

Just as they were leaving the landing-place they were introduced to the manager of one of the silver mines in the neighborhood of Puno, who was about crossing the lake on business connected with his enterprise. Acquaintance is quickly made under such circumstances, and the time of the voyage passed quickly in the society of this intelligent gentleman.

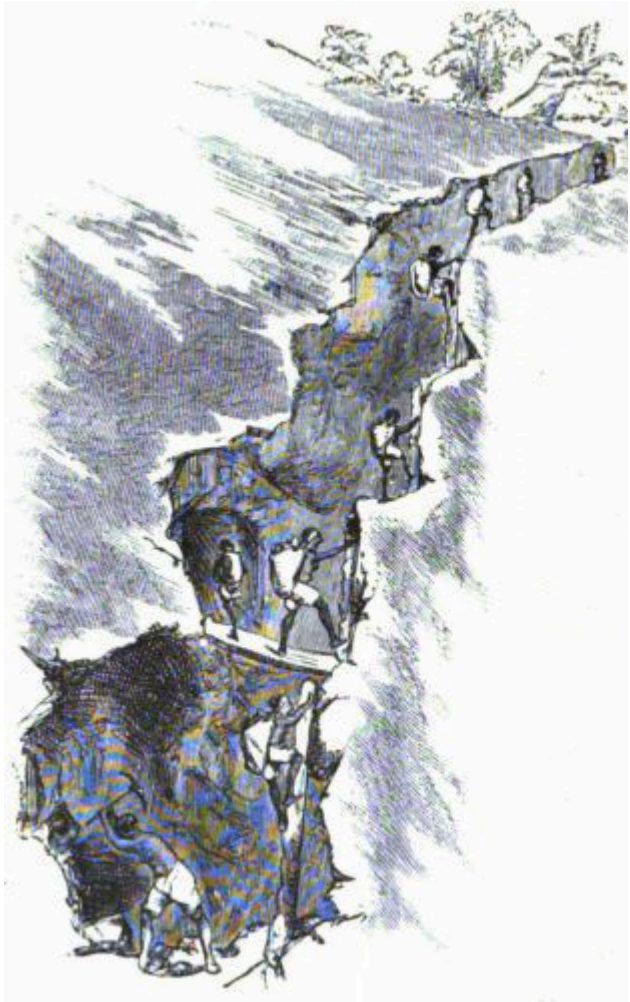


TANATERO (ORE-CARRIER).

"The silver mines of Peru," said he, "are yielding very little at present, owing to bad management and slovenly methods, and the same is the case with the mines of Bolivia. During the last two and a half centuries the mines of Peru alone have yielded five hundred million dollars worth of silver; the mines near Puno are famous in history, and are enormously rich, but for a long time little has been done beyond reducing by modern processes the refuse of the old miners. When the country becomes tranquil, and capital can be securely invested, the mines will be reopened, American and other machinery

introduced, and the world can again be supplied with silver from the Andes.

"Potosi, in Bolivia, is probably the richest silver region of South America and of the whole world, but its mines are now almost neglected. In the seventeenth century the city had more than a hundred thousand inhabitants, while it has barely twenty-five thousand to-day. Between 1545 and 1789 the mines of Potosi yielded one thousand million dollars' worth of silver, but of late years the product has not exceeded two and a half millions annually. The word 'Potosi' signifies 'an eruption of silver,' and the place is certainly well named. It is in a province of the same name, which produces also gold, copper, iron, lead, tin, quicksilver, zinc, antimony, and other minerals, but silver is its principal yield.

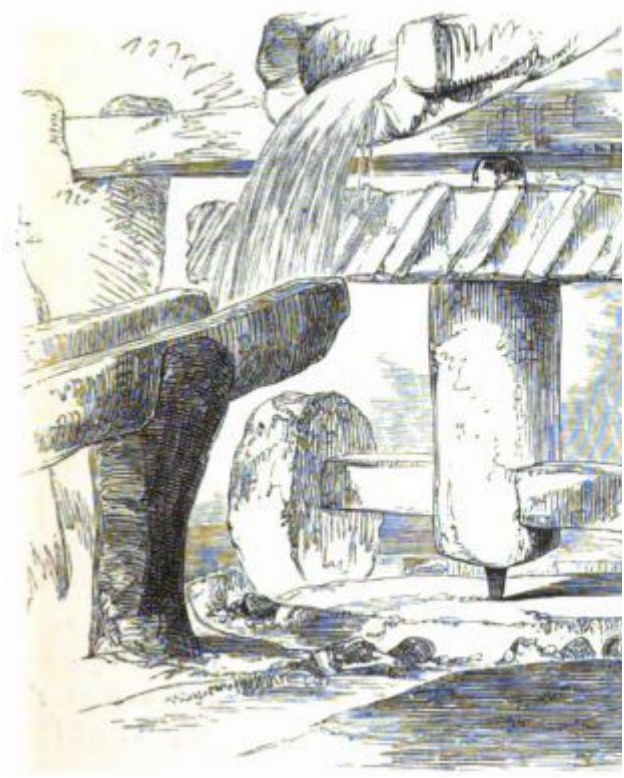


SECTION OF A SILVER M

"Potosi suffers for lack of modern methods, as much as do the mines of Peru and other South American countries; nearly all the mining is done by Indians, who adhere to the processes that have been in use for centuries; the spirit of enterprise does not prevail here, and until it does there will be no revival of the

business."

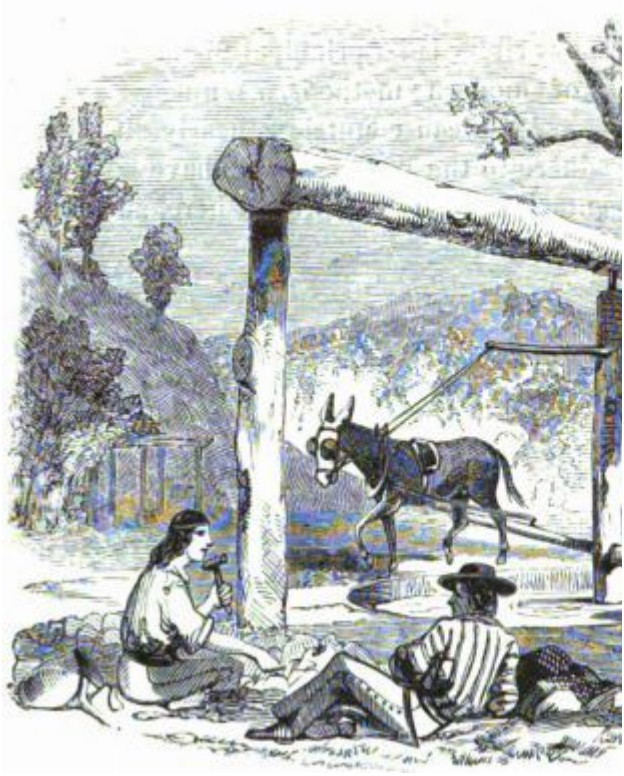
One of the youths asked a question which led to a description of the primitive ways of mining at Potosi.



A PRIMITIVE MILI

"Take, for example," said their entertainer, "the mill in which the ores are crushed. It is a rude affair, with two wheels of stone at the end of a horizontal bar moved by an upright shaft. The propelling force is an ox, a mule, or possibly a stream of water, and sometimes the mill is worked by the power of men. The apparatus somewhat resembles an old-fashioned cider-mill in the Northern States of America, but the roughest cider-mill you ever saw is a piece of

cabinet-maker's work compared with a Bolivian *arastra*. The broken ore is placed in a trough in which the stone wheels move slowly around, crushing, perhaps, half a ton of ore daily. Modern mills, such as are used by the miners of California and Nevada, would crush twenty times as much ore at little more than the same cost!



ARASTRA, WITH MULE-P

"From the beginning to the end of the work the whole business is very slow and primitive. The ore is broken out of the veins by sheer force of labor, powder or other blasting material being rarely employed. It is carried on the backs of men to the

surface of the ground; the *tanateros*, or ore-carriers, load the substance into baskets or bags of rawhide, and climb patiently upwards along perpendicular logs that are notched to give holding-places for the feet.



BREAKING ORE.

"With a hammer a native breaks the ore into pieces suitable for the crushing-wheels; then it is reduced to mud by the slow operation I have described; it is roasted or treated with quicksilver according to its requirements; and finally the pure silver is obtained, and smelted into bars for transportation to the coast.

"Now, here is the difference between this way of working and the modern methods. The American or English miner would hoist the ore from the mine by

machinery instead of carrying it out by man-power. Then he would use machinery for reducing it to powder, allowing none to be wasted, and after the reduction he would extract the silver from the rock in such a way as to save every grain of metal it contained, and preserve all the quicksilver to be used over and over again. A great part of the silver is lost at present, together with much of the quicksilver used in the work of amalgamation. Where there is a profit of ten dollars by the old process in working a ton of ore there would be fifty dollars of profit under the new. And yet it is hard to convince these people that it is worth their while to try the new system!

"Some of the mines are in the sides of the mountains, where no hoisting is required, and the ore is brought directly to the open air without the necessity of climbing. Such mines are more profitable than the others, as they can be readily drained, and the expense of carrying the ore upwards is saved.

"The ore of Potosi is very rich, but, for that matter, so are the ores of Puno and Cerro de Pasco. Some deposits yield as high as two hundred dollars a ton. When you bear in mind that the miners of California find a profit in working mineral at ten dollars a ton you can realize the wealth of the silver deposits of the Andes.

"When I first came here," he continued, "I was fresh from the mines of Nevada. The rudeness of the Bolivian work was in very marked contrast to what I was so lately familiar with.

"Near the entrance of the first mine I visited I saw some specimens of rich ore lying on the ground. There was a group of three natives lounging around the place, a man, a woman, and a boy. The mine had been deserted for some time, and I found these

people helped themselves to the mineral whenever they wanted it. Telling them I wished to see how they operated, and promising a reward for their trouble, I induced them to go to work.



INDIANS EXTRACTING SILVER

"The man entered the mine, carrying a bar of iron and a rawhide bag. In a little while I heard the blows of the bar, and in the course of half an hour he returned with about twenty pounds of ore in the bag. Then the man and the woman pounded the ore upon flat stones, and reduced it to a coarse dust, which was placed in an earthen pot over a fire. The fire was fed and tended by the boy, while the man and woman looked on; they had performed their share of

the toil, and were willing to give the youth a chance.

"A smaller pot was brought, in which the ore was placed after half an hour's roasting in the large one. This pot was filled with the dust, deposited on the bed of coals, and covered with a loosely fitting lid. The wood was piled over it and the fire burned fiercely. The whole mass became red-hot, and the fumes of sulphur filled the air as they rose from the smelting-pot.

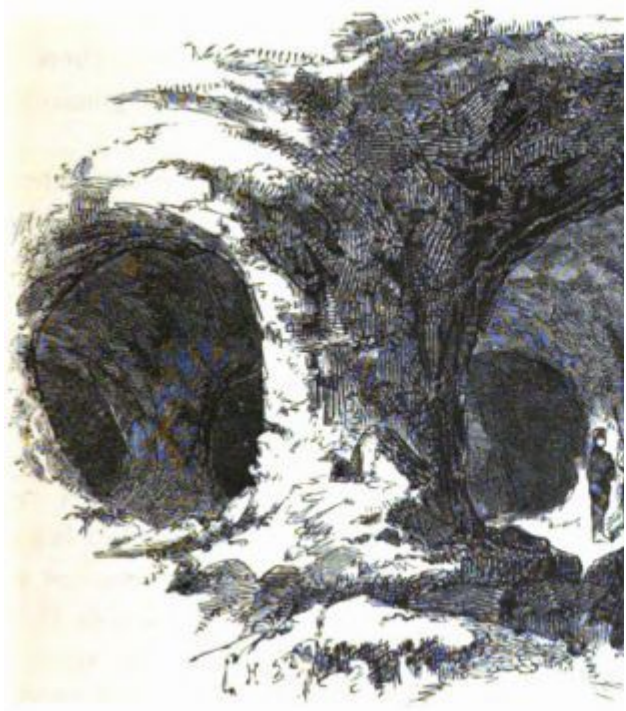
"The fire was allowed to burn down, and when it was reduced to ashes and embers the pot was lifted out, and its contents were poured on the ground. There was a confused mass of slag and ashes, and in a few moments the man who had taken the ore from the mine pushed from the slag a button of silver weighing something more than an ounce. It was thrown into water to cool, and when in a condition to be handled it was passed over to me. I gave the man a dollar, together with some smaller coins to the woman and boy, and then walked away with my trophy."

Frank and Fred were much interested in this account of the silver mines of Bolivia, and the primitive ways of working them. As soon as the conversation was over they wrote it out, as nearly as they remembered it, in order that none of the information should be lost.

Then followed a technical account of the character of the ores, but it might be tedious to the general reader, and we will omit it. Their informant further told the youths that a good many of the natives support themselves by melting the ores in the manner just described, and selling the buttons for what they will bring. The silver thus obtained is not chemically pure, but is good enough for purposes of

sale.

Fred asked if accidents were common in the mines at Potosi.



GALLERIES IN A SILVER

"Of course they have accidents there," was the reply, "but probably no more on the average than in mines in other parts of the world. Most of them are due to carelessness, either in failing to support the roof properly after the ore is taken out, or not taking proper hold of the ladders while ascending or descending. Sometimes the roof of a mine falls in, but there is generally sufficient warning to allow the men to escape. Rocks occasionally become dislodged and fall upon the workmen; I was one day walking in a mine when a stone weighing at least a ton fell

behind me, right in my tracks. If I had been three or four seconds later it would have crushed me.



CAVING IN.

"The weight of rock and earth becomes too great for the timbers along the sides and across the roof, and they are crushed and broken. But before falling they groan and crack and settle, but rarely give way suddenly. The Indians can tell from long experience when there is any real danger, and are generally quick enough to escape."

From mining the conversation turned to general subjects relating to Bolivia. The substance of what the youths learned may be set down as follows:

Silver is found in many parts of the republic, and

some of the mines are said to yield ore as rich as of Potosi. The Potosi mines are mainly in a single mountain, which has been pierced with more than five thousand tunnels and openings. Gold is found in many places, but it has not been extensively mined. Occasionally large nuggets or masses of pure gold are found, and they bring a higher price as curiosities than when reduced to bullion. One of these masses was detached from a mountain by a stroke of lightning, and sold at an enormous price to the royal museum at Madrid.

There are some valuable mines of tin and copper in Bolivia; the tin mines of Oruro are said to be the richest in the world, and copper is said to be as abundant in the mountains of Corocoro as silver is at Potosi. The other mineral wealth of Bolivia is well known, but none of it is available on account of the lack of transportation. The country has no outlet by which it can reach the markets of the world. Transportation to the Pacific coast is over the passes of the Andes and across deserts, while the ocean ports are lacking in facilities for landing or discharging cargoes. There is a route through Buenos Ayres, and another through Brazil; both are long and expensive, and the greater part of the products of the country will not bear the cost of removal. There will be occasion for referring to this subject again.





WILD INDIAN OF BOLIVIA.

Bolivia has a little more than two millions of inhabitants, about one fourth of them whites. There are several varieties of the native and mixed races, from the civilized Indians of La Paz and other cities to the wild tribes of the upper waters of the Amazon. The latter lead a wandering life, and wear no clothes; they have resisted all attempts to civilize them, and until recently they were hostile to the white people who passed along the river in boats. A curious story is told of the incident by which their hostility was suppressed.

In a survey made by the Bolivian government of the falls of the Madeira River a camp was established on the banks of that stream. Soon after it was located one of the men of the exploring party was taken ill, and his disease proved to be small-pox. He was immediately isolated from the rest of the camp, and carefully attended by the doctor.

Recovery was impossible. One day, while the doctor was at the side of the dying patient, these warlike natives attacked the hut, and barely gave the doctor time to escape. The death of the sufferer was hastened by the Indians, and they triumphantly carried away his clothes and bedding. Nearly the whole tribe died in consequence; the few that survived have ever since regarded the occurrence as a manifestation of divine wrath, and let the white men carefully alone.

Frank and Fred heard so much about the undeveloped sources of wealth in Bolivia that they were inclined to form stock companies for various enterprises out of which enormous amounts of money could be made. But as their previous dreams of this sort had amounted to nothing, they wisely forbore even going so far as to put their ideas on paper.

They heard of vast numbers of cattle on the *pampas*, or plains of eastern Bolivia, which could be bought for a few shillings each, and converted into beef and leather, at a great advance on the original cost. Their informant said they would yield a profit on their hides alone, while the beef could be sent to London, or other places of large demand, by some of the preservative processes that have been recently invented. Then they learned that Bolivia could supply fine woods for cabinet purposes, in

inexhaustible quantities, from the forests on the lower slopes of the Andes, and the banks of the Beni and other rivers. They found, on consulting the statistics, that the country could export the following articles if it only had the means of transporting them:

Gold, silver, tin, copper, lead, quicksilver, chinchona bark, rubber, coffee, cacao, sugar, vanilla, balsams, copal, wax, dyes, sarsaparilla, tobacco, farina, cotton, llama and alpaca wool, cattle, hides, horns, tallow, dried meat, tiger and deer skins, furs, feathers, hammocks, and hats.

Glancing at the history of the country, Frank found that Bolivia was formerly a province of Peru, under the Spanish domination. It joined in the revolution in the early part of the present century, and, in common with the other dependencies of Spain on the west coast of South America, achieved its independence. In 1825 it was made a separate republic, and named Bolivia, in honor of General Bolivar, the leader of the revolution. It has had the usual checkered career of South American republics, with perhaps fewer insurrections than some of its fraternity. It formerly had a strip of sea-coast, but at present it has none; its coast possessions were annexed to Chili as one of the results of the late war, and for the future its must seek its commercial outlet through another country or by way of the Amazon River.

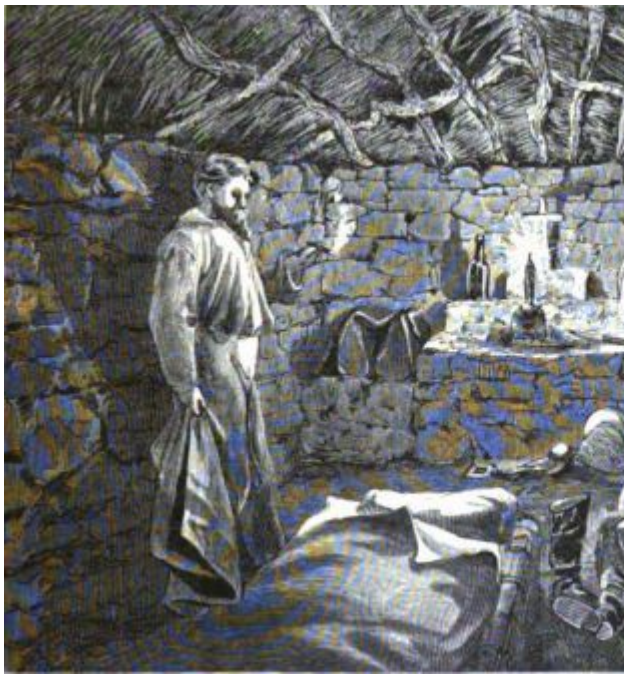
The steamer carried our friends across the lake in a northeasterly direction and entered the Bay of Huancané. They were landed at the little village of Vilquechico, whence there is a route through the eastern Andes to the head-waters of the Amazon. The *alcalde* of the village welcomed them to his dominions, and in true Spanish politeness announced

that the village and all it contained were theirs. They didn't want the village, nor anything in it, except the means of getting out of it.

The Doctor explained that their desires could be gratified with mules and llamas for continuing their journey; for these they would pay promptly, and would likewise pay for everything they chose to buy. As for the village, they would be content to let it remain in its delightful position on the shore of Lake Titicaca.

It was easier to say "mules and llamas" than to obtain them. The alcalde issued orders for the people to bring all their spare animals; four saddle mules were needed for the journey, one for each of the party to ride, and a dozen mules or their equivalents in llamas were wanted for carrying the baggage and provisions. The offers of beasts of burden came in slowly, and it was necessary to send to Huancané, a town twelve miles away, to find a sufficient number. Most of the provisions for the party had been brought from Puno, as already stated, but there were still a few purchases to be made; it was decided to take matters leisurely, and accordingly the departure was fixed for the morning of the third day after their arrival.

Manuel was kept busy acting as an aid to the alcalde in collecting the animals; in the intervals of looking after them he bought whatever provisions were needed, and made bargains with the men who were to accompany the train. The supplies were almost identical with those for the journey from Quito to Napo, and therefore will not need repetition here.



LIMITED ACCOMMODAT

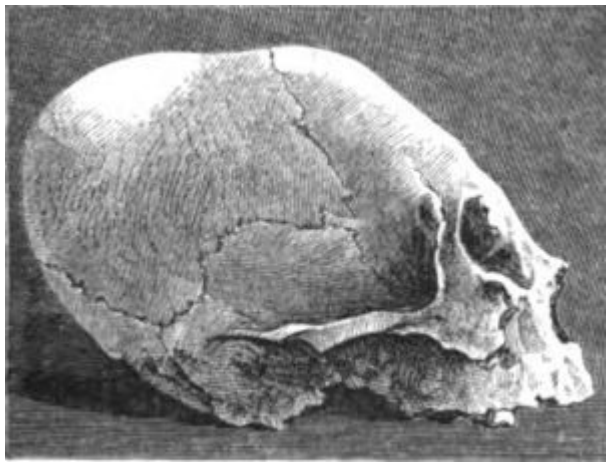
Lodgings at Vilquechico were not equal to the Palace Hotel at San Francisco, or, in fact, to any other hotel of civilized cities. Dr. Bronson and Frank were assigned to a hut about six feet wide by eight or nine in length, while Fred was quartered in another hut along with the most of the baggage, on which Manuel slept by way of security. The beds were spread on what was literally the ground-floor, and there was just room enough for the two beds, and a few of the equipments of the travellers. At the end of the single apartment there was a mud altar with a crucifix, before which a candle was burning; the door was wanting altogether, and the doorway was closed by hanging a blanket across it.

The night was cold, but, shielded by their coverings,

the trio slept well; they were out early, as there was nothing in the luxury of their quarters to lead to late sleeping. They endeavored to find more commodious lodgings for the other nights of their stay, but were unable to do so, and quickly determined to be content with what they had, which was certainly philosophical.

"We are better lodged now than we shall be for most of the nights of our journey to the Amazon," explained the Doctor; "and too much luxury would be bad for us."

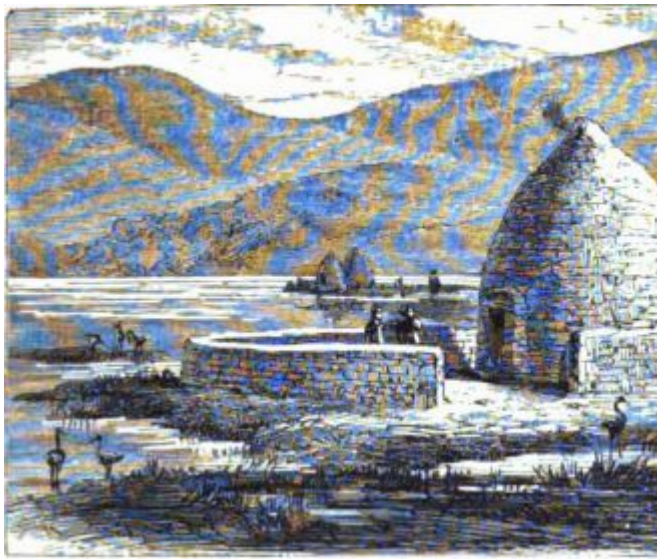
Frank and Fred agreed with this intelligent suggestion, when they found it was impossible to improve upon the situation. Fred said they should remember how the fox consoled himself for his failure to obtain the fruits of the vine, by reflections upon their acidity.



AYMARA SKULL.

It was nearly noon on the day fixed for the departure that the baggage train moved out of the village and took the road to Huancané, where the first night was to be passed. Dr. Bronson and Frank had started

early in the morning, leaving Fred and Manuel to look after the baggage animals, and bring them forward. There were one or two purchases which could not be made at Vilquechico on account of the limited stock of supplies; Huancané could supply the deficiency, as it is a larger place and has more extensive stores. It is occupied almost exclusively by Aymara and Quichua families, who live as distinctly, but on the same terms of amity, as their kindred in Puno.

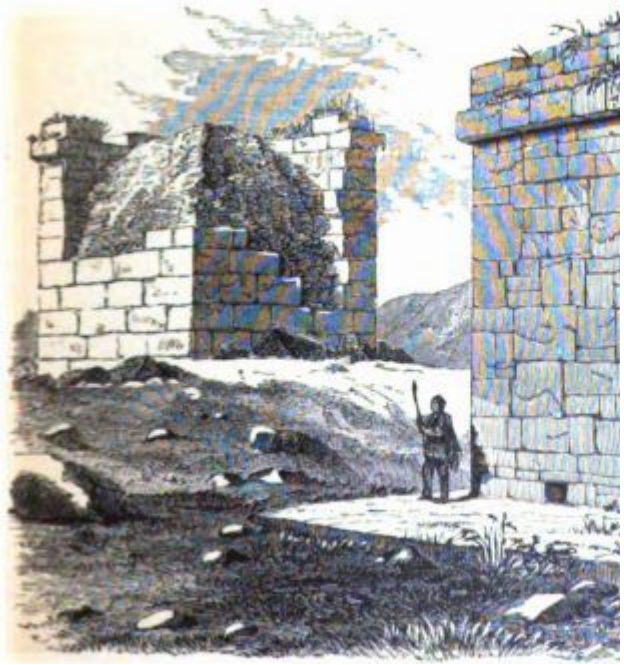


TURF HOUSE NEAR LAKE TITICACA.

The road winds along the shore of the lake for a large part of the way. The ground is destitute of trees, and the only vegetation is the grass, which furnishes nourishment to the sheep and other animals, and the *tola* or *tortora* that fill the shallow waters, and often extend long distances from the shores. The houses of the shepherds are made of turf, which is thin, but tough, and serves admirably for building purposes. Not only the houses are made of

it, but the corrals for sheep, and any other needed edifices. At a little distance these houses resemble haystacks, as they are nearly always conical in shape; there is a hole near the apex of the cone, where the smoke finds its way outward after leisurely traversing the whole interior of the building.

Fred entered one of these huts, but he did not stay long. The interior was extremely dirty; Manuel said, that when it became so bad that the owners could not longer endure it they deserted the hut and built another. "But they don't move often," he added, "and the huts must be very bad indeed before their owners will take the trouble to put up new ones."



CHULPAS, OR BURIAL-TO

There are some ruins in the neighborhood of Huancané, but it was not considered worth while to

visit them. They consist mostly of *chulpas*, or burial-towers, which are nothing more than towers, either round or square, with interior spaces for the reception of the remains of the dead. A description of one will suffice for all.

It is seventeen feet square, and twenty-four feet high, and rises from a platform of cut stones twenty-two feet on each side, and raised a foot above the ground. Three feet below the top there is a cornice two feet deep, which projects about twelve inches on every side, and is the only external ornament. There is a door or opening eighteen inches square on the eastern face, and level with the platform on which the chulpa stands. Inside there is a vault or chamber eleven feet square and thirteen feet high; its sides rise vertically for about eight feet, and then come together to form a pointed arch. On each of the sides of the interior there is a niche three feet high and eighteen inches wide, and the entrance is directly under one of these niches.

The round chulpas have a close resemblance to the turf huts of the shepherds; some of the huts have cornices, in imitation of the architecture of the chulpas, and it is possible that the form of the dwelling was taken from that of the burial-towers.

On the road to Huancané Dr. Bronson and Frank turned aside to look at a sepulchre built of flat stones piled irregularly together. It is thought to be the earliest form of the chulpa, before the Inca architects had learned to shape their structures like the one just described. The stones were flat, some of them being five or six feet long, and correspondingly broad, with a thickness of twelve or fifteen inches. Frank made a sketch of the monument, and introduced the figure of a man standing beside it, so that its proportions

could be readily seen.



ANCIENT SEPULCHRE.

CHAPTER XIV.

OVER THE EASTERN ANDES INTO THE AMAZON VALLEY.—AN EXCITING JOURNEY.—ADVENTURES BY THE WAY.—TROUBLES OF TRAVELLING WITH A TIGER.



MANUEL.

The lodgings of the travellers on their night at Huancané were an improvement upon their quarters at Vilquechico. They had a stone floor to sleep upon in place of the bare ground, and the room was large enough to accommodate all three of them without crowding. They rose early, and managed to get out of the place in good season, in spite of the desire of their drivers to linger in the town, and the evident willingness of Manuel to accommodate them.

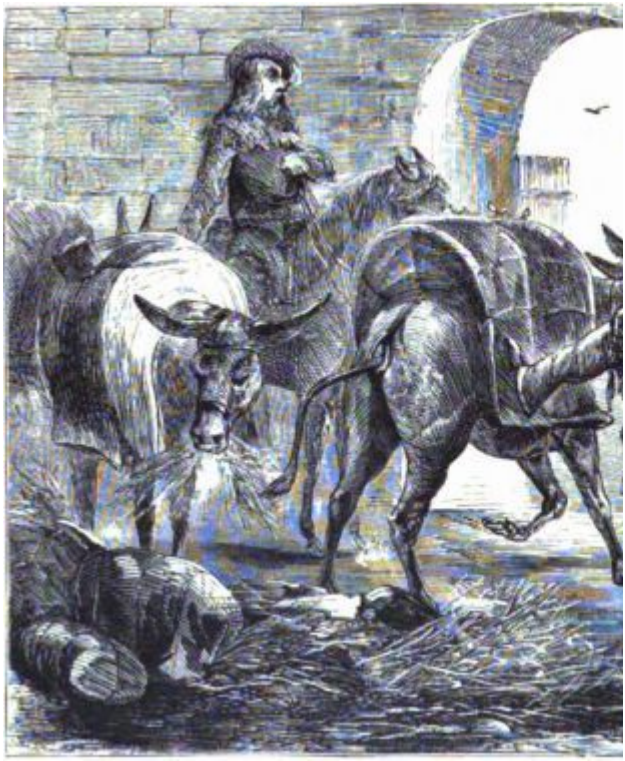
It was deemed prudent to see the baggage-train on its way before venturing outside the limits of the town, and consequently our friends waited until the

last of the burden-animals had received his load before they ordered the saddles placed on their mules. Under the eye of his employers Manuel worked vigorously, when he made up his mind that further delay was impossible.

Immediately on leaving town the road began to ascend, and in a little while they were winding among the mountains in a way that recalled the journey from Guayaquil to Quito. The western shore of Lake Titicaca is comparatively low, but on the east the mountains come pretty close to the water, and in places fall off into precipices. In the region of Huancané the snowy peaks rise in full view, and seem but a few miles distant; Sorata, the Crown of the Andes, fills the horizon in the south, and there are other peaks that continue the chain far as the eye can reach.

Up and down the hills wound the path, but, until the summit of the pass was reached, the ups were far more numerous than the downs. Four or five miles from Huancané the train halted at a hacienda where a train from the eastward had just arrived. The animals became a good deal mixed up, and as each of the trains was composed of mules and llamas in about equal proportions there was a prospect of trouble in sorting them out. The Doctor suggested to Manuel the possibility of a trade, whereby they could send back all the llamas, and have the train consist entirely of mules. Somewhat to his surprise it was quickly arranged, through the offer of a small premium to the owners on each side. The loss of time in the transaction, and the changing of the loads, was more than made up by the superior speed of the mules. The llama cannot travel as far in a day as a mule can; he carries less weight, and consequently a

train of llamas is longer than a train of mules with the same amount of baggage, and more difficult to manage.



LOADING THE MUL

Occasionally a load slipped or there was a kicking-match among the beasts of the train, but on the whole they got along very well. The mule of South America is much like his fellow in the North, but Frank was of the opinion that he is not so active with his heels. High altitudes may possibly render him more docile, and he may have the good sense to understand the folly of expending his energy against the air. The mules on these mountain paths follow their leaders with great fidelity; the foremost of the

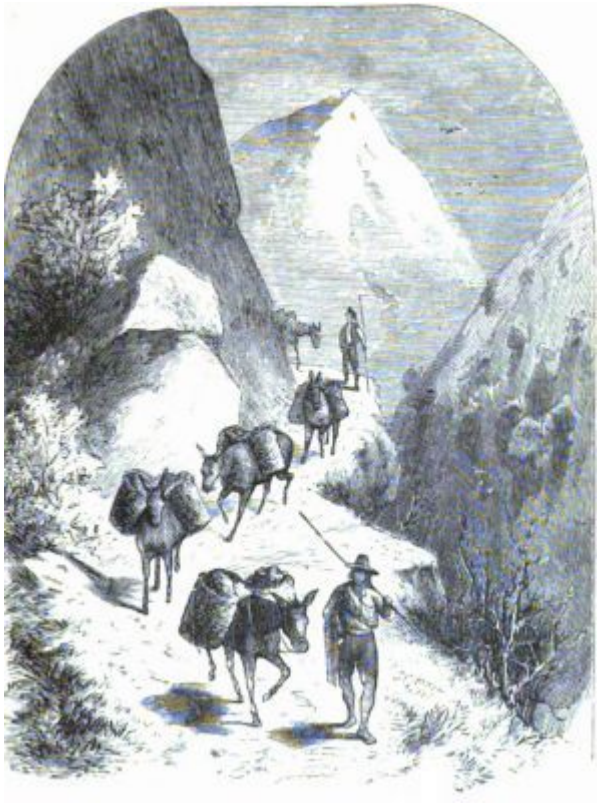
train wears a bell, and its tinkling is the magic sound which draws them on. If the bell is silenced the drivers have far more difficulty in managing their charges than when it is audible.



THE START.

But all is not smooth travelling with the hybrid beast of burden. The saddle mules were the best and strongest of the entire collection engaged by our friends, and on several occasions they manifested their sportiveness in a way that was far from reassuring. The second morning of the journey one of them began to dance just as his rider was putting a foot in the stirrup; the others caught the contagion, and in a very few seconds all the saddles were

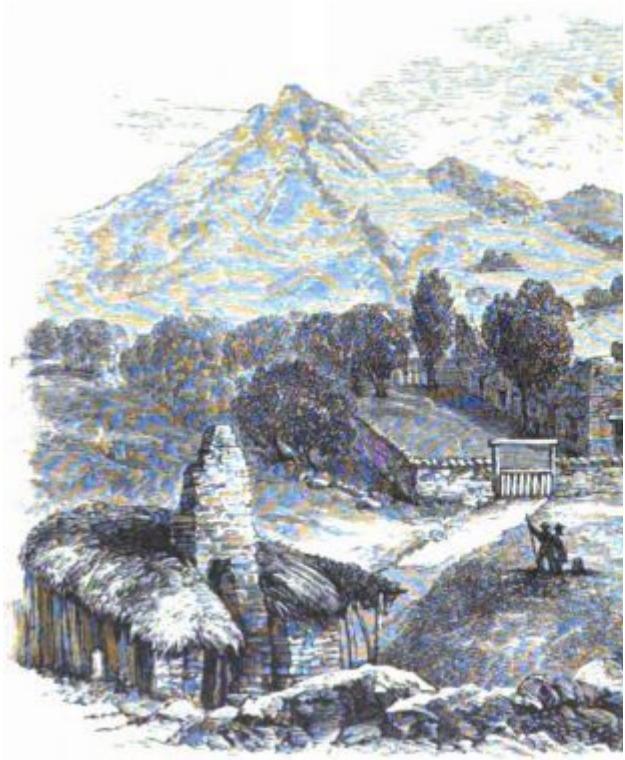
empty, and the travellers were scattered on the ground or surveying the scene with feelings the reverse of amiable. Fortunately, the incident took place in the corral, and the unruly beasts were not able to escape. One after another they were secured and held until the mount could be successfully accomplished. In the evening Frank made a sketch of the scene, which contained a good deal of action to the square foot of paper.



A MOUNTAIN TRAIL.

The road increased in roughness as they ascended to the crest of the pass, and the descent down the eastern slope of the mountains was equally steep. As

they crossed the pass, 14,750 feet above the level of the sea, the air was thin and cold, and the glittering crests of the snow-covered mountains seemed to be close at hand. Far in the east the Cordilleras filled the horizon; the party halted a few minutes, and Manuel indicated the route they were to follow among the mountains while descending into the valley of the Beni. It was too cold to stay long, and they were soon winding down the slippery path.



HACIENDA AMONG THE MO

Before nightfall they reached a hacienda, which was kept by an Indian for the accommodation of travellers. It was a sorry establishment, but as it was far better than no accommodation at all they passed

the night there. The sleeping-quarters were open to the winds almost as much as the corral where the animals were secured; a cold blast blew from the mountains, and the temperature hovered in the neighborhood of zero. There was no fire, or even a fire-place, but by a judicious use of all their wraps and coverings the travellers managed to sleep fairly. By the next night they were considerably farther down the slope, and experienced no more trouble with the cold.

As they descended the mountains they entered the region of moisture, much like that encountered on going down to Napo from the crest of the Andes, near Quito. Clouds swept over them, the rains fell, vegetation was everywhere about them, and the indications of a change of climatic conditions were plainly to be seen. By and by the wooded district was reached, and with each mile of advance the density of the growth increased.

It is interesting to watch the changes as one descends eastward from high elevations in the Andes. At the crest all is sterile—nothing but bare rocks, with possibly a few mosses clinging to their sides. No water is visible, but by and by we find a tiny thread formed by the melting snows, or the condensed vapor from the eastern winds. The thread enlarges; after a time it grows to a brook, with little pools here and there in which a cup can be dipped, or our tired animals can drink. Most of the mountain trails follow the valleys and ravines which form the natural channels of the water, and so hour by hour the brook increases in width and volume. The mosses on the rocks grow more dense, they give place to shrubs, and the shrubs in turn give place to bushes. Then come stunted trees, only a few inches in height, but

having the form and appearance of perfect trees, gnarled and twisted by the wintry blasts.

The stunted trees are less and less dwarfed, and from inches they increase in height to feet. The ground is covered with grass, at first, in stray bunches, as though life was a struggle under the low temperature constantly surrounding them. The bunches increase in number till they become a carpet, and the rich verdure covers the open ground where the trees are absent. Bogs and swamps take the place of arid wastes. Pines and larches are larger and larger; after a time they disappear to make way for foliferous trees. The way of the traveller is devious and full of toil; it is blocked by fallen trunks mingled in perplexing confusion, and unless he is where a road has been opened the progress of an hour is counted by feet or yards, in place of the miles left behind in the open country.

Especially in the mountain ravines, where the trees have been swept down by the torrents, is the way thus obstructed. Trees and great stones are piled closely together, and sometimes they form an arch beneath which the stream meanders during the dry season.

The first part of the downward journey is generally along the valley of a river flowing from the mountain, but after some thousands of feet of descent it is necessary to follow a larger stream, and cross one by one its numerous tributaries. There are fresh and great difficulties in this part of the route. After crossing a stream its bank must be ascended, sometimes almost precipitously, then a dividing ridge is traversed, and then comes the descent into the next valley. In this way the main valley is descended until the lower country is reached, where

the river becomes tranquil, and suited to navigation by canoes or other craft.

Dr. Bronson and his young companions travelled thus down the eastern slope of the Andes into the valley of the Beni. Ten days after their departure from Huancané they reached the point where it was necessary to leave the mules; the drivers were paid off and discharged, and were ready to start back to the shore of Lake Titicaca. Fortunately, they found an engagement with a merchant who had some goods to transport over the mountains, and was glad to secure their services.

For the next thirty miles the way was so steep and rough as to be impracticable for even the sure-footed mule. Travellers have the choice of the *silla* or to go on foot, while their baggage is carried on the backs of men.

Frank and Fred looked doubtingly at the silla, and so did the Doctor. They preferred to walk, but at the suggestion of Dr. Bronson each of the party engaged a silla, to be used whenever he was inclined to it.

Perhaps you are wondering what the silla is. It is thus described by Fred:



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"A bamboo chair is strapped to the back of the *sillero*, or porter, by means of belts going around his chest and another which crosses his forehead. The traveller sits in this chair, with his feet supported on a step which forms part of the conveyance. He must sit perfectly still while the sillero is in motion, as the least change of position might cause the porter to stumble and fall, and a fall among the rocks is liable to be a very serious affair for both parties.

"Mr. Horton, in his 'Twenty Months in the Andes,' tells of a Spanish officer who was travelling in this way, and wore a pair of spurs with which he

occasionally prodded the porter, to urge him to greater speed. The latter took a fearful revenge.

"Maddened with the pain produced by the cruel spurs, he pitched his rider headlong over a precipice, where there was a sheer fall of two or three hundred feet. The officer was killed instantly, and before his companions could secure the sillero the latter fled into the forest and escaped. The scene of this occurrence is pointed out, and there is little doubt of the truth of the story. It is easy to see that the traveller is entirely at the mercy of his carrier; knowing this, we were careful to secure the good-will of our silleros by promising an extra payment if they went through without accident.

"We walked the greater part of the distance; it may surprise you to know that we walked over the easiest part of the route, and rode where the way was dangerous, except in a few places. Manuel told us that these men were accustomed to this work from the time they were able to carry burdens, and they knew every inch of the way. It was really safer for us to ride on their backs, in the dangerous places, than to attempt to walk; they knew exactly where to put their feet at every step, while we did not. We followed his advice and found it correct, and we were very careful, you may be sure, not to move a muscle when ascending or descending the steep slopes of the ravines."

Three days were consumed in this journey of thirty miles. The porters with the baggage led the caravan, and sometimes they were an hour or more in advance of the travellers. At night they spread a small tent, which formed a part of their equipment, and were thus sheltered from the weather. It was necessary to wear rubber clothing, as the rains were

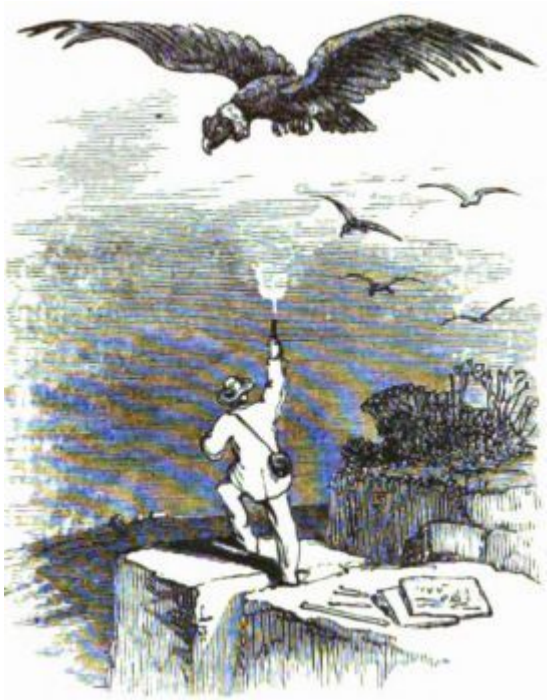
frequent, and even with this precaution the evening generally found them wet through to the skin. But a change to dry clothing and several cups of steaming hot tea with their supper drove away all suggestions of rheumatism and kindred ills resulting from the dampness, and they finished the novel ride without a mishap.

Fred took note of the changes in the animal life as they descended from the crest of the great Andean chain. In the mountains they frequently saw the condor, the giant bird of South America, whose range extends from the Isthmus of Darien to the Strait of Magellan. Both the youths were disappointed in the size of the condor, which had been grossly exaggerated in the tales of travellers and the accounts of the old historians. He has been represented as having wings spreading fifteen or twenty feet from tip to tip. The largest they could hear of measured thirteen feet, and even this was not entirely authentic; the largest they *saw* was nine feet across the wings; Humboldt never found one of more than nine feet, and the largest specimen seen by Darwin measured eight and a half feet. The body from the tip of the beak to the end of the tail is from three to three and a half feet in extreme length.



DEAD WHALE ON SH(

Equally exaggerated were the stories about the condors attacking men or carrying away children; they belong to the vulture family, and though they sometimes carry off small animals, they greatly prefer to feed upon carcasses of horses, cattle, or similar beasts. They live usually in the mountains, but on the west coast they come down to the sea to feed upon dead whales, and they serve as scavengers on some of the cattle estates of Peru and other South American countries.



SHOT AT A CONDOR.

Frank tried a shot at a condor one day, but the bird flew away unharmed. After his excitement was over the youth wondered what he would have done with his prize if the shot had been successful. An Indian offered to capture one alive for a couple of dollars; Frank declined the proposal, but gave the man a small present to tell how it was done.

"Easy enough," was the reply, "I should watch near a cattle estate for the first dead ox, and immediately build a pen around him. The condor cannot rise from the ground without running a short distance to get a headway, and this is the reason why I make the pen.

"When my pen is done I go away. The condors come down to eat the flesh of the ox, and when they have

gorged themselves full I come around again. They cannot fly because they are so filled with food, and, besides, they cannot get the short run they want to rise in the air, because they are in the pen. I throw a lasso around one of them; he fights; I throw another lasso and another; he tires himself out fighting; then I tie more ropes around him, put him in a cage, cut the ropes, and you have him safe for two dollars."

Frank thought he would like a condor's egg, and would pay a good price for it. He was told that few persons had ever seen an egg of the condor, partly for the reason that the nests of this bird are built on high cliffs, almost if not quite inaccessible, and partly because the Indians have a superstitious fear of going in search of them. And besides their superstition there is the dread of the bird itself, which will fight in defence of its nest, and is a match for a full-grown man, unless his assailant is armed with a gun. It is no easy matter to shoot a condor, as the skin is very tough and protected by a dense mass of feathers.



PUMA, COUGAR, OR AMERICAN LION.

They looked for wild vicunas among the mountains,

but saw none. Manuel said there were lions farther down, and when they descended below the timber line he pointed out some tracks which he declared were made by that beast. The lion is better described as the puma, or cougar, and it has a range from the lowlands up to an elevation of ten or twelve thousand feet. It is not a courageous animal, and will flee from danger if it has the opportunity.



CAPYBARA.

A more dangerous beast than the puma is the jaguar, or *onca*, which is not infrequently called tiger. He is the most savage and the strongest animal in the South American continent, and in some regions is very destructive to cattle, though he rarely attacks man unless pursued and assailed. He is spotted like the leopard, but his spots are angular instead of rounded, and there are dots in the centre of the spots. Humboldt says he saw a jaguar "whose length surpassed that of any of the tigers of India which he had seen in the collections of Europe." He haunts the borders of rivers and lagoons, and his favorite food is the capybara; the latter is the largest of living rodents, and resembles a greatly overgrown guinea-pig. The capybara is amphibious and gregarious, and is found all through the valley of the Amazon and its tributaries; he is sometimes called the water-hog, from his general resemblance to the animal which

supplies us with pork. His length often exceeds three feet, and the naturalists say he is a connecting link between the rodents and the pachyderms.

The first game secured by our friends was a capybara. It was resting comfortably on the bank of a river, where it was seen by the sharp eyes of Manuel. The guide made the motion of bringing a gun to his shoulder, and then beckoned for Frank to advance; the latter took his rifle from its sling, and cautiously crept forward in the direction indicated. Considerable manœuvring was required to get a good position for a shot, as Manuel had previously explained that it was necessary to kill the animal instantly, or it would dart into the water and be lost.

The rest of the party remained quietly in the rear until Frank had gained the place he wanted. Then a well-directed bullet crashed through the capybara's brain; Manuel ran forward and secured the prize, which furnished fresh meat for the next meal. It was a welcome addition to their stores, as the flesh proved excellent eating; the good taste of the jaguar was commended, and Fred said he wondered that the beast of prey should condescend to kill cattle as long as capybara meat was obtainable.

Elated with his success in the hunting-field, Frank desired to try his skill upon a jaguar, but was advised to be careful. Manuel said there was very little probability of his having the chance to shoot at one, as the jaguar rarely shows himself. He prefers seeing to being seen, and unless you catch him swimming in the rivers or lagoons there is not much likelihood of ever setting eyes on him.



JAGUAR.

"It sometimes happens," said the Doctor, "that the jaguar is seen in the water from a steamer on the river. A friend of mine was ascending the Amazon some years ago on one of the Brazilian boats. Just as they rounded a bend in the river the pilot saw a jaguar swimming from one bank to the other and nearly in mid-stream. The boat was turned in his direction; the jaguar increased his speed, but could not escape. The odds of steam against muscle proved too much for the muscle; the animal turned for the side whence he started, but the boat turned too and pressed him closely. Then he was forced out into the middle of the river again; a small boat was lowered, as it could follow his turnings much more readily than the unwieldy steamer. A few vigorous strokes of

the oars brought the boat near him; a lasso was thrown over his head, and then he wheeled about and attacked his pursuers.

"They had him at an advantage, as he could not sustain himself in the water and maintain a vigorous fight at the same time. Just as his paws touched the side of the boat he was killed by a bullet from a revolver; his body was towed to the steamer and taken on board, where the skin was removed and carefully preserved. He was one of the largest of his race, and estimated to be only an inch or two less than three feet high at the shoulder when standing erect. He could have slaughtered and dragged off an ox easily. The jaguar's method of killing horses or oxen is to spring on the back, and break the animal's neck by a single blow of his powerful paw."



GAME FOR THE JAGUAR.

"The jaguar will dig in the sand for turtle's eggs," said Manuel, "and he will also kill and devour turtles of good size; he can scoop out their shells as easily as though he had all the implements of a skilful cook,

and he will stand in the water, where he seizes fish with his paws and tosses them on shore. If captured when very young he can be made as docile as a kitten, but when he gets his growth and strength he is a dangerous pet. I had one once," continued the guide, "and didn't realize what he was until he one day came near eating up one of my friends while playing with him. I concluded he was not good to have about a family, and sold him to a collector of curiosities."

Fred asked what the collector did with him.

"I heard that he had a hard time with the beast," said Manuel. "He went down the Amazon, and was several months on the voyage. By the time he reached Para the animal was nearly full-grown, and though perfectly submissive was averse to familiarity on the part of strangers. He bit the hand of a passenger on one of the steamers, and it was necessary to shut him in a cage; this made him ill-natured, and he refused to be quiet except in the presence of his owner.

"When the collector reached Para he received letters that called him down the coast, and compelled him to part with his pet. He tried to sell the beast, but nobody in Para wanted to buy a tiger; then he tried to give him away, but nobody would accept a tiger as a gift; next he offered him to the city to start a menagerie with, but the city didn't propose starting one; he tried to hire somebody to kill the beast, but nobody would take the contract; then he caged him for shipment to England, but the agent of the steamer refused the freight; the hotel-keeper wouldn't accept the tiger as security for the gentleman's board, and altogether he was in an awkward predicament.



STEAMER LEAVING P

"When the southward-bound steamer arrived he took the tiger and cage along as part of his personal baggage, having placed a large stone in the bottom of the cage for the animal to 'scratch his claws upon.' The captain of the steamer demanded extra payment for such a package, the passenger refused it, and during the altercation the cage and contents were thrown overboard. The stone carried the whole thing to the bottom, and there it rested."

"That was the end of the jaguar, I suppose?" queried Fred.

"The end of the animal," was the reply, "but not of the owner's troubles. When the steamer returned to Para the authorities presented the captain with a bill for violating an ordinance relative to obstructing the harbor by throwing things overboard. He escaped responsibility on the ground that the animal was the personal luggage of the passenger; when the latter came again to Para he was presented with the account, and had to pay it."

"He was glad to get out of the scrape," remarked Frank, "and didn't hesitate to pay the final bill."

"Quite likely," answered Manuel. "But somebody had fished up the drowned beast, and stuffed the skin. When the traveller had settled with the authorities the skin was brought to him. He paid for the work of preservation, and then sent the specimen to a friend in England, in care of a taxidermist. It arrived in bad condition, at least the taxidermist said so, as he sent a bill for repairs, and explained that he supposed the gentleman wanted to have the skin in proper shape when presented to his friend.

"He paid this bill, and happily it was the last. I don't believe he will buy another jaguar in a hurry."

Manuel's story was voted a good one, and worthy of preservation—like the hide of the animal whose adventures it recorded. Frank agreed to be the taxidermist of the story, without charge; he rendered Manuel's fluent Spanish into the vernacular of the United States, wherein it is here presented.



HEAD OF NAVIGATION.

CHAPTER XV.

DOWN THE RIVER.—ARRIVAL ON THE BENI.—BIRDS OF THE AMAZON VALLEY.—BUILDING A HUT.—HUNTING WITH POISONED ARROWS.—TURTLES, AND TURTLE-HUNTING.



A CHANCE ACQUAINTANCE.

All were heartily glad to terminate the journey by mule and on foot, and there was sound sleep in their little tent on the night following their arrival at the village on the river's bank. They were up early, and for two or three hours were occupied with paying the carriers, and negotiating for canoes for the voyage down the stream. The settlement with the carriers was less difficult than the engagement of the canoes. The price for land transportation had been agreed upon beforehand, so that there was little occasion for dispute; the porters of the sillas had exaggerated ideas of the value of their services in bringing their charges through without accident; but the question did not rise to anything like a serious misunderstanding.

The Indians of the village were disinclined to move, as it happened to be a period of festival, and they resented the idea of stopping their rejoicings in order to make a voyage down the river. Manuel argued that it was a downward voyage, and they would have no hard work to do; by the time they were at their journey's end the festival would be over, and consequently the proposed trip would not really interfere with their amusements. They admitted the force of his suggestion, and when this was fairly conceded the negotiations proceeded, with some hitches, to a happy termination.

In spite of all efforts to secure an early departure, they did not get away until the morning of the third day following their arrival from the Andes. Four canoes were engaged; two for the baggage, and two for the three travellers and their guide. The canoes were each about twenty feet long, and two in width; they were hollowed from the trunks of trees, and closely resembled the American "dugout." In fact they were literally of that type of craft, and reminded Frank and Fred of the boats they had seen in the Malay Archipelago, and at Singapore and Point de Galle.

Each canoe had four rowers, and a *popero*, or pilot; the latter was an important personage, as the safety of the boat in the rapids depended upon his watchfulness, and his prompt action in moments of peril. The baggage was placed in two of the canoes; the third was occupied by Doctor Bronson and Frank, while the fourth held Fred and the guide. The Doctor and Frank led the advance, while Fred and the guide brought up the rear, the baggage canoes being in the centre of the column. After an affectionate parting of the Indians with their friends on shore the canoes

were manned, and the flotilla was under way. The leave-taking of the Indians was peculiar; they clasped hands, then kissed the hands alternately, and then kissed each other. As each Indian was obliged to go through this ceremony with every one whom he left behind, the osculation consumed considerable time.

The canoes were to take them to the point where the river they were descending unites with the Beni; it was estimated that the downward journey would occupy two days, while the Indians would be eight or ten days in returning. In descending they keep the canoes in the middle of the stream, and take advantage of the current, but in ascending they hug the banks, and propel the boat by means of poles, or by dragging it around the rapids. The current is swift, as there is a considerable fall to the river; nowhere was the flow less than three miles an hour, and in many places it amounted to five miles. Several rapids were passed which had a dangerous appearance, and undoubtedly they would have been full of peril to any one unaccustomed to them.

Dr. Bronson certainly looked very serious while passing the first of the rapids, and the face of Frank wore an expression of anxiety. But their possible doubt as to the result was removed when they saw the skill with which the popero swung his long paddle, dexterously brought the canoe around when it seemed about to go headlong on a rock, and let it glide past a whirling eddy which threatened to swamp it. They were only a few minutes in the rapid, but it seemed at least an hour to the travellers.



A LANDING-PLACE.

The trees on the banks of the river showed that they were in the tropics. Palms of several varieties were visible, bamboos grew luxuriantly, banana bushes were numerous, while papayas, plantains, and similar vegetable growths were everywhere to be seen. Frank had his rifle ready for use in case of large game, but none was discovered; birds rich in plumage flew among the trees, but, like most of the birds of the tropics, they were seen rather than heard. Few tropical birds have the power of song, and it is possible that their brilliant feathers are given in compensation for their deprivation.

But do not understand that all the birds of South America are unmusical. On the borders of Guiana is a rare bird, known as the Uruponga or Campanero, which may be rendered into English as "the tolling-bell bird." It is white, and somewhat smaller than a dove, and has a black tubercle under the beak. One traveller, Waterton, says of this bird, "Orpheus himself would drop his lute to listen to him, so sweet, so novel, and romantic is the toll of the pretty, snow-white campanero." Sydney Smith, in reviewing Waterton's narrative, says "The campanero may be heard three miles! This single little bird being more powerful than the belfry of a cathedral ringing for a new dean! It is impossible to contradict a gentleman who has been in the forests of Cayenne, but we are determined, as soon as a campanero is brought to England, to make him toll in a public place, and have the distance measured."

Professor Orton says the most remarkable songster of the Amazonian forest is the Realejo, or organ bird. Its notes are as musical as the flageolet. Another authority says it is the only songster which makes any impression on the natives. The umbrella bird has a deep, loud, and long fluty note, which can be heard a great distance through the forest. He is black as a crow, and has a crest of waving plumes above his head, while there is a long lobe below his neck covered with blue feathers so glossy that they shine at every movement he makes.



HUMMING-BIRDS OF THE ANDES.

Before reaching the river our friends had seen a good many humming-birds, and Frank tried in vain to secure specimens of these tiniest members of the feathered race. On the river he was more fortunate, and he made sketches of some of the most remarkable, after fixing them upon wires, to give the

greatest possible resemblance to life. There is one variety that has two long feathers forming the tail; each of these feathers has a broad tuft at the end, and when the bird darts among the leaves and flowers the tail seems like a flash of bright color among the varied hues of the foliage.



HUMMING-BIRD'S NEST.

A little past noon the foremost boat drew up at the bank, and the others followed its example. Here they remained an hour, while the boatmen partook of their repast of bananas and parched corn, and the civilized travellers regaled themselves upon provisions better suited to American tastes. Frank and Fred endeavored to take a stroll in the forest, but the way was blocked by vines and thick undergrowth, so that their advance was slight.



PAIR OF TOUCANS AND THEIR NEST.

Frank saw a toucan, one of those comical birds, with an enormous beak which seems specially made for devouring bananas; the bird was seated on the sloping trunk of a tree, and close observation showed the head of another bird of the same kind protruding from the wood. Frank guessed rightly that he had come upon a pair of toucans and their nest. The toucan makes his home in a hollow tree, as his bill is quite unadapted to nest-building after the manner of the robin or the oriole. Think of a toucan endeavoring to weave a nest like the graceful structure the oriole hangs from the tree! As well expect to see a lace collar wrought with a crowbar.

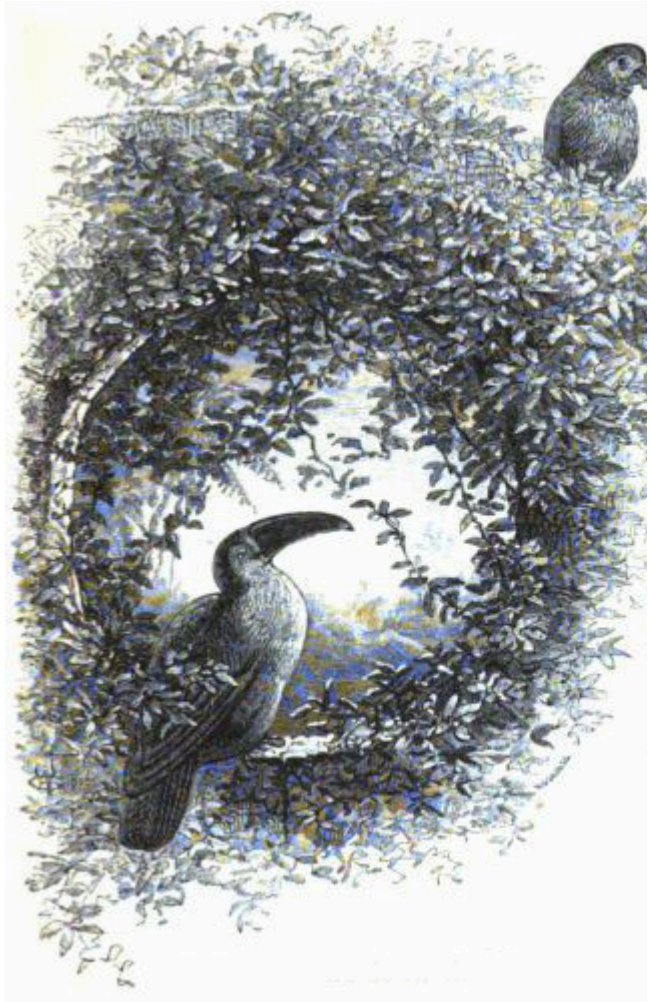


TANAGERS AND NEST.

On they went through the tropical forest, along the swiftly flowing river, passing now and then little stretches of open pampas or grassy plain, where there is excellent pasturage for cattle. At night they halted at an island; the boatmen always prefer to pass the nights on islands when journeying along the river, as they are then much more secure against the wild Indians who might do them harm. Most of the hostiles are without boats, and even when possessing them they are cautious about venturing on the islands for the purpose of making an attack. They greatly prefer to have a safe line of retreat behind them in the shape of the forest, where pursuit is next to impossible.

At their second day's nooning it was Fred's turn to make a discovery in ornithology. Several times they had heard the shrill voice of the parrot, but had not succeeded in detecting the bird that made it; at the halting-place we have just mentioned Fred saw two or three parrots among the trees just as his boat

swung to the shore, but they flew away at the approach of their disturbers and disappeared. As soon as they had landed, the youth followed in the direction the birds had taken, and was fortunate enough to see them again; evidently they were near their nesting-place, but they did not manifest any willingness to invite the stranger to see them at home.



TOUCAN. PARROTS.

The hooked bill of the parrot is as inconvenient in nest-making as the great beak of the toucan; the philosophical bird accepts the situation, and rears its young in a hollow tree, like its huge-billed friend. Parrots are more numerous than toucans and also more noisy; probably for these reasons they are seen

quite frequently, while the discovery of a toucan is not easily made. The Doctor said a traveller might make the descent of the Amazon without seeing one of the latter birds, while he would encounter the parrot very often. Consequently Frank might feel proud of what he had seen the day before, and but for the accident of stumbling upon the locality of the nest he would not have been thus favored. Occasionally parrots and toucans are found together; both are gregarious, and the same may be said of most of the birds of South America.

To the parrot family belong the true parrots, paroquets, and macaws. Paroquets go in flocks, while the parrots always fly in pairs, though they flock together in large numbers on the trees. A few Indian tribes consider the macaw sacred, and it is called by some of them "the bird of the sun."

It was near evening when they reached their destination, a village of perhaps fifty huts, on the tongue of land forming the junction between the Beni and the river they had descended. Half the payment for the boats and boatmen had been made before starting; the balance was now due, but by common consent the settlement was postponed till morning. All the huts were so intolerably dirty that the travellers refused to occupy one of them; the little tent was spread near the cleanest of the huts, the baggage being piled in the latter, in charge of Manuel, while the Doctor and his young companions slept under canvas.

The boatmen were paid off in the morning, and started at once on their homeward journey. The prospects for an immediate departure down the Beni were not brilliant, as most of the Indians were away, and nobody could say when they would return. They

were absent on a turtle-hunting expedition along the Beni; they might be back in a day or not for a week. *Quien sabe?*

"Never mind," said the Doctor; "what can't be cured must be endured. We will build a hut for ourselves, and study the Beni and anything else that comes in our way. We can make excursions into the forest and learn something of the country. The time will not be wasted, by any means."

Frank and Fred assented readily to the proposal; in fact, they never did anything else when the Doctor gave advice or suggestions.

But it was easier to agree to build a hut than to build it. Labor was not easy to obtain.



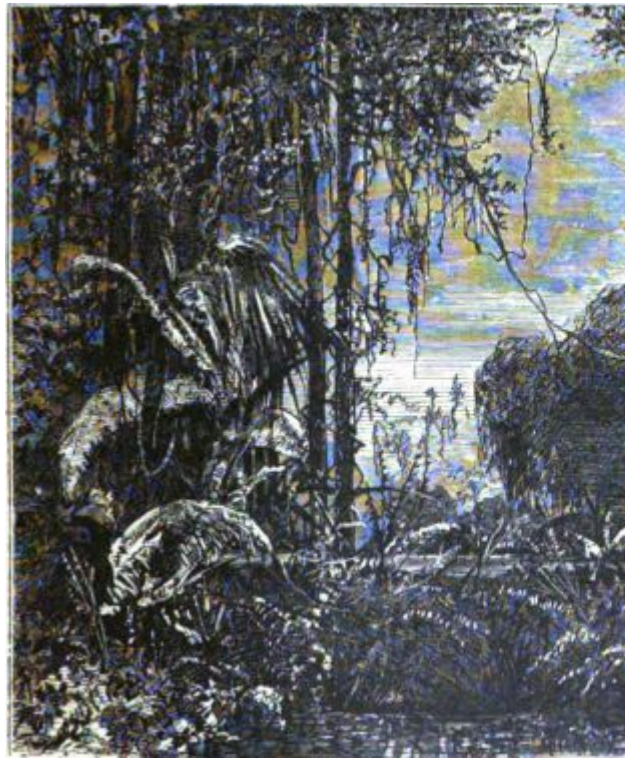
AN AMAZONIAN DWEL

The forest supplied the material, but it was difficult to induce the Indians to do anything. After considerable argument they prevailed upon some of the men to cut the requisite bamboos, and bring them to the spot selected for the temporary dwelling. Under the supervision of the youths and their guide, the walls were put up by driving some of the bamboos into the ground; a space was left for a doorway; the roof was put on, and thatched with leaves of the Pandanus palm; and by nightfall the new house was completed. It measured about twelve feet by fifteen, and was admirably ventilated; the total cost was estimated at six dollars and a half, and it was pronounced one of the handsomest structures in the village. The Indians were well paid for their labor, according to the rates of the local trades union; and it was understood that the building was to become the property of the alcalde, or chief man of the village, after the departure of the strangers.

The alcalde surveyed the edifice with evident pride, and the Doctor thought he discovered an avaricious expression on the fellow's face. Frank and Fred thought likewise.

"I tell you what it is," said Fred, "we have 'builded wiser than we knew.' He will be anxious enough to get us away in order to take possession of his new residence."

"I was thinking the same thing," said Frank, "and we shall save more than the cost of the building when we make our bargain with the alcalde for boats, to go down the river."



NEAR THE VILLAG

It was the first new house erected in that village for several years, and the alcalde was covetous. The prediction of the youths was correct, and the old fellow was quite active in speeding the parting guests. When the Indians returned from their turtle-hunt the bargains were easily made and the necessary boats and men obtained. But they did not return for a week, and while we are waiting for them we will take a glance at the Beni and observe its peculiarities.

The Beni is formed by several head streams, that rise in the Andes east and northeast of the plain of Titicaca. It flows to the northwest for about three

hundred miles, receiving numerous tributaries, and then in a northeasterly direction to the frontier of Brazil. Here it enters the Madeira, which is formed by the Mamoré and Iténez Rivers, and from the point of junction its name and identity are lost. It is the largest of the affluents of the Madeira, and is thought to be equal to both the other streams combined. It is half a mile wide at its mouth, and fifty feet deep, and is estimated to discharge at an ordinary stage five thousand cubic yards of water every second.

The Beni and its tributaries are navigable for many hundreds of miles in the interior of Bolivia; how far this navigation may be carried is not known, as no complete survey has been made. With a fleet of steamboats on the Beni and its kindred streams, and a railway around the falls of the Madeira, the resources of Bolivia could be developed with ease; until that work is accomplished the foreign commerce of the country can never be extensive.

Through much of its course the Beni runs through forests, but there is also a wide extent of pampas or grassy plains, where millions of cattle and horses might find pasturage. So abundant and cheap are the cattle at the present time that they are killed for their hides alone, the flesh being left to rot on the ground. The other rivers that form the Madeira traverse a similar country, but have their sources farther east than those of the Beni. They are fed by the rains brought from the Atlantic by the easterly winds, which are heavily charged with moisture.

Frank and Fred were not slow to win the confidence of the Indians during their stay at the village; through the aid of Manuel, who understood the language of this people, they learned some of the ways of native life on the tributaries of the Amazon.

They did not hesitate to ask questions about anything they saw; sometimes the answers were evasive, while at others the information sought was readily obtained.

While visiting one of the huts Fred espied some reeds, ten or twelve feet long and perfectly straight, among the rafters of the building. Pointing to them, the youth asked what they were for.

"They are guns," answered Manuel; "the guns that the Indians kill game with."

"How can they kill game with guns like these?" queried the astonished visitor. "They would explode with the lightest charge of powder."

"But they don't use powder at all," was the reply; "they blow arrows through the reeds, and shoot in that way."

Fred expressed a desire to see how it was done, and Frank joined in the wish. Manuel talked a moment with the owner of the implements, and at Fred's suggestion agreed to pay a good price for a chicken if the Indian would kill it with the blow-gun. The Indian consented, and the party adjourned to the open space near the new house.

The Indian placed a small arrow in one of the reeds. The missile had a sharp point of iron, and was fitted with a tuft of cotton at its other end, to prevent the air from passing it during the act of shooting. Thus equipped, the man took a position behind a bush, and the unsuspecting chicken was placed on the ground about twenty yards away.

The bird walked around a few moments, uncertain where to go. The Indian raised the reed to his lips, took aim, and "fired."

The arrow went true to the mark, and pierced through the chicken from side to side. The man offered to repeat the experiment as long as the visitors would pay for fresh game, but they had seen enough to satisfy them, and declined his proposal.

"But can they kill large animals in this way?" said Frank. "I understand how they can shoot birds by concealing themselves in the trees, and watching for them to come near, but when it comes to large game, I wonder how they can give force enough to the arrows, especially where the animals have tough skins, like the capybara and the tapir."

"For killing large game," replied Manuel, "they use arrows poisoned with *curari* or *woorara*. The name has several pronunciations in different parts of South America, and there are at least half a dozen kinds of the poison."

"What is that?"

"If you should ask the Indian he would not tell you. The Indians have long guarded the secret of its origin and preparation, but it was obtained from them some years ago by Sir Robert Schomburgh, I believe. It is made from the juice of the *Strychnos toxifera*, a tree or shrub resembling that which supplies the St. Ignatius bean; the St. Ignatius bean is familiarly known as the 'Quaker button,' and yields the strychnine or nux vomica of commerce."

"But it is more powerful even than strychnine," said the Doctor, who had just joined them; "in fact, it is considered the most active narcotic known to science. It acts on the nervous system and produces paralysis, with convulsive movements followed by death. It has been tried with some success in the treatment of lockjaw and hydrophobia, but it is too

dangerous for general use.



AGAVE, OR SISAL HEMP.

"If introduced into a wound its effect is almost instantaneous, but when taken through the stomach in minute quantities it is comparatively harmless. Now let us hear from Manuel how it is used by the Indians."



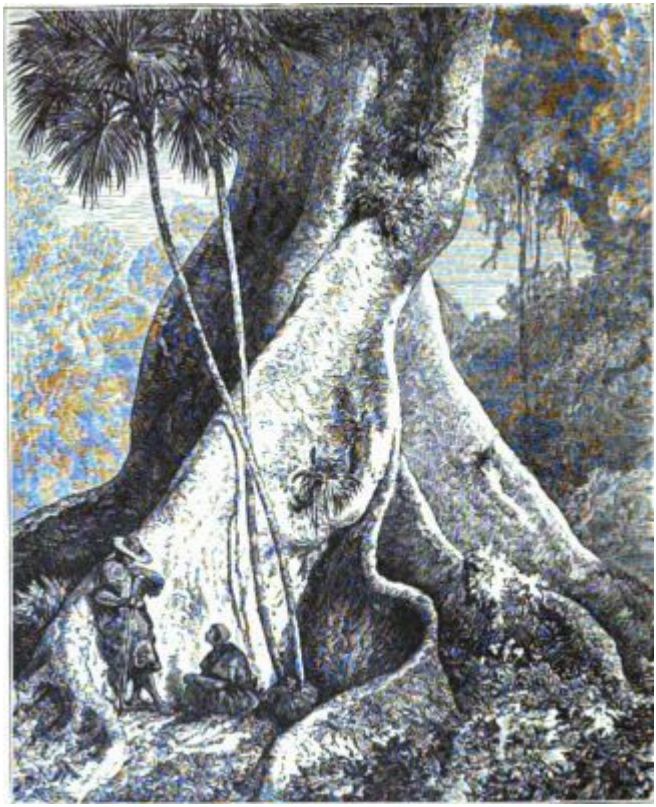
HUNT

"They dip the points of the arrows in curari," said the latter, "and project the arrows at the game. If it punctures the skin enough to let the poison enter the blood the work is done. In a few seconds or a few minutes at farthest the animal falls to the ground and dies in convulsions, and it is a curious fact that the flesh is in no way tainted with the deadly substance. A bear or a tapir has died within five minutes after being wounded, and smaller animals in less than one minute. Great care is necessary in using it, as the

least scratch with the point of a poisoned arrow may prove fatal to the hunter.

"These Indians will kill more birds in a day with the blow-gun than the most experienced hunter could bring down with a rifle. When they go out for birds they use arrows only a few inches long. Taking a position in the top of a tree, an Indian will often empty his quiver, bringing down bird after bird as fast as he can load and shoot. The weapon is noiseless, and the man remains in concealment till he has finished his work and is ready to pick up his game."

Frank and Fred thought they did not care to practise with these weapons, however effective they might be, and they determined to keep on the friendly side of the Indians, and thus avoid being aimed at with the deadly blow-gun. The Indian was paid for his chicken, and the party separated.



A GIANT OF THE FOREST.

They made a short excursion into the forest, and were greatly impressed with the size of the trees, and the great extent of arboreal productions. Travelling was difficult, owing to the thickness of the under-brush and the vast number of vines that covered the ground and hung in festoons from the trees. Several varieties of mahogany were observed; a rubber-tree was pointed out by Manuel; there were half a dozen kinds of palms, and they were told that many more were to be seen farther down the river; and there were several giant trees with soft wood, whose names are not known to the English language.

One day Manuel took a skiff and rowed out into the river with the avowed intention of bringing in a turtle for dinner; he was accompanied by an Indian, the one who had experimented with the blow-gun, but this time the fellow was armed with a spear, and an ordinary bow and arrow.

Fred wondered how the turtle was to be taken with these implements, but he had not long to wait before ascertaining.

The Indian stood in the bow of the skiff with the bow and arrow ready, while Manuel paddled slowly along, taking the direction indicated by the marksman. Keeping where the water was shallow, they traversed quite a distance before anything worth shooting was found. After a while the Indian spied a turtle, and the boat was rapidly rowed in his direction.



TURTLE-SHOOTING IN SOUTI

The arrow was skilfully projected, and pierced the turtle through the neck. He tried to get away, but his progress was impeded by the arrow, which gave an

opportunity for using the spear; then a cord was passed around the turtle's neck and he was brought triumphantly to land.

On the lower Amazon the hunters have a cord wound around the shaft of the arrow, to which it is fastened; the other end of the cord is tied to the head, which fits loosely in the shaft. When a turtle is struck he dives; the head detaches from the shaft, the cord unwinds, and the stick floats on the water. The hunter can then follow his game, and easily secures it by hauling in the cord.

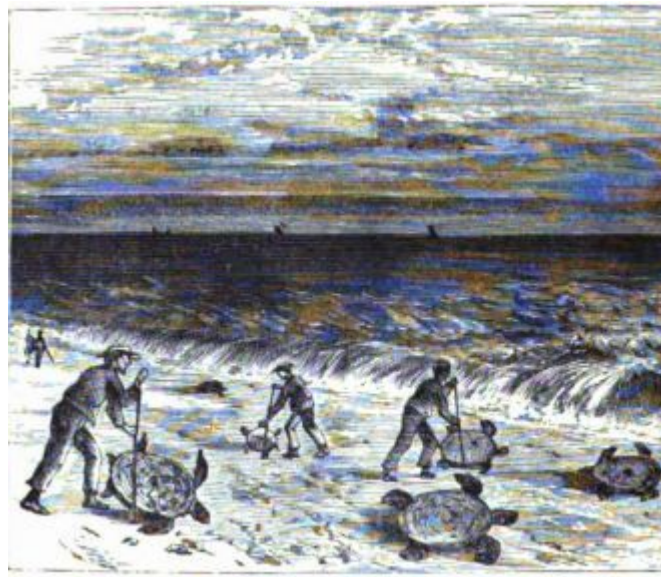
Our friends supped on turtle as the result of Manuel's hunting adventure. They found it palatable, especially when served up in steaks, though Frank was of opinion that it could not be surpassed in a stew. The next day the hunting-party returned, and the market of the little village was abundantly supplied with turtle meat.

Frank interested himself in the history and statistics of the Amazonian turtle, with the following result:

"Turtles are the most important product of the Amazon and its tributaries, and furnish the sustenance of the majority of the natives of the great valley. Seven kinds of turtles are known to the natives, but only two of them, the tartaruga or charapa, and the charapilla, are eaten. The charapa is the largest, being often found three feet long and broad in proportion, but the charapilla is considered the best.

"The eggs of the turtle are used for making oil or butter, and also for cooking in various ways. They are found along the banks of the rivers or on sand-bars; the charapa lays from one hundred and fifty to two hundred eggs, and the charapilla from thirty to

forty. The turtle comes up at night, digs a hole two or three feet deep in the sand with its hind flippers, and then deposits its eggs. It covers them with sand again and returns to the water, unless, as too often happens, it is caught by the native who has been on the watch for it. I say 'too often,' as the indiscriminate slaughter of the turtle and the destruction of the eggs are fast reducing the number and raising the price. The hunters turn the turtles on their backs and there leave them till the next day, when they return and collect them. Once on its back the poor turtle is helpless.



TURTLE-TURNING.

"The natives hunt for turtle eggs by pushing sticks in the sand; if the stick enters easily it reveals the locality of the deposit, and a little digging brings it to light. It is estimated that not fewer than fifty millions of turtle eggs are taken every year on the Amazon and its tributaries, and some authorities think the

number is much larger.

"The wonder is that any turtles remain. They are shot in the water or caught when returning from the banks where they have deposited their eggs; young turtles by the thousand are eaten by alligators and large fishes; jaguars and pumas seize them when they are travelling overland, to or from their nesting-places; and the birds of prey by no means let them alone. But they could get along well enough were it not for their human foes, which are the worst of all. The turtles of the Amazon will follow the fate of the buffalo and the salmon of North America whenever the country becomes fully peopled and the demand increases in proportion.

"The Indians have brought back many gallons of oil from turtles' eggs, which they made during their absence. The eggs are thrown into a canoe, and then trampled and beaten up by the feet of men and boys till the mass resembles a Brobdingnagian omelette ready for cooking. Water is poured into the canoe and mixed with the stuff; the oil rises to the surface and is skimmed off. Then it is purified over the fire and put into jars holding about three gallons each, for transportation to market."

CHAPTER XVI.

DOWN THE BENI.—PRODUCTS OF THE VALLEY.—PLANS FOR DEVELOPING COMMERCE.—OBSTRUCTIONS TO NAVIGATION.—VOYAGE ON THE MAMORÉ.

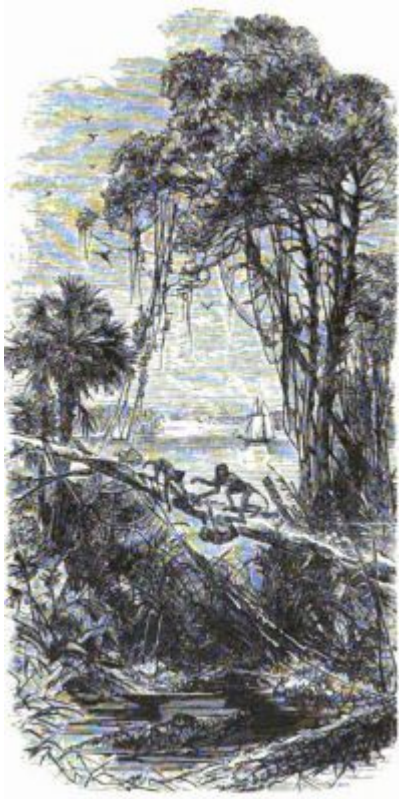
Negotiations for descending the river could not

proceed with rapidity, as the Indians were in no hurry to get away after their return from the turtle-hunt. Everything among these people is connected in one way or another with a festival, and it was necessary to celebrate the success of the expedition with a period of rejoicing. The alcalde did his best, but though he possesses great power, an alcalde is not absolute in his authority at all times; it was finally arranged that the festivity would continue two days, and on the morning of the third our friends could hope to depart.

The morning came, but there were still many things to be done, and it was fully noon before the boats were ready. As there were no rapids to pass, it was decided to lash two boats together side by side and connect them with a platform. The tent could be spread on this platform, in addition to an awning of palm-leaves, to shelter the travellers from the heat of the sun and the not infrequent rains. Two of the largest attainable boats were taken and connected in this way. It proved an excellent arrangement, and the party was unanimous in recommending it to all future travellers descending the tributaries of the Amazon where they are not navigated by steamboats.

The rowers and pilots had little to do beyond keeping the raft (as we will call the combination of boats and platform just described) in the middle of the stream, where the current was strongest. There was a good deal of drift-wood in the river, but it was far less troublesome than if their course had been up the stream. Dr. Bronson explained to the youths that Madeira means "wood," and the Madeira River, into which the Beni flows, was so named by the Portuguese in consequence of the great number of

floating trees that were met by the early explorers. The Beni contributes more than its share of this floating material, as the forests extend far along its banks, which are constantly crumbling away through the action of the current. In many places the Beni resembles the Missouri, and seems to be subject to the same forces of nature.



SOUTH AMERICAN RIVER SCENE.

Forests and pampas, pampas and forests, succeeded each other as the raft followed the course of this affluent of the mighty Amazon. Parrots and toucans and other birds flew among the trees, monkeys stared in astonishment, jumped from limb to limb,

swung by feet and tail, and kept up a continual chattering as the raft floated by their haunts. Frank made note of the difference between the South American monkey and his Asiatic brother; he had never seen the latter using his tail for anything but ornamental purposes, while with the South American monkey it gave the advantage of an extra hand or foot.



SOUTH AMERICAN MONKEY WITH PREHENSILE TAIL.

"The Asiatic monkey's tail is not prehensile," said the Doctor, "and all monkeys of South America have not this advantage. In the words of a famous naturalist," he continued, "all monkeys with prehensile tails are American, but all American monkeys do not have prehensile tails. The Asiatic monkey does not seem to have heard of such a thing, though some of the varieties of monkey in the far East occasionally use the tail in a bungling sort of way. Professor Wallace lived four years in South America, and in that time he saw twenty-one species of monkey, seven with prehensile and fourteen with non-prehensile tails. All the American monkeys are climbers, and live in the trees, while such is not the case in the old world."

While they were talking on the subject of monkeys a most unearthly yell was heard in the forest to the right of the raft. Both the boys turned in amazement to Manuel, and asked what it was.



HOWLING MONKEY.

"It's a guariba," said Manuel, "as the natives call it."

"And what is a guariba?" Fred inquired.

"A guariba is a howling monkey," the guide answered, "and that is the noise he makes. You can hear him a long distance, and he howls night and day without seeming to get tired of the amusement."

"There are three kinds of howling monkeys in South America," said the Doctor, "but the difference is more observable in their appearance than in their voices. The braying of a mule is like the note of a violin, compared to the noise of a howling monkey in good health and condition, accompanied by his friends. The howlers, like most others of the Simian family, are gregarious, and if we happen to have our camp near a village of them we shall not sleep much."

Frank thought he would buy one of these brutes and take him home, but Manuel said the howlers could not be tamed.

"A wise provision of nature," remarked Fred. "Imagine your neighbor having a pet howler; it would be worse than all the cats in a dozen blocks of New York city."

Frank agreed with him, and changed his views on the subject of domesticating one of these curiosities. Manuel said further that the natives had repeatedly tried to tame the howlers, but could not; they were the only members of the monkey family in South America that utterly refused to be converted into pets.

They fell into the monkey-market sooner than they had expected. While passing an island, an hour or two before sunset, they saw two or three canoes drawn up on the shore, and at the Doctor's suggestion Manuel told the pilot to run in and see who and what the owners were. They proved to be a

hunting-party of Indians from the other side of the river; they had been successful in killing several monkeys, and offered some of the meat for sale.

Frank and Fred thought it would be too much like cannibalism to eat of monkey meat, and the Doctor agreed with them. Manuel said the flesh of the howler was not to be recommended, as it was dry and tough, but there were some varieties on the lower Amazon which were not to be despised. He particularly mentioned the white-whiskered coaita, one of the thumbless "spider-monkeys," which was held in high repute among the natives. Another variety called the maquisapa was said to be good eating, but he could not speak from personal knowledge. Monkey flesh is an important article of food in many parts of the Amazon valley, and there are certain districts where it is the only meat to be had.

But monkey in its live form was not declined, at least in limited quantity. One of the Indians offered a marmoset, a pretty little creature about eight inches long, and with a soft, silky fur covering its skin. It was restless and timid; at first it shrank from the youth, but quickly seemed to understand that it would find him a better master than the Indian. He took it in his hand and gently stroked its back; in a few moments it clung to him, and when the Indian reached for his property the little creature struggled to remain.

Frank's sympathies were awakened by the affection displayed by the marmoset, and a bargain was quickly made. Manuel conducted the negotiation, and the monkey became the property of the youth for an outlay of fifty cents. He paid a high price, as he afterwards ascertained, but at that time he was

not familiar with the market quotations for this kind of live-stock.

Marmosets are the smallest members of the monkey family. The name is confined to the American varieties, and is sometimes restricted to the striated monkey of Guiana or Brazil. This last-named monkey has a tail a third longer than the body, the latter rarely exceeding eight or ten inches. Its fur is long and soft, and of a yellowish-gray color; both tail and body are banded with black, and there is a long tuft of white hairs on each side of the head, which is of a deep black or brown.

The new purchase received the name of Gypsy, and soon became a general favorite with the party, though it always recognized Frank as its master. It was a well-behaved pet, and, contrary to Frank's expectation, it never indulged in mischievous tricks. Manuel said the marmosets were rarely destructive, but the same could not be said of the rest of the monkey tribe in South America. The sapajous, he pronounced the worst of the lot; they are distributed through Brazil, and, though affectionate enough as pets, are too mischievous to be kept in a house or camp.



A MONKEY ROBBING BIRD

"Three or four years ago," said Manuel, "I was on the Mamoré River with an English gentleman who had bought a sapajou while ascending the Amazon. He kept the fellow in a cage for a while, and then allowed him the run of the boat. The first day he was at liberty he threw overboard two of the dinner plates, and was punished by being shut up again.

"When he was free once more, he picked up a book that was lying on the deck, and when discovered he had torn out at least half the leaves, and tossed them into the water. He was again caged, and after a time was let out, but they fastened a chain about him so that he could not run around.

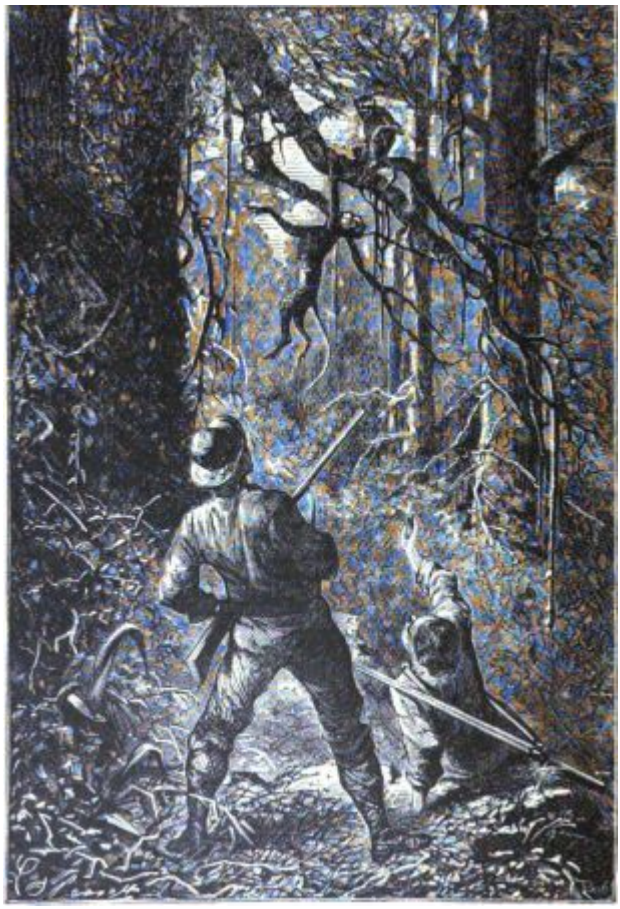
"Under this restraint he behaved very well, and displayed, or pretended to display, a fondness for his owner. The gentleman was one day working at the notes of his journey, and the monkey was chained close to his table, under the awning in the centre of the boat.

"He had a large map on the table, and had been marking his route with red ink along the course of the river. He was called suddenly from the table, leaving the map and the ink-bottle within the monkey's reach.

"As soon as he had gone, the monkey, doubtless in a spirit of imitation, climbed to the table, pulled the map towards him, and with his paw, dipped in the ink, made an imaginary survey of a railway or a steamboat route, at least a thousand miles long, according to the scale of the drawing. Just as he was finishing the performance the master returned, and caught him at it."

"What happened to the monkey?" Fred asked.

"I don't know exactly what became of him," was the reply. "He was given to one of the boatmen, who sold him to an Indian at the next landing. It wasn't safe to mention monkey to that gentleman for the rest of the time he stayed in the country."

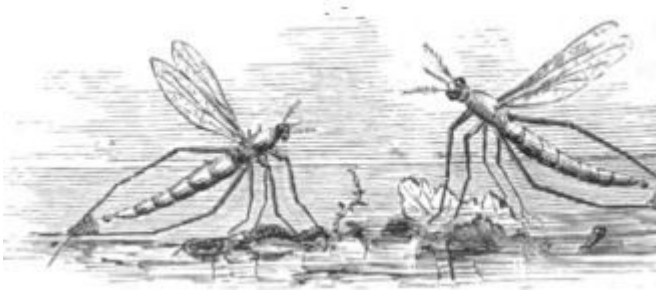


HUNTING THE MONKEY.

Sunset came, and they stopped for the night. The raft was tied up at a small island, where there was little prospect of disturbance by hostile Indians; the tribe occupying this part of the country did not have a bad reputation, and there was no real danger, but the pilot was cautious on general principles. Watch was kept through the night, but nothing happened to disturb the slumber of those whose duties did not require them to be wakeful, if we except the visits of

the mosquitoes.

Mosquitoes are the pests of the upper part of the entire valley of the Amazon. They are found wherever the rains fall, from the foot of the Andes, eastward, until within a few hundred miles of the Atlantic coast, from which they are kept in great measure, though not entirely, by the force of the trade winds. The middle Amazon swarms with them, and the Maranon, Madeira, and other tributaries are almost uninhabitable at certain seasons of the year, in consequence of these nuisances. They are always on duty, and no manner of objecting to their presence will induce them to leave.



AMAZONIAN MOSQUITOES AT HOME

There are several varieties of mosquitoes, some working at night, and others in the daytime; between them they divide the hours, and give their victim no chance for rest. The Indians say they always come in greater swarms than usual when a traveller is approaching, and evidently they can scent blood from afar. Frank said "the mosquitoes fairly danced with joy at the arrival of our party." A mass meeting was called, which was attended by some millions of mosquitoes, "very hungry and very thirsty." This mass meeting was kept up as long as they were in the region of the upper and middle Amazon. After passing Manaos, on their way down the river, there

were few mosquitoes, and these few were not as voracious as their more uncivilized brethren.

Parts of Brazil and Bolivia will long remain unsettled, owing to the perpetual annoyance caused by the mosquitoes. Their powers were tested by one traveller, Dr. Spruce, who, in the interest of science, allowed the insects to feed upon him without interruption, and found they took three ounces of blood daily!

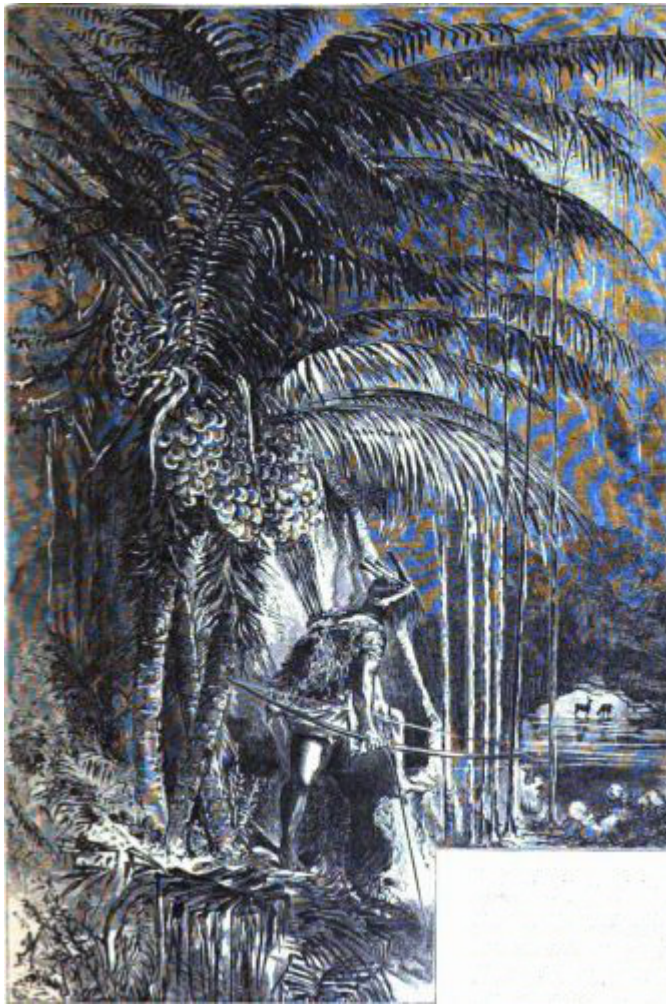
Our friends were provided with mosquito nettings, and brought them into use on entering the mosquito-haunted region. At night they surrounded their beds with them, and by day kept their heads enveloped in the small nets made for that purpose; in this way they managed to keep from being devoured bodily, or bled to death, but could not escape the annoyance and constant inconvenience of the presence of the dreaded carapana, as he is called by the Brazilians.

The mosquito is not the only insect pest of the Amazon valley. Professor Orton says the pium, or sand-fly, is almost as bad as the better-known tormentor. He has two triangular, horny lancets, which leave a small circular red spot on the skin. There are several species, all working by day, and relieving the mosquito from sunrise to sunset. Then there is the maruim, which resembles the pium, and inhabits some, but not all, of the valleys; Humboldt estimated that there was a million of them to a cubic foot of air where he was. There is also the mutuca, which resembles a horse-fly; one variety has a lancet half an inch long, and he knows how to use it to advantage.

There is a carapato, or tick, which mounts to the tips of the blades of grass, and attaches himself to any one brushing against them. The carapatas bury

themselves so deeply that their heads break off at any attempt to pull them out; their bite is painless, but it often causes sores and ulcers. Happily, their range is less extensive than that of the mosquito, and some parts of the country are wholly free from them.

Frank asked Manuel how the natives, who had no nets, managed to get along in the height of the mosquito season.

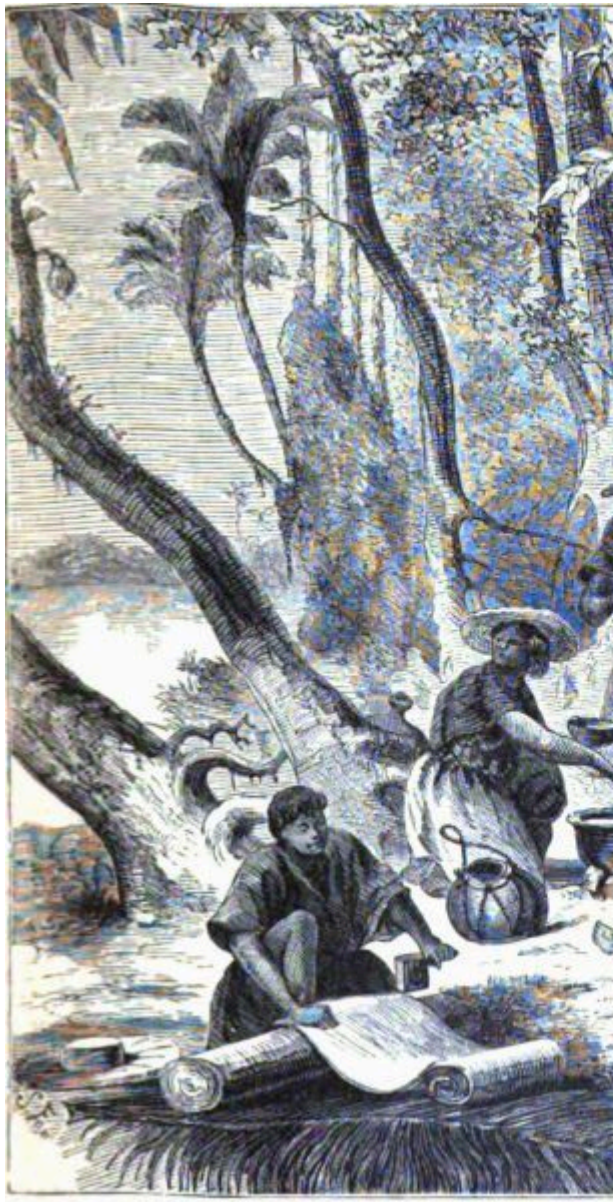


AN INDIAN OF NORTHERN BOLIVIA.

"They get along very badly," was the reply. "One plan is to cover their bodies with oil, which the mosquitoes don't like, but it does not drive them away. Smudging or smoking keeps them down, but then it is almost as bad for the people as for the mosquitoes. Sometimes they bury themselves in the

sand, leaving only the head exposed; this they cover with a piece of wetted cloth, either wrapped around the head, or supported above it like a miniature tent. Some of the Indians plaster their bodies with mud, laying it on like varnish, and allowing it to dry, but it has to be pretty thick to keep the mosquitoes from penetrating it. Some of the insects will pierce through any ordinary clothing; I have heard of their going through ordinary shoe-leather, but never saw with my own eyes a mosquito that could do it."

Sheltered by their nettings, they passed the night in comparative comfort, and were off early in the morning. In fact, the raft was in motion before the youths had risen; the Indians were so silent in their movements that they did not disturb the slumber of the travellers. Frank made a comparison with the noisy boatmen of the Nile which was very much in favor of the Indians of the Beni.



BREAKFAST SCENE ON TH

About seven o'clock they stopped for breakfast and

the scene was so picturesque that Frank made a sketch of it.

The spot they chose was under some lofty trees covered with climbing plants, where previous visitors had removed enough of the undergrowth to render the place suitable for a temporary camp. A fire was kindled, and over it they placed a pot for the concoction of a porridge of meat and mandioca flour mingled with water. A hammock was stretched between two of the trees, and a large fish that had been caught early in the morning was hung up by way of ornament.

While the soup was in preparation, one of the men busied himself with pounding a piece of bast, or the inner bark of a tree, with a wooden hammer. Much of the clothing of the Amazonian Indians is made in this way; the material resembles the famous tappa-cloth of the South Sea Islands, and though not very serviceable, it has the merit of great cheapness.

The breakfast, when ready, was distributed by the *capitano* or first mate, who served each man in turn. It was devoured with a good appetite, and in a little while the crew was ready to resume the journey. The travellers amused themselves by studying the peculiarities of the forest, and took their own breakfast while the boat was floating down the stream.

"If all goes well," said the Doctor, "we shall not be long in reaching the junction with the Madeira, and the falls of that stream."

"Then we have some falls to pass, have we?" Frank asked.

"Yes," replied the Doctor, "and they are a serious hinderance to navigation. In descending we can

'shoot' some of them, though not all; but if we were ascending the river it would be different. The boats must be dragged around the falls, or their cargoes unloaded and transported to other boats beyond the falls.

"The Madeira drains an area of forty thousand square leagues," he continued, "and but for the falls would furnish water communication to the very heart of Bolivia. It is the natural waterway of the country, and its upper affluents traverse the richest agricultural region of South America. They have been partially but not wholly explored, and the actual number of miles open to steamboats is not yet known.

"There are nineteen falls and rapids, having a descent of nearly three hundred feet altogether. They are scattered along a distance of two hundred and thirty miles. Above and below there are no impediments to navigation, with a single exception in the shape of a rapid, which may be passed by a steamboat when the river is high.

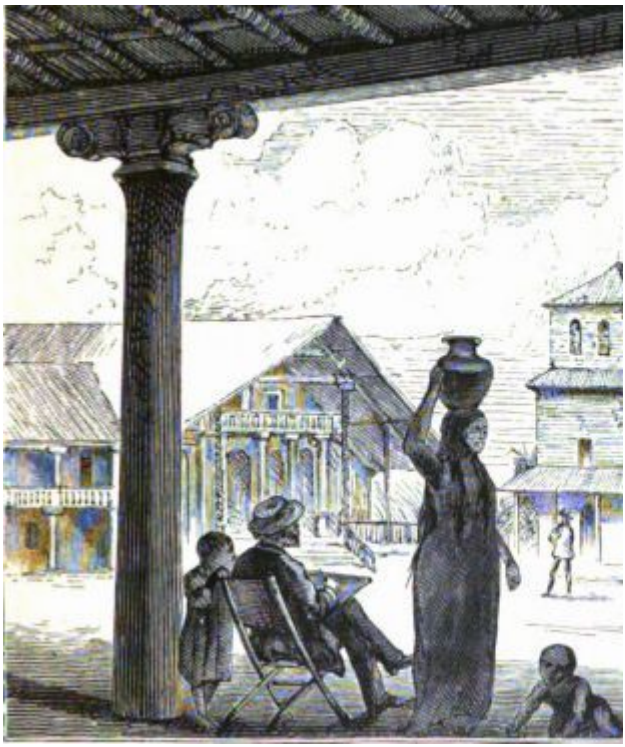
"The governments of Bolivia and Brazil have endeavored to overcome these falls by building a canal or a railway around them, and spent considerable money in the preliminary work. It was found that a canal would cost a great deal of money, far more than a railway, and so it was decided to build the latter."

"Did they build it?"

"It has not been built as yet," was the reply, "though a portion of the work has been done. A company was formed in England, principally on paper, with important concessions from the governments interested. Engineers were sent out, together with a

small force of laborers, but the project came to nothing. Then the enterprise was taken up by some Americans, who sent Colonel George E. Church, of New York, to complete the surveys and supervise the construction of the line. He reported favorably upon the prospects of business for the completed railway, which would be less than two hundred miles long. The line leaves the Madeira just below the first fall, and comes again to the Mamoré above the last one. It avoids the windings of the stream, and thus saves a considerable distance.

"Colonel Church sounded the Mamoré for six hundred miles above the rapids, and found always a depth of at least fifteen feet, a width of six hundred feet, and an average current of two miles an hour. He visited Santa Cruz, Trinidad, Exaltacion, and some other Bolivian towns and cities, and was everywhere cordially welcomed. I am sorry that our time and facilities will not permit us to repeat his journey, as it is through a region rarely seen by travellers. Colonel Church was preceded by Mr. Keller, a German engineer; and the stories they tell are full of interest.

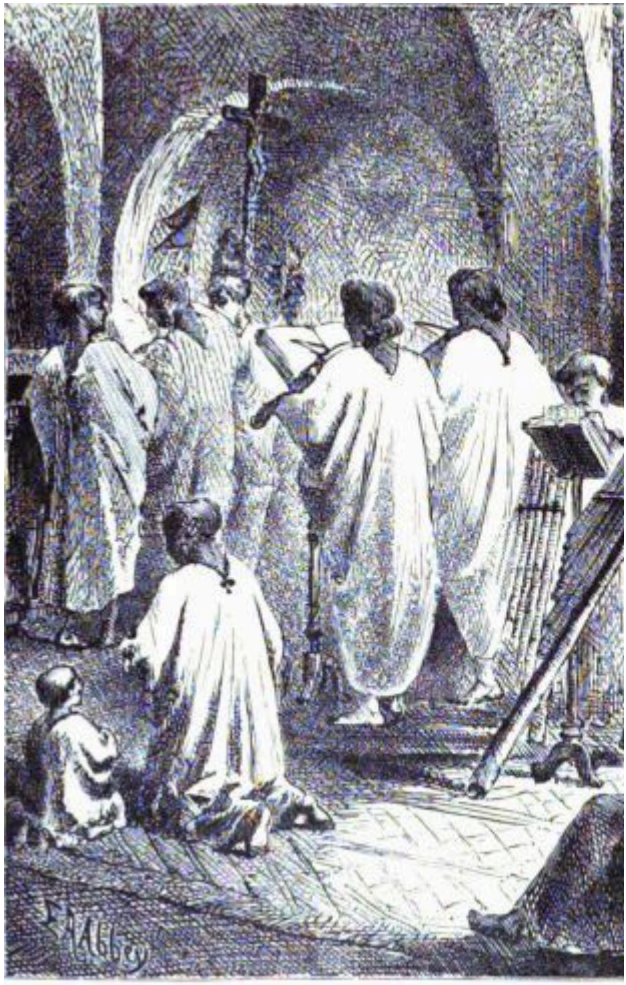


PLAZA AND CHURCH AT EX

"They describe Exaltacion as a dull, and, at first glance, a deserted town, standing a mile or more from the river. Many of its buildings are in ruins, and the walls of the houses are without paint or other ornament. The streets are wide, and the plaza is at least three hundred feet square; the church, with an isolated bell-tower, occupies one side of the plaza, while the other three sides are lined with the dwellings of the Indians, rarely more than a single story in height. The church is a large and well-constructed building; it is more than a century old, and has received very few repairs since the day of its completion.

"The Indians living in the towns of Bolivia are nearly all devout Catholics, and have been carefully trained in the observances of the Church. It is said that when the first Jesuit missionary penetrated the Beni districts of Bolivia, from the frontier of the country, that had been partially civilized, he was immediately killed. Another followed soon after, and met the same fate, and then came another.

"The Indians were astonished beyond description, as it appeared to them to be the same man they had twice put to death. He was identical in dress, appearance, and words, and evidently he was immortal. It would do no good to kill him a third time, and they held a consultation, and concluded he was a god. Thus concluding, they worshipped him, listened to his teachings, and adopted his religion, to which they have ever since remained faithful.



MOJOS INDIANS CELEBRAT

"In the church they had an organ which was played during mass by one of the Indians, while another performed on a sort of pan-pipe of enormous proportions. Several tubes were arranged side by side, and fastened together; the largest was about six feet in length, and the opening at its end measured at least four inches. The performer kept his eye on the

music before him, and blew into one pipe after another with great facility. The instrument compassed two octaves, and the sound it gave resembled that of a trombone.

"The church contains several relics, among them a piece of the True Cross, which was brought here by the Jesuits nearly two centuries ago. That the people have degenerated somewhat from their old-fashioned honesty is revealed by a little incident of Mr. Keller's visit to the church.



A MOJOS INDIAN.

"In the pedestals of two of the columns he saw some enormous nails, and asked their use. It was explained that in the time of the *Padres* all articles found in the streets were hung on these nails, so that anybody who lost anything would know where to find it. 'But to-day,' said the sacristan, 'these nails rust in their places, for no one thinks of returning what he finds.'

Colonel Church thinks Exaltacion must be an exception to the rest of Bolivia, as he found everywhere the most scrupulous honesty on the part of the people among whom he travelled. The Mojos Indians who inhabit the valley of the Mamoré are an inoffensive race, and have a high reputation for honesty and integrity.



THE CHERIMBITA.

"Some of them wear a curious ornament, known as the *cherimbita*. It is a little rod with a head, and has a general resemblance to an ordinary screw. It is made of white quartz, or some other hard material, and is worn in the under lip, which is pierced for its admission, just as ladies in America, and other countries, have their ears pierced for the wearing of ornaments.

"The other towns that were visited did not materially differ from the one already described. They had the same kind of population, the same dilapidated churches, and the same devout worshippers who adhered to the religion taught by the Jesuit fathers two hundred years ago. There was said to be a great abundance of silver in all these Bolivian towns, but it is far less than formerly. Everything imported from other parts of the world is enormously dear, while the products of the country are correspondingly cheap. At Exaltacion, English iron was worth four hundred dollars a ton, while gold at ten dollars an ounce was much easier to obtain."

CHAPTER XVII.

HUNTING THE TAPIR.—AMONG THE CARIPUNA INDIANS.—ARRIVAL AT THE FALLS OF THE MADEIRA.—MAKING INDIA-RUBBER.

One day was much like another in the descent of the river, as the party was not disturbed by hostile natives, and met with no accidents of consequence. Frank was disappointed in his hopes of hunting-adventures, as the jaguars and pumas persisted in keeping out of sight, and utterly deprived the young gentleman of an opportunity to try his weapons.



THE AGOUTI.

Less powerful game abounded, however, since the tapir and the agouti were frequently encountered. The agouti is about the size of a rabbit, which it greatly resembles both in appearance and habits. When pursued it runs rapidly for a short distance and then tries to conceal itself; if it is captured it makes no resistance beyond a plaintive cry.

The tapir deserves a more extended notice than the agouti, as he is much larger, and resists the attacks of his enemies with a good deal of vigor. Fred's account of a fight with a tapir will give an idea of the characteristics of this animal.

"The tapir is very widely distributed through tropical South America, and is probably more generally hunted than any other denizen of the country. His favorite haunts are narrow gorges and moist ravines, and the forests on the banks of all streams, whether large or small, though he prefers the latter. He is like an Englishman in desiring a cold bath in the morning, and the first tapir we saw was seated up to his neck in the water, at a bend of the river. We had told Manuel to call us when a tapir was discovered, and early one morning he roused us.

"Frank threw on his garments very hastily, and seized his rifle for a shot at the beast. As he emerged from

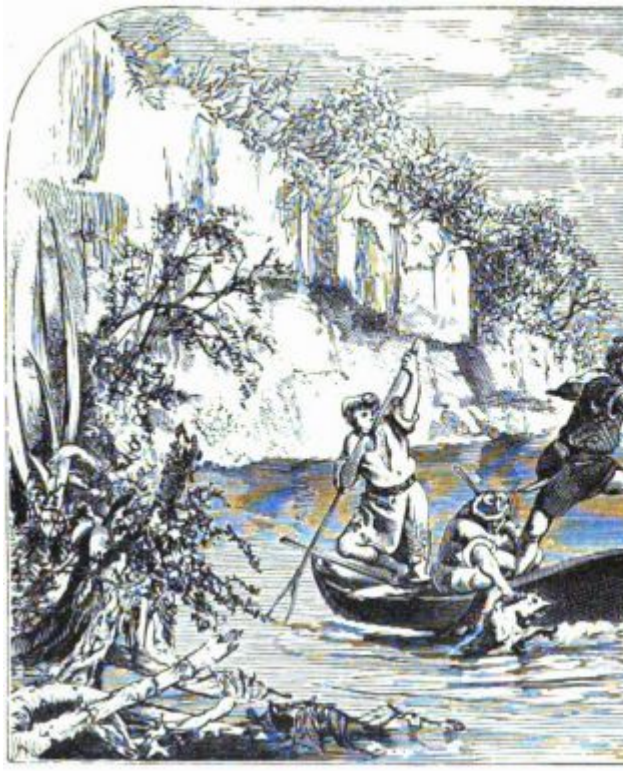
the tent our pilot whispered, 'anta' (the native name for tapir), and pointed directly ahead of our course. The men had stopped rowing, and were silently urging the raft towards the shore, where it would be concealed from what we hoped to make game of, by an intervening bush.

"The desired position was gained without disturbing the animal at his bath, and under cover of the bank we drew quite near. Only his head was visible; Frank aimed and fired, and the head disappeared. Soon it came to the surface, and there was a loud snort which showed that the beast had been thoroughly alarmed.

"The rowers now did their best, as further concealment was unnecessary. With loud cries they urged the raft forward, but the unwieldy concern could not be turned as quickly as the tapir was able to double on us. Fortunately for us, he only tried two or three times to double, or he would have escaped altogether; after these efforts he struck straight across the river, where we came up to him and were able to throw a harpoon into his back. He had been severely wounded by Frank, and after the harpoon was thrown he was easily secured. It is always desirable to harpoon a tapir after shooting him in the water, as he dives to the bottom, and if he dies there his body does not rise.

"We had tapir steaks for breakfast, and found them very good. They resembled beef, though they were rather more dry than that well-known article of food; we had been rather limited in our supply of fresh provisions, and consequently the tapir steak was not to be despised. The flesh of this animal is highly prized by the natives; it is eaten fresh, like beef or pork, and is preserved by drying or salting.

"But this is not the fight I was going to tell about. One day we stopped at a village where there was a tame tapir running among the houses; it was perfectly docile, and allowed the boys to ride on its back as often and as long as they liked. The alcalde of the village told us how it was caught, a few months' before, in a hunting-excursion, only a few miles from the place.



HUNTING THE TAPI

"The alcalde kept several dogs especially for hunting the tapir. The hunter takes his position in a canoe carefully concealed in the bushes near the end of a tapir's road. The tapir lays out his own path with the

skill of an engineer; he goes along this path regularly every morning, from his haunt to his bath in the river, and then from the river to his haunt again. The dogs are let loose near the tapir's retreat, and the frightened animal runs to the river for safety.

"He dives and swims with great rapidity, but the hunter is generally successful in capturing him. He is shot or speared as he takes to the water, evading the dogs only to fall into the hands of his human enemy.

"On the occasion I speak of the alcalde had gone for his customary sport, and roused a tapir. The keeper of the dogs was with these animals, while the alcalde was waiting at the river ready to shoot the game when it appeared. But it happened to be a female anta, this time, and she had a young tapir with her. The male flees before the dogs, but the female with a cub does nothing of the sort; she remains in her lair and defends the little fellow, who crouches beneath her and indicates his alarm by short, shrill whistles. She never yields, and is a terrible foe for the dogs. Her teeth do effective work on any of them that come too near, and her powerful fore-legs crush their ribs as though they were made of paper.

"The alcalde waited, but the tapir did not come. At length one of his men appeared, and said that two of the six dogs had been killed by the tapir and another was severely hurt. They were young dogs, and had not shown proper caution; the old and experienced ones had refrained from venturing within reach of jaws or feet, and confined their attentions to barking at a safe distance.

"The alcalde hastened to the spot, and with his gun soon laid low the desperate animal. The young tapir was secured unhurt and brought home to the village. It was kindly treated, and in three days it followed

its master around like a dog, and was perfectly domesticated. The animal lives on vegetable food (grass, fruit, and roots), and consequently he is easy to keep. This was the tame tapir that we saw; he was perfectly amiable in disposition, but his great size rendered him unsuitable to be maintained as a house pet, and he had been turned into the street to make his own living. I was told that the tame tapir never shows any disposition to return to his native wilds. In this respect he resembles the elephant, and I believe the naturalists class him in the elephant family.

"The alcalde had a houseful of pets, including several birds and monkeys, and, strangest of all, a snake. It was perfectly free, and was kept for killing rats, mice, lizards, and other things that were more destructive of the owner's property than is the snake. Manuel said it was a giboia, a species of boa constrictor; it is not poisonous, and when taken young is easily tamed. Frank was reminded of the rat-snake they had seen in Ceylon, and thought it must be the first cousin of the giboia."



WATER-SNAKES AT HOME.

Snakes are less common in South America than is generally supposed, though they are numerous enough for all practical purposes. There are one hundred and fifty species in all, while a similar area in tropical Asia contains three hundred varieties. Most of them are non-poisonous, but the proportion of venomous snakes is greater than in India or Ceylon.

The largest member of the serpent family is the boa; it has been found twenty-six feet long, though it rarely exceeds twenty feet. The largest of the boas can kill and swallow a small horse, while a goat or

sheep forms only a comfortable mouthful. One of the most venomous is the coral, which haunts the cacao plantations, and has a fatal bite. Ammonia is used as an antidote to snake-bites, but the application must be made in a few minutes, before the poison is diffused in the blood. Doses of strong coffee, brandy, or some other stimulant will sometimes keep up the action of the heart and neutralize the effect of the poison until the victim is out of danger.



RATTLESNAKE DISTURBED BY A WILD

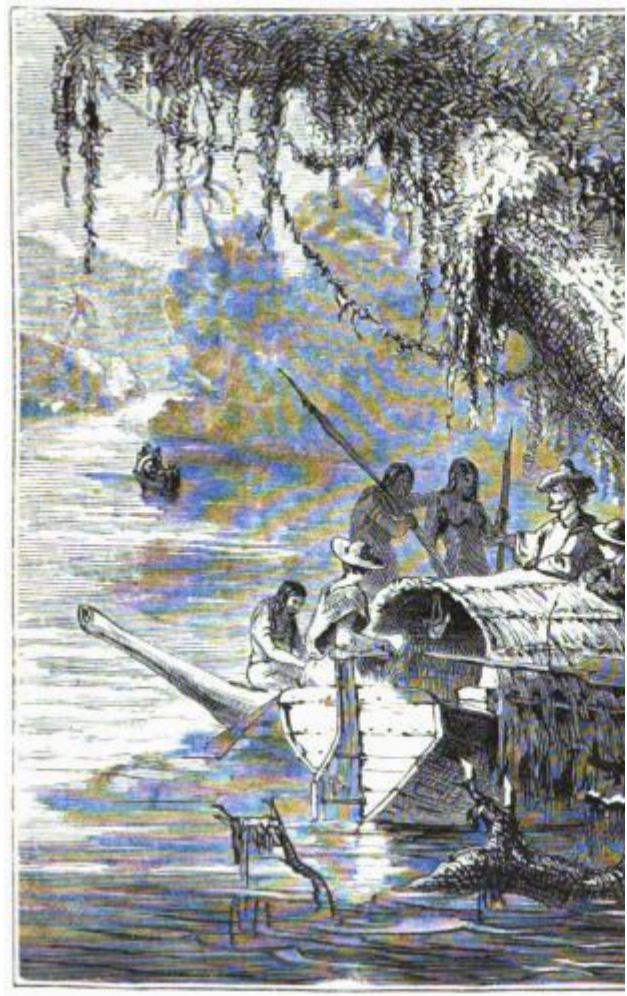
The alcalde showed some of the venomous snakes that he kept as curiosities, but wisely restrained of their liberty. Among them was a rattlesnake, which appeared to be identical with the rattlesnake of North America; a "parrot-snake" of a dull green color, which makes it difficult to discover among the grass and leaves, and a "surucucu," which does not belong to the valley of the Mamoré, but inhabits the lower Amazon and the Rio Negro. The coral snake, already mentioned, was among them; he was a pretty serpent (if serpents can be called pretty), of a vermilion hue striped with black bands. The youths stood at a respectful distance while surveying the collection, and did not care for a near acquaintance.

Manuel said that serious accidents from the bites of snakes were far less frequent than might be supposed. Natives are the principal sufferers, partly for the reason that the number of Europeans is not large, and partly because they go constantly clothed, which is not the case with the natives. It is the same as in India and Ceylon, where thousands of natives die every year from snake-bites, while not half a dozen deaths of Europeans from this cause have occurred during the century.

They passed from the Beni into the Madeira, and found the river increased to double its former volume. Frank and Fred looked anxiously up the Madeira, and wished they could explore the stream to its source; but as the wish could not be gratified, they quickly dismissed it from their thoughts. Their pilot said they were in the country of the Caripuna Indians, and it was quite possible that some of these aboriginals would pay them a visit at their next halting-place.

"The Caripunas were formerly quite hostile to the

white men," said Manuel, "and used to attack the boats that went up or down the river. With boats going down stream they could not do much, as the pilots keep in the middle of the current and float along with it, but in ascending the river it is necessary to keep close to the bank, and this was the opportunity for them to make trouble. They had a spite against the Mojos Indians, and the latter had great fear of the Caripunas, who had the reputation of roasting and eating their victims, whether they did so or not. But since the surveys were made for the railway, and trade on the river has increased, they have made no trouble; they have found that they can do better by being friendly to the white man, and begging what he has to give them."



VISITING THE CARIPU

While they were halted for breakfast three canoes put out from a nook on the opposite shore; two of them paddled across to where the raft was tied up, while the third went a little way up the stream and stopped near the bank, as if waiting to see what reception would be given to their friends. Each canoe

contained two men and one woman, all wearing very little clothing, and having their hair thick and long, so as to cover the shoulders. They had bows and arrows in their canoes, but did not offer to use them or even to pick them up, with the exception of one Indian, who took his weapons over his shoulder and stepped on shore.



A CARIPU

INDIAN.

In spite of his scanty costume he was rather picturesque in appearance, as he had ornaments in his ears and a necklace of jaguar's claws hanging on his breast. By signs, he invited the party to visit their camp on the other side of the river; the rowers were timid about venturing there, but the Doctor quieted their fears by intimating, through Manuel and the pilot, that the weapons of the party were sufficient to defend them in case of trouble.

The Caripunas were given to understand that the

visit would be made as soon as breakfast was over; they seemed perfectly satisfied with this arrangement, and returned to their canoes, where they sat until the meal was finished. The return of the boatmen to their oars was the signal for the Caripunas, who paddled on ahead and indicated the best place for landing.

The landing was made without difficulty, and the whole population of the village, some twenty or thirty men, women, and children, came out to meet the strangers. For fear of treachery, Dr. Bronson gave orders that none of the rowers should leave their places; Manuel was to remain standing by the side of the boat, and the three Americans were not to go more than a few yards from the shore, where the huts of the Indians stood about ten feet above the water's level.

An old man, who was evidently the chief of the tribe, came forward and led the way to an open shed between the two principal huts. It was evidently a place of public resort, and corresponded to the city hall or court-house of civilized lands. All the rest of the natives followed, and the conversation soon became as animated as it is possible to make it where neither party understands a word the other says. Frank observed that the skins of the natives were of a reddish-brown color, and the tallest of them did not exceed five feet eight inches in height.

Beads, small mirrors, fish-hooks, and similar barbaric goods were distributed in the shape of presents, and then our friends tried to make a bargain for whatever the Indians had to sell. Unfortunately they had only a few bows and arrows and some feathers from the birds of the forest; beyond these nothing was in the market; and as the natives were unwilling to part

with their weapons, it required a good deal of persuasion and the display of the glittering baubles to secure their consent. With these trifles the strangers were compelled to be satisfied, and after a visit of an hour or more they returned to their boat and continued the voyage.

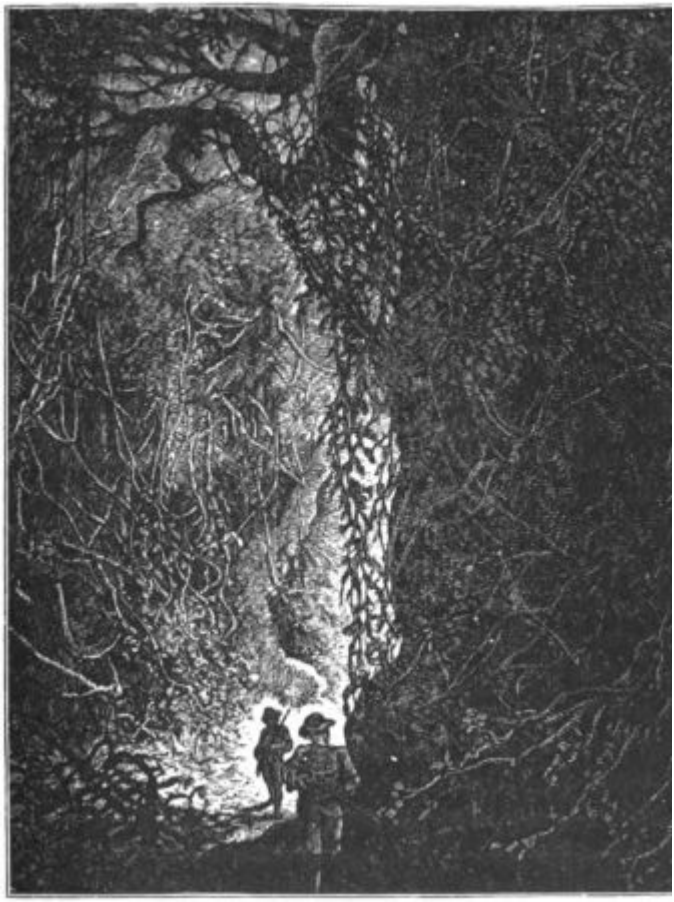
A curious fact was ascertained by Mr. Keller in his visit to the Caripunas, that they bury their dead in their houses, removing the earth of the floor for that purpose. When a space beneath a hut is occupied with graves the place is abandoned, and a new dwelling is erected elsewhere. This is deserted in its turn, under the same conditions.

The Caripunas are skilful hunters and fishermen; they cultivate the soil occasionally, but not often, depending for their vegetable food upon the products of the forest. Some attempts have been made to civilize this people, but they have not succeeded, except in convincing them that it is better to be on friendly terms with their neighbors than in open hostility.

When the travellers reached Guajara-Merim, the first of the falls of the Madeira, their contract with their boatmen terminated. The men were paid off, each one receiving a small present in addition to his wages, and the pilot a larger one, in proportion to his importance. There is a small village of Mojos Indians just above the falls, and their special occupation is to transport travellers and their property up or down the stream. Manuel opened negotiations, but they could not be rapidly pushed, as it is not the custom of this people to do anything in a hurry.

It took an entire day to finish the transaction. A "garitea," a boat of about four tons' burden and having a crew of twelve men, was engaged for the

voyage to San Antonio, at the foot of the lowest rapid. In addition to the crew there was a thirteenth man as pilot or captain, one of the twelve being second in command. Some of the rapids may be passed without danger in descending the river, and without the necessity of unloading the cargo; at others the cargo must be taken out, and the empty boat navigated down the rapids; while at others both boat and cargo must be taken around over the land. The whole distance where the boats must be drawn overland is nearly three miles, while for more than two miles the cargoes must be taken out in order to save them from possible damage or loss.



A WALK IN THE FOREST.

Frank and Fred had plenty of time for studying the falls of the Madeira and making a short excursion into the forest in the vicinity, as another day was required for getting ready to start after the bargain had been concluded for the hire of the boat and its crew. We will refer to Fred's note-book for an account of what they saw and learned.

"There is a village of Caripuna Indians," wrote Fred, "a little way inland from the falls, and we paid it a

visit. Most of the men were away on a fishing excursion, and the few that remained did not have anything we could buy. We made them some presents, but did not stay long, as we wanted to see a rubber-tree, and the manner of collecting the India-rubber of commerce.

"We had a guide from the Mojos village at the falls; he had been a collector of rubber, and spoke enough Spanish to enable us to understand his explanations. Since the surveys were made for the railway a good many Mojos Indians have settled here, and they do quite a business in collecting rubber and sending it down the river to market.

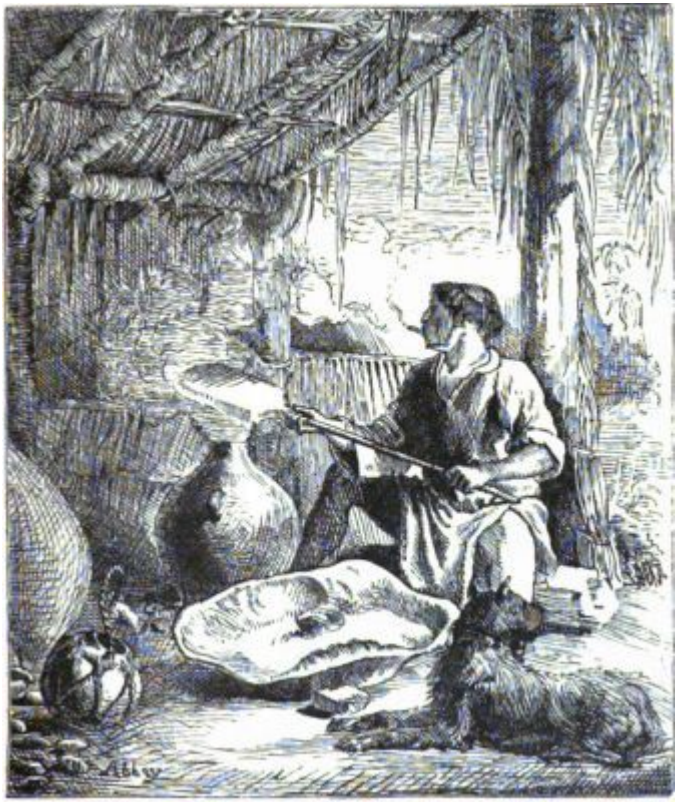


BRANCH OF THE INDIA-RUBBER TREE

"The rubber-trees are abundant on both sides of the river for a long distance in either direction. How far inland they may be found is not definitely known. The scientific name of the tree is *Siphonia elastica*, or *Siphonia cachucha*, but there are several other trees that produce the gum which is so largely used in American and European industry. An incision is made in the side of the tree, and a cup made of leaves and clay is so placed as to catch the juice which flows from the cut. In a few hours the cup is filled, and a man comes around with a large jar in which the juice is collected.

"The liquid is about the consistency of milk, and contains from ten to twenty per cent. of gum. It is poured into shallow basins, very often into empty turtle-shells, and allowed to stand in the sun, by which a good deal of the liquid is evaporated. When it is about the thickness of ordinary cream it is poured into a turtle-shell, and an Indian sits down to convert the liquid into rubber.





INDIA-R

MAKING ON THE MADEIRA.

"He has a small fire made of palm nuts, and over the fire is an inverted jar with a hole in the bottom, through which the smoke ascends. He dips a paddle into the cream, and then holds it over the hole in the jar until it is dried by the heat, which must always be gentle, through fear of spoiling the rubber. When the gum is hardened he dips the paddle again, and again dries it; he repeats the process until the desired thickness is secured.

"When the rubber is thick enough it is cut off and is ready for market. Instead of a paddle he sometimes

uses a mould of clay; formerly they made moulds resembling the human foot, and thus fashioned the rubber shoes that were worn in America forty or fifty years ago. Fantastic figures were traced on the shoes with the end of a hot wire, and the mould was generally soaked in water till it fell to pieces, and the clay could be washed out. The modern processes of working rubber have driven these shoes from the market, and very few of them are made at present.

"A good day's work for one man is six pounds of rubber. Another way of hardening the gum is to place it in a kettle and suspend it over a small fire, taking care not to burn the material. When it is sufficiently reduced, and is still warm and plastic, it is shaped into balls or bricks, weighing several pounds each; the buyers prefer to have it dried on the paddle, as the natives occasionally commit frauds by putting sand or lumps of clay inside the masses while shaping them. The deception can only be detected by cutting carefully through the mass, and dividing it into small pieces. Frank suggests that the natives have probably heard of some of the tricks attributed to Connecticut Yankees, but I think he must be mistaken.

"The rubber of the Amazon valley is considered the best in the world, and the amount of the product is rapidly increasing. I am told it is not far from six thousand tons a year, and will be increased to ten thousand tons as soon as the means of transportation from Bolivia are made more practicable. This does not include the rubber sent from the northern part of the continent, from the country not drained by the Amazon.

"We call this substance 'India-rubber,' because it was first brought from the Indies, but, properly speaking,

the name does not belong to it at the present day. The greater part of the rubber of commerce is from South America, which produces more than all other countries together."

"And why is it called *rubber*?" Frank asked.

"Because," replied Fred, "it was first used in England for rubbing out pencil-marks. It was imported into England for that purpose about the end of the last century, and was greatly esteemed by artists, who paid high prices for it; it was popularly called 'lead-eater,' and in some parts of England it is yet known by that name. It was not until 1820 that its use extended much beyond the erasure of pencil-marks; its first important use was in the manufacture of water-proof clothing, and about the same time it was employed for the formation of flexible tubes, and for other purposes.

"It is a curious fact that the uses of rubber which have been discovered in England and America in the present century were known in South America nearly three hundred years ago. In a book published in Madrid in 1615, Juan de Torquemada describes a tree in Mexico yielding a gum from which the natives make shoes and other things, and he also says that the Spaniards used this gum for waxing their canvas cloaks to make them resist water. Herrara's account of the second voyage of Columbus mentions balls which the natives of Hayti use in their amusements; he says they are made from the gum of a tree, and are lighter and bounce better than the wind-balls of Castile."

When the above notes were read over to the Doctor he suggested an addition, which was made at once.

"By far the most extensive uses of this material at

present are in its vulcanized form, as the pure India-rubber can only be employed to a limited extent. The process of vulcanizing was discovered by an American, Charles Goodyear, in 1843, and consists in mixing rubber with sulphur and heating it to a high degree. There are two kinds of vulcanized rubber, one hard and horny, and the other soft and elastic; for the first the rubber is cut into small shreds, mixed with a third of its weight of sulphur, and heated for several hours, the final heat being not less than 300° Fahrenheit. For the elastic rubber the proportion of sulphur and the degree of heat are much less. An endless variety of articles is made from the two kinds of vulcanized rubber."

"While we are on this subject," said Frank, "I wonder if there is a cow-tree in this region. The cow-tree is a South American production, is it not?"

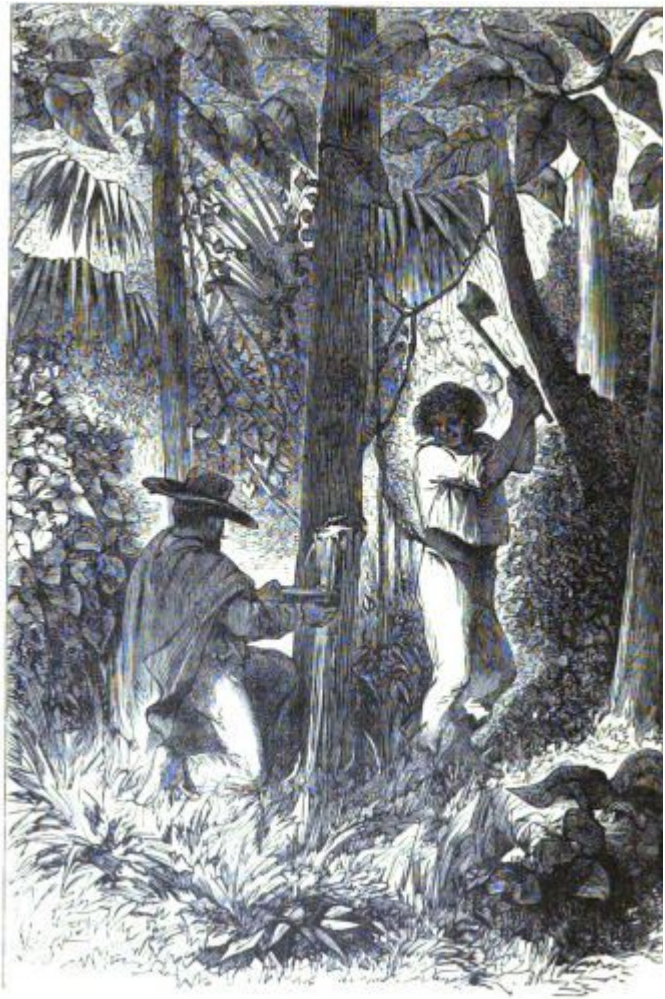
"Yes," answered the Doctor, "but it is not in this part of the continent, or, at any rate, the most famous of the family does not grow in the lowlands. There are several trees known by that name, but the *Palo do Vaca* is found principally in Venezuela and the northern part of the continent, generally at an elevation of three or four thousand feet."

"Please tell us what it is like."



LEAVES, FRUIT, AND FLOWERS OF THE COW

"It is a tall, slender tree, with leaves resembling the laurel in shape, but ten or twelve inches long. It grows in rocky places where there is very little moisture, and during the dry season its leaves are withered and the branches appear dead. But as soon as the trunk is pierced it gives forth a rich, nourishing juice that resembles milk in appearance, taste, and qualities, though it differs materially from the milk of animals. It contains a good deal of wax and fibrin, a little sugar and a salt of magnesia, the rest being water."



MILKING THE COW-TREE.

"And does it make cream like the milk of a living cow?"

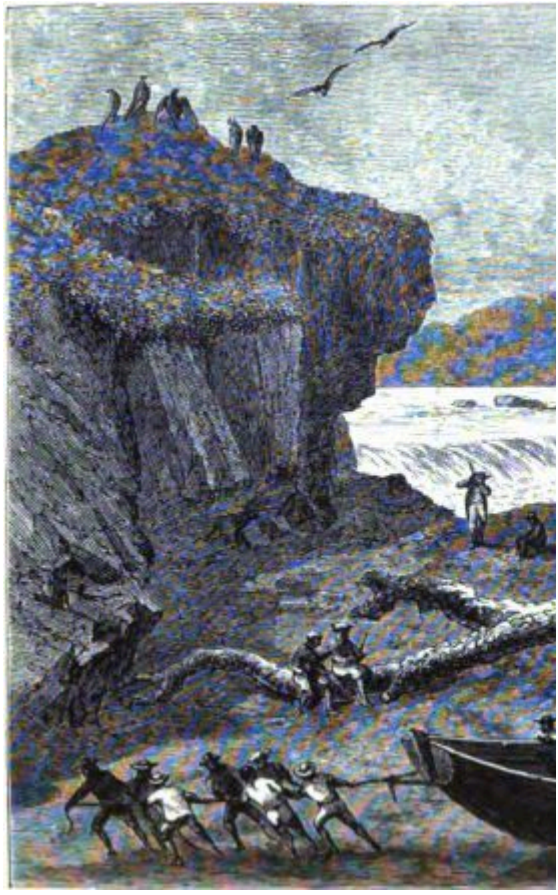
"Yes; after standing a short time it becomes yellow and forms a sort of cream on the surface; this cream will gradually thicken into a semblance of cheese before it begins to putrefy. And the tree further

resembles the cow in having its best milking-time in the morning; it yields more juice at sunrise than at any other time, and before daylight the natives gather at the trees to fill their bowls with the milk. The negroes and Indians drink freely of this milk, but the white inhabitants generally care little for it."

Frank fell to meditating upon the feasibility of introducing the cow-tree into his father's orchard, and having a supply of milk where it did not need to be driven up at night. His calculations were suddenly interrupted by the announcement that dinner was ready, and his practical nature, backed by a good appetite, put an immediate end to his enterprise.

CHAPTER XVIII.

SLOW TRANSIT.—PASSING AROUND THE FALLS.—ANCIENT INSCRIPTIONS.—THE MADEIRA TO THE AMAZON.—THE JANUARY RIVER.—THE AMAZON FOREST.



DRAGGIN(

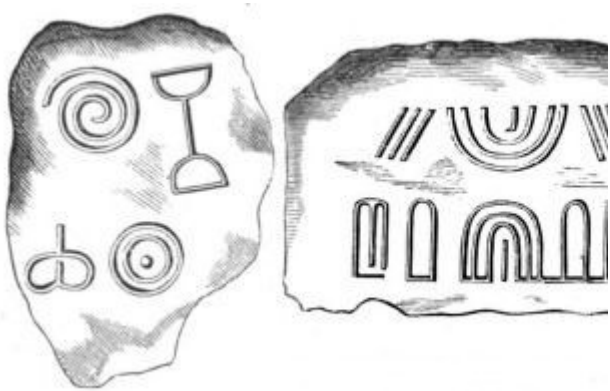
The garitea was placed on rollers, and dragged along the ground, over a road that was by no means smooth. It was hard work for the Indians, particularly as the day was warm, but they toiled steadily, and did not once pause till they had launched the boat into the river below Guajara-Merim. Then they returned for the baggage, which was distributed among them, under the watchful eyes of Dr. Bronson and Frank. Fred and Manuel had preceded the baggage, and were ready to

superintend its reception and stowage in the boat.

In spite of the difficulties of this rude mode of transportation there is a considerable traffic between Bolivia and the lower Amazon, around the falls of the Madeira. Colonel Church says it amounts to more than a thousand tons a year, and many bulky and heavy articles are carried through safely. Pianos have even been sent from Brazil to the interior of Bolivia by this route, and, what is strangest of all, they have arrived in perfect order, and were ready for use after a little attention from the tuner.

The same gentleman, in speaking of the Mojos Indians of the department of the Beni, says their imitative powers are wonderful. The law requires that all voters shall be able to write. On the day of election an Indian comes to the polls to vote for a president or a deputy to congress; without knowing a letter of the alphabet he copies in a clear and legible hand the name of the one for whom he votes. He will also copy an entire manuscript in any language, without knowing a word of it.

When everything was ready the boat was pushed off, and the voyage continued to the next rapid, where the same process was repeated. As before stated, some of the rapids were passed without the necessity of unloading, while at others the cargo, and sometimes both cargo and boat, required to be carried overland. Once the boat was run upon a rock and considerably injured, but happily none of the cargo was damaged, and neither passengers nor crew suffered harm.



INSCRIPTIONS ON THE ROCKS

During one of their halts, while passing the falls, Frank and Fred amused themselves by copying some curious inscriptions on the rocks. These were more numerous at the falls known as the Ribeirao than at any other place, and were evidently the result of long and patient work.



CUTTINGS ON STONES NEAR THE RAPIDS.

The inscriptions are nearly all in regular lines, and were made with great care. They are certainly not the work of the people now occupying this region, and their signification is unknown. They were made ages and ages ago, judging by the appearance of the

stones, and it is supposed that the cutting was done with chisels of flint or quartz. The stones bearing the inscriptions are very hard and smooth, and not far from the edge of the river at the low stage of water. In the season of floods they are covered, and the action of the water has worn away some of the lines so that they are barely visible.

Near another fall there are some deep lines cut in one of the granite rocks; they are nearly half an inch in depth, and cross each other at different angles. Whether they were made at the same time and by the same people as the others it is impossible to ascertain.

On the eighth day the passage around Teotonio, the last of the falls, was safely accomplished, and the garitea floated in front of San Antonio. This is a small town, which was founded when the surveys of the railway were begun, and has had a somewhat checkered existence. The boatmen were paid off and discharged; the baggage of the party was stored in a little house temporarily hired for its reception, and for the accommodation of the travellers.

San Antonio owes its existence to the railway enterprise. At one time several hundred men were gathered there, principally laborers from Spain and the West Indies, and it was expected that the work of opening the railway line would be vigorously prosecuted. But the men died off so rapidly as to seriously impede the undertaking; those that survived became alarmed and deserted the spot, and down to the visit of our friends all attempts to make a permanent settlement at San Antonio had failed.

There was but one white man in the place—a Brazilian, in charge of the property that belonged to the railway company. His haggard features and

sallow complexion told that he was suffering from fever, and he promptly confirmed what had been said of the unhealthiness of the region.

"The obstacle which has prevented the construction of the railway," said he, in answer to Dr. Bronson's question, "was one not easy to foresee. The engineers who visited the place, and made a preliminary examination of the route, did not remain long enough to suffer from the pestilential atmosphere, and consequently they did not know of it. But when the labor actually began the case was different, the men died off very fast, and it soon took all the time of those who could get about to care for the sufferers and bury the dead.

"There are no engineering difficulties to prevent the construction of the line, as the country is only slightly undulating, and there are but few rivers to cross. But it appears that there are terrible fevers lurking wherever cataracts in tropical countries fall over granite rocks. There are hollows between the rocks that retain the waters when the rivers fall from their highest levels, and these waters become stagnant pools. Vegetation decays in these pools, and they give off miasmatic vapors under the heat of the tropical sun. Europeans die rapidly in consequence, and even the negroes and natives cannot long endure the poisonous atmosphere.





BURIED IN THE TROPICAL FOREST.

"Mr. Davis, the English engineer who came here to superintend the work, endeavored to improve the place by blowing up the rocks at the pools, and where this could not be done he set his men to pumping out the water in order to drain off the surplus and arrest the decay. He accomplished a good deal in this way, but fell a victim to the fevers, and died in spite of all the efforts of the doctor to save him. His grave is in the forest, just behind the village.

"The loss of the chief disheartened his subordinates,

and all who could leave made haste to do so. The Mojos Indians and the Caripunas do not appear to be affected by the climate, but they cannot be induced to work at railway building, preferring employment in transporting goods and boats around the falls."

The information thus obtained made the little party of strangers desirous of leaving San Antonio as soon as possible. The Indians took advantage of their desire by demanding a high price for carrying them down the river. A steamer was expected to arrive in a few days, but they were unwilling to wait there, wisely preferring to spend the time in a less unhealthy locality. Dr. Bronson told Manuel to engage a boat at any price, on the condition that it would leave at once, and the negotiation was speedily made.

Three hours after the conversation with the Brazilian the boat with our friends and their baggage pushed off from shore, and floated on the current of the Madeira. The fever-stricken residents of San Antonio gazed sadly after them, and mourned the fortune that detained them in that deadly place.

Night came an hour or two after their departure, but the boat did not stop, as it had been agreed that the rowers would not rest until reaching the mouth of the January River, about fifty miles below San Antonio. The January joins the Madeira from the east, and at the point of junction there is a large house occupied by the Bolivian consul, who has charge of the Madeira district, extending from the mouth of that river to the falls. It was about nine in the forenoon when the boat reached this point and drew up to the bank.

Dr. Bronson had no official letters from the Bolivian authorities, as he had not visited the capital of the

country, or any of its important towns, but he was cordially received by the consul, and invited to remain until the return of the steamboat, which was expected to pass up the river the same day on its way to San Antonio. His family was away, and he had an abundance of room, and after repeated assurances of welcome the invitation was accepted.

The boatmen were retained for an excursion up the January, and the baggage of the party was carried to the rooms they were to occupy during their stay. The rest of the day was spent in the society of the consul, who told them many things of interest concerning the Madeira and its tributaries. The steamboat passed in the afternoon, making a brief stop at the landing, and it was arranged that she should return to take them away in a week or ten days at farthest.





BAN

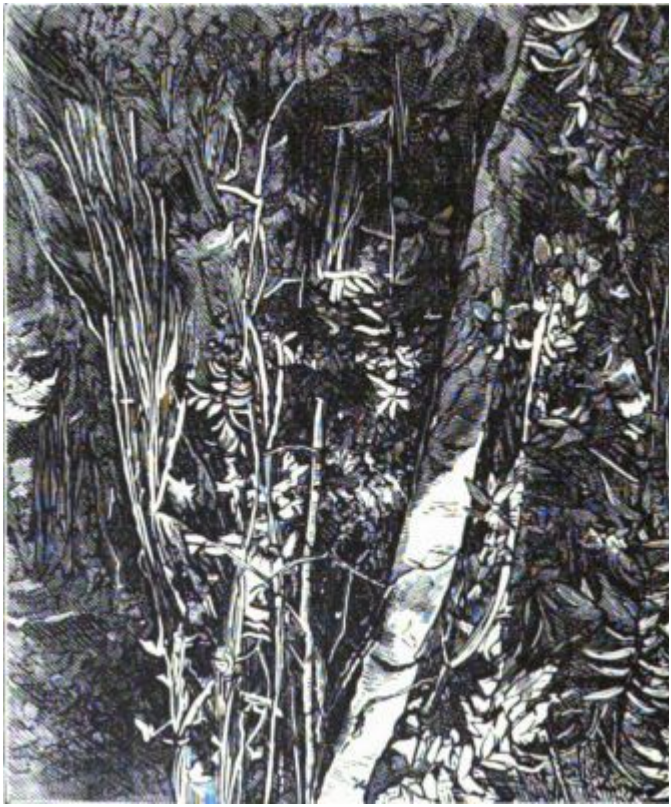
BLOSSOM.

The consul's house was a large two-story building, and the upper floor commanded fine views of the two rivers; his reception-room on this floor was open on three sides, but could be closed by curtains whenever required. A fine breeze blew during the afternoon, and both Frank and Fred declared they had not, in months, found such an agreeable lounging-place. All the sleeping-rooms were provided with mosquito-nettings; mosquitoes are abundant and persistent throughout the year, and every precaution must be taken against them.

The next morning the party went up the January with their boat, and were absent three days. They visited a camp of rubber collectors, which was controlled by a Bolivian who had obtained a grant of land, with the exclusive right of gathering rubber thereon for a term of years. He had some forty or fifty men in his employ, all Indians from Bolivia. Frank learned something about the business which he had not ascertained in their previous visit to the rubber collectors, and we are permitted to copy it from his note-book.

"The whole rubber trade of the Amazon is run upon the credit system. The employer keeps his men constantly in debt, and as long as they are owing him for goods he can claim their work. They are engaged for a term of years, but in consequence of their debts are practically never released from their contract.

"Next, the employer is in debt to the small traders in the river towns, to whom he sells his rubber; he pays very dear for his goods, and gets a low price for the products of his enterprise. Then the small trader is in debt to the wholesale dealer at Para, and the wholesalers are in debt to London and New York, where the rubber goes for a market. Heavy profits are made in every transaction, and the result of it is that the Indian who collects the gum and prepares the crude rubber works for very low wages, and is paid in goods at very high prices. The annual exportation from Para is said to be twenty million pounds of rubber, worth from six to eight million dollars.



RUBBER TREE AND PARASITES.

"Rubber trees begin to yield when they are fifteen years old, and it has been proposed to cultivate rubber by planting large areas with trees, and conducting the business like that of a coffee or sugar plantation. But the necessity of waiting fifteen years before any return can be obtained for the outlay will naturally deter capitalists from making investments."



STATION OF A RUBBER COLLECTOR.

While on the January our friends saw a new way of catching turtles. An Indian stood on the bow of his canoe, watching the water, with bow and arrow ready.

Suddenly he aimed the arrow at the sky, drew it to the head, and fired. It rose to a great height, then made a graceful curve, and descended. It struck the water within twenty feet of the Indian, pierced the shell of a turtle, and the creature was secured in the manner already described. Manuel explained that this was the only way in which the shells of the large

turtles could be pierced, the arrow obtaining great penetrative force through the momentum it acquires in descending. The Indians are so expert in this difficult mode of shooting that they rarely miss their mark.

The January is not an important river, and the only settlements along its banks are those of the rubber collectors. Some of them have made clearings, and established banana and mandioca groves, but none of these groves rise to the dignity of plantations.

The return to the consul's house was safely made, and the rest of the time of waiting for the steamer was passed in writing up the story of the journey and preparing letters for home. They did not expect to make any delay in their journey down the Amazon, and if the boat kept to her schedule she would reach Para just in time for the outward mail for New York.

The steamers leave Manaos, on the Amazon, for San Antonio on the 27th of every month, and in the busy seasons of the year there is generally an extra steamer about the middle of the month. Between Manaos and Para there is always a fortnightly and generally a weekly service each way, and from Manaos most of the tributaries of the Amazon have a monthly service as far as they are navigable. Steam navigation on the Amazon had its beginning in 1852, but its growth has not been rapid, owing to the slow development of commerce.

In 1867 Brazil declared the Amazon open to the ships of all nations, but practically the navigation of the river is under the Brazilian flag. Steamers of any nationality may ascend to Manaos, one thousand miles above Para; from that point Brazilian steamers run to the frontier of Peru, where they connect with Peruvian steamers navigating almost to the base of

the great Andean chain. At present the entire service is performed by about fifty steamers, some of large size and others light enough for the fancy of the western captain who desired a craft that could run where a heavy dew had fallen. The smallest of the steamers is less than twenty tons' burden, while the largest exceeds a thousand tons.

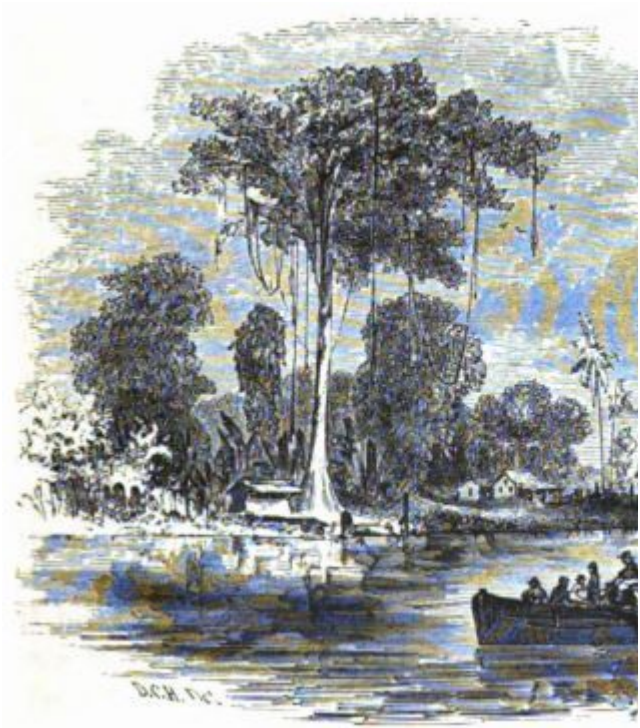
The following note by Colonel Church will give an idea of the extent of the navigable waters of the Amazon:

"South America contains seven millions of square miles. The Amazon River drains over one third of this vast area. Its basin is more than twice the size of the valley of the Mississippi. It would hold forty-nine countries the size of England. Only by floating on the majestic tide of the Amazon does one get an idea of its mass of waters. The Mississippi River, poured into it near its mouth, would not raise it six inches. In Bolivia, on the Beni branch of its Madeira affluent, two thousand miles from its outlet, it is one hundred and seventy feet deep! It presents still more astonishing soundings the same distance up the main stream. With its branches it offers not less than fifteen thousand miles of waters suitable for steamboat navigation. The Bolivian affluents of its main branch alone count three thousand miles of river navigation. One half of this is suitable for steamers drawing six feet of water, and the other half for craft drawing three feet."

The great lack of the Amazon Valley is in population; until it is peopled it will be impossible to develop commerce to any great extent. There are not fifty thousand inhabitants on the banks of the great river from a point one hundred miles above Para to the base of the Andes; Professor Orton says the Amazon

Valley is the most thinly peopled region on the surface of the globe, with the exception of the great deserts and the polar zones. Even including the savage Indians who dwell away from the rivers, the number of inhabitants is not great.

Raimondi, who is considered an excellent authority, gives the Peruvian province of Loreto, which stretches from Ecuador to Cuzco, and from the crest of the Andes to the Brazilian frontier, a population of less than seventy thousand. He puts the wild Indians at forty thousand, and allows thirty thousand for all other races and kinds of men!



A RIVER TOWN.

In their voyage down the river, Frank and Fred found

that many of the towns marked on the map had no existence whatever, and some of the most pretentious could not boast half a dozen huts. Several towns had each but a single dwelling, and one was only to be recognized by a post set in the bank to uphold a sign-board bearing the name of the place. Dr. Bronson said he was reminded of the days of land speculations in the West, when elaborate maps were printed of so-called "cities," which never had any existence beyond the paper one of the speculative founders.

Back from the river the population is as scattered and scanty as upon its banks; there is room for millions of people in the valley of the Amazon, and but for the great density of the forests, the fevers and other diseases, and the pestiferous insects that fill the air from beginning to end of the year, the country would doubtless attract emigration from the overcrowded cities and rural districts of Europe. Brazil has made repeated efforts to attract emigration, but thus far they have amounted to very little; a few thousand Germans and others have gone there, but their experience has not been such as to encourage the coming of others. It will doubtless be a long time before the Amazon Valley can honestly claim half a dozen inhabitants to the square mile.

In due time the steamer returned from San Antonio, and our friends continued their journey.

They were the only passengers, and had things their own way. The steamer had a large upper saloon, open on all sides, but capable of being closed in by curtains in bad weather. There was a long table in the centre at which meals were served, and at each corner of the saloon stood an earthen jar filled with drinking water which had been carefully filtered.

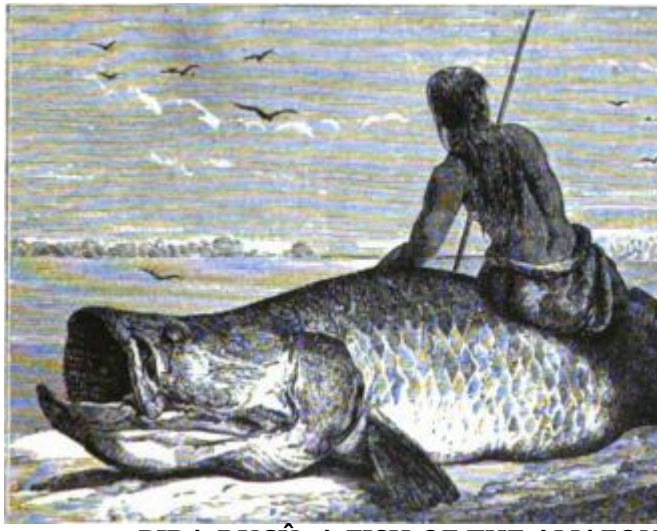
The water of the Amazon and its tributaries contains many vegetable impurities; it should not be drank without filtering, and the prudent traveller will also have it boiled.

Between the table and the sides of the saloon there were hooks for suspending hammocks; Manuel explained that they could hang their hammocks in any unoccupied places, sleeping there by night and reclining during the day. They could have private cabins on the main-deck if they preferred, but the private rooms were less airy, and not to be desired. By a party just from the trip over the Andes and down the Beni such a proposal was naturally laughed at; the youths and their mentor swung their hammocks where they liked, and enjoyed the beautiful panorama that was unfolded to their eyes as the steamer moved on her course.

Frank declared it the perfection of travelling comfort to lie in a hammock and study the scenery with hardly the motion of a muscle; it surpassed the indolence of a chair on the deck of a transatlantic steamship, or the fauteuil of a Pullman car from New York to San Francisco. But it is proper to add that neither of the young gentlemen adhered closely to his hammock during the daytime, in spite of any theories in that direction. They were here, there, and everywhere on the steamboat; now studying the magnificent forest that passed before their eyes, or gazing into the dark waters through which they ploughed their way. Turtles and great fishes were their delight, and of the former at least there was no lack. When a sand-bar was approached they eagerly scanned it with their glasses in search of alligators, and as these products of the river were abundant and sand-bars were numerous, they had plenty of

amusement in this line.

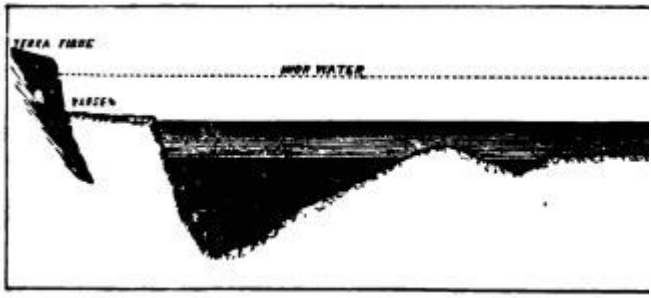
The ordinary life on the steamboat, so far as meals were concerned, was as follows: coffee was served as soon as the passengers were out of their hammocks, and if they were specially inclined to laziness they had it before they rose. Breakfast was served at ten o'clock, dinner at five, and tea at eight. At breakfast and dinner there was a plentiful supply of meat, sometimes half a dozen courses being served of meats alone. Live turtles and fowls were kept on board for the wants of the table; on the large steamers on the lower Amazon there are always a few bullocks carried along and slaughtered when wanted, in addition to chickens and turtles. Rice and farina are abundantly supplied at every meal, and the cook (a Chinaman) brought back recollections of Java and India in his skill in making curries and *pilaufs*. The captain of a steamer on the Amazon has an allowance for feeding the passengers and crew; sometimes he delegates the purchases to the cook, but quite as often he takes the matter into his own hands and does his buying in person. By so doing he avoids extravagance, and escapes the inevitable "squeezes" of the cook.



PIRA-RUCÛ, A FISH OF THE AMAZON

The captains are usually paid a salary, and commissions on the freight and passengers; in a prosperous season the commissions will amount to more than the salary, and if the captain has an inclination to dishonesty his opportunities are excellent. Most of the steamboats receive a subsidy from the government, which guarantees them against loss, and altogether their business shows a very good profit.

With stoppages at the various landings where real or imaginary villages existed, the voyage from the mouth of the January River to the junction of the Madeira and the Amazon occupied four days. It was enlivened by several incidents of an amusing character, and one or two that threatened to be serious.



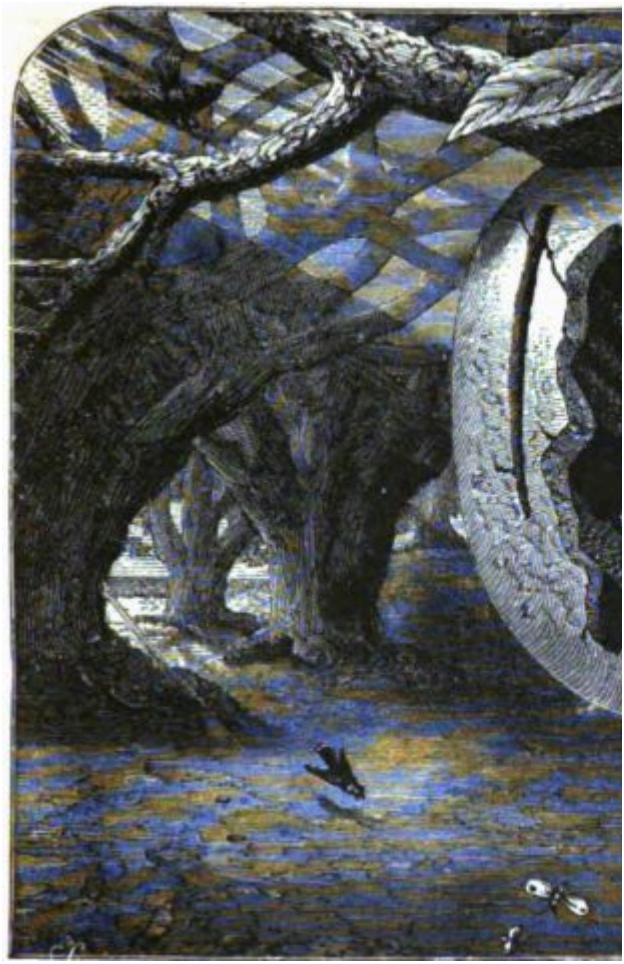
DEPOSITS IN THE AMAZON VALLEY.

Once the boat ran hard aground on a sand-bar, and for some time it was feared that the whole cargo would need to be removed to lighten the craft sufficiently to get her off. But by pulling hard upon ropes fastened to anchors placed in the rear of the boat, and a vigorous backing of the engines at the same time, they managed to get afloat. One morning, while crawling along through a fog, they crashed into the bank, but happily with no great force; some of the lighter work of the boat was broken, but the hull remained uninjured.

When near the Amazon the boat struck hard against something that was supposed to be a log. The engines were stopped, and an examination showed that instead of a log it was a huge turtle, that had evidently been taking a nap on the surface, and was unconscious of the steamer's approach.

One afternoon, as they were turning a point under the overhanging branches of an immense tree, the upper works of the boat brushed against a wasps' nest; the disturbed insects came on board without invitation, and for some minutes they made things very lively. Frank was stung on the nose, and that ornament of his face began to swell almost immediately; it was assuming gigantic proportions

when the Doctor made an application of ammonia that soon neutralized the effect of the poison, though not until the youth had suffered considerable pain.



WASP-NEST, SHOWING INTERIOR

Manuel explained that the particular kind of wasp which had caused the trouble was known as the "Yessi Marabunta," a large black wasp with a powerful sting. His nest in the limbs of a tree

resembles a Dutch cheese, and it is generally inhabited by a large family. There are several varieties of wasp on the Amazon; all of them are troublesome, and some are actually dangerous to life. Away from the rivers they are numerous in the neighborhood of springs, and cause great annoyance to cattle going to drink; in the towns and villages they take possession of the upper part of the houses, building their nests under the eaves and beneath the roof. Woe betide the individual who disturbs them in their occupations, unless he is protected by coverings their lances cannot penetrate.

While they were passing under another tree a snake dropped on board, close to where the captain was standing on the upper deck, engaged in giving directions to the man at the wheel. It was a member of the boa family, about six feet in length; though he was classed as "harmless," there was a manifest desire of the captain to get out of the reptile's way, and both Frank and Fred, who were in the vicinity, showed similar inclinations. The intruder was equally frightened, and wriggled towards the edge of the deck, whence a push with a pole sent him spinning overboard.

The beauty of the forest that bordered the river was a never-ending source of attraction to our friends. Giant trees and trees of lower stature covered the banks, and extended back from the shore as far as the eye could reach. Their trunks were almost concealed by the profusion of climbing plants, and their foliage was intermingled with bright orchids, some of immense size, and with colors rivalling those of the rainbow. The variety of the trees and plants was bewildering, and as our friends gazed hour by hour upon the ever-changing panorama, with its

ever-sameness, they realized that it would be a labor of years for a botanist, to number and classify the vegetable growths comprised in the limits of a single day's travel.



LEAVES, NUT, AND FLOWERS OF SAPUCAYA,

Fred copied into his note-book the following, from Professor Orton's narrative:

"No spot on the globe contains so much vegetable matter as the valley of the Amazon. In it we may draw a circle a thousand miles in diameter, which

will include an evergreen forest broken only by the rivers and a few grassy *campos*. There is a most bewildering diversity of grand and beautiful trees—a wild, unconquered race of vegetable giants—draped, festooned, corded, matted, and ribboned with creeping and climbing plants, woody and succulent, in endless variety.



"The flowers are on the top. On many of the trees not a single blossom is to be found at a height less than one hundred feet. The glory of the forest can be seen only by sailing in a balloon over the undulating flowery surface above. There, too, in that green cloud, are the insects and birds and monkeys. You are in 'the empty nave of the cathedral, and the service is being celebrated aloft in the blazing roof.' In place of mosses and lichens, the trunks and boughs are bearded with orchids, ferns, tillandsias, and cactuses, frequently forming hanging gardens of great beauty. The branches are so thoroughly interwoven, and so densely veiled with twiners and epiphytes, that one sees little more than a green wall. He might roam a hundred years in the Amazon thicket, and at the end find it impossible to classify the myriad crowded, competing shapes of vegetation. The exuberance of nature, displayed in these million square miles of tangled, impenetrable forest, offers a bar to civilization nearly as great as its sterility in the African deserts."

CHAPTER XIX.

FROM THE MADEIRA TO THE RIO NEGRO.—OTHER TRIBUTARIES OF THE AMAZON.—NOTES ON THE GREAT RIVER.—MANAOS.—DOWN THE AMAZON TO PARA.

Entering the Amazon from the Madeira, the steamer turned her prow to the westward and ascended the great river for sixty miles, to the mouth of the Rio

Negro. The yellow waters of the Amazon and Madeira had reminded Frank and Fred of the Mississippi; there was some dispute between them as to which of the two streams was dirtier in color, but they finally agreed that the Madeira was the worse of the two.

"We will compare the Madeira to the Missouri," said Fred, "and the united stream to the Mississippi as we see it below the mouth of the Ohio." Frank agreed to this distinction, and there the discussion ended.

The Amazon brings down a vast amount of alluvial matter which it receives from its tributaries, in addition to what it breaks away from the banks on its own account below the mouth of the Madeira. The sediment is carried far into the sea, and there is no proper delta at its mouth, as with the other great rivers of the world.

Frank made some notes concerning the great river, which we will now introduce.

"The Amazon," said he, "is undoubtedly the largest river on the globe, but it is not the longest. Lieutenant Herndon estimates its length, considering the Huallaga as the head-stream, at three thousand nine hundred and forty-four miles; another authority makes it three thousand miles; another two thousand seven hundred and fifty, and other travellers give various figures up to three thousand six hundred miles. The differences arise from disputes as to which of the tributaries should be called the head-stream.

"The Amazon is rather a vast system of rivers than a river by itself. More than three hundred and fifty branches and tributaries unite to form the Amazon; all the rivers flowing from the eastern slope of the Andes from three degrees north latitude to nineteen

degrees south latitude, a distance of two thousand miles, as we follow the windings of the mountain chain, pour into the Amazon and contribute to its immense volume. It is three hundred and twelve feet deep at its mouth, and where it crosses the Brazilian frontier at Tabatinga it is sixty-six feet deep! The *Great Eastern* steamship might navigate it for more than a thousand miles from the sea.



NATIVES ON THE MIDDLE

"Half a million cubic feet of water flow out of the Amazon every second, or thirty million cubic feet in a minute. The ordinary current is three miles an hour. Two thousand three hundred miles from the sea it is three fourths of a mile wide, at the mouth of the Madeira it is three miles wide, and below Santarem it is ten miles from side to side. Its mouth is said to be one hundred and eighty miles wide, but this is hardly a fair statement of the case, as the island of Marajo occupies a large portion of the mouth, and the river reaches the ocean through many channels.

"The tide is perceptible five hundred miles from the sea; it does not carry the salt water up with it, but

there is simply a rise and fall of the fresh water. So great is the volume of the Amazon where it enters the sea that ships can dip up fresh water while yet out of sight of land."

"In speaking of the tide," said the Doctor, "don't forget to mention the *pirorόco* or 'bore' of the Amazon."

"I was just coming to it," replied the youth, "and cannot do better than quote a description by La Condamine, written more than a hundred years ago. Here it is:

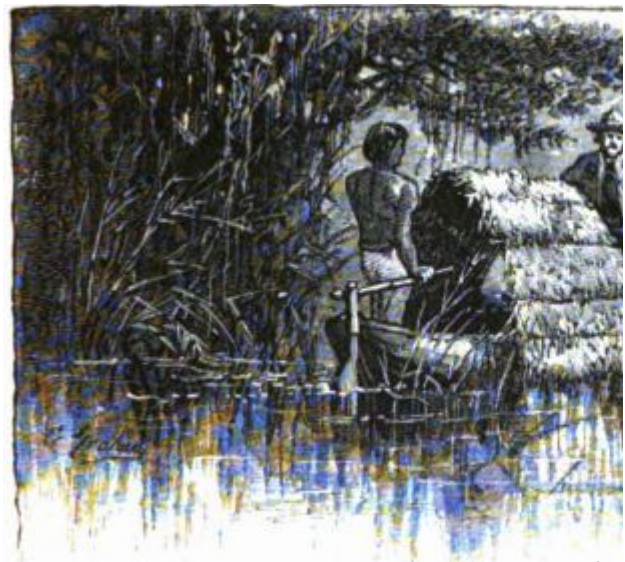
"'During three days before the new and full moons, the period of the highest tides, the sea, instead of occupying six hours to reach its flood, swells to its highest limits in one or two minutes. The noise of this terrible flood is heard five or six miles, and increases as it approaches. Presently you see a liquid promontory, twelve or fifteen feet high, followed by another and another, and sometimes by a fourth. These watery mountains spread across the whole channel, and advance with a prodigious rapidity, rending and crushing everything in their way. Immense trees are instantly uprooted by it, and sometimes whole tracts of land are swept away.'"

"It must be a terrible thing for boats to encounter, especially the small ones," Fred remarked, as Frank concluded the above description.

"It is," Dr. Bronson answered, "and many of them are lost every year. But those engaged in navigating the river know when to expect the bore, and take precautions against it. They have *esperas*, or resting-places, where they are sheltered from its force, and wait until it has passed.

"The bore is not confined to the Amazon," continued

the Doctor; "it is known in other rivers, especially in the Hoogly, below Calcutta, but the bore of the Amazon is undoubtedly the largest."



IN AN IGARIPÉ.

"Another curious feature of the Amazon," said Frank, resuming, "is the great number of lateral channels, which are technically called *igaripés*, or canoe-paths. Boats may go for hundreds of miles along the lower Amazon in the *igaripés* without once entering the main stream. They remind us of the bayous of the lower part of the Mississippi Valley."

"Don't forget," said Fred, "that the Amazon rises within sixty miles of the Pacific Ocean, and touches every country of South America except Chili and Patagonia. The Madeira rises close to the sources of the La Plata, while the Negro, the great northern tributary of the Amazon, is connected with the Orinoco by a navigable canal called the Cassiquari. The navigation of this network of waters is favored

by nature; the current is eastward, while the trade wind blows west from the Atlantic, so that ships going either way have the stream or the wind to help them along."

"And another thing," said the Doctor, "that should be mentioned, is the annual rise and fall. There is a succession of freshets in the tributaries of the Amazon, so that the main stream can never run low. Most of its affluents are in the southern hemisphere, and consequently the river has its greatest flood when the sun is south of the equator. The rise is gradual, beginning in September or October, and increasing not more than one foot daily, and often less than that. The difference between the highest and lowest levels is about forty-five feet, and at the time of the flood vast areas of land are covered with water. Once in every six years the flood is greater than usual."

"The Amazon is too large to be content with one name," said Frank. "From its mouth to the junction with the Negro it is called the Amazon, or the Amazons; from the Negro to the Peruvian frontier it is the Solimoens; and the part in Peru is the Marañon. But these distinctions are passing away since the river was opened to universal navigation; the Solimoens is now generally called the Middle Amazon and the Marañon the Upper Amazon. Probably another twenty years will see the old names disappear altogether."

Manaos is on the Rio Negro, ten miles above the junction of the latter stream with the Amazon. Frank and Fred observed with interest the change from one river to the other, which was as marked as that from the Mississippi to the Missouri, near Alton, Illinois. The Amazon is yellow, while the Negro, as its name

indicates, is black. For miles the line between the two waters is sharply defined; they hold apart from each other, as if unwilling to mingle, but the greater river at length absorbs the smaller, and henceforth, to the sea, the yellow color is retained.

The youths dipped some water from the two rivers and placed it in glasses side by side. That of the Amazon was like milk, as sometimes seen in boarding-houses or cheap restaurants, while the water of the Negro was clear, with a tinge of red. The difference in the banks of the rivers was as marked as that of their waters, those of the Amazon being low and broken, as on the Mississippi. The banks of the Negro gave no indication of alluvial washings, but presented many sandy beaches, backed by low hills covered with dark forests, in which few palms or similar trees were visible.

The steamer anchored in front of Manaos, and the little party went on shore. They found a town resembling some of the river-landings in Arkansas or Missouri, with the addition of tropical surroundings. It straggled along the shore and back over the undulating hills for a considerable distance, and at first glance resembled a city of no small importance. It had about four thousand inhabitants, but there is room for many times that number when all the "lots" are occupied with well-filled dwellings. On an elevation in the centre is the cathedral, which was unfinished at the time of Dr. Bronson's visit, and has been a work of very slow growth since its foundation.

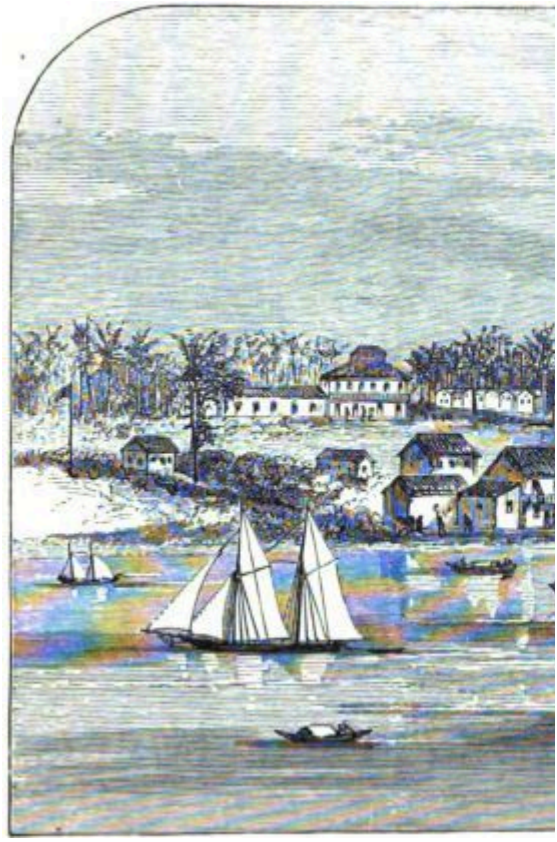
Facing the river is a large open square with a few palm-trees on its borders, and near the water there are several buildings variously occupied as custom-house, hotel, and steamboat offices. A long avenue

known as Brazil Street runs through the town, with its ends on two *igaripés*, or canals; these canals run back from the river, so that Manaos is surrounded on three sides by water. The houses are by no means crowded, as in most European cities, but each has a comfortable area of ground around it, affording good ventilation and plenty of moving space.



FRUIT-PEDLERS.

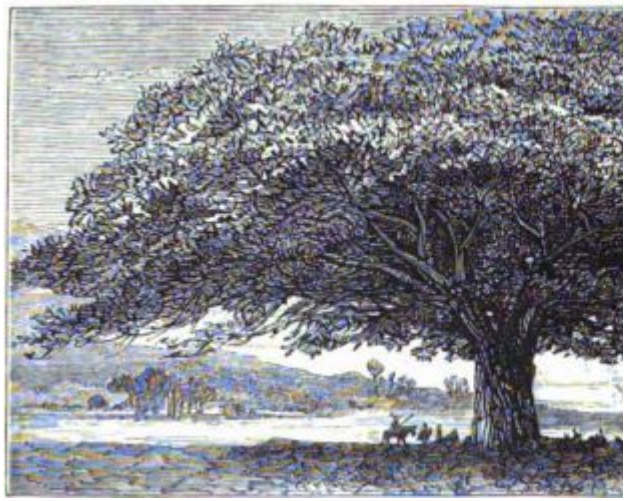
Manaos is destined to be the St. Louis of the Amazon Valley, as it is the diverging and converging point for a great deal of commerce. Freight up or down the Amazon and its tributaries is generally transshipped here, and at some seasons of the year the river front is a scene of much activity. The population is a mixed one, and includes negroes, Indians, Brazilians, Portuguese, Italians, and half a dozen nationalities of Europe, together with a few Chinese and East Indians, and occasionally Englishmen and North Americans. As the commerce of the Amazon Valley develops, Manaos will grow in population and wealth, and the day may not be far distant when ocean steamers will receive their cargoes at its docks instead of at Para.



A

Frank and Fred wished to make some purchases, and sallied out for that purpose. They returned with the declaration that Manaos was like home in one respect, according to the old song, as it was "The dearest spot on earth." Hardly anything they saw was the product of the country; everything was imported, and the importers held their goods at high prices. An American whom they met said there was little agriculture in the surrounding region; beef came up the Madeira; sheep, and other meat-supplying animals were imported, and so were hams and all

other preserved edibles; while manufactured articles were from New York, Liverpool, or other Atlantic ports.



GIANT FIG-TREE.

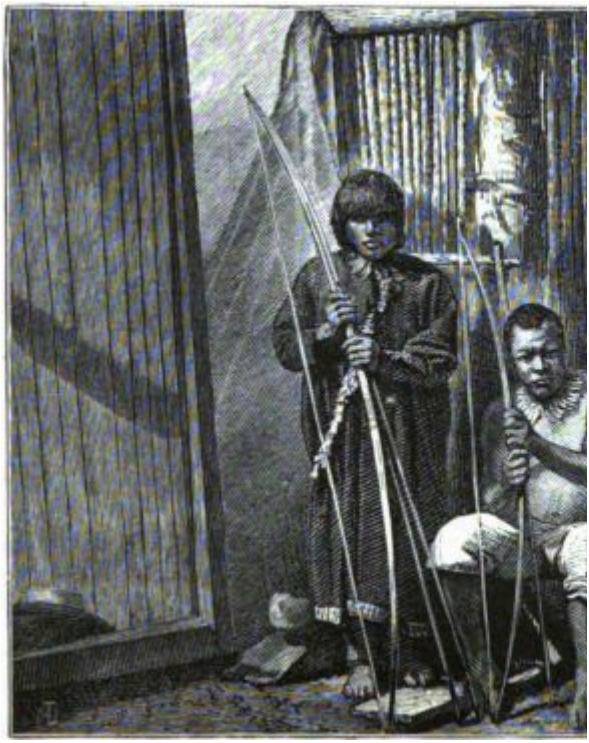
Fred asked what were the industries of Manaos, and was told there were none at all.

"Brazilians and Indians will not work," said his informant. "The immigrants from Europe live by trading. Since their emancipation, the negroes prefer fishing to any other mode of existence, and the Americans that came here as colonists have mostly gone back disappointed. There is really no laboring class here, and until there is we can have no agriculture. The land would produce abundantly, but there is nobody to cultivate it. I doubt if there are five hundred acres of tilled land on the Amazon, between this point and the foot of the Andes."

The exports of Manaos are rubber, coffee, sarsaparilla, Brazil nuts, pissaba, chinchona, fish, and turtles. The imports are cotton cloth, beads, and

other "Indian goods" for the natives, and various articles of necessity or luxury for the European inhabitants. The surrounding country is diversified with valleys, hills, and ravines, and not far from the place is a pretty cascade ten feet high and fifty feet wide, falling over a precipice of red sandstone. The sheet of water resembles Minnehaha in its general outline, but its peculiarity is in its deep orange color, obtained from the soil through which the streams flows.

The youths wished to ascend the Rio Negro, but circumstances did not permit the excursion. The Negro rises in Colombia, and is twelve hundred miles in length; at one place it is ten or twelve miles in width, and at Manaos not less than two miles. During the flood of the Amazon the dark waters of the Negro are dammed and held back, for hundreds of miles, by the rise of the giant stream. The natural canal, the Cassiquari, which connects the Negro with the Orinoco, is half a mile wide, and drains off the superfluous waters which go to swell the lower part of the last-named river.



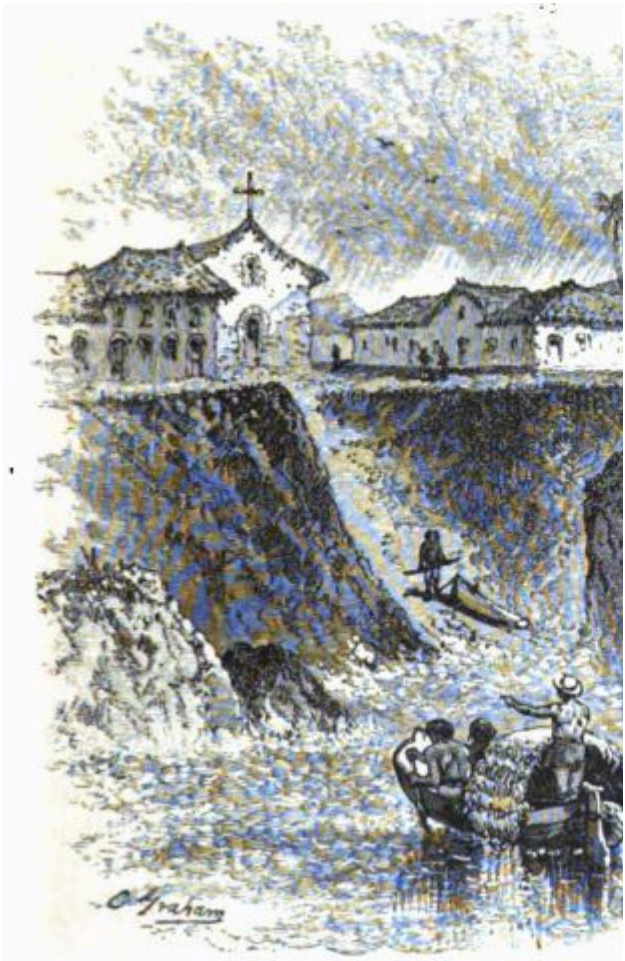
NATIVES OF THE BA

Other great tributaries of the Amazon are the Huallaga and the Ucayali; both rise on the Peruvian Andes, the latter near ancient Cuzco. Either can be compared to the Ohio, and both are navigable for long distances. Like the other streams that flow into the Amazon, they run through regions with few inhabitants, and consequently there is little commerce along their banks. There are many rivers as large as the Hudson or the Connecticut, that are unknown to geographers, and not named on the maps.

Glad enough were our friends to leave Manaos, after a day's detention, and descend the Amazon. The heat

was severe, the thermometer mounting to ninety-two degrees Fahrenheit, with a damp atmosphere, which made the temperature very oppressive. Manaos has the reputation of being the warmest spot on the Amazon; the mercury mounts very often to the nineties, and can touch ninety-eight without apparent effort. There are few amusements, and the most comfortable occupation is to do nothing. The European residents indulge in balls and parties, but more as a matter of form than for the sake of enjoyment.

Aided by the current, the steamer made the sixty miles between Manaos and the mouth of the Madeira in a trifle over four hours. The boat resembled the one on which they had descended the Madeira, but was more than twice as large; the arrangement of the cabins and decks was the same, and each traveller hung his hammock between the decks, and took advantage of the cooling trade wind that blew up the river.



A BRAZILIAN LANDING-

Frank's inquiring mind led him among the boxes, bales, and bags which comprised the freight of the steamer; he was accompanied by Manuel, who answered the youth's questions to the best of his ability. Where he did not know the correct answer he followed the custom of the country in giving the first that his imagination suggested.

Frank's first question related to pissaba.

"Pissaba comes from the Pissaba palm," said the guide, "and is a fibre which is manufactured into cables and ropes, and is exported to Europe and America to be made into brushes and brooms. It is stronger than hemp, and more elastic, and if the people were enterprising it could drive hemp out of the market for many uses."

"Please tell me about Brazil nuts," was the next suggestion.

"Brazil nuts grow on one of the tallest trees of the forest," was the reply. "There are eighteen or twenty nuts in a hard shell like a cannon ball, and they are packed in so wonderfully that when once taken out no man is ingenious enough to put them all back again. I have seen Brazil-nut trees two hundred feet high, and fourteen feet through at the base, and not a branch within a hundred feet of the ground."

Frank asked how the nuts were gathered.

"They are allowed to ripen and fall to the ground," answered the guide, "partly because they will not keep if picked from the tree, and partly because it is difficult and dangerous to climb for them."

"It must be equally dangerous to stand under the tree, and risk being hit by one of the falling nuts."

"It is," was the reply. "The large shells or cases are five inches in diameter, and weigh two or three pounds; in their descent they attain a momentum resembling that of a cannon-ball, and often bury themselves out of sight in the ground. A nut falling on a man's head will certainly break the shell, and this has happened in many instances.

"The nut-gatherers build their huts among the trees,

or more often a little distance from them; if under the trees, they give the roof a sharp incline, so that nuts falling upon it will slide off and do no harm. The wind blows in the morning, and at that time the gatherers stay at home, employing their time in breaking open the shells of the previous day's collection, and getting the nuts ready for packing in sacks. When the wind ceases they go out and collect what have been shaken off by the breeze.

"It is a hard life," continued the guide, "and many of the people die in consequence of the fatigue and exposure. They must tramp through the forest, and bring in heavy loads of nuts; they have scanty food; and the swamps and forests are full of malaria. They suffer from fevers and rheumatism, and are without medicines; they receive very low wages, and are constantly in debt to their employers; they lose their way, and starve to death; and sometimes their canoes laden with nuts are overturned, and the occupants drowned. But all these dangers combined are less than the peril from the falling nuts, and not a year passes without the death of nut-gatherers from this cause.

"The trade is conducted on the credit system, very much like that of the rubber-collecting industry. The annual shipment of Brazil nuts from Para is about eleven million pounds; and the nut trade is the third in importance among foreign exports, rubber and cacao being the first and second."

"Who eats the nuts?" was the next interrogatory.

"I don't exactly know," answered Manuel, "but am told that more than half of the nuts sent from Brazil are eaten by schoolboys in England, France, and the United States."

"Yes, I remember now," said Frank, "but had forgotten for the moment the hard, black, triangular nuts we used to buy in our school-days. They are favorites with boys, but the taste for them seems to disappear as we grow older. Now, please tell me about cacao."

"Cacao is cultivated in Brazil and other lowland countries of South America," replied Manuel, "but I can't tell you much about it. You must ask Dr. Bronson."

At this moment the Doctor happened along, and Frank repeated his question.

"Cacao is the substance from which chocolate is made," he explained, "and it is the same as the French '*chocolat*' or '*coco*.' It is cultivated in tropical countries, twenty-five degrees each way from the equator, and sometimes the forests of cacao are miles and miles in extent. It grows to a height of twenty-five or thirty feet, and resembles a black-heart cherry-tree in size and shape. It is an evergreen, and has a smooth, oblong leaf, terminating in a sharp point. The fruit resembles a short, thick cucumber; it is from five to nine inches long, and contains from twenty to forty, or even fifty, beans which resemble the pit of an almond. From these beans the chocolate of commerce is made."

"Do they make it here or export the bean to other countries?" Frank inquired.

"The beans are separated from the pulp that surrounds them, and when dried are ready for market. Sometimes they undergo a fermentation to remove certain acrid qualities, but, except for local use, no attempt is made to manufacture the chocolate here. The manufacturing is done in

England, France, and other countries, by means of delicate but powerful machinery. The shells of the seeds are of a dark-brown color, quite thin and brittle; they are the cocoa-shells which are sold in American grocery-stores to be used in making 'cocoa' for our tables.

"A rich oil is made from the seeds, but its manufacture is less profitable than the sale of the seeds for making chocolate or cocoa. The trees begin to bear when four years old, and the harvest season is in July and August; the industry is said to be profitable when properly managed, as the expense of maintaining a plantation is not great, and the harvest season occurs when other industries are at a standstill. The pulp that surrounds the seeds is made into a refreshing drink for immediate use, and some of the planters make from it a jelly which is said to equal the famous guava jelly. The outer shell is burned, and its ashes are the basis of a strong brown soap, like the home-made soap of New England."



THE ANT-EATER ASLEEP.

Fred interrupted the conversation by calling attention to an ant-eater, the property of one of the passengers, which was secured in a cage containing an upright branch of a tree for its accommodation. Manuel said the beast made his home in the trees, and lived on the tree-ants, which were numerous in Brazil. He sleeps by day, and roams at night, and when he sleeps he gives his whole mind to it. He has strong claws and a prehensile tail; by the use of these, and by placing his head in the fork of a limb, he can slumber without any fear of falling out of bed.

The fellow was taking his afternoon nap, and the

youths did not disturb him. Fred make a sketch of the ant-eater in repose, and pronounced him a model drawing-model, as he did not move a muscle during the time required for taking his portrait.

The first stopping-place of the steamer was at Serpa, thirty miles below the mouth of the Madeira; it was a town of about one hundred houses, with as mixed a population as that of Manaos, though not as numerous. The proportion of negroes seemed larger than at Manaos, and Manuel said they would find this the case in each of the river towns as they approached Para. They took on board a considerable quantity of rubber, and then steamed onward.



THE MOUTHS OF THE AM

One hundred and fifty miles farther on they stopped at Villa Nova, the twin brother of Serpa in size and general appearance. Here the Amazon began to

contract its banks, and the current increased in strength until, at Obidos, one hundred miles beyond Villa Nova, they found it narrowed to about a mile in width. The river is here two hundred and fifty feet deep, and its velocity, according to Professor Orton, is 2.4 feet per second. All the water of the Amazon does not go through this passage, as there are lateral channels which carry off a considerable quantity. Obidos is on a high bank of hard clay, and presents a bold front to the river. There are many cacao plantations in the vicinity; from Villa Nova to Para these plantations are numerous, and the industry is more important than anything else.

The river widened again as they moved on to Santarem, which is fifty miles below Obidos, and occupies a healthy position at the mouth of the Rio Tapajos, five hundred miles from the ocean. This river sends to market rubber, sarsaparilla, Brazil nuts, farina, and copaiba, and there are several cattle estates along its banks. Colonists from the southern states of North America settled here after our civil war; some of them established a prosperous business, but the greater number went away disappointed. Those who remain cultivate the sugar-cane and make sugar; some are engaged in commerce, and others have gone to rearing cattle and making butter. The latter industry was formerly unknown here, all butter used in Para, and elsewhere on the Amazon, being imported from Europe or the United States.

Below Santarem the river increased in width so greatly that at times both banks were not visible from the steamer. Several unimportant points were visited; rubber, cacao, and other products were received at the landings; and the horizon of tropical forest along the banks retained its luxuriance and

monotony. There were few signs of animal life beyond an occasional hut of a rubber-maker, or a group of natives gazing idly at the steamer.

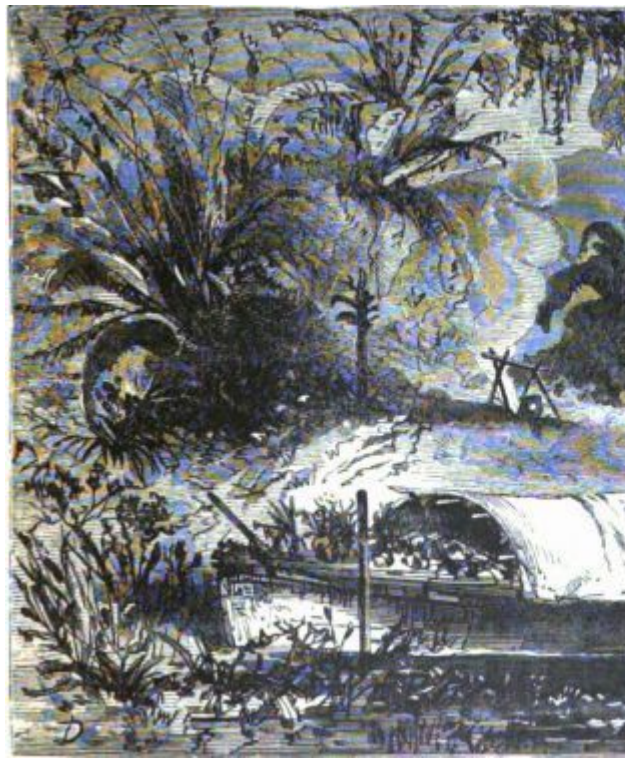
After stopping a little while at Breves, on the southwest corner of the island of Marajo, the steamer next entered the part of the Amazon known as the Para River. Eighteen hours after her departure from Breves she dropped her anchor in the harbor of Para, and ended the journey of our friends across the South American continent.



PARA, FROM THE RIV

CHAPTER XX.

PARA.—ITS BUSINESS AND CHARACTERISTICS.—THE ISLAND OF MARAJO.—DOWN THE COAST.—PERNAMBUCO.—THE SUGAR INDUSTRY.



ENVIRONS OF PAR

Para is an important seaport, and has regular communication with Europe and America by several lines of steamers. Naturally, the trade of the Amazon Valley centres here; Para is nearer to Europe and North America than is Rio Janeiro, and therefore it possesses great commercial advantages over the capital. It has a population of little less than fifty thousand, and but for the political troubles which have fallen upon it at different times, and the laws which hamper commerce, it would have more than double that number of inhabitants.



A TROPICAL PLANT.

We will read what Frank and Fred had to say of their visit to this *entrepot* of the Amazon.

"It was a great pleasure to us to reach this place, the first real city we had seen since we left Lima months ago, and thousands of miles away. Here we find gas and street railways; theatres and hotels; paved streets, and markets with roofs; houses elegantly furnished, and built as though intended for something more enduring than the thatched huts of the interior; public and private carriages, though not many of the latter; well-dressed men and women; churches and schools; prosperous merchants and

extensive commercial houses, together with many other attributes of a permanent city. Several visitors have remarked that it was founded in the year that saw the death of Shakespeare, and we will follow their example. Its history dates from 1616, when Francesco Caldeira laid the foundations of a fort which was intended to close the Amazon River to foreigners who had begun trading with the Indians. Its full name is Santa Maria do Belem do Gram Pará, but nobody in this busy nineteenth century thinks of stopping to pronounce it; it is called simply 'Pará,' with the accent on the last syllable.

"It has had several insurrections, which have retarded its prosperity and caused the death of many of its citizens. In one of these insurrections two hundred and fifty of the most prominent participants were carried on board a ship in the harbor, and confined in the hold. There was no ventilation, and the prisoners struggled and fought for air; those who came near the hatches were shot, and finally the hatches were nailed up. They remained closed until the next morning, when only four persons were found alive! It was the Black Hole of Calcutta of the western hemisphere!

"In a later revolt, thirteen war-ships that had been sent from Rio Janeiro were sunk by the guns of the fort, but a land force of soldiers succeeded in restoring the national authority and suppressing the insurrection. Since that time the city treasury has been plundered by successive 'rings,' resembling the Tweed organization in New York, and altogether Para has had a hard experience. At present it is said to be in honest hands, and we hope it may always remain so.



A DEALER IN MONKEYS.

"Our first walk was through the commercial quarter, where we found most of the buildings solidly constructed, and generally two stories high; they are of brick or stone, plastered on the outside, and either painted or whitewashed so that the exact nature of their material is not readily ascertained. Formerly most of the merchants lived above their offices, but of late years they have established residences in other parts of the city, and the old fashion of living is generally abandoned.

"We entered the first tram or street-railway car that we saw, and rode out nearly five miles along the

beautiful Rua de Nazareth, or Nazareth Avenue, to Marco da Legua, the terminus of the line. Here we found the public wells of the city, and a great crowd of negro laundresses, besides the water-carriers, with their water-hogsheads mounted on wheels. They were as noisy as they were numerous, and so loud and animated was the conversation that we looked around every moment, expecting a fight with a free use of knives. Happily they confined themselves to words and gesticulations, and we have no scene of bloodshed to record.

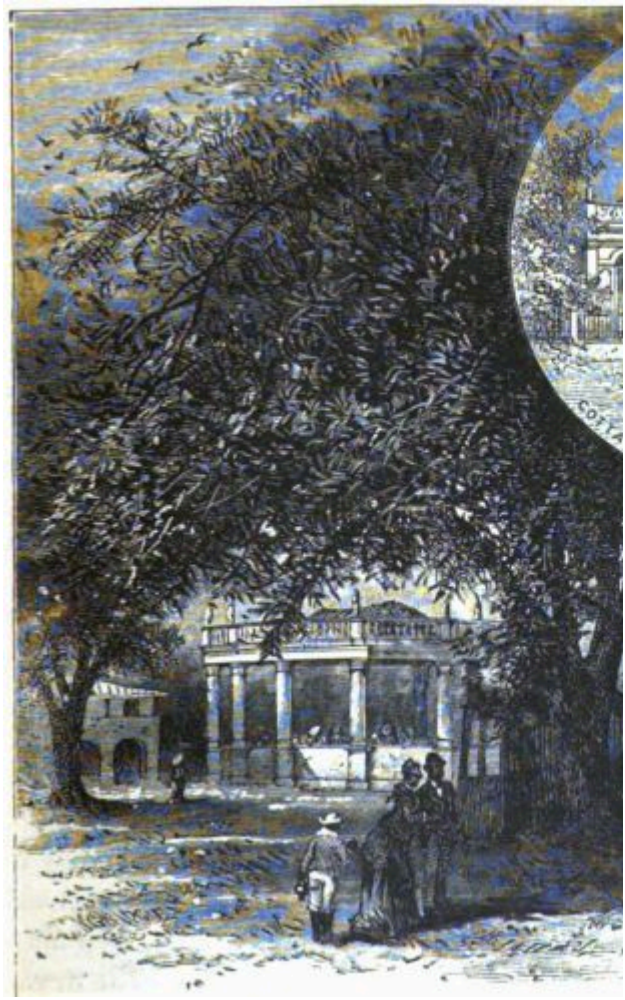
"The water-carriers are generally known as *Gallegos*; the term is a contemptuous one, applied by the Portuguese to the Spanish emigrants from Galicia, who go to the cities of Portugal and embrace the occupation of carrying water. The Brazilians have adopted the word, and apply it to the Portuguese; a good deal of enmity is kept alive by its use, which is as offensive to an inhabitant of Para as the term 'Paddy' applied to an emigrant from the Emerald Isle, in an American city.

"For the first two miles of its course the Rua de Nazareth is lined with pretty dwelling-houses, and every year there is an addition to the number. Few avenues that we have seen are more picturesque than this. The sidewalks are shaded with tropical trees, and the air is filled with the odor of lemon and orange blossoms, together with similar floral perfumes. In our morning's ride we saw, on this avenue, and on some of the streets leading from it, not less than a dozen varieties of trees peculiar to the region of the equator, and we needed to shut our eyes only for a moment to imagine ourselves again in Singapore or beneath the tropical sky of Ceylon.



STREET IN PARA WITH SILK-CO

"Orange and lemon trees alternated with traveller's palms and silk-cotton trees, and these again with the producers of the almond and cocoa-nut. One of the most attractive of the arboreal ornaments is the silk-cotton tree; it has a broad base, tapering rapidly towards the top, where it spreads out into a leafy tuft like that of the palm. It is an evergreen, and the changes of the seasons make no difference in its foliage. The product that gives the name to the tree is a species of cotton, as soft as silk; it can be spun and woven, and is used by the Indians for wrapping the arrows of their blow-guns to prevent the escape of air when the weapon is discharged.



NAZARETH SQUARE, P

"We came to the Largo de Nazareth, or Nazareth Square, which must have been named by a Hibernian, as it is round, and not rectangular. It contains the church and chapel where Our Lady of Nazareth is worshipped; on our return from the end of the railway we stopped at the square and visited the revered place. What struck us particularly was

the great number of votive offerings on the walls of the church and chapel; they represent heads and limbs of the faithful who have been cured of diseases through the interposition of the patron saint of the edifice. We had seen the same sort of things in European churches, but the large number at Para seems to indicate that the cures have been as numerous as they are miraculous.

"The festival of Our Lady of Nazareth occurs in October, and the event draws great numbers of people to Para from all the provinces of the Amazon. It lasts for two weeks, and during that time the square is crowded, especially at night, and many of the scenes that are witnessed at that period are anything but pious. There are many festivals during the course of the year, somewhat to the inconvenience of visitors, as it is the rule to close the government offices on these days, and no business of an official character can be transacted. Many of the laboring classes refuse to work on saints' days, and only those who are in debt to their employers can be required to do so.

"It is proper to remark here that our street-car was drawn by a mule, this animal being generally preferred to the horse. He is said to endure the heat better than the nobler beast, and certainly he has a good deal of it to endure. The average temperature of Para is not far from eighty degrees, and there is very little variation. Overcoats, except for rain, are of no use here, and thick clothing is at a discount. We find ourselves entirely comfortable in blue serge by day, and do not require blankets at night.

"It is hottest about two o'clock in the afternoon, but the heat is always tempered by the breeze from the ocean. Five days out of six there is an afternoon

shower, and as the air is laden with moisture taken up from the sea the streets of Para are never dry and dusty. The paved ones are not the best in the world; they are full of ruts and hollows, and any one who rides in a carriage is pretty certain to be shaken violently in every joint before reaching his journey's end. As for the unpaved streets, they are often deep with sandy mud which makes very disagreeable walking.

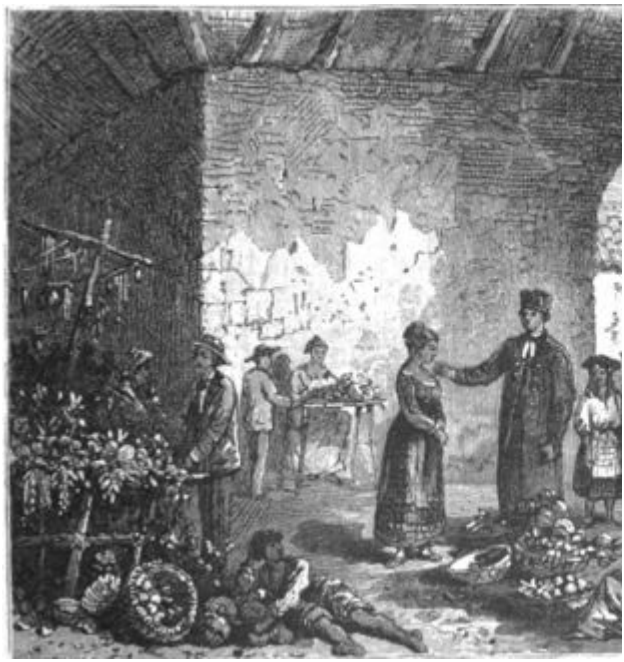


A PARA BELLE.

"We have voted unanimously that most of the ladies of Para that we have seen are pretty, but unfortunately they are not many. The women of the

upper classes are quite secluded; they rarely appear on the street except on their way to or from church, and they do not often receive company. Their features are Portuguese, with black hair, and a decidedly brunette tinge to their complexions. We have bought a photograph of one of the belles of Para and enclose it in this letter.

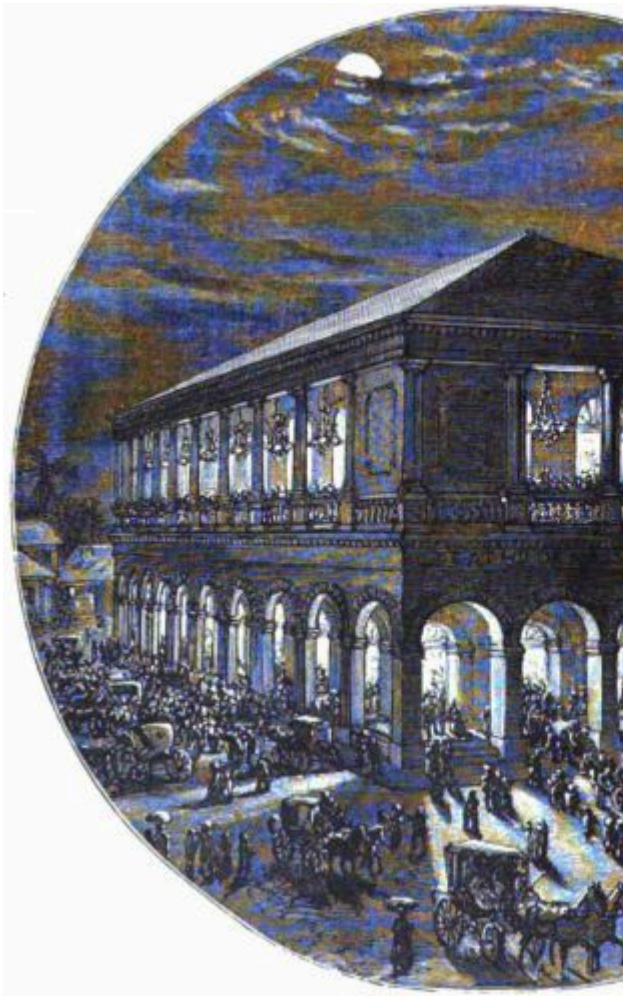
"But though we have seen few of the ladies of Para, we have not been deprived of a sight of the people of the lower classes. The wealthy and commercial population includes Portuguese and native Brazilians, together with English, German, French, Italians, and a few North Americans from the United States. The great mass of the inhabitants are Indians, negroes, Chinese, and some others who cannot be readily classified.



THE MARKET AT PA

"The best place to study the lower classes is at the market, which is an active place in the early hours of the day. We went there on our second morning, and our attention was at once drawn to the piles of bananas, pineapples, oranges, lemons, and all other tropical fruits you could think of, besides a great number you could not possibly name. Then there were garden vegetables and tobacco, baskets of flowers, heaps of fish, cages of chickens and other fowls, and a lot of monkeys and parrots that made noise enough for a menagerie. We have a suspicion that the parrots are disposed of as chickens to the restaurants, while the monkeys are useful as a substitute for spring lamb.

"The Indian and negro women sat or stood in the vicinity of their stalls, and chatted freely with each other in the intervals of waiting on their customers. Most of the chatting was done by the negresses; the Indian women manifested a good deal of the taciturnity for which Indians are famous through both North and South America. Two or three priests wandered through the market, occasionally stopping to say a word to the peasant women, whose bright garments made a marked contrast to the ecclesiastical black robes. The market is held in a large building which surrounds an open square; the centre of the square is devoted to the sale of meat and fish, while the roofed portion contains the stalls where other edibles are displayed.



THEATRE OF OUR LADY OF

"It is an easy step from the market to the theatre, and it may surprise you to know that this city of fifty thousand inhabitants has one of the finest theatres on the American continent. The interior reminds us of the Scala at Milan, or the San Carlo at Naples; it has five tiers of boxes, and each box has a little anteroom where the occupants receive and entertain

their friends between the acts. And if no friends are calling, the ladies and gentlemen promenade in the corridors and through a large ball-room which fills the front of the building. Everybody likes this part of the entertainment better than the performance on the stage, and in order to accommodate them the waits between the acts are very long.

"The outside of the theatre has deep alcoves on three sides supported by massive pillars, affording shelter from the rain and furnishing a delightful promenade. When performances are given the square in front of the theatre is crowded with people and carriages, and the lights flashing from the interior illumine the scene with a brilliant glow. The building was erected just after the close of the war with Paraguay; to commemorate that event it was named "The Theatre of Our Lady of The Peace." That the city can afford such a theatre and support it is an indication of the commercial prosperity of Para.



THE GOVERNMENT PALACE AT I

"There are six large churches in Para, and there are a post-office and a custom-house, together with the other public buildings of a first-class seaport. The government palace would do honor to any city in the world, and it has a marble staircase which is the perfection of architectural beauty. Then comes the Portuguese Hospital, which has few superiors anywhere; Dr. Bronson says it is a model of neatness and order, and bears every indication that it is admirably managed. A student of skin diseases would find a good field for observation in Para. The hot and damp air of the Amazon causes numerous sores, and they are very difficult to heal; the hospital is full of cases of this kind, and they tax to the utmost the skill of the physicians in charge.

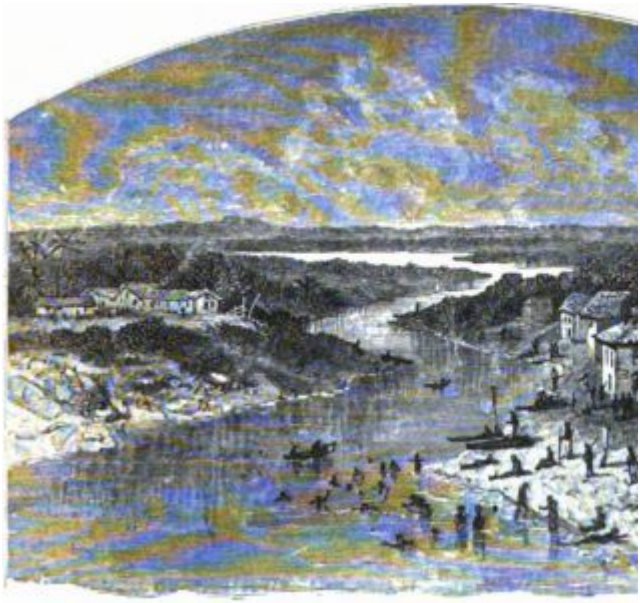
"So much for Para, and now for its environs.

"Para is at the edge of a swamp, and so luxuriant is the vegetation in the rear of the city that it is said to be necessary to keep a sergeant and a squad of police constantly on guard to prevent encroachments. We are seventy-five miles from the sea, and the way thither is through the great estuary, or Para River, which is so wide that both banks are not visible at the same time.

"Para is on the southern side of this estuary; opposite is the island of Marajo, one hundred and fifty miles in length, and about one hundred miles wide in its broadest part. Half of it is covered with forest, and the other, the northeastern half, with an extensive *campos* or prairie, dotted here and there with clumps of trees. The forests are the haunt of rubber collectors, as the rubber-trees are abundant; the campos is an immense grazing land, with a curious history, which is told in this wise:

"The advantages of the island for raising cattle and horses were recognized by the early settlers, who founded *estancias*, or ranches, there, some of them of immense extent. At the end of the last century there were a million horses, and half as many oxen and cows, on the island; the horses were nearly or quite wild, and drove the cattle to the swamps where many of them died. About the year 1825, the settlers complained so much about the ravages of the horses that the government gave licenses permitting enterprising men to slaughter these animals for their hides, and the work of destruction went on rapidly. In a few years hundreds of thousands of horses had been killed off; the bodies were left to rot on the ground, and bred a pestilence which destroyed most of the remaining horses and cattle. Its effects still continue, and the farmers have sought the assistance

of government to protect the remaining animals, and stop the ravages of the disease.



SOURRÉ AND SALVATERRA

"We were not able to visit any of the estancias, but confined our inspection of Marajo to the villages of Sourré and Salvaterra, on the southern side of the island, at the entrance of the Igarapé Grande. They are picturesquely situated on opposite banks of the igarapé, Sourré being a little farther inland than its sister place with the longer name. We crossed the Para River on a steamer that rolled viciously under the effect of the wind blowing in from the Atlantic, and long before we reached the other shore more than half the passengers were overcome with sea-sickness and unable to move.

"The accommodations were not of the best, but we were accustomed to rough life, and had no reason to complain. Both these places are filled from August to

January by many people from Para, to whom Sourré and Salvaterra are as Newport or Long Branch to New-Yorkers. The tide brings in a fine flow of sea-water, and the breezes are stronger and cooler than at the capital city. There is a good beach for bathing, and when it is not occupied by the fashionables it is the scene of a great deal of activity on the part of the natives. We hired a boat and a couple of Indians to paddle us two or three miles up the igarapé and back again. The banks are lined with gardens, from which many vegetables are sent to the market of Para.

"In the interior of the island there are farms and plantations where sugar-cane, cacao, cotton, rice, and mandioca are grown, but the greatest industry of Marajo is in the exportation of cattle. The trade is said to reach about ten thousand head every year; horses are scarce, and a good riding animal brings a high price.

"We returned from Sourré by the way we went, and reached Para one day before the steamer was due which would carry us down the coast. This letter will go to New York by the next steamer, and so for the present we will say good-bye.

"FRANK AND FRED.

"P. S.—Our account of Para would be incomplete without an allusion to snakes. In many houses they have snakes of the boa-constrictor family—of the kind we saw on the Amazon—to keep the place clear of rats and mice. They do their work very well, and live on terms of quiet friendship with the biped inhabitants. At Sourré we saw the household snake coiled up in a corner very much as we might see a cat in a New England dwelling; when we manifested a curiosity to look at it one of the servants took the

reptile by the neck and held it up to full view until we declared ourselves satisfied with the inspection. The creature did not seem at all angry at his treatment, for as soon as he was released he returned to his corner and resumed his nap.



A SNAKE MERCHANT.

"We have just visited Monkey Joe's establishment, which is devoted to the sale of monkeys, parrots, snakes, and other Amazonian live-stock. We made no purchases, in spite of the tempting offers at low prices, as we have found one monkey quite as much as we wish to carry in our travels. Outside of the shop a man was standing with a barrel by his side;

when we left the place he followed us a short distance and emptied his barrel on the ground. He was a snake-merchant, with a choice selection of rat-killers that he vainly urged us to buy. We left him and his wares; as he was perfectly at home among the wriggling serpents, and had no fear of them, he was unable to understand why we departed so suddenly.

"F. AND F."

Before leaving Para our friends had an experience at the custom-house which was the reverse of pleasing. They had bought some curiosities they wished to send to New York; the formalities of the tariff required them to pay an export duty of seventeen per cent. on the cost of the goods at Para prices, and they learned that on some articles the duties were much larger. This is particularly the case with fine cabinet woods, which are abundant in Brazil, but are very little in demand for shipment to foreign countries, in consequence of the high export tariff.

"Foreign trade can never be prosperous in Brazil," said Dr. Bronson, "until these export duties are removed. In addition to the custom-house tariff at Para, there is a duty on goods carried from one province to another, so that all articles of Brazilian manufacture or production are heavily burdened before they get out of the country. Brazil may become enlightened one of these days, and adopt the practices of other nations in this respect, but for the present she ranks with Turkey and other semi-barbarous countries in keeping a burden upon her home industries."

Frank asked about the import duties on foreign goods.

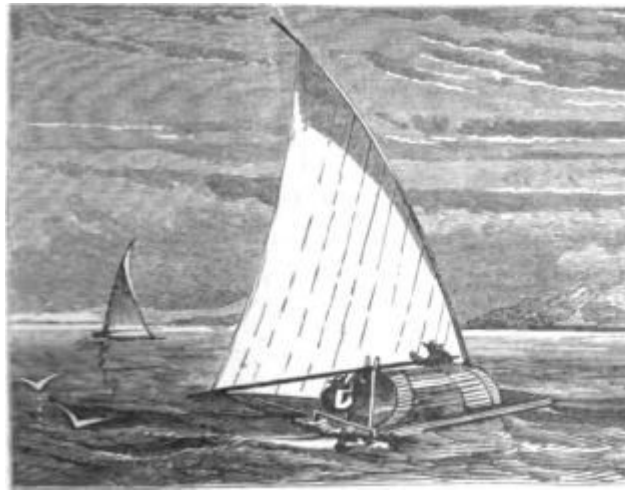
"They are from five to eighty per cent. on the valuation," replied the Doctor, "and a general average of the duties on importations is about forty per cent. They vary according to the caprice of the official through whose hands the articles may pass, so that one importer may pay twice as much as another on the same kind of goods. Bribery is said to be practised with very little effort at concealment, and an importer may be highly favored in his business by an 'arrangement' with an officer. As long as this state of things continues there will be no great increase in business.

"The Brazilian plan of collecting the revenues is full of absurdities. For example, shoes pay according to the length of the sole, and ready-made clothing is taxed by its weight. The people who came here from the United States to settle in Brazil were required to pay enormous duties on their wagons, farming implements, and other personal property, and in some cases the duties amounted to more than the original cost of the articles they brought. Many of them had invested all their means in farming implements, and found on arrival that they could not remove their property from the custom-house until every cent of the heavy duty had been paid. This was one cause of the discouragements of the emigrants at the beginning, and has deterred others from coming."

From the latest reports at hand Frank ascertained that, of the import trade into the whole of Brazil, England had forty-five per cent., France seventeen per cent., Buenos Ayres seven per cent., the United States five per cent., and Portugal three and one half per cent. Of all the exports from Brazil the United States took forty-five per cent. and Great Britain nine per cent., the rest going principally to France,

Germany, and Portugal. England and the United States each take about two thousand five hundred tons of rubber annually, France has most of the cacao, and the other products are about equally divided among the various nations, the United States having probably the largest share. Brazil supplies more than half of the coffee consumed by the rest of the world; it is well known that thousands of tons of Brazilian coffee are sold every year as "Government Java," while Java coffee in its turn is sold as "best Mocha."

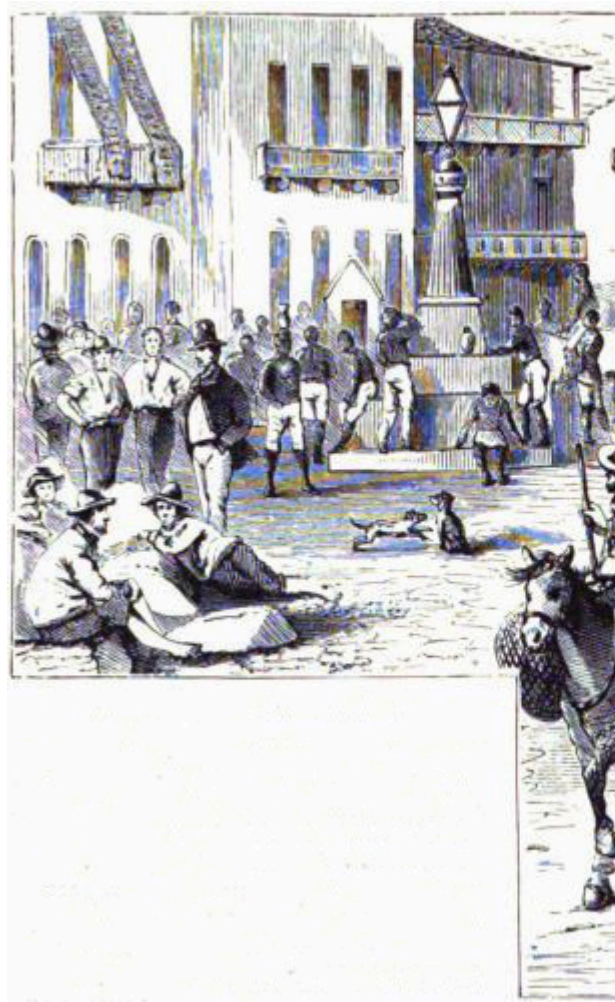
In due time the little party embarked on one of the English steamers bound to the southward; in a few hours they had passed out of the estuary of the Para River and were floating on the broad Atlantic. Their first stopping-place was Pernambuco, a distance of fifteen hundred miles, and for much of the way there they were in sight of the coast. A few towns were visible with the aid of glasses, but for the most part there were no more signs of human activity than on the banks of the Amazon.



GOING ASHORE IN A JA(

They had a day at Pernambuco, which has a harbor inside of a long reef affording secure anchorage for small ships. Large steamers anchor outside, and transfer their cargoes by means of lighters. A steam tender came alongside, but as the wind was fair to the shore, and there was likely to be some delay in transferring the mails and express freight, Manuel negotiated for a *jaganda*, which seemed to the youths a twin brother of the *balsa*, whose acquaintance they made on the western coast.

It is a raft with a sail, and the most of the jagandas have a cabin, where a passenger is sheltered from the spray. Frank and Fred greatly enjoyed the sail to the shore, and had the satisfaction of landing at least half an hour in advance of their companion travellers who waited for the tender.



STREET SCENE IN PERNA

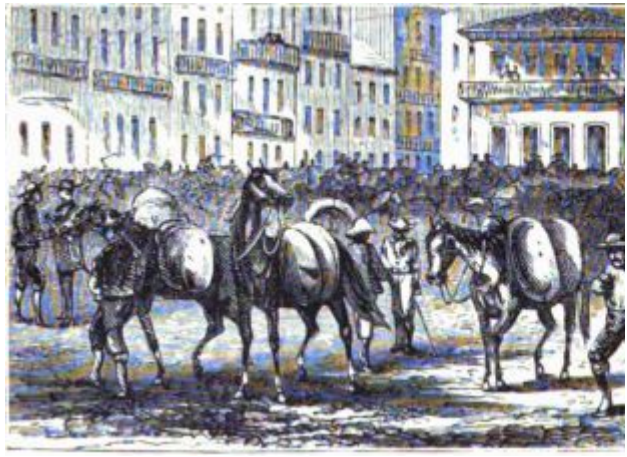
The *recife* or reef which forms the front of Pernambuco is connected with the city by an iron bridge; at its upper end it is joined to the land by a sand-spit, and the principal business of the place is centred there. As their time was limited, the youths confined their attentions to the old city and the

sights of the streets of the newer portion.



PERNAMBUCO.

Pernambuco stands in an enclosure of mountains that sweep in a semi-circle around a fertile plain. *Recife* is the business part; *San Antonio* is the middle district; and *Boa Vista* may be called the suburb. The city has about one hundred and twenty thousand inhabitants, and is the third in commercial importance in Brazil. It is the greatest sugar-market of South America, its exportation often reaching twelve hundred thousand tons in a single year. Most of the sugar sent from Pernambuco is of a low grade, and must be refined in the United States or England before going into the market for consumption.



PACK HORSES LADEN WIT

Frank and Fred were not long in finding by observation the chief industry of the city. At every step they saw sugar; it was on the lighters going to the ships in the harbor; it was in the warehouses, where the negro porters were handling sacks filled with it; it was on the backs of pack-horses, coming from the country in great droves; it was heaped on ox-wagons, which filled the streets; in fact, it was here, there, and everywhere. The very atmosphere was redolent with sugar, and the pavements were sticky with molasses. Pernambuco without sugar would be Hamlet without Hamlet.



OX-CART.

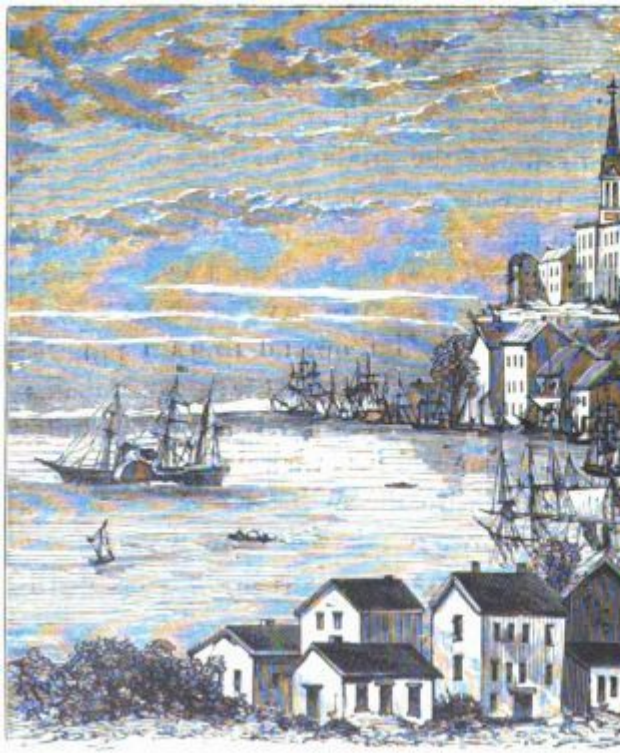
The streets of the business portion are narrow, and there are traces of Flemish architecture in the buildings erected during the time when Count Moritz of Nassau and his followers were domiciled in Pernambuco. There are houses of many stories, such as we see in cities of Holland, but rarely find in the tropics, where the effort of ascending a stairway is one of the trials of existence. Farther on the streets are wide, and run in straight lines, and they have broad sidewalks, tracks for street cars, and handsome dwellings that might have come from Philadelphia or Baltimore. There are several public edifices that would be creditable anywhere; the market is a model of beauty and good arrangement, and the squares and gardens are handsome and spacious. Time did not permit an excursion into the country nor a visit to one of the sugar plantations in the neighborhood.

Frank learned that within the last few years the most enterprising of the sugar-planters have gone to refining the product of their plantations by means of

machinery, much to the consternation of the refiners of England and the United States. The sugar, after being boiled to crystallization, but containing a good deal of molasses, is placed in a cylinder perforated with thousands of small holes that seem to have been made with a pin. The cylinder is whirled around two thousand times a minute; the molasses is thrown off by centrifugal force and the sugar remains. Then a jet of water is introduced, and afterwards a jet of steam; water and steam wash the sugar perfectly clean, and it is then dried and broken into coarse powder. The whole work with the cylinder occupies only a few minutes; the molasses that is thrown off is boiled to make brown sugar, and the second molasses which comes from it is utilized for distillation.

CHAPTER XXI.

BAHIA AND ITS INDUSTRIES.—RIO JANEIRO.—THE BAY AND THE CITY.—SIGHTS OF THE CAPITAL.—EMPEROR DOM PEDRO II.



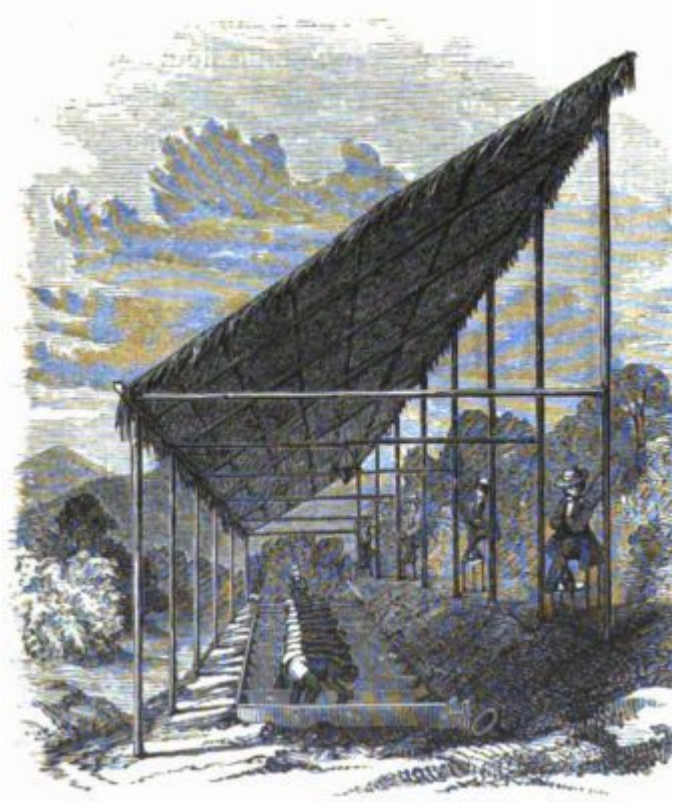
VIEW OF BAHIA.

Bahia was the next city visited by the youthful travellers. For two days the steamer kept near the coast of Brazil, which presented a more picturesque appearance than near the mouth of the Amazon. There was a background of hills filling the western horizon, and occasional headlands jutting into the sea; in several places the hills rose to the dignity of mountains, and formed an agreeable contrast to the stretches of sandy beach, backed by low forests, which extend much of the way from Para to Pernambuco.

Bahia takes its name from the Bay of All Saints

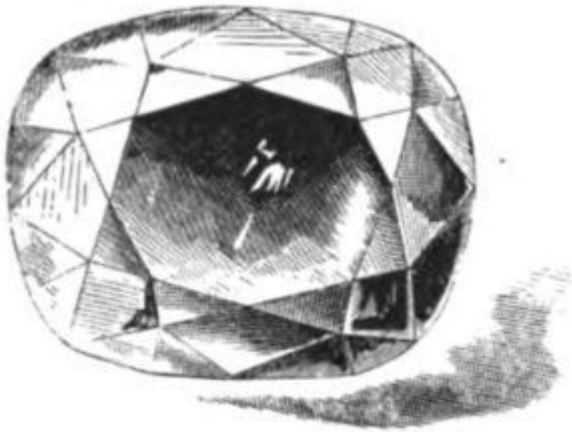
(Bahia de Todos os Santos), on which it stands. It is a magnificent sheet of water, thirty-seven miles long from north to south, and twenty-seven from east to west, and its depth varies from eight to forty fathoms. It has two entrances from the south, and is an admirable shelter for ships of all possible tonnage.

The bay also gives its name to a province with an area of two hundred thousand square miles; the province of Bahia contains some of the richest land of Brazil, especially along the coast, where there are many plantations, and a liberal sprinkling of towns and villages. Sugar, tobacco, rice, cotton, and coffee are the principal products; the coffee is inferior to that of Rio, but the tobacco is good enough to be made into "Havana" cigars and sold as such in England and the United States.



DIAMOND-WASHING IN BRAZIL.

Diamonds were discovered in the province of Bahia in 1844, and since that time their fame has spread through the world. The celebrated diamond "Star of the South" came from the mines of Brazil, and in the few years following the discovery the yield was so great as to seriously disturb the diamond market of Europe, and cause a heavy decline in the prices of the gems. At present the product has greatly diminished.



"STAR OF THE SOUTH."

The steamer entered the bay and anchored in front of the city, which is beautifully situated, partly on a series of hills, and partly at their base. The old, and business, portion is near the water; its streets are narrow, and the buildings are four or five stories high, very solidly built of stone. The great business street is the Praya, which runs for about four miles along the water front, and contains, among other public edifices, a church built of stone imported from Europe in the ships that came out in ballast to carry away the produce of Brazil.

Altogether there are about sixty churches in Bahia, and some of them are among the finest on the South American continent. Bahia was the first settlement of Europeans in Brazil, and a flourishing city before Rio Janeiro was known to the world. The bay was discovered by Americus Vespucius in 1503, and the city was founded seven years later. From 1549 until 1763 it was the capital of the Portuguese possessions in South America; in the last-named year the honor was transferred to Rio Janeiro, and the city has suffered a great deal during the various political

commotions to which Brazil has been subject.



PORTERS ASLEEP.

The population of more than one hundred and fifty thousand is as variously composed as that of Para or Pernambuco. The whites, blacks, and mixed races are about equally divided; among the former there are many English and German merchants, the Germans predominating. The foreign commerce is chiefly with England and Germany, but there is a considerable trade with the United States, in which the Brazilian exports vastly exceed the importations.

"We were saved the exertion of walking to the upper town," said Fred, in his note-book, "as there is a steam elevator which performs the work much more cheaply than human muscle could do it. From the top of the hill, about four hundred feet above the bay, we had a magnificent view that we will never forget.

"In front was the ocean, with the deep blue of the tropics, and its horizon line, which seemed rising to meet the sky. The bay was dotted with sails and row-

boats; out on the ocean there was here and there a stipple of white which told of a sail, or a stream of smoke denoting the course of a steamer; on either side of our position were streets and squares of handsome houses, standing in rows and groups of palm or other trees of the equatorial regions; and in the background of the picture was a setting of everlasting hills, interspersed with bits and patches of prairie or undulating ground. We have nowhere seen a prettier spot than this, and endorse the assertion of previous visitors that Bahia is one of the most picturesque cities of the South American continent.

"When we landed we were pestered by pedlers who wanted to sell the famous feather-flowers of Brazil, and this reminded us that Bahia is the centre of the industry. After we had enjoyed the view from the upper part of the city we engaged a carriage and drove to the convent where the finest of these flowers are made. Formerly the convent had a monopoly of the business, and derived a handsome revenue from the work of the nuns; but of late years there have been many rivals, and the convent trade has not been as prosperous as of yore.

"You never saw anything more perfect than these imitations of natural flowers. Put a cluster of them side by side with a bouquet of genuine flowers and you will have to guess 'which is which.' It would be nothing more than a guess so far as the eye is concerned, as the imitation is perfect in color, shape, size—in everything but smell. Here are lilies, budding, half-opened, or in full bloom; hyacinths with their delicate purple; orange-flowers that seem just crystallized from the snow; violets shrinking in their modest hue of blue; roses, in all the colors for

which the rose is famed, and in all conditions of growth and bloom; together with buds and blooms and blossoms of many and many a flower unfamiliar to our eyes.

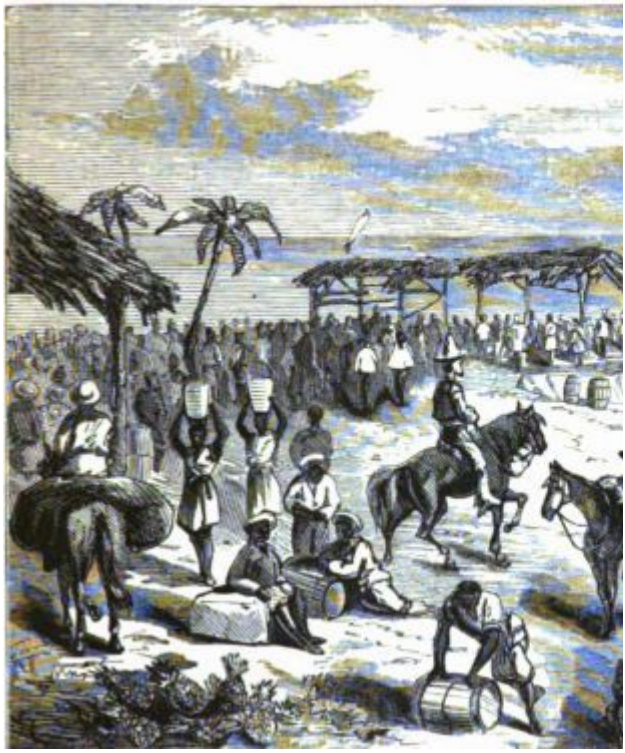


BRAZILIAN HUMMING-BIRDS.

"They showed us admirable collections of humming-birds flying among leaves and flowers. The birds were the natural bodies, carefully preserved, and so poised in their positions as to present the appearance of life; the flowers and leaves were formed of the feathers of other birds, and simulated to perfection the growth of the forest. One collection embraced nearly five hundred humming-birds of all colors and

combinations of colors, but we were told that it did not include all the varieties of humming-bird in South America.

"We bought several dollars' worth of these flowers, and it was well that our time was limited, or we might have been tempted to spend more money than we could afford. The feather-flowers are made by the nuns in the convent; they have the natural flowers before them, or carefully drawn and tinted representations upon paper, to serve as models. Practice makes perfect in this as in everything else, but I imagine that those who achieve success in the work must have a natural aptitude for the selection of colors. We were assured that all the colors of the feathers were natural, though we have our suspicions that the establishment makes use of dyes. Whether our suspicions are correct or not it is certain that the birds of South America are blessed with brilliant plumage.



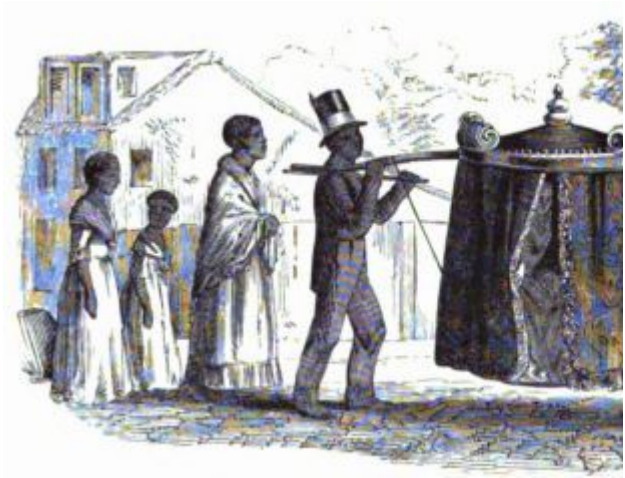
MARKET SCENE, BAH

"There is a fine market-house at Bahia, which we visited, and another which may be called 'the open market,' on the shore of the bay. Most of the frequenters of the latter market were negroes and other people of very dark complexions; there were a few planters on horseback, and from the way they remained close to their steeds when not sitting upon them we inferred that it would compromise their dignity to appear as pedestrians. Many of the negroes carried burdens on their heads; those who rolled casks or moved heavy bales acted as though they would prefer to transport them in the other fashion, but a barrel is too unwieldy to be carried on the summit of the skull.

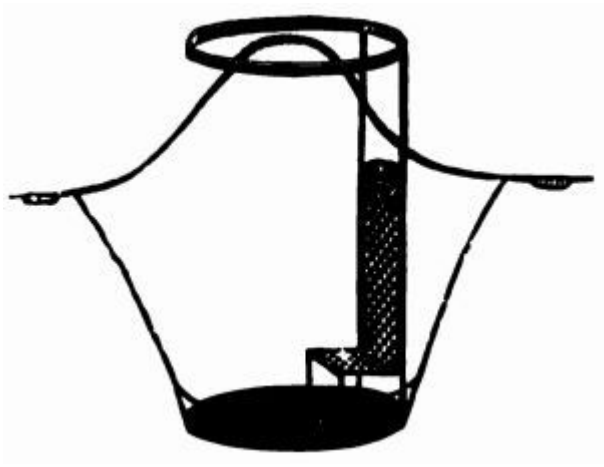


PORTERS AND CASK.

"Most of the heavy work of Bahia is performed by negroes, as at Para or Pernambuco, and the effort to domesticate Chinese coolies has not been successful. The planters complain that since the decree of emancipation they cannot get as much work out of the negroes as formerly. This is more than probable, as the slaves were treated with great cruelty; a Brazilian slave-owner was a type of all that was barbarous, though there were doubtless many owners who treated their human property with kindness. To judge by the faces of some of the planters we have seen, I would not like to be in their power, and incur their displeasure. There is little compassion visible in the hard lines of their features.



SEDAN CHAIR.



FRAME O

SEDAN.

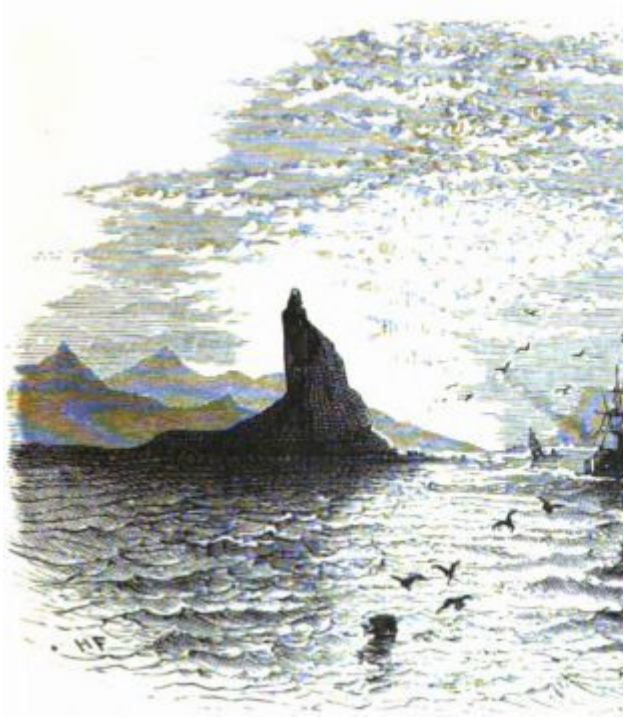
"Modern modes of travel have not abolished the sedan chair, which flourishes in Bahia, Rio Janeiro, and other cities of Brazil. It is less comfortable than the sedan chair of Hong Kong and Canton, but preferable to the palanquin or the *dhoolie* of India. Like the Chinese chair or the Indian palkee, it is

slung on a pole, and carried by porters; the latter are generally a couple of stalwart negroes, who make the best porters in the world, especially where the climate is as warm as that of Bahia. Every respectable citizen must have his sedan; the vehicle is richly decorated, according to the taste and wealth of the owner, and when it is no longer serviceable it is sold for public use. Not infrequently a public sedan bears the crest of a private citizen; the decayed and faded curtains, and the general air of dilapidation pervading the concern, tell very plainly what has been its former state. Some of the porters are arrayed in solemn black, including dress coats and stiff hats, and their appearance has a suggestion of the grotesque. But it is the fashion of the country, and we do not propose to interfere with it.

"Evening found us back on the steamer, and at sunset we passed through the southern entrance of the bay and were once more on the ocean. Our prow was turned to Rio, eight hundred miles away, and we steamed gayly along on our course. Sometimes we kept far out to sea, to avoid dangerous reefs, on which many a ship has gone to pieces, and at others we swept close in shore, and had fine views of the land. The hills grow in size as we increase our distance from the equator, and after a time the mountains of the coast range fill the western horizon. With our glasses we can distinguish many houses and villages, and are not surprised to learn that the region is a fertile one.

"The coasting steamers make half a dozen stoppages on the way from Bahia to Rio, but we do not halt. None of the way ports are of great consequence, but if the country behind them could be developed to its proper capacity there would be a heavy business at

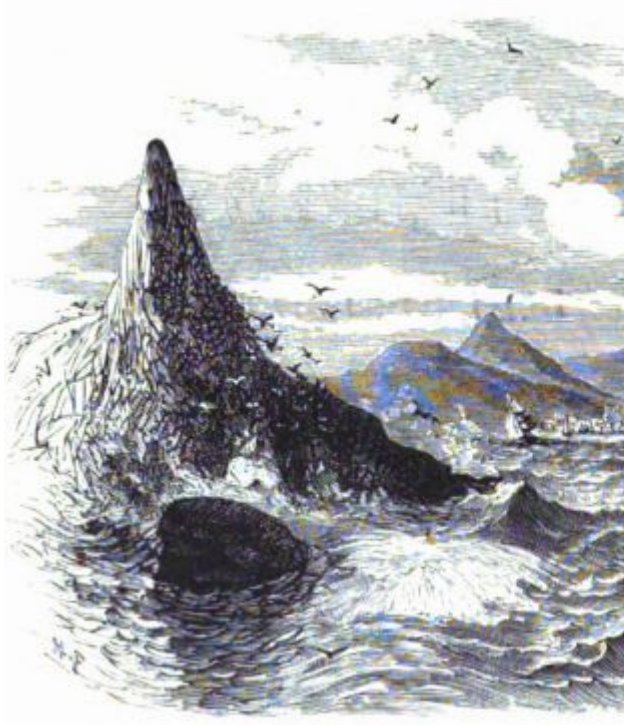
places now unknown to the commercial world. Some of the mountain slopes may be difficult of cultivation on account of their dryness, but there is a vast area of country that only waits the work of the colonist to enable it to produce abundantly."



ENTRANCE TO THE HARBO

Four days from Bahia brought the steamer in sight of "The Sugar-Loaf," the sharply conical peak nearly two thousand feet high which is the landmark of the magnificent bay of Rio Janeiro, pronounced by many visitors the finest in the world. Some there are who claim pre-eminence for the Bay of Naples; others, but they are few in number, who have entered Avatcha Bay, in Kamtchatka, say it surpasses the Bay of Rio; and others again give preference to the Bay of

Yokohama, in Japan. Among our three friends there were no less than three opinions: Naples, Avatcha, and Yokohama had each an advocate, but all agreed in giving the second honor to Rio. With this honor it must remain content.



VIEW OF RIO JANEIRO FRO

Its general shape is that of a triangle, and it is nearly a hundred miles in circumference. There is but a single entrance, and that a narrow one, so that a ship once inside is in water as smooth as that of a lake. It is set in mountains whose sides are thickly covered with foliage, and its surface is studded with islands, nearly a hundred in all. The name of the bay, "Rio de Janeiro," was given under the supposition that it was not a bay, but the mouth of a large river. There is no

stream of consequence entering the ocean at this point, and the "River of January" exists only in the imagination.

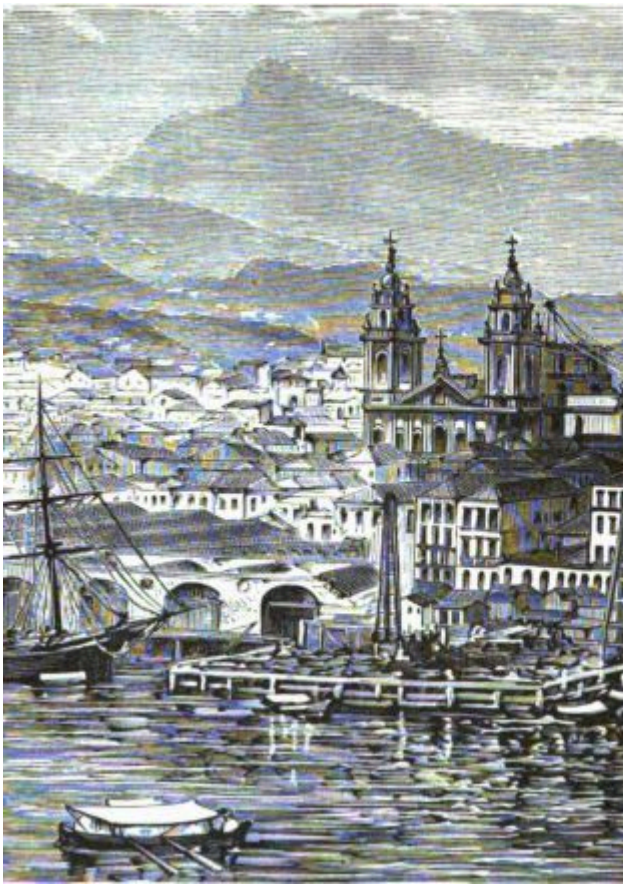
Not wholly in the imagination, however, as it belongs to the city which is the capital of Brazil, and has a population of three hundred thousand; to the municipality containing the city, and having an area of five hundred and forty square miles; and to the province containing city and municipality, with an area of eighteen thousand square miles, and a population of a million and a quarter, of many races, colors, and kinds. In the bay, city, municipality, and province we have Rio de Janeiro four times over. Perhaps in some future day the empire will cease to be known as Brazil, and adopt the name of its capital.

The larger islands in the bay are occupied, and cultivated wherever possible; many of them are fortified, and several are surmounted by churches or chapels. The entrance to the bay is only two thousand feet wide, and defended by forts, one at the base of the Sugar Loaf and the other nearly opposite. Together they would make it very tropical for a hostile fleet, and just inside the entrance is another fort, which is intended to take care of anything that escapes the outer defences.

As the steamer came to her anchorage she was surrounded by a swarm of boats, which kept at a respectful distance until the arrival of the health officer, without whose authority there could be no communication between ship and shore. If the doctor and the youths had been unaware of their latitude the merchandise of the boats would have told them, without the aid of the hot sun in the sky overhead. There were monkeys and parrots in great abundance;

an assortment of snakes and other creeping things; bananas, pineapples, and other tropical fruits; yams, sweet potatoes, mandioca root, and other "garden truck" of the country; tobacco and cigars in all conditions of badness; and other merchandise only to be designated by native names. The boatmen kept up an incessant talk, mingled with many gesticulations, and the half-hour spent in waiting for the health officer was by no means lost.

By and by that official came, the ship was pronounced "clean," and the passengers were free to land. From the anchorage the city does not present an imposing appearance, as it is only partially visible; portions of it are screened by the hills, which break its front and divide it into several quarters. In consequence of these hills it straggles over a considerable area, and is really made up of a series of suburbs; from the centre of the city to Botofago is a good three miles, and it is the same distance the other way to another suburb or district of equal importance. Like our Washington, it is a city of magnificent distances; in order to see it all at once you must climb the hills in the rear, and look at the metropolis nestling at your feet. Only till you do this can you realize its greatness.



FRONT VIEW OF THE

Rio was evidently built with a view to permanence. At least Frank and Fred thought so, as they landed at the piers of solid granite, with steps leading down to the water and facilitating debarkation at every stage of the tide. Near the landing-place was a market, where they found groups of negroes waiting for work, or possibly waiting to avoid having work to do. There were heaps of fruit and vegetables, similar to what they had seen in Para and Pernambuco, and the same chatter and commotion prevailed among

the venders and their patrons.

We depended upon Fred for an account of the visit to Bahia, and will ask Frank to tell us about Rio de Janeiro.

"From the landing-place we went first to the hotel," said Frank, "under the guidance of a runner, who had met us at the steamer. We went without our baggage, which was taken directly from the ship to the custom-house. Nobody is in a hurry in this country; we knew there would be a delay in bringing the trunks and bags from the steamer, and that we could utilize it by securing our quarters. We made all arrangements for our stay, and then went to the custom-house, which we reached just as Manuel arrived with our impedimenta.

"The officials were polite but slow. We managed to get the attention of one of them, who promised to 'expediate' our business; as he took at least an hour for accomplishing what might have been done in five or ten minutes, I shudder to think what would have been our fate without any 'expedition.' Porters were ready to seize upon the parcels as they were released from the custom-house, and it was a comical spectacle that Manuel presented as he marched at the front of a column of scantily-dressed negroes, each of whom bore some part of our personal effects on his head.



COFFEE-CARRIERS

"Down to a few years ago nearly all the transportation of Rio was conducted in this way. Coffee, sugar, and other merchandise was placed on the heads of negroes, who trotted nimbly along, carrying sacks weighing one hundred and sixty pounds as though they were only a tenth of that amount. Articles that were too much for one man were slung on poles, or balanced on the heads of two, four, or possibly eight or ten porters; it was no uncommon sight to see a piano or a large box poised on the heads of four or six men, and the stranger could not help thinking what might be the result if one of the number should make a misstep and fall to the ground.



COAL-CARRIERS.

"The negroes had almost a monopoly of the carrying trade, and when carts were introduced there was very nearly a riot in consequence. Danger was averted by placing a limit to the number of carts, and a continuance of the old system without a reduction of prices. The business of transportation still requires a great deal of head-work on the part of the negroes, and there is no likelihood that they will be altogether superseded. We met several groups of coffee-carriers, each with a sack on his head, and near the landing-place was a line of coal-carriers with their appropriate burdens.



MODERN INNOVATIONS.

"Many of the trucks and carts are drawn by hand, and consequently the mule and the negro may be regarded as rivals in this department of labor. But there seems to be perfect friendship between them, if I may judge by a scene I witnessed of a mule and a negro lying down together, and the negro using the mule as a pillow.

"The leader of a gang of coffee-carriers has a rattle in his hand, and keeps time with it for his followers. They step to the music, and aid it by a low,

monotonous chant, in words quite unintelligible to our ears. Sometimes the rattle gives place to a small flag, which is waved in unison with the step; the men who propel carts or trucks have no use for flags or rattles, though sometimes they stick a flag in front of the vehicle as an indication of ownership.



PEDLERS OF DRY-GOODS.

"All things considered, I have never seen a city where so many things were carried on the head as in Rio Janeiro. Pedlers of dry-goods go from house to house, followed by negroes bearing boxes or bales of the finery which they offer for sale; the practice saves the ladies the trouble of going to the shops when they want to buy anything, and enables the dealers to work off a great many things that would not be easy to dispose of otherwise. Before we had fairly landed at the hotel we were besieged by pedlers, and forcibly reminded of our experience at

Singapore, Calcutta, and other cities of Asia.



POULTRY DEALER.

"Fruit and poultry are borne on the heads of the market men and women, the former in open baskets and the latter in covered ones. We met a poultry dealer with a huge basket on his head, and at least a dozen chickens were craning their necks out of the spaces between the slats. He was farther weighted with a goose and a couple of turkeys swinging at his side, and I have no doubt he would have added another dozen of chickens without hesitation.



FRUIT VENDER.

"Water-carriers balance casks and buckets on their heads; cooks, chambermaids, and servants of all kinds and descriptions follow the universal custom; and it would be interesting to know what Mr. Darwin thinks of the development of species under such circumstances. The skull of the Brazilian porter a thousand years hence ought to be not less than an inch in thickness, and have a resisting power equal to that of a mortar shell.

"Sedan chairs abound, but they are less numerous than formerly, as a good many people now indulge in carriages who once relied upon chairs for their locomotion. They are of the same model as the chairs of Bahia, and the bearers have a kindred complexion and dress. For public conveyances there are carriages, omnibuses, and street cars; the street railways of Rio Janeiro are patronized by everybody, and it is said that the original company has made a dividend of three hundred per cent. every year on

the amount of capital invested! The concession was obtained by some New-Yorkers, and the Brazilians have been much chagrined at the ease with which they allowed the foreigners to take possession of such an excellent bonanza as this.

"The omnibus is here called a gondola, and we have been told how the name originated. It may not be true, but you know the old Italian proverb, '*Si non é vero é ben trovato.*'

"An omnibus company had a monopoly of the business indicated by its name; the government and people were much dissatisfied with the way its business was conducted, as the vehicles were small, dirty, and insufficient in number, and the fares were very high. The government could not break its word by giving privileges to another company, and the monopolists felt secure.

"But an enterprising genius suggested that a company could be licensed to run gondolas in the streets of Rio, and the hint was taken at once. The gondola company placed its vehicles in operation, and, though the old company protested, the protests were of no avail. Who shall say hereafter that there's nothing in a name?

"While I've been writing the foregoing, Fred has been looking up the history of the city, and is prepared to tell you about it. I will rest a while and let him have the floor."



VIEW IN THE BAY OF RIO DE JANEIRO

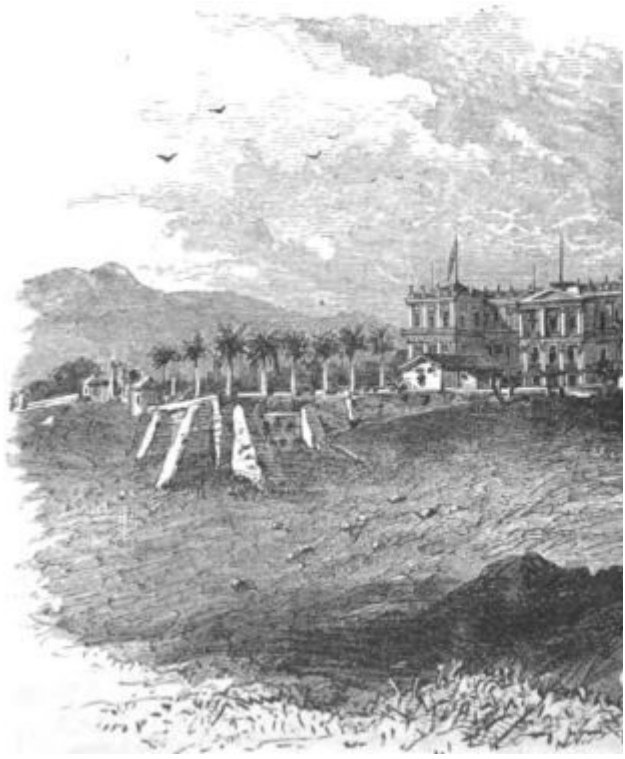
"Rio is a younger city than Bahia," wrote Fred, "as it was not permanently settled until 1555. There were two temporary settlements previous to this—in 1531 and 1552—but they lasted only a short time, the first being abandoned in less than four months after its formation.

"The first settlers were French Huguenots, who prospered so well that the king of Portugal ordered them driven out in ten years from the founding of the colony. The governor of Bahia executed the order, and established a Portuguese colony in place of the French one.

"The Huguenots got along very well with the natives, but the Portuguese were constantly at war with them; the history of the first hundred years of the colony is full of bloodshed, not only in conflicts with the Indians, but in quarrels among the settlers. Assassinations were frequent, and on several occasions it seemed as though the local dissensions would bring the colonization of the country to an end.

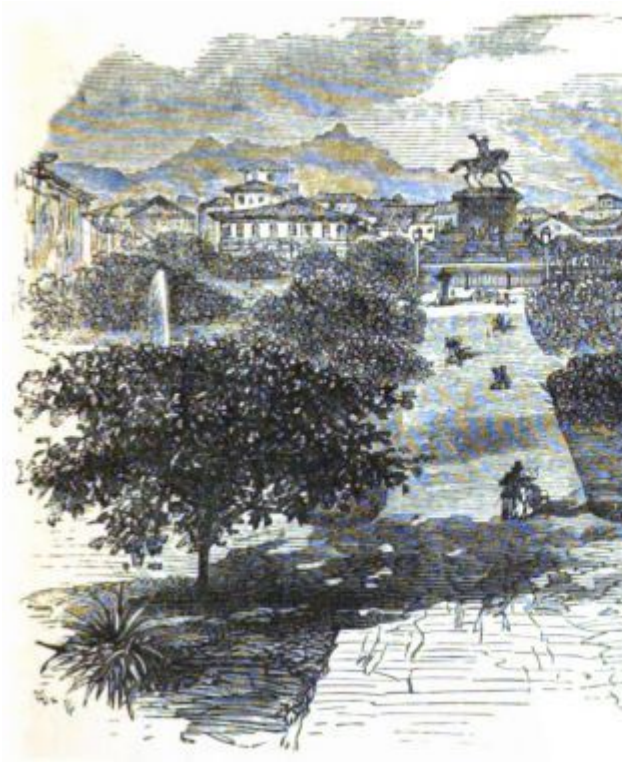
"In 1763 Rio was made the viceregal capital, much to the annoyance of the inhabitants of Bahia, which had hitherto held the honor. The transfer of the capital was a piece of good fortune for Rio, which it has maintained without interruption. Its glory was increased in 1808, when the Prince-Regent of Portugal arrived with the intention of making his home in Brazil until the declaration of a general peace in Europe.

"The residence of the royal family at Rio was the occasion of public rejoicing, and the people readily surrendered their houses for the accommodation of the sovereign and the retainers of his court. After the declaration of peace, and the return of the king to Europe, their loyalty cooled very materially, and in 1821 came the revolution, which made Brazil independent of Portugal.



AN IMPERIAL PALA

"In 1822, the son of the King of Portugal was declared Emperor of Brazil, with the title of Dom Pedro I. The present occupant of the throne, Dom Pedro II., is the son of the first Emperor of Brazil, and ranks among the enlightened rulers of the nineteenth century. The country is indebted to him for much of its material progress; it is no fault of the emperor that Brazil is not yet in a foremost position among the nations of the globe.



STATUE OF PEDRO

"We had a glimpse of the emperor to-day, as he drove rapidly along the principal street of the city, about four o'clock in the afternoon. He was born in 1825, and is therefore well along in years, as you can see by his full beard, which is of almost snowy whiteness. He has a keen, sharp, commanding eye, and an expression that proclaims him 'every inch a king.' We had a glance only, and then he was out of our sight, but we cannot soon forget the impression it left behind. He was in civilian dress, and if we had looked for his crown and sceptre we should have looked in vain. He is said to maintain comparatively little of the pomp and vanity of an imperial court,

and would like to banish them altogether, if it were possible and judicious to do so.

"He is probably the most industrious imperial ruler in the world, as he devotes from twelve to fifteen hours daily to official work in one form or another. He examines state papers, sits with the officers of his cabinet, listens to reports and suggestions, visits schools, hospitals, and other public institutions, is present at ceremonials, entertains strangers, and can talk well on almost any topic of the day. He has a taste for music, science, and geography, and can discuss the last new opera, the researches of Darwin, or the explorations of Stanley, with intelligence and discrimination.

"You may remember his visit to the United States at the time of our Centennial; how rapidly he moved from place to place, and with what interest he went on sight-seeing expeditions. The officers of his staff who accompanied him were exhausted by their exertions, while the emperor was always fresh, and ready for something new. He avoided public demonstrations wherever he could do so without giving offence, and devoted his limited stay of four months to an inspection of the country, and a study of its institutions. From America he went to Europe for a longer tour. His return to Rio was the occasion of great rejoicing, and the demonstrations were as sincere as they were elaborate."



SCENE IN A BRAZILIAN SUBURB.

CHAPTER XXII.

THE SIGHTS OF RIO.—PUBLIC BUILDINGS, AQUEDUCT, CHURCHES, MIRACLES, AND FUNERALS.—VISIT TO TIJUCA AND PETROPOLIS. —THE SERRA.

The party remained several days in Rio, and had abundant occupation for eyes and ears. One of the days was devoted to a religious festival; there were processions on the streets and services in the churches, and the whole population seemed to give itself to idleness in honor of the saint to whom that date of the almanac belonged. Rio Janeiro is a Catholic city, but less intense in its religious feeling than Bahia. Many adherents of the Catholic Church regard Bahia as an American Rome, from which all religious dogmas and teachings affecting the continent are expected to proceed.

Rio is well provided with churches, and some of them are admirable specimens of ecclesiastical architecture. The youths visited the cathedral and perhaps half a dozen of the principal churches, but did not take the trouble to go through the entire list. The churches of Rio are never closed; at almost any hour service is going on in one of the chapels of the cathedral, and the stranger who desires to see the people at worship has no lack of opportunity.

Votive offerings are as numerous in the churches of Rio as at Para, if we may judge by the accounts of the youths. Frank made a sketch of one collection of these offerings, while Fred recorded the inscriptions relating to them.



VOTIVE OFFERINGS IN A CHU

The sketch included busts, arms, legs, hands, and faces, moulded in wax or carved in wood, perhaps twenty in all. There was a representation of a large tumor on the neck of one of the faithful, who was cured by the interposition of the saint, and below it was a painting of a ship being driven on the rocks at the base of a steep cliff. The ship and crew seemed doomed to certain destruction, but though the ship was lost all the crew escaped, in consequence of an appeal to the patron saint.

Another painting showed the saint appearing in the form of an angel, to an invalid sitting in an arm-chair; the inscription says he had not been able to walk for years, but by following the direction he received he was a well man on the following day.

Another picture represented a similar visit to a man lying on a sick-bed, and the legend below it records a similar miraculous result.



VIEW IN THE BAY

The abundance of these votive offerings shows the trusting faith of the pious Brazilians, and their conscientious belief in saintly power. The religion of the country is Catholic; the emperor is a devout worshipper, and a careful observer of the feasts and fasts ordained by the Church, but he is a firm believer in the fullest toleration of all religions, and sternly represses any demonstrations of bigotry.

There are Protestant churches in most of the cities of Brazil. The United States Board of Foreign Missions has an establishment in the empire, which receives a small allowance from the Brazilian government; the ministers of the German and Swiss colonies of emigrants are paid by the imperial government; and, altogether, the adherents of other religions than that of the state run no risk of persecution "for opinion's sake." The constitution says that religionists other than Catholics shall restrict their worship to

buildings "without the exterior form of temples."

For religious purposes the empire is divided into twelve dioceses, comprising one metropolitan province, under the archbishop at Bahia. The diocese of Bahia is presided over by the archbishop, and each of the other eleven is under the control of a bishop. The empire is further divided into twelve hundred and ninety-nine parishes; the vicars are mostly foreigners, and among these foreign vicars the Portuguese predominate.

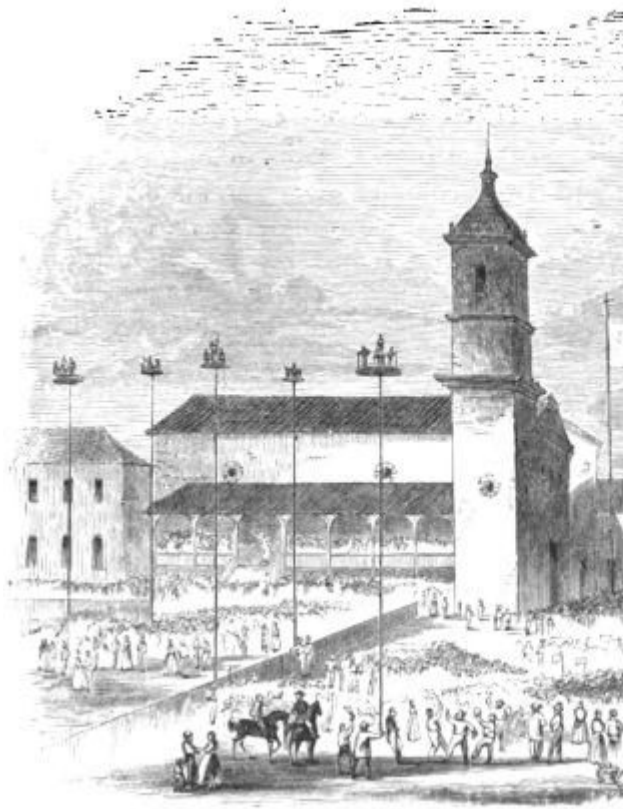


ALMS-BOX.

Some of the votive offerings and relics are very old, bearing dates of two or three centuries ago. In one church our friends were shown an alms-box which was anciently used for collecting donations for "Our Lady of the Good Voyage." It was suspended by a strap from the neck of the collector, who went among the sailors on the arrival of ships from any

part of the world, and especially from Portugal, in the days of the viceroyalty. The honesty of the collector was insured by a lock, which is a curious, three-cornered affair closing with a key. Key and lock are now heavily rusted from long disuse. The front of the box has a picture of Our Lady standing on the deck of a ship; the halo around the head of the figure indicates its saintly character.

The fronts of the altars were adorned with candles, many of them set in candlesticks of solid silver, of great original cost. They were the gifts of wealthy worshippers in times gone by. One of the attendants sighingly remarked to Fred that people didn't give such magnificent candlesticks to the church nowadays. Even the candles seemed to be yellow with age, and from the dust collected on them it was evident they were not often renewed.



RELIGIOUS FESTIVAL IN FRONT

It was formerly the custom to offer the sails of a ship, or some one of them, as a votive tribute to Our Lady of the Good Voyage, or to some other saint, for protection in time of peril. The following story is given by Mr. Ewbank in "Life in Brazil."

"A lady told me that some years ago she came from Rio Grande in one of her father's vessels. The passage was pleasant till within a day's sail of the Sugar-Loaf. A small cloud then rose rapidly from the horizon, darkness settled over them, the sea began to swell, and other indications of a storm so alarmed the

captain that he called the men aft, and asked them to join him in offering the mainsail to St. Francis de Paula, on condition of his carrying them safe in. The lady remembers them standing around the commander, and with loud voices calling on the saint, reminding him of what they had promised, each man confirming the gift so far as his proportion of the cost went.



MONK IN A PROCESSION.

"On arriving safe in port they paid for a mass, and a few days afterwards went to the saint's quarters in procession, barefoot, bearing the sail through the streets, with the captain at their head. The offering was deposited in front of the church. A fair value was put upon it in presence of the priest; the captain laid down the money, and was handed a receipt stating the amount which the pious commander, Antonia Martinez Bezerra, had paid into the treasury

of the saint—the value of his mainsail—in fulfilment of a vow made at the approach of a storm (naming the day), as an acknowledgment of the saint's miraculous interposition in behalf of himself, his ship, and his crew."

The same writer says that auctions of ships' sails which have been vowed to the saints for interposition are not yet obsolete. The captains always buy them in, and frequently the priests have some one to run them up to prevent their going too cheaply.

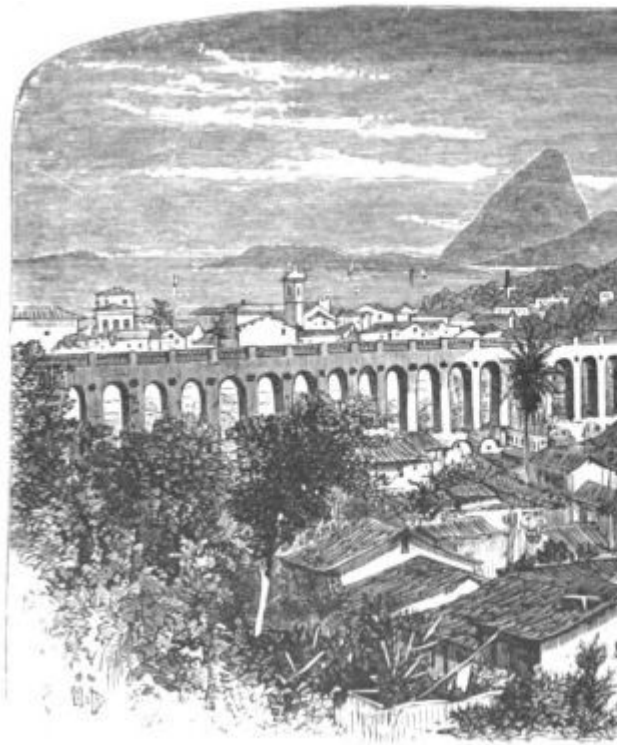
Our friends visited one of the hospitals, accompanied by a doctor to whom they had been introduced. Dr. Bronson was greatly pleased with the appearance of the place, and commended the excellence of its arrangements, its perfect cleanliness, and the evidence of careful training on the part of the physicians and nurses. Their escort told them that the cases most often under treatment in Rio were diseases of the respiratory organs, caused by the dampness of the climate and the prevailing heat. The mean annual temperature is 82° Fahrenheit, and the annual rainfall averages about forty-six inches. There is hardly a year without yellow fever; it is not usually fatal, but in some seasons there is great mortality from it. People from Europe and the northern cities of the United States suffer greatly from the heat for months after their arrival, and many of them flee to the mountains at the first opportunity.

From the hospital they drove to the Paseo Publico, a pretty garden within the city limits, and much resorted to as a promenade. There are gravelled walks shaded by tall palms and other tropical trees, and on the water front is a marble pavement, which

is crowded on pleasant evenings by groups of well-dressed people, listening to the music, and indulging in conversation, which is never boisterous.

Hospitals, asylums, theatres, colleges, academies, schools, and similar institutions appropriate to a great city are not lacking in Rio, and their abundance and good management speak well for the administration of the government. Beyond the Botofago suburb is the Botanic Garden, which no visitor should neglect; it contains an avenue of palms not surpassed in any similar garden in the world, and there are other stately trees which tell of the tropical situation. The place is on the plan of the Experimental Gardens of the English colonies, or the *Jardins d'Essai* of the French, and forcibly reminded our young friends of what they had seen in Ceylon, Singapore, Algiers, and other places or countries on the other side of the world.

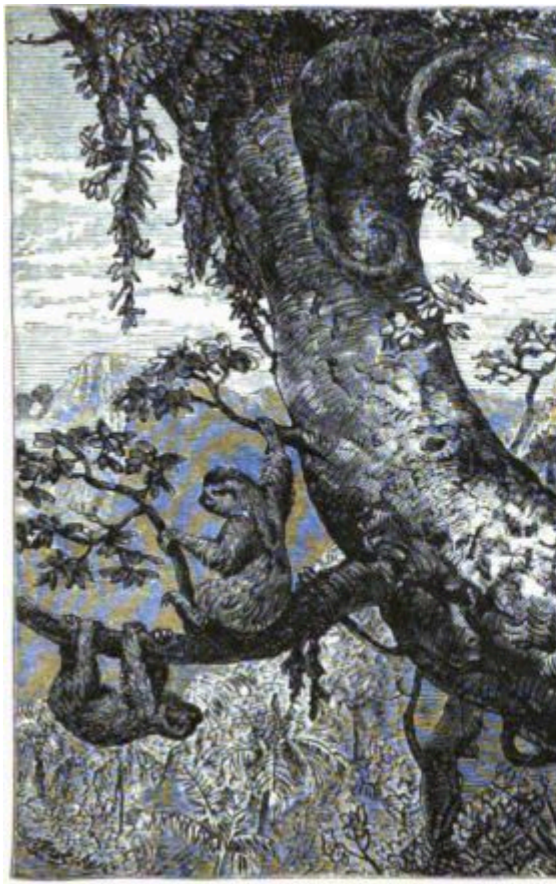
Most of the trees and plants of the continent of South America are cultivated in the Botanic Garden, and there are rare exotics from all parts of the globe. Frank espied a grove of cinnamon and clove trees at the same moment that Fred called his attention to a collection of tea-plants from China and Japan; Dr. Bronson pointed out a bread-fruit tree side by side with cacao and camphor trees, while not far off were maples and pines that seemed like old friends from the home of their boyhood. Many trees from tropical Asia have found a home in Brazil through the instrumentality of the Botanic Garden, which has demonstrated their fitness for the climate of South America.



THE AQUEDUCT.

Water is brought to the city through an aqueduct which was built a hundred years ago, and is in good condition; some of the best modern houses are supplied through pipes from the aqueduct, but the greater part of the inhabitants rely upon the water-carriers, who are similar to their fellow-craftsmen whom we have already seen at Para. In the early morning the streets abound with these men, and with numerous house-servants, bearing buckets or small casks of water on their heads. The fountains are the great meeting-places for gossipers, as similar places have been since the days when the New Testament was written, and sometimes the scenes at the fountains of Rio are animated to a degree bordering

on commotion. Of course, the aqueduct is one of the sights of the city, and the drive along the road leading past it was greatly enjoyed by the youths.

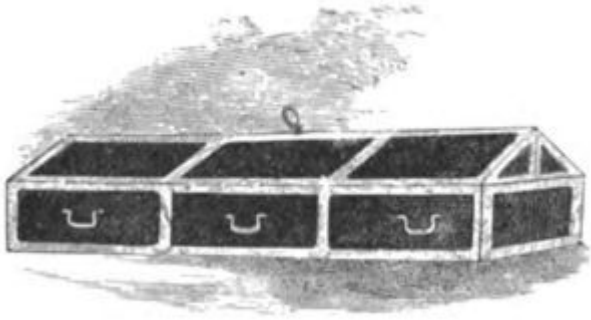


A BRAZILIAN FORES

The aqueduct is twelve miles long, and at one place it crosses a valley seven hundred and forty feet wide and ninety feet deep, on double arches. It is insufficient for the wants of the city, and a new one is likely to be completed before long.

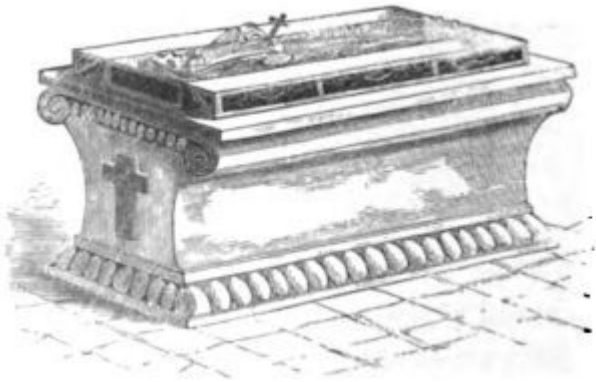
People die in Rio as well as in other cities, and the

cemetery is one of the institutions of the place. The old cemeteries of Rio adjoin the churches; since 1850 no interments have been allowed in them, and new cemeteries have been established in the suburbs. The foreign cemetery is at Gamboa, on the shore of the bay.



COFFIN CLOSED.

"We went to one of the cemeteries," said Frank, "and happened to arrive at the entrance chapel just as a funeral was going on. The coffin was so shallow that the body lying within it was distinctly visible above the sides as it stood on a stand resembling a sarcophagus; the lid is shaped like the roof of a house, and is made of two sloping boards meeting and forming a ridge. The Catholic service for the dead was performed, and then a procession of priests and mourners formed, and the coffin was borne from the chapel to the cemetery.



COFFIN OPENED.

"This was an enclosure with four thick walls, in which there were niches for the coffins, in the same manner as in a receiving tomb at Greenwood or Mount Auburn. The coffin was placed on a stand near one of the niches, the cover was opened, a handkerchief was spread over the face of the corpse, and one of the priests sprinkled the body with holy water, and threw a scoopful of quicklime upon it.

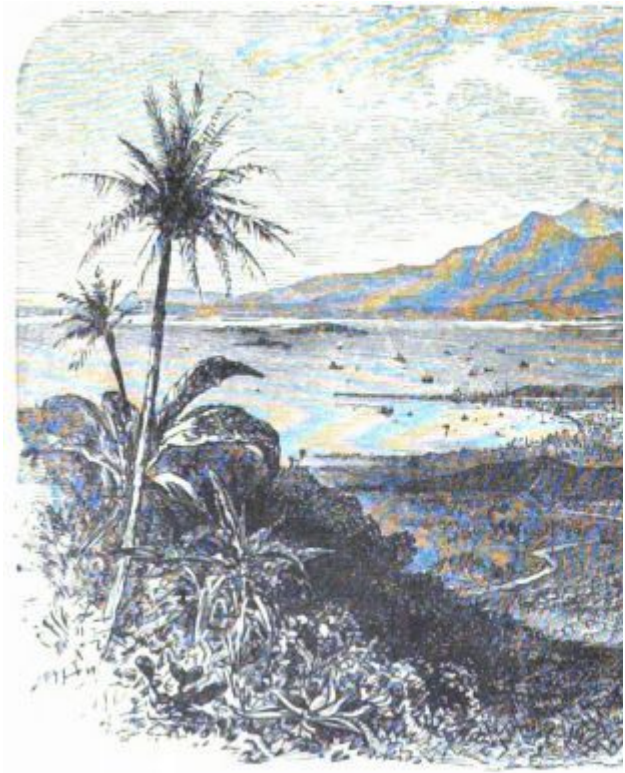


CEMETERY OF THE PAULA CHURCH.

"The other priests and the friends of the deceased followed his example one by one, the sprinkler and scoop being passed to them by a sacristan. The lime was thus heaped on until there was at least a bushel of it, completely concealing the body; the coffin was slid into its niche; the door was closed and locked, the key was delivered to one of the friends of the deceased, and then the attendants proceeded to close the space in front of the door with brick and plaster. Orations were pronounced by those who chose to speak, and the ceremonies were over.

"We were told that the bodies do not decay, in the ordinary acceptation of the word. The flesh is

consumed by the quicklime; at the end of two years the niche is opened, the bones are removed and placed in a funeral vase, and the niche is then ready for another tenant. No names are placed above the niches, but each one is numbered, and a reference to the register of the cemetery will show by whom and for how long a particular place is occupied. Fees are exacted for the funeral services and the rent of the niches; in fact, there is hardly anything in life or death in Brazil in which the Church does not have a place. Christenings, baptisms, marriages, death, and burials are all within its supervision."

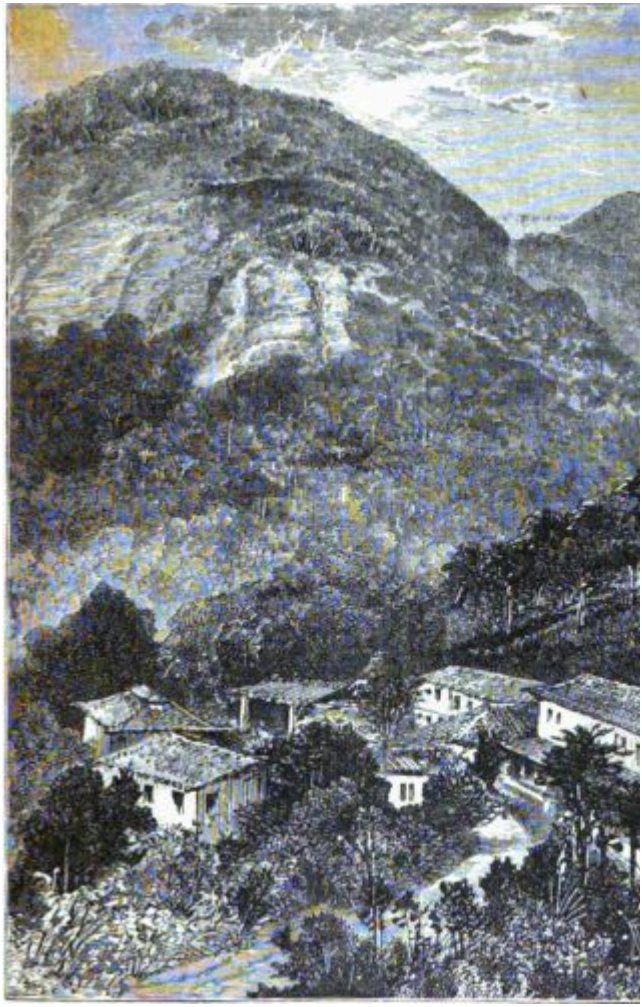


VIEW OF RIO FROM BOA

Rio de Janeiro has beautiful surroundings, and there is no prettier spot among them than Tijuca, a favorite resort of the residents who seek to escape the heat of the city. Other retreats are Petropolis, Boa Vista, Constantia, Nova Friborga, and Teresopolis, all of them at elevations of from one to three thousand feet above the water front of the city. Boa Vista offers a fine view of Rio as it nestles on the shore of the bay; all these resorts are reached by carriage-roads, and some by railway, and in whatever way the journey is made it is sure to be enjoyed.

It was decided to visit Tijuca first of all, and for this purpose a carriage was engaged for a drive of less than two hours, over a magnificent road. They started late in the afternoon, panting with the heat, but within an hour each of the party had donned his overcoat, and found its warmth acceptable. Frank thought he could perceive a fall of the temperature with every foot of the ascent, and regretted that he had not held a thermometer in his hand during the journey.

Tijuca beautifully is situated among the hills and in the midst of dense forests and groves. There is a waterfall which has a local reputation, something like that of Niagara; it possesses quiet beauty rather than grandeur, and is in a charming retreat where the thickness of the foliage keeps out the rays of the tropical sun. There are several similar cascades in the neighborhood, and the sound of the water pouring among the rocks is very gratifying to the ear of one just escaped from the heat of the city.



HOTEL AT TIJUCA, NEAR RIO

Foreign residents of Rio have their summer residences at Tijuca, Boa Vista, and other places within easy reach of the capital, and a liberal expenditure has been made by them in the construction of houses and in laying out gardens and lawns. There are several hotels at Tijuca, and the

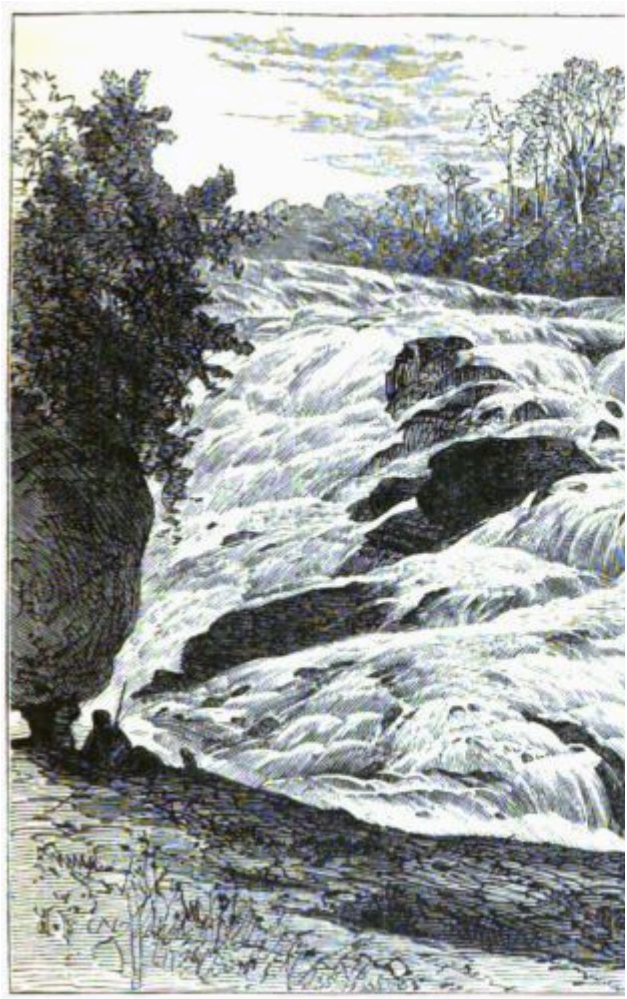
stranger can be reasonably sure of satisfactory quarters during his stay. Dr. Bronson and his young companions were highly pleased with what they found there, and wrote a line of commendation in the register of the hotel.

Frank had wearied of carrying a monkey as part of his baggage, but was so much attached to his purchase on the Madeira that he was unwilling to part with it except to some one who would treat it well. With some trouble to the youth, and more to Manuel, Gypsy had been tenderly cared for during all their travels, from the day of her purchase until they reached Tijuca, where the tiny animal found a genuine admirer.

The daughter of the landlord was mourning the loss of a pet which she declared was "the very image" of Gypsy. Frank was touched by her grief, and with the permission of the proprietor of the establishment the ownership of Gypsy was transferred to the child.

Frank rejoiced that his pet had found a good home; the girl was delighted with the possession of the duplicate of the animal she mourned; the father was pleased at the daughter's joy; and it is to be presumed that the monkey was contented to give up travelling, and settle down amid the pure air and charming scenery of Tijuca. But our record closes without a distinct avowal from Gypsy of the sentiments that swelled her simian breast.

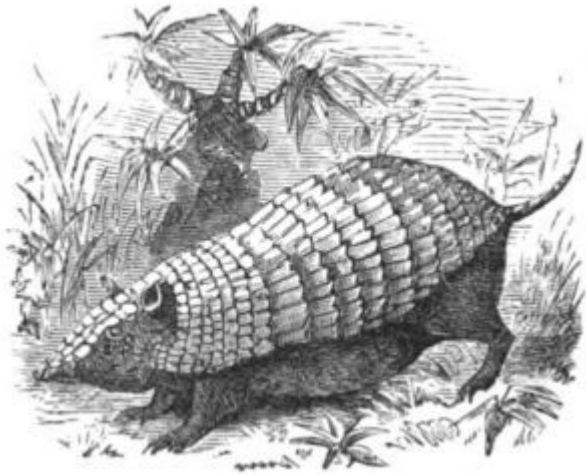
Frank and Fred were up early in the morning after their arrival at Tijuca, and ready for a horseback excursion to the top of a neighboring mountain. Dr. Bronson concluded to remain at the hotel, and satisfy himself with a promenade among the trees, and so the youths departed without him.



CASCADE AT TIJUCA

They had an exhilarating ride, and came back about ten o'clock full of enthusiasm concerning it. There is a carriage-road nearly to the top of the mountain, and a bridle-path the rest of the way, so that they had no occasion to leave their saddles. At every step they had beautiful views of mountain and valley,

thick forest and open lawn, and there were frequent glimpses of the bay and the distant ocean. From the top of the mountain the view embraces a considerable extent of country, backed by the higher mountains of the Serra, which fills the horizon to the west.



THE ARMADILLO.

Breakfast was served soon after their return, and they sat down to the meal with good appetites. After breakfast they busied themselves with letters and journals, and with the contemplation of a happy family of monkeys and other Brazilian animals in a large cage in the court-yard of the hotel. One occupant of the cage was an armadillo; as nature had not adapted him for climbing, he wisely remained on the floor and allowed the monkeys a monopoly of acrobatic feats. The upper half of him was protected with scales like plates of mail, and when alarmed he closed himself together till he resembled a cocoa-nut. At such times there was little else than the mail-plates presented to outside view, and he could be tossed around with impunity, at least to the tosser.

The monkeys had a way of rolling him from side to side of the cage, and occasionally they carried him to the top and let him fall. This application of the laws of gravitation did not affect his gravity, and when they wearied of the performance he opened out his iron-clad coating and looked as serene as ever.

Frank wished to know the uses of the armadillo; Manuel told him it was an excellent article of food, and was liked by both native and foreign residents of Brazil. The youth was sceptical until he had the opportunity of tasting the new diet, whereupon he declared that he would be a friend of the armadillo as long as he remained in South America.

From Tijuca they went to Petropolis, a summer resort higher in the mountains and more distant from the sea than is the former place. They took the carriage-route by the Union and Industry road, a magnificent highway, which was built by private enterprise, and is a model of engineering skill. It penetrates the coffee district back of Rio, and until the railway was built from the capital to and beyond the mountains of the Serra it had almost a monopoly of transportation. It still has a large business, and the company which controls it runs a line of stages and freight wagons, in addition to collecting tolls on every private wagon and every pack animal that passes over it.



ROAD OVER THE SERRA, NEAR

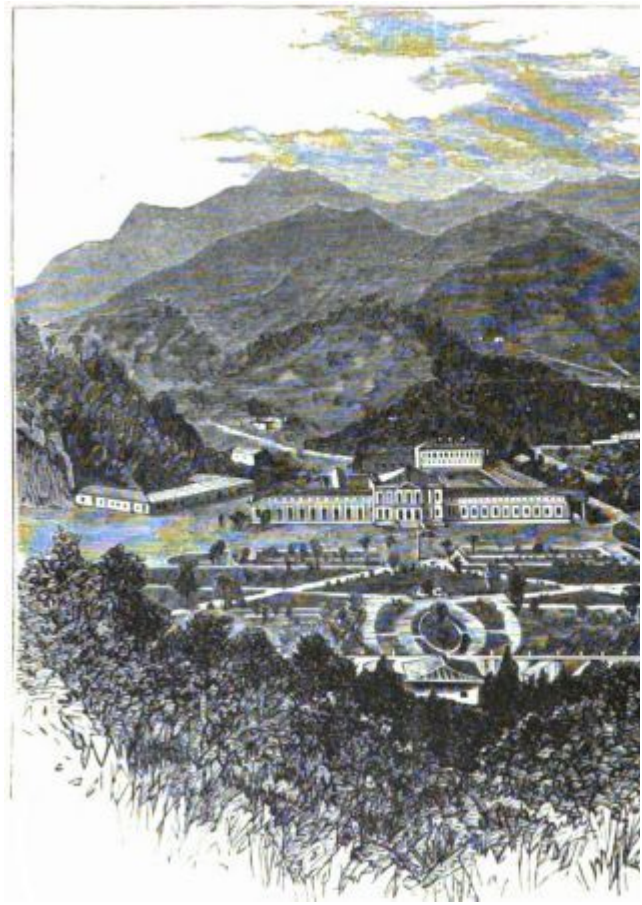
The scenery along the road, where it crosses the Serra, elicited the warmest expressions of admiration from the Doctor and his young companions. Frank said it was a combination of the Corniche road from Nice to Genoa and the mountain journey from Colombo to Kandy, in Ceylon. Fred was reminded of the passage of the Alleghenies in Pennsylvania, and the Simplon in the Alps, though he missed the snow-clad peaks of the latter, and the pines and other northern trees of the former. They unanimously agreed that the engineers who made the road understood their work thoroughly, and had constructed a route which would endure through

everything except the demolition of the mountains by an earthquake, or the outbreak of a volcano beneath them.

They were caught in a storm while ascending the Serra; one is generally caught in a storm in some part of the day in the mountains near Rio. The rain falls in such quantities as to drive the wayfarer to the nearest shelter, and if he is not quick to reach it he is drenched to the skin. Rain falls every afternoon at Tijuca, and so certainly may it be expected that the sojourners so time their excursions that they may be indoors when the showers come. The moisture from the ocean is driven against the mountains, where it is condensed into rain, and by this daily rain the streams around Tijuca have an unfailing source of supply. The morning is clear and comfortable; from ten or eleven in the forenoon until three hours after the meridian it is too warm to stir about; and at three o'clock the clouds gather, and the rain falls an hour or so later. At sunset the clouds roll away, and the night sees the canopy of the heavens glistening with stars.

The storm on the Serra had the peculiarity of rolling below their route and leaving them travelling above the clouds. It began at the summit of the mountain and then descended; it wrapped them in its misty folds; lightning played about them; they met wagons and pack-mules looming suddenly out of the fog as though literally dropping from the clouds; then the mist became less and less dense; and at length they emerged from it into the open sky, and looked upon the storm sweeping over the valley below. From the Alto do Serra, the highest point of the road, they had a view of immense extent. The mountains rose above and around them; the valley, visible through

occasional breaks in the clouds, was a picture of serene loveliness, disturbed only by the lightnings and the rain that fell copiously. Far off was the Bay of Rio de Janeiro, dotted with its many islands, dominated by the mountains that encircle it, and lighted by the afternoon sun.

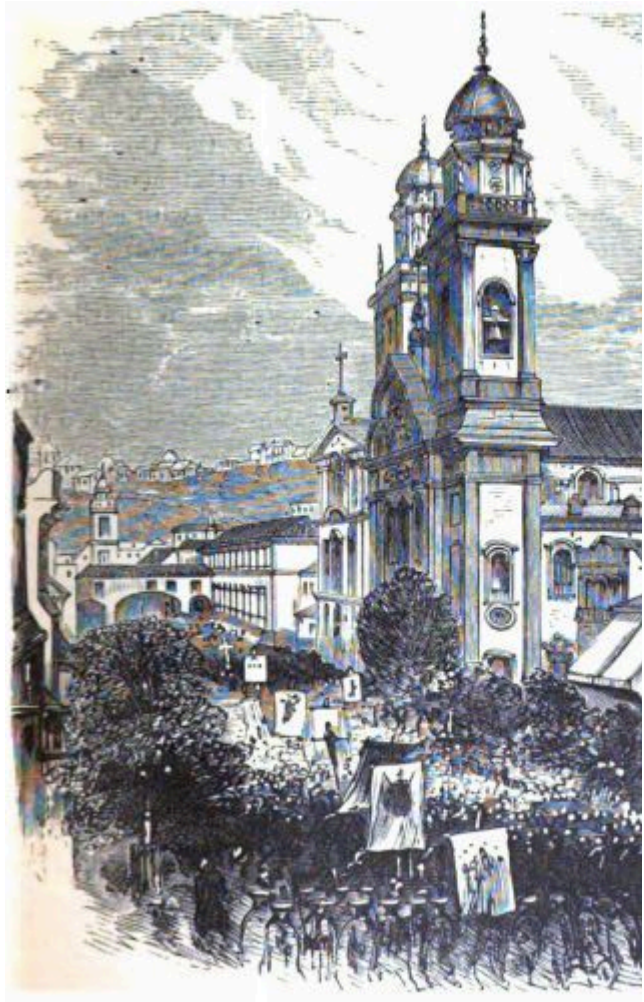


THE PALACE AT PETROPOLI

Petropolis lies in a beautiful valley among the mountains; it was founded by Dom Pedro I., who

built a palace there and established a colony of Swiss and Germans, which were imported from Europe at considerable cost to the government. The plan was continued by his son and successor, and of late years the place has become a fashionable resort of no small importance. It has fifteen thousand inhabitants, and many of the wealthy residents of Rio have their summer homes in Petropolis; the imperial palace is an extensive building with beautiful grounds, and the situation is certainly an attractive one.

The German settlers brought the names of their fatherland when they came here to live, and also retained many of their home customs. Some of them have become wealthy coffee-planters, and a good deal of business passes through their hands. Many of the hotels are kept by Swiss or Germans, and not infrequently the buildings are perfect copies of the chalets we have seen in the Alps, or among the lowlands of Switzerland. Petropolis has several Lutheran and other churches, and the government makes an annual appropriation for schools, in which the children of the colonists are educated. There are several hotels, and the stranger can pleasantly pass a few days in this attractive spot.



RELIGIOUS PROCESSION IN BR

CHAPTER XXIII.

RAILWAYS IN BRAZIL.—COFFEE PLANTATIONS.

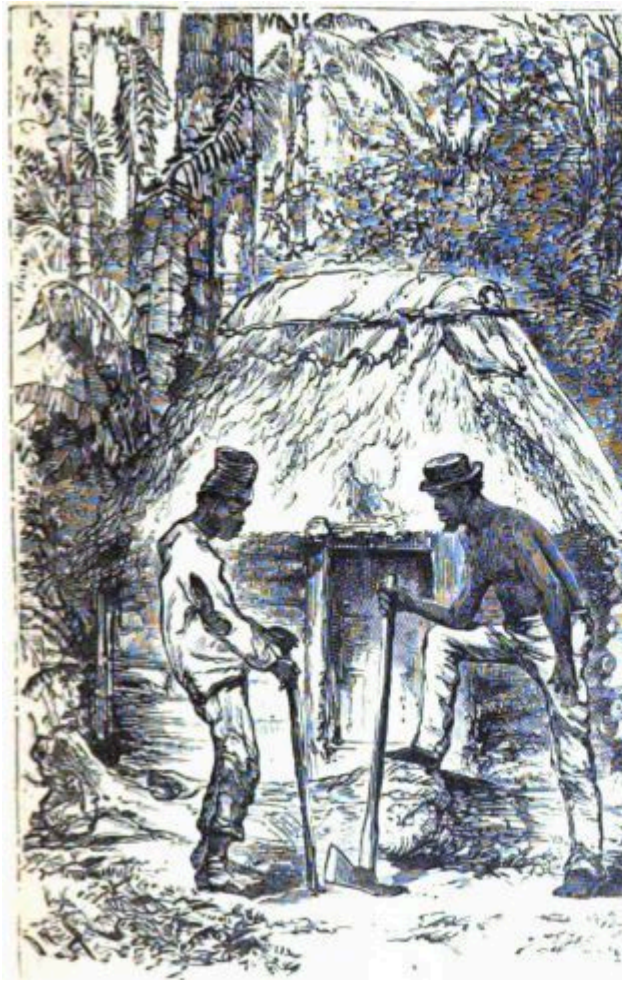
—MANDIOCA AND ITS CULTURE.—TERRIBLE FAMINES.—SLAVERY AND EMANCIPATION.

There are several railways running out of Rio de Janeiro, of which the longest and probably the most important is the Dom Pedro Segundo, so named in honor of the emperor. The first section of the line was opened in 1857; it was started by a private company, with a government guarantee of seven per cent. interest, but the capital was speedily absorbed, owing to the enormous extent of the outlay beyond the estimates. Instances of this last have happened in other countries than Brazil, and will probably continue to happen until railways are superseded by other modes of travel and transportation. The first hundred miles took all the capital of the company, and then more money was needed. In 1865 the government bought out the stockholders, and since then the railway has been run as an imperial concern, like many of the railways on the continent of Europe.

The present length of the railway is about four hundred miles. The main line is extended every year or two, and branches are built whenever their value as feeders can be demonstrated. The road has been of great benefit to the coffee planters in the region it penetrates; in fact, the line was built for the transportation of coffee, and the people or goods dependent upon it. Nearly every passenger is in some way connected with the coffee interest, and nineteen twentieths of the freight has some relation to it. Take away the coffee business and the road would require government aid to pay the cost of the fuel for its locomotives. At present it returns to the government about five per cent. upon the capital invested in the line, without counting the indirect benefits of the

development of the country's industries.

The other railways of Brazil are less profitable than the Pedro II., and some of them would be given up altogether were it not for the aid received from the government. Freight and passenger tariffs are very high, and the limited amount of business renders it impossible to fix low rates. The passenger fares are from four to five cents a mile, first class, and about half these figures for second class, while excursion tickets, limited in time, and not transferable, are sold at twenty-five per cent. discount from the double tariff. Every pound of baggage beyond that carried in the traveller's hand is charged extra, and a fair-sized trunk costs as much as a passenger's ticket. Live-stock may be said to "ride their heads off" if carried by railway in Brazil, and for this reason horses, oxen, cows, and goats are rarely shipped by the trains.



NEGRO HUT NEAR THE R

The freight on a sack of coffee (133 pounds) is about one cent a mile; coffee coming from the end of the Dom Pedro railway must pay four dollars a sack, which is about one third of its value, when delivered in Rio. From Rio to New York the freight rarely exceeds sixty cents a sack, and is often no more than twenty-five. Fifty miles of railway transportation in

Brazil costs more than five thousand two hundred miles on the ocean.

A few of the planters send their coffee to market by mule trains, and say it is cheaper than by railway, and there have been several schemes proposed for organizing a system of mule transportation on a large scale, in the hope of making a material saving of money. Of course, the government would not favor such an enterprise; and as it could not be extensively conducted without imperial sanction, the experiment is not likely to be tried.

Our travelling trio made a journey over the great railway line, and had an interesting ride. The engineering was found worthy of the praise that has been given by others; the passage of the mountains near Rio presented many obstacles which were successfully met by the English and American builders of the road. The line was begun by Englishmen, but since the first section was opened the work has been in charge of engineers from the United States.

Frank and Fred were disappointed in the amount of business over the road, as they had been told it drained a large district which produced coffee in abundance. The Doctor came to their relief with the following explanation:

"You must bear in mind," said he, "that there is a vast difference in the producing power of land, according to what is raised upon it. You cannot raise more than five hundred pounds of coffee from an acre of ground under the best conditions, while you can get five or ten times that weight in corn or wheat, especially the former. One gentleman who has studied the subject (Mr. Herbert H. Smith) says, the coffee district drained by the Dom Pedro railway and

another line near it does not give one thirtieth as much freight as would come from the same area of ground in the western states of North America. The large plantations are very widely scattered, and their products do not afford sufficient business for the railways; much of the land held by the planters is uncultivated, and, besides, their laborers are mostly slaves, or people who have very few wants beyond what the country around them will meet.



ENTRANCE TO A COFFEE PL

"A coffee plantation requires nothing but the machinery for tilling the land and preparing the coffee for market, the furniture, and some provisions for the house of the owner, and possibly a few bales of cloth for the garments of the slaves. The food of the negroes is grown on the place, their houses are built of bamboos, also grown there, and they raise enough mandioca and corn for their food. Those who have looked carefully into this matter say that long lines of railway in Brazil could not pay their running expenses if they were built for nothing. There have been several schemes for extending railways into the Matto Grosso province; at the present rate of freight it would cost eight dollars to bring a sack of coffee to Rio, which would be two-thirds of its value. The product of the land would not pay the cost of exporting it to a market."

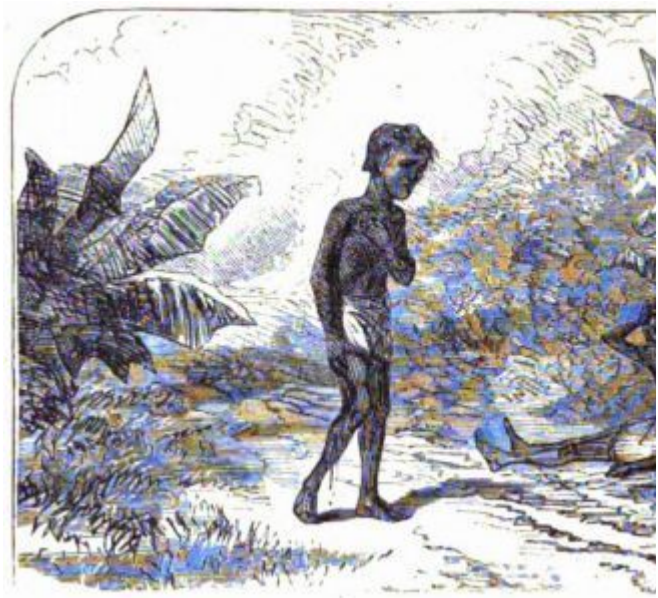
"But why don't they raise corn or wheat instead of coffee?" one of the youths asked.

"They have talked of doing so," the Doctor answered, "and some parts of the interior provinces are well adapted to the culture of our American staples. But they have not the right kind of a population for such work, and even if they had it, the cost of bringing grain or flour to Rio would be greater at the present railway tariffs than transporting it from the United States. I am told it has been carefully figured out that wheat from Wisconsin or Minnesota could be laid down in Rio cheaper than wheat from the end of the Dom Pedro railway.

"While we are on the subject of railways," the Doctor continued, "you may be interested in knowing that Brazil owes some of her railway lines to a calamity."

"To a calamity! how can that be?"

"In the past hundred years," Dr. Bronson explained, "there have been several famines in some of the interior and coast districts, particularly in the Ceara. One of the worst began in 1790; it lasted three or four years, and when it ended the province of the Ceara was nearly depopulated. Another followed in 1824-25, and another in 1844-45, the latter being less severe than its predecessor.



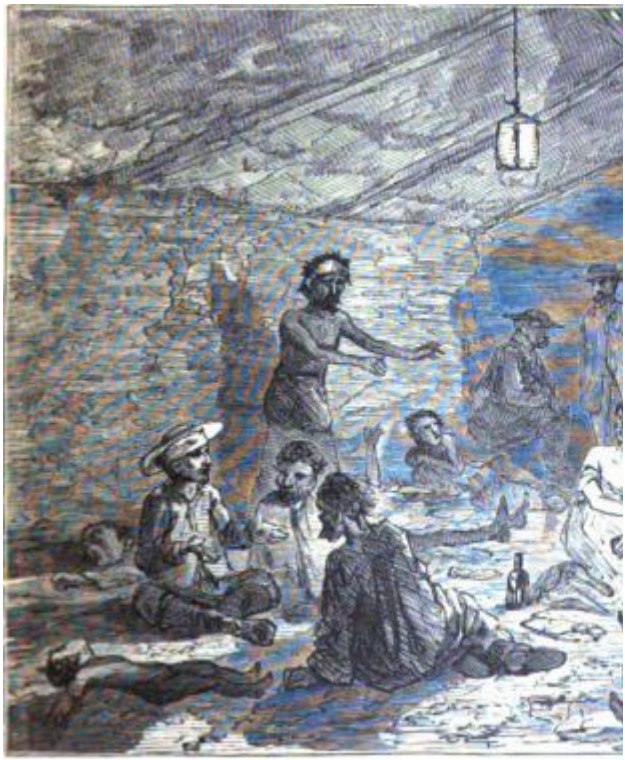
VICTIMS OF THE FAMINE.

"The next, and thus far the most terrible, *secca* or famine was in 1877-78. There was an excess of rain in 1875 and 1876 which caused great losses in consequence of the floods. Lands could not be tilled, as they were buried in water, and many cattle on the estates were drowned.

"The excess of rain was followed by a drought that dried up the streams and withered the grass and trees. The seed placed in the ground did not sprout, as there was no moisture to give it life, and month after month passed without rain. All this time the tropical sun poured its heat over the land, and you can easily imagine how it could change the rich forest into a desert of withered and blasted trunks, and the open country to a desert.

"The people left the plantations and flocked to the villages, many of them dying of hunger on the way.

Thousands perished at their homes; they remained there hoping for rain until too weak and famished to move. As long as the cattle lasted there was no hunger; the herdsmen killed the animals for their hides, and meat was abundant for all who would come and take it. Of course this could not last long, and when the herds were killed the people began to perish of starvation.



DYING FOR LACK OF F

"In a little while all the produce of the country was gone, and an appeal came to the government for aid. There was little law and order in the midst of the famine, and many people were killed in the struggle for existence; thieves were numerous, and desperate

men wandered about taking food wherever they could find it; when they met the trains of provisions going to the relief of the famished district they exercised the right of might, and even killed the horses and mules that were laden with food.

"When the horrors of the famine became known in the cities of Brazil an appropriation was voted by the government for the relief of the sufferers. Fairs were held, subscriptions raised, and a large amount of money was obtained, which went for supplying food to the survivors. The government sent engineers to lay out lines of railway and employ the people; in this way they obtained relief, and the country was provided with iron roads that will develop the country and be of practical use in transporting provisions in case of another drought.

"That was the way the calamity helped the building of railways," said the Doctor, "just as famines have led to similar public works in India and other countries. In the beginning of the distress the government and the public contributions supplied food to the people free of charge; the result was that they soon looked upon it as their right, and refused work when it was offered. When the government began operations on the railways it was ordered that no one who declined to work should receive either money or rations, and in this way the indolent were compelled to do something."

Frank asked what was the mortality in consequence of this famine?

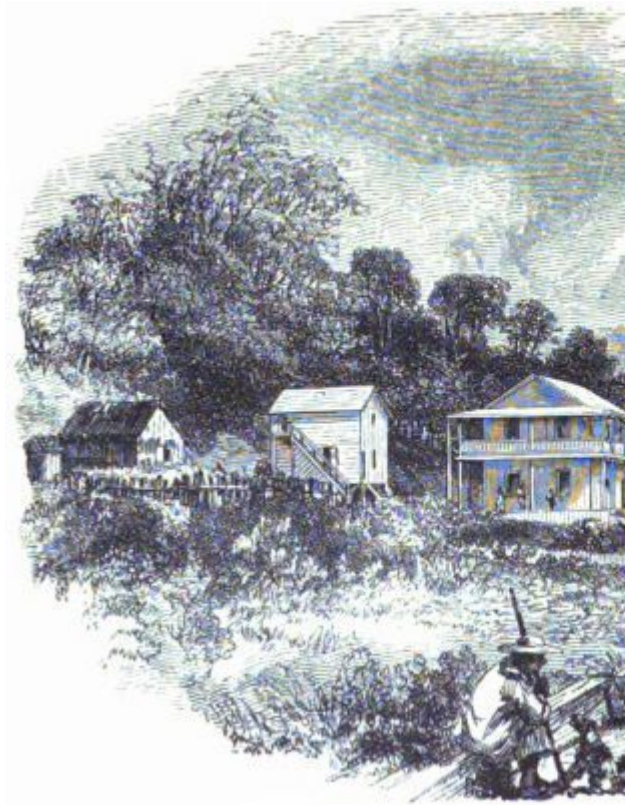
"According to the figures at my command," said the Doctor, "there were in 1876 about nine hundred thousand inhabitants in Ceara. In 1877 and 1878 five hundred thousand people died, or more than half the

whole population!"

"Did they all die of famine?"

"Not all; but the greater part of the mortality was the result of the famine. Fifty thousand died of starvation and disease in 1877, and about two hundred thousand in the first four months of 1878. Then small-pox, fevers, and other diseases appeared, and numbered their victims by many thousands, in addition to those who perished directly for want of food in the remaining months of the second year. Many persons moved away to other provinces and will not return to Ceara; the periodic occurrence of droughts will make life there very uncertain, and the probabilities are that it will never be prosperous.

"But enough of this sad subject," said the Doctor, with a sigh; "let us talk of something else." His suggestion was adopted, and Fred called attention to a patch of mandioca near the station where the train was coming to a halt.



A TROPICAL RAILWAY ST

"That is one of the staples of Brazil," said Dr. Bronson, "and it figures in her exports in the shape of tapioca. Mandioca is as necessary to the native of Brazil as the potato to the Irishman, or beef to the Englishman; mandioca flour, in this country, fills the place occupied by wheat flour or corn meal among ourselves."

They had repeatedly seen mandioca growing in patches near the villages, and in their journey down the Madeira and Amazon they had found it an excellent article of food. Ascertaining that the train

would be nearly half an hour at the station, they strolled over to the little garden and learned how mandioca is cultivated.



MANDIOCA PLANT.

"The plant has several names," said the Doctor, as they were walking to the garden; "the one most generally used is mandioca, but it is also called manioc, mandioc, yucca, and cassava, while its scientific appellation is *Jatropha manihot.* It is a native of South America, but has been introduced into Africa and other tropical countries, where it is extensively cultivated. There are two kinds of the plant; one is called the sweet cassava or sweet yucca,

and its roots are eaten raw, but are more commonly roasted or boiled, and they are as nutritions as their South American brother, the potato. The other, which produces the tapioca of commerce and the mandioca flour of South America, contains a poison so deadly that thirty-five drops of it were sufficient to kill in six minutes a negro convicted of murder."

"And this poisonous plant is used as an article of food?" Fred asked, in astonishment.

"Yes. The juice contains hydrocyanic acid; but it is removed by pressure and by the action of heat, so that the dried flour is perfectly harmless. It is still a mystery how the unlettered Indians learned the virtues of the plant, which was in universal use when the Spaniards and Portuguese first came here.





PLANTATION NEGRO.

"The Indians have a pretty fable concerning the origin of mandioca," the Doctor continued. "They say that long ago, in one of their tribes, a child was born which walked and talked precociously. It was named Mani, and died when it was only a year old. It was buried in the house where it died, according to the custom of the tribe; the roof of the building was removed, and the grave was watered daily. An unknown plant sprung from the grave; and when it ripened the earth cracked open and revealed the root. The Indians ate this root, and thus learned the uses of mandioca. Believing it to be the body of

Mani, they gave it the name *Mani-oca*, the house of Mani."

"A very pretty story, indeed," said Frank. "I will make a sketch of the plant in remembrance of it."

By this time they had reached the garden, and Frank busied himself with his pencil, while Fred made note of the appearance of the bush, which was about five feet high, and had long, pointed leaves at the extremity of the branches.

One of the plants was dug from the ground in their presence; the roots were in a cluster, and resembled large turnips, and the aggregate weight of the half-dozen roots that were taken out was from twenty-five to thirty pounds. In a shed close by a native was preparing the substance for use; the process may be thus described:

The roots are washed, and then scraped, with a shell or knife, into a fine pulp. This pulp is placed in a loosely-woven bag of palm-fibre, which is suspended from a pole; a weight at the lower end of the bag brings a pressure upon the pulp, by which the juice is forced out. While the substance is still damp it is spread on metal plates, and dried over a fire; and great care must be taken to drive off every drop of the poisonous juice. During the drying it is stirred and broken into coarse grains, and this forms the *farina*, or meal of mandioca.

The poisonous juice is placed in a vat, where it deposits a fine sediment after standing a few hours. This sediment is the tapioca which is extensively used in Europe and America for the manufacture of puddings and other articles of food. Arrow-root is another form of the same substance.

The whistle recalled them, and they returned to the

train. From tapioca the conversation turned to slavery; a very natural turn, as a good deal of the tapioca which comes from Brazil is grown by slave labor.

"Slavery is in process of extinction here," said the Doctor, "as a system of gradual emancipation was adopted in 1871. There will be nothing left of the institution after the year 1892. Many slaves have been freed already, and it is thought that the northern provinces of Brazil will anticipate the enforcement of the law, and give freedom to everybody before that date. Most of the slaves are on the plantations in the southern part of the empire; some of the coffee-carriers in Rio are still held in bondage, and pay their masters a certain amount daily for their time. All they earn beyond that they retain for themselves."

"How does the system of gradual emancipation affect the slaves at the present time?" one of the youths inquired.



PUNISHMENT.

"It affects them unfavorably," was the reply, "as you can readily see. If a man has a lifelong interest in his slaves, he is apt to treat them well out of regard to his own pocket, by making them useful as long as he can. But if they are to be free in a given number of years, he is tempted to get as much work from them as possible during that time, and leave them broken down and quite worn out at the end. Sell a yoke of oxen to a man, and he will work them much less than if he had hired them for a year, and was not bound to return them in good condition, would he not? This is exactly the position of the slaveholder in Brazil; there are many humane masters who treat their slaves well, but, unhappily, they are in the minority. These people have been accustomed to regard the negroes as their property, and they use them as they would property of any other kind. Whether the slaves will be well or harshly used depends very much upon the temperaments of their owners.



IN THE FIELDS.

"On a coffee or sugar plantation the slaves are required to work about seventeen hours out of the twenty-four. Some masters are satisfied with fifteen or sixteen hours, and others exact eighteen hours at least. Here is the ordinary routine:



SLAVES WITH COLLARS.

"The slaves are called to work at four o'clock in the morning; coffee is given to them at six, and their breakfast at nine in the forenoon. The breakfast consists of dried beef cooked with mandioca-meal and beans, together with corn-bread; and it is eaten in the field, in an intermission of not more than fifteen minutes. At noon they have a small drink of rum, and at four in the afternoon they have a dinner which is exactly like the breakfast, and eaten in the same way and time. At seven o'clock they leave their field-work, and go to the mill or the household until nine o'clock, when they are locked in their quarters,

and can sleep until roused for the next day's toil."

"But do they have no holidays?"



SLAVE WITH MASK.

"Yes, they have a holiday on Sunday, but it simply amounts to a cessation of labor for three or four hours; in busy seasons the Sunday's rest is reduced to one or two hours, and with many masters to nothing at all. They have no allowance of Christmas holidays, as was the custom in the United States in the slavery days, and in many respects the life of the Brazilian slaves is harder than was that of the slaves in most of the Southern States of North America before the emancipation.



MASK.

"But, with all the toil of the Brazilian plantations, the life of the slave is a great improvement upon what it was twenty or more years ago. The blacksmiths' shops in Rio used to expose slave-shackles for sale as freely as those of our own country exhibit horseshoes, and the demand for these things was not small. There were collars to be locked around the neck, made of round iron an inch in diameter, and provided with prongs to prevent the unfortunate wearer from turning his head to either side; there were masks, through which no food or drink could be taken; shackles for fastening the ankles together, or for binding the wrists to the ankles; chains to be fastened to the waist or ankles, and attached to logs of wood, which the wearer was obliged to drag around wherever he moved; and numberless other devices of cruelty.



SHACKLES.

"A picture of slavery, drawn by an English clergyman in British Guiana before England had freed the slaves in her colonies, will apply to Brazil as it was twenty years ago, and as it may now be on some of the country plantations. Remember, it is a picture of English slavery as it existed in an English colony.

"'The cruelty of the lash, which was often steeped in brine, or pickle and pepper, is something very dreadful to think of. Twenty-five was the number of lashes laid on the bare back of the slave when a dry leaf or piece of the boll was found in the cotton, or a branch was broken in the field; fifty for all offences of the next grade; a hundred for standing idle in the field; from a hundred and fifty to two hundred for quarrelling with fellow-slaves; and five hundred, laid on with the greatest possible severity, for any attempt to run away or escape from an estate or plantation. The overseers and gang-drivers made the slaves work with the greatest possible rigor, and their lives bitter with hard bondage. Up to the day before the slaves were emancipated, or proclaimed

free, the lash was freely used on a plantation near Georgetown, and on the morning of the emancipation several freed slaves walked up to their overseer and asked if they were not to be whipped for obtaining their freedom.'[2]

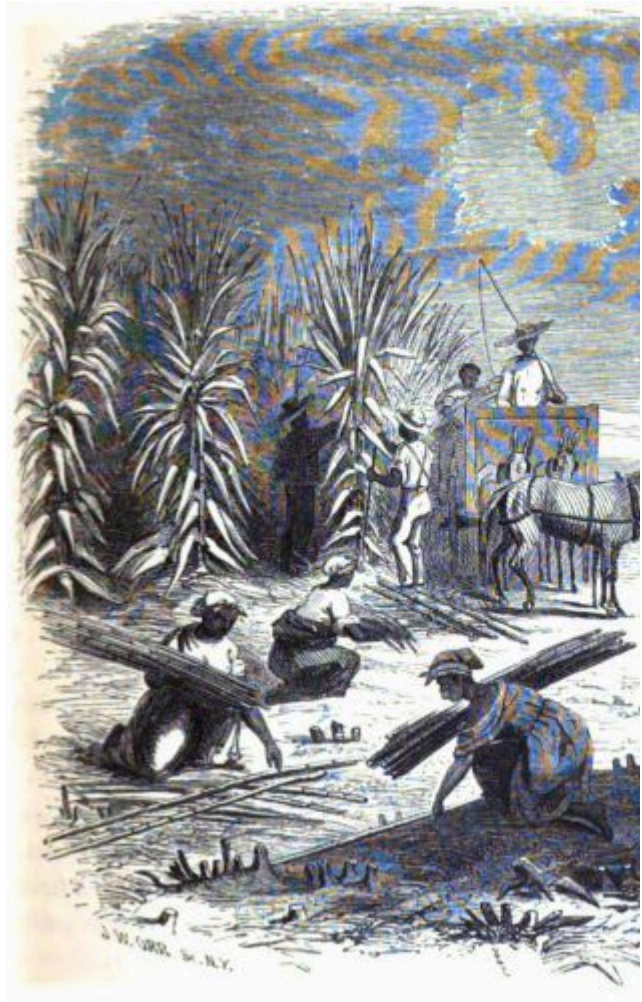


HOUSEHOLD SERVANT.

"Emancipation in Brazil is largely due to the humanity of the present emperor," continued the Doctor. "He urged the suppression of the slave-trade, and was considerably in advance of his cabinet on the subject. When this was accomplished, he presented plans for the emancipation of the negroes held in bondage. He repeatedly sent messages to the

Brazilian parliament on the subject. Progress in the movement was slow, as four fifths of the members of that body were slave-owners, and more than half of them planters. But he never gave up the struggle, and in 1871 the law was passed. He had set the example by freeing his own slaves, and inducing the members of his family and many wealthy citizens to do the same. Slaves were allowed to purchase their own freedom, and in other ways the humane movement was accelerated. In 1855 there were, in round figures, three million slaves in Brazil. Twenty years later the number had been reduced nearly one half, and it has been further diminished since that time. Year by year the number of bondmen is growing less, and it is by no means impossible that, when the day comes for the final proclamation of freedom, there will be no one to set free."

"Let us hope it will be so," said both our young friends. Every reader of this narrative will echo the sentiment, and give all honor to Dom Pedro II., the enlightened Emperor of Brazil.



SLAVES GATHERING SUGAR-C

CHAPTER XXIV.

RETURN TO THE CAPITAL.—INTRUDO SPORTS.—

MUSEUM AT RIO.—MONTEVIDEO AND BUENOS AYRES.—THE ARGENTINE REPUBLIC.—ASCENDING THE RIVER PLATE.



THE SUGAR-CANE.

Our friends remained several days among the coffee and sugar planters to whom they had letters of introduction, and then returned to Rio. They found the planters exceedingly hospitable, and it was no easy matter to bring their visit to an end. They were pressed to remain indefinitely, and Frank and Fred were half inclined to accept the invitation, and become growers of Brazilian staples, but when they

reflected what a life of isolation they would be compelled to lead they abandoned the idea, and were ready to depart at the appointed time.

"It is no wonder," said Fred, when they left the house of Señor J——, "that he urged us to stay longer. I know we must make allowances for Spanish and Portuguese politeness, but in this case it was not altogether politeness, but a genuine desire for society. Think what it must be to be cooped up in this plantation with no one but your family and the servants for weeks together. If I were he I should hail with delight the arrival of an intelligent visitor, and would shed genuine tears when he announced his intention to move on."

Frank shared the opinion of his cousin, and the youths resolved that they would not entertain the thought of becoming Brazilian planters.

Their return to the capital was timed to correspond very nearly with the departure of a steamer for the south. They had a day to spare, and devoted it to a few farewell calls, and a visit to the museum, to inspect some of its antiquities and other curiosities. They had already seen the collection, but their first visit was unsatisfactory, as it was on a day when the place was altogether too crowded for comfort in sight-seeing.

As they came out of the hotel on their way to the museum several urchins in the street were pelting each other with balls filled with water, one of which accidentally struck against Frank. The youth frowned and then laughed; for the moment he could not understand the situation, but suddenly remembered that it was "Intrudo Day."

The youths retreated to the balcony, and for half an

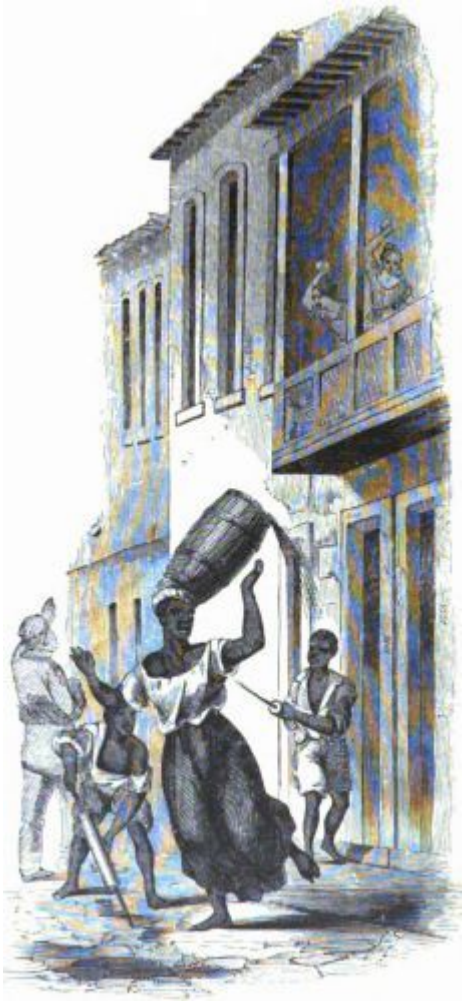
hour watched the performance in the street. They were joined by the Doctor and a gentleman with whom they had become acquainted; the latter explained the Intrudo, which corresponds to the carnival of Italy in some respects, but differs widely from it in others.

"The Intrudo festival begins on the Sunday previous to Ash Wednesday," said their informant, "and lasts three days; the carnival has special reference to abstinence from eating flesh, but the Intrudo has no such significance. In the carnival of Naples and other Italian cities, dust, flowers, confectionery and its counterfeits, are the missiles used in the mimic combats, while the Intrudo is devoted to throwing balls filled with water, emptying small bags of flour and starch, and to playing jokes more or less practical in their nature.

"As you are strangers in the hotel you are exempted from the tricks connected with the Intrudo, but you must expect an occasional attention of the kind you have already experienced. When I rose this morning I found that one leg of my trousers had been sewn up near the bottom, and on placing my foot inside in the effort to dress myself half a dozen Intrudo balls were crushed. Fortunately I had some clothing in a trunk of which I alone held the key, and the trunk was in a locked closet in sole charge of my butler. All clothing that was accessible had been removed; it was probably done while I was busy late the previous evening in despoiling the apartment of a friend.

"Of the two boiled eggs I had for breakfast one was raw and the other hard enough to be used as a bullet; my tea was sweetened with salt; slices of boiled tongue were really pieces of soaked leather; and the cold chicken had evidently been run through

a sewing machine, to judge by the number of threads in it. Pranks had been played with everything on the table; while you were laughing at the perplexities of your neighbor you found yourself the victim of a kindred deception.



INTRUDO SPORTS THIRTY YEARS AGO.

"Ladies are the greatest lovers of the Intrudo sports,

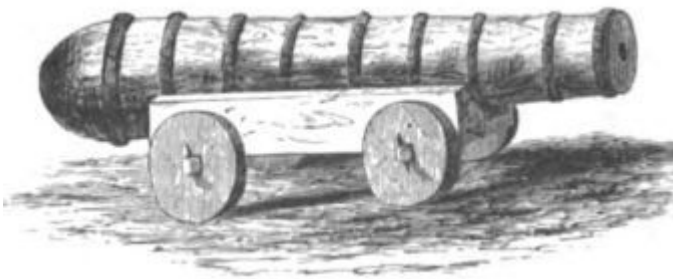
and if you have any lady acquaintances here I warn you not to make any formal calls on them to-day, if you wish to preserve your dignity unruffled. It is a proverb here that 'Intrudo lies are no sin;' and while a lady is inviting a friend to a chair, and promising not to molest him in any way, she is getting ready to crush an Intrudo ball in his neck, or upon his shoulder, or arranging for him to sit down upon a dozen of them."



INTRUDO BALLS AND BO

The gentleman sent a servant for some Intrudo balls and bottles, and gave the youths an opportunity to examine them. They were composed of wax thin enough to be easily broken in the hand or when striking an object a few feet away, and were filled with scented water. "They were formerly," said their informant, "made much larger than at present, and immense quantities were sold and used. At present

they are small. The throwing of Intrudo balls in the streets is forbidden by the police, but occasionally the unruly urchins will embrace the opportunity to use them on each other, as you have already discovered. In many houses the balls are filled with flour instead of water, and the sport of the season resembles that of Naples and Venice. Thirty years ago every negro boy on the street was armed with a large 'squirt-gun,' which he used freely upon those of his own color; white people were at liberty to pelt any one of their complexion, and the sport became so riotous that its suppression was a public necessity."



WOODEN CANNON.

Among the curiosities in the museum they found a fine collection of living and stuffed specimens of the wild animals of Brazil. It included several jaguars and other carnivora from the interior provinces; a large cage filled with monkeys of every sort; another of snakes, among which was an anaconda seventeen feet long—at least, so said the attendant, and they were willing to take his word for it without personally measuring the reptile. There were stuffed humming-birds of many kinds; eagles, and their kindred, the vulture and condor; beautiful specimens of the ibis, which recalled the sacred bird of Egypt; together with many other winged creatures that have

no names in our vocabulary. One of the condors had been recently used in a bull-baiting; the attendant narrated, with great animation, how the bird had been chained to the back of a young bull, and then turned into a ring. Bird and beast were maddened by the explosion of fireworks fastened to the animal's head; in his efforts to escape the condor tore great gashes in the flesh of his companion in misfortune. It is pleasant to record that these amusements are every year less and less appreciated in South America, and it is to be hoped the day is not far distant when they will cease altogether.



THE CONDOR AND THE BULL.

There was a wooden cannon which was captured from the rebels in one of the northern provinces in the last revolution. It was made of slabs of wood

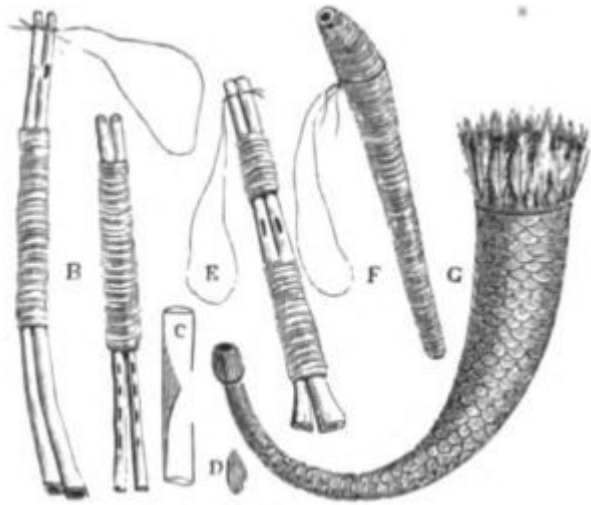
bound together with hoops of iron, and appeared to have been used; it was a type of the earliest known cannon, and carried the thoughts of the spectators back to the days when artillery was first used on the battlefield. Horrible in appearance were embalmed heads from the country of the Tapajos; Dr. Bronson explained that this tribe used to preserve the heads of their enemies, and wear them on their necks as trophies of their valor. A string through the mouth was used for suspending such a prize; the eyes were filled with wax and cement, and the whole face was built out with this material, to make it as lifelike as possible. On the top of the head was a tuft of hair, and the positions of the ears were indicated by rosettes.



EMBALMED HEAD.

Close to these preserved heads was a case containing musical instruments resembling flutes and horns, and

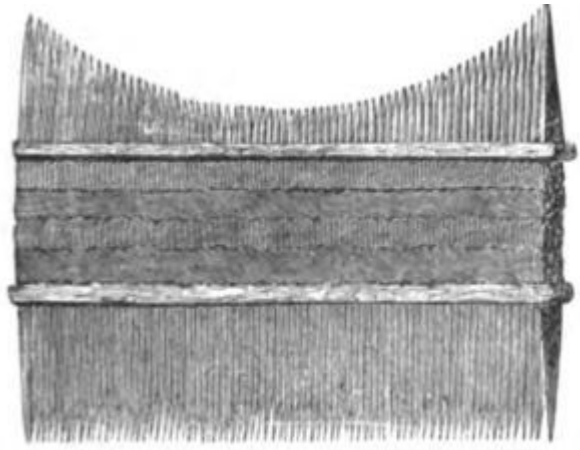
said to be of great antiquity; they were from the upper part of the Amazon Valley, and coeval with the incas of Peru. One trumpet attracted the attention of the youths; it was about three feet long, tapering regularly from end to end, and provided at the larger extremity with a fringe of feathers, which modulated the sound when the instrument was used. The attendant asked Frank and Fred to guess what it was made of; they named everything they could think of, but without success, and were finally told it was an alligator's tail!



ANCIENT MUSICAL INSTRUMENTS.

There were ancient combs, household utensils, and other things in the collection; Frank made a sketch of a comb which consisted of thin strips of a very hard wood set in transverse bars, and firmly bound with fine threads of a fibre resembling silk. One edge of the comb was straight, and the other curved; between the transverse strips that held the teeth in place, the flat space was covered with a closely

woven mass of binding material, and a careful inspection showed the tracery of figures so delicate as to require very strong eyesight on the part of the operator.



ANCIENT COMB.

Among the specimens of pottery was a basin about eighteen inches in diameter, and perfectly preserved. The outside was quite plain, and somewhat blackened by smoke, but the inside was decorated with a great variety of lines that resembled serpents twisted together; the glazing was broken in many places, and did not seem to be well put on, while the shape of the basin indicated that it was made without the assistance of the potter's wheel.



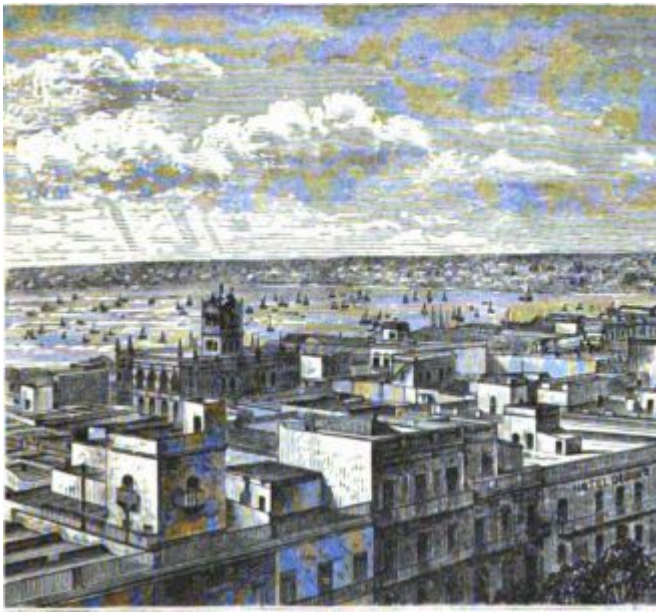
BRAZILIAN BASIN.

Space will not permit us to name all the objects which occupied the time of the youths in their visit to the museum; we will drop the basin, at the risk of breaking it, and accompany the party on board the steamer which is to carry them southward.



MON

They left the bay of Rio Janeiro as they had entered it, passing near the base of the Sugar-Loaf, and keeping their eyes fixed on its lofty peak until it dwindled to a mere point on the horizon. Southward and a little to the westward they took their course, and six days after leaving Rio were in front of Montevideo, the capital of Uruguay.



VIEW IN THE CAPITAL OF URUGUAY

They found it a clean and well-built city, consisting largely of flat-roofed houses a single story in height, though there were many modern structures of two or three stories. It is on a point of land extending into a bay which affords shelter from all winds except the southwest; the harbor is well provided with docks and other conveniences for shipping purposes, and the city has half a dozen street railways, is lighted with gas, and has several steam railways into the interior of Uruguay. The business of the place is principally in the exportation of hides, wool, horse-hair, and other products of Uruguay and the surrounding country, and the importation of machinery, lumber, and numerous articles which may be classified as "assorted goods." Frank investigated the statistics, and found that Montevideo has a population of more than one hundred thousand, while Uruguay, of which it is the

capital, has half a million inhabitants, and an area of seventy thousand square miles. The party had about five hours on shore at Montevideo, and then returned to the steamer to cross the mouth of the Rio de la Plata to Buenos Ayres, one hundred and thirty miles distant. From the anchorage, about six miles from the city, they were taken ashore in a steam tender which came puffing out to meet them.

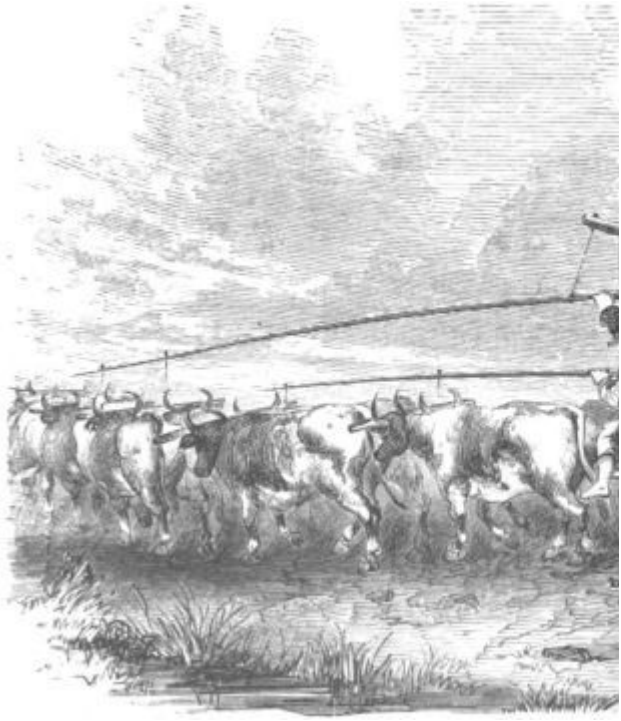
They landed with all their baggage, and after a delay in port of some twenty hours the steamer proceeded to the Strait of Magellan and the Pacific Ocean. In a subsequent chapter we will know more about her course. Most of the foreign steamers going southward from Montevideo do not visit Buenos Ayres, but go direct to the strait without stopping.

Twice as large as Montevideo, and with many evidences of wealth and prosperity, Buenos Ayres impressed our young friends as second only to Rio Janeiro among the cities of the South American continent, as far as they had seen them. Its streets are parallel to each other; it contains many fine buildings, both public and private; has ten daily newspapers in Spanish, French, English, German, and Italian, besides several weekly or monthly publications; can boast of banks, theatres, hospitals, churches, convents, public libraries, museums, and the like; has several good hotels; and is, in fact, a comfortable place to be in. So thought our friends as they settled in their hotel and afterwards took a stroll through one of the principal streets.

"If only Montevideo had a country back of it like that which feeds Buenos Ayres it would get the most of the business at the mouth of the River Plate. Montevideo has a good harbor and Buenos Ayres a poor one; the former has safe anchorage and is well

sheltered, while the latter is shallow, and open to half the winds that blow. In the easterly gales the estuary at Buenos Ayres is apt to overflow its banks, and when there is a strong wind from the west the water is so blown out that ships of deep draught have to change their moorings. But Montevideo has no important country behind it, while Buenos Ayres sweeps all the way westward to the Andes, south to Patagonia, and north into Paraguay."

So spoke the captain of the steamer as they were crossing the broad estuary of the La Plata. As they looked on the evidences of prosperity in Buenos Ayres, and learned that the city had grown up under many disadvantages, they expressed their admiration for the energy and enterprise of its merchants in no stinted terms.



OX-CART OF BUENOS A

Only small vessels can come close to the water-front of the city; ships drawing more than eighteen feet must anchor several miles out, and all freight and passengers come to the shore in lighters. Two piers, each fifteen hundred feet long, have been built, for the use of small steamers and other boats of light draught; before these piers were constructed it was necessary to land in flat-bottomed boats, or in carts with wheels ten or twelve feet in diameter, which were pushed out into the water, where they could receive their loads. Even at present the carts must be used occasionally, when an extremely low tide prevents boats from reaching the piers. Frank and Fred were reminded of the harbor of Madras, and

their adventures in going ashore there in a masullah boat; on the whole they thought the cart preferable to the masullah boat, but would risk a brief delay rather than intrust themselves to it if a gale happened to be blowing.

Water for drinking purposes was formerly as scarce in the city as that for anchoring ships in front of it. Down to a few years ago the inhabitants depended upon wells within the city limits, and carts which brought water from the river, where it was not affected by the tide from the sea. The well water was brackish and hardly drinkable, while the river water was sold at a high price. Now the city has been provided with waterworks and the old troubles have ceased. The drainage has been improved, and altogether it is a cleanly place, though less so than Montevideo. The latter owes its name to the mountain or hill on which it is partly built, and from which there is a fine view; while the former is named for its "good air." It is certainly a healthy place, according to the reports of residents, though it is liable to sudden changes of temperature. The thermometer rarely exceeds ninety degrees or descends below eighteen degrees; yellow fever comes occasionally, but not often, and there are no other epidemics.

Two days in Buenos Ayres were sufficient to exhaust the characteristic features of the place, and give the youths an insight into the history of the country of which it was the seaport. We will again exercise our privilege of peeping into Fred's note-book for information which will interest our readers.



SOLDIERS OF THE ARGENTIN

"Buenos Ayres," the record says, "is the capital of the province of the same name, and also of the Argentine Republic, or Argentine Confederation, of which the province forms a part. The country has been through a series of wars which it is not necessary to describe here; from present indications it has a destiny of peace before it, though a revolution may break out at any moment. The Argentine Confederation includes fourteen provinces; it has a president, who is elected for six years, a cabinet of five ministers, a congress of two houses, a national debt, an army and a navy, together with other paraphernalia of government. It has two thousand miles of railway, and another thousand is in process of building; it has frequent

disputes with Chili as to its rights in Patagonia; a population of about two millions; and herds of cattle, sheep, and horses too large for careful enumeration.

"Of late years it has encouraged emigration from Europe, and there are probably half a million people of European birth now living in the country. One fourth of these are Italians, and the rest are Spaniards, Irish, English and Scotch, Germans, Portuguese, and a few other nationalities; in the province of Buenos Ayres there are seventy thousand Italians, forty thousand of whom are in the city of that name. At every step we hear the Italian language spoken, and the signs over the shop doors bear more Italian than Spanish names. The Spaniards were the original settlers of the country, but their identity is rapidly disappearing under the influx of immigration from Europe.



A GUACHO.

"It is interesting to note the occupations of the various nationalities as they settle in this new country. The descendants of the original conquerors are generally known as *Guachos*, or 'countrymen;' they rarely live in the cities, preferring the wild life of the interior, where they dwell in rude huts, subsist on the flesh of cattle or wild game, and have an existence little better than semi-civilized. They are the finest horsemen in the world, if half the stories we hear of them are true, and a group of guachos ought to put to shame the best circus troupe that was ever organized.

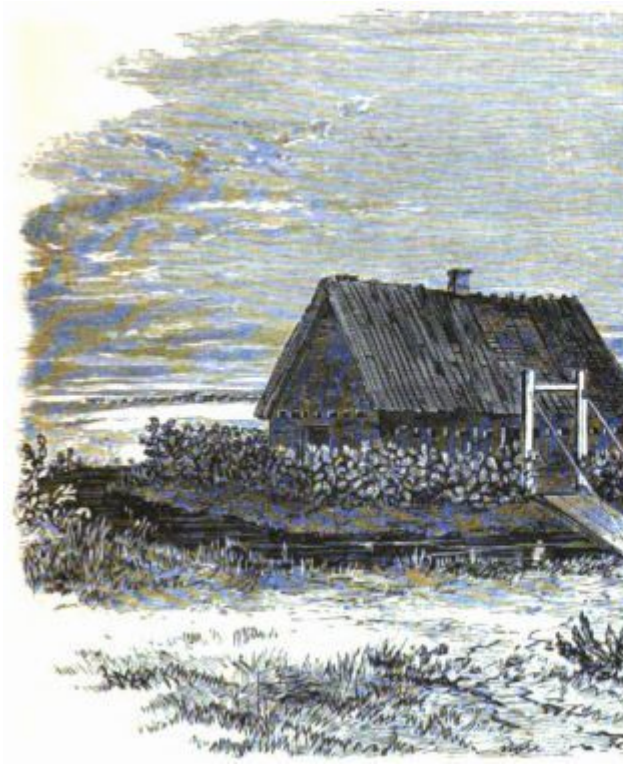


A GUACHO ON HORSEBACK.

"Apropos of this, I am told that a circus company came to Buenos Ayres, years ago, when the place was the resort of the guachos, and gave a performance. Just as the show ended a group of guachos rode into the ring and completely outdid the circus men in every one of their tricks, besides several that were not down in the bills. The circus company sailed away for Valparaiso, but it had no better luck there than at Buenos Ayres. The Chilians are splendid horsemen, and defeated the professional performers at their own game. It was probably the same company we heard about at Lima.

"The Italian emigrants engage in building houses and in raising vegetables in the market-gardens surrounding the principal cities; those from Genoa

have almost a monopoly of the boating business on the rivers, and they man the coasting ships and other craft. The Catalonian Spaniards are mostly wine-merchants; the Andalusians are shop-keepers and cigar dealers; and the Galicians are employed as domestics, porters, watchmen, and railway servants of the lower grades. Emigrants from the Basque provinces are the most numerous, next to the Italians, and their employments are similar to those of the Galicians, in addition to bricklaying, sheep-tending, and farm-work in general. The Irish are the sheep-farmers of the country, and it is said there are thirty millions of sheep in the Argentine Republic owned by Irish settlers. The English, Scotch, and Germans are generally occupied with commerce, though some of them have gone into cattle and sheep farming, like the Irish; the French are commercially inclined, some branches of trade being almost monopolized by them, and they assimilate with the native Argentines more readily than do the English and Germans. The aboriginal Araucanians generally retain their independence, leading a nomadic life, and keeping large herds of cattle and horses, which furnish their subsistence.

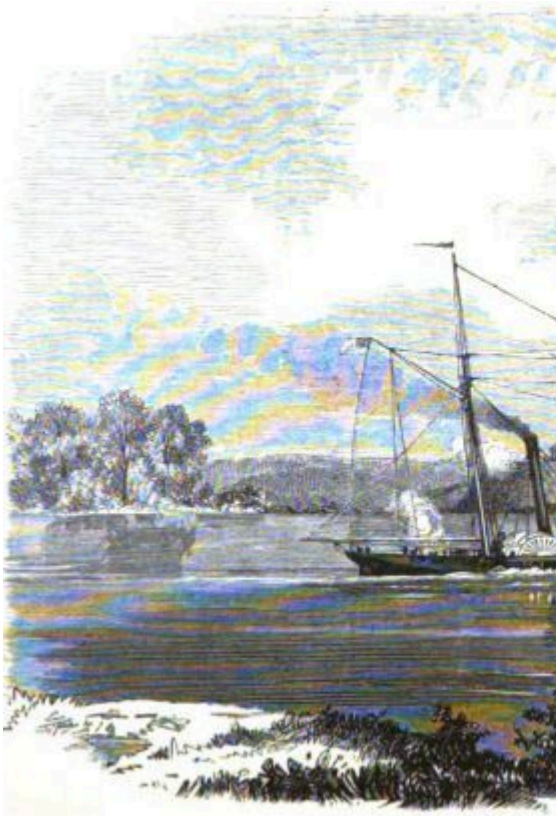


POST-STATION ON THE P

"There you have a picture of the population, which is as heterogeneous as that of the United States of North America, and has good promise for the future. The country is as diversified as the people; it consists of dense forests and vast pampas or plains, in which the herds of countless cattle and horses, and flocks of equally countless sheep, find a nutritious pasture. The pampas are far more extensive than the forests, and there are places where you may travel miles and miles without seeing a tree, or even a bush. Altogether, the Argentine Republic contains a million square miles of land between latitude 21° and 41° south, and from the Atlantic Ocean to the Andes,

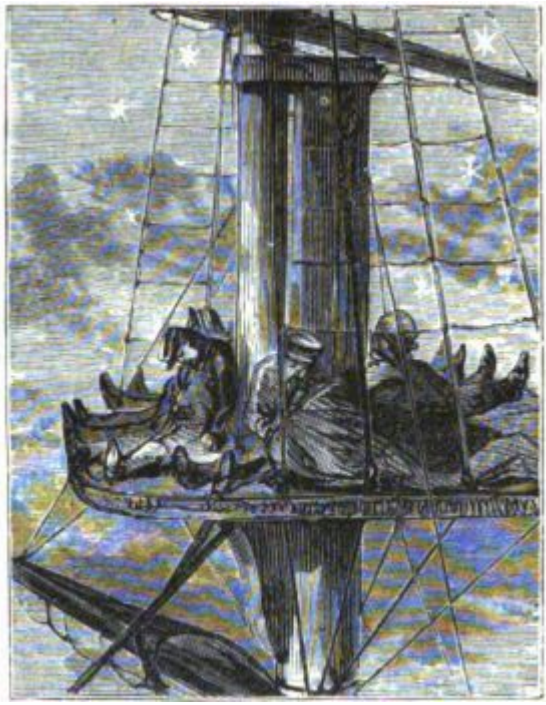
which separate it from Chili. The southern part of the territory is a vast desert; it is certainly a foolish quarrel between Chili and the republic, for the possession of this inhospitable region. The whole area in dispute is not worth the lives of the men who have died there while trying to hold on to it."

While Fred was writing the foregoing notes on the country, and Dr. Bronson and Frank were occupied with letters for home, Manuel was sent to engage passage on a steamer bound up the River Plate. Frank will tell us the story of the voyage.



A STEA

"Navigation on the River Plate is free to all nations," wrote the youth in his journal, "the same as on the Amazon. The river is variously called 'Rio de la Plata,' 'River Plate,' and 'Plate River,' and, strictly speaking, it is an estuary rather than a river. It is formed by the junction of the Parana River with the Uruguay almost within sight of the ocean; the broad estuary is full of shoals and intricate channels which render the navigation difficult. Large steamers can ascend the Parana a thousand miles from the sea; the basin of the River Plate is estimated to contain a million and a quarter square miles of land, and the inland navigation which terminates at Buenos Ayres and Montevideo is said to be not less than ten thousand miles. The Paraguay may be considered the head and principal stream of the Plate system; its sources are only a few miles from those of the Madeira, and the two streams might be easily united by means of a canal.



A REFUGE FROM MOSQUITOES.

"We left Buenos Ayres on a boat drawing about ten feet of water, and rigged like an ocean steamer; we wondered what could be the use of the masts in river navigation, but found out before the voyage was over. Mosquitoes were thick and thirsty, but, like mosquitoes in other countries, they did not fly high in the air; when they were too numerous on deck for comfort, we climbed into the rigging and escaped their attentions. We advise all travellers who may follow us to provide themselves with mosquito nettings; and if they have preference in steamers, to choose one that has rigging in which they can find shelter. The cabins are apt to be disagreeably warm, and, besides, one does not like to be shut up there in the evening, when he can find a spot where the night

air can be enjoyed without the presence of the winged pests of South America."

CHAPTER XXV.

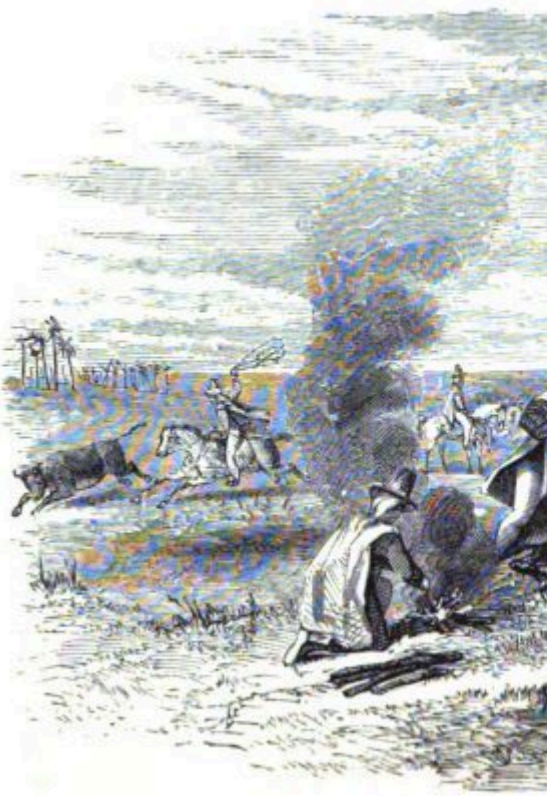
VISITING A CATTLE ESTATE.—THE LASSO AND BOLAS.—ASCENDING THE PARAGUAY AND PARANA RIVERS.—ROSARIO AND ASUNCION.—PARAGUAYAN WAR.—INDUSTRIES OF THE COUNTRY.—MATÉ.

"The terms Argentine Republic and River Plate are misnomers," said Frank, in his journal; "Argentine Republic means 'Republic of Silver,' and 'Rio de La Plata' has the same significance applied to the great stream. There is no silver on the banks of the river or anywhere near it; argentiferous deposits have been found in the mountainous parts of the country, but they have not been worked to any extent. The wealth of the republic is in the fertility of the soil, and its grazing facilities. Precious or other metals do not figure in the exports, which are almost entirely confined to hides, beef, horns, tallow, and wool.

"After passing the mouth of the Uruguay we were frequently quite near the shore, and could see great herds of cattle grazing wherever the country was open. We stopped at one of the *estancias*, or cattle estates; an accident to the machinery detained us several hours, and we accepted the invitation of one of the guachos to ride out about a mile from the landing and witness the operation of branding cattle.

"It was conducted without any regard to the feelings

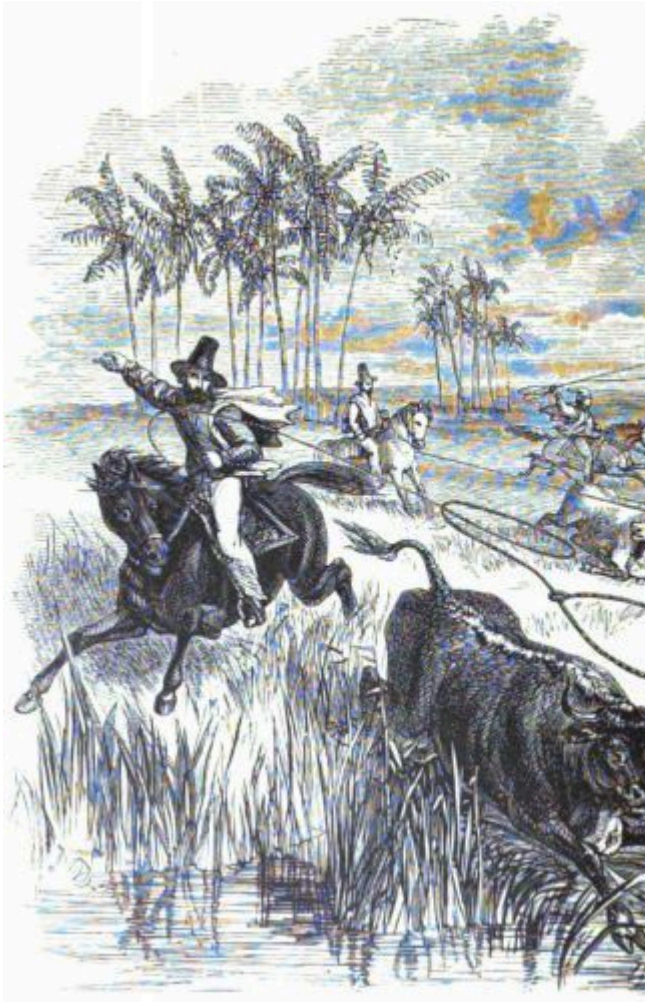
of the animal which received the brand. He was singled out from his fellows by one of the *vaqueros*, or herdsmen, who was mounted on a swift horse and equipped with a lasso, a long rope with a noose at the end. The lasso was thrown over the horns of the victim, or, perhaps, over one of his fore-legs; in either case it brought him to the ground, or enabled the vaquero to lead him to where several men stood ready for their share of the work.



BRANDI

"They held him firmly on the earth, and then the branding-iron, which had been heated to redness, was applied to his hide, and held there with such

force that it burned in deeply. The bellowing of the poor brute was unheeded; when the iron was removed he was allowed to rise and gallop off to his companions, and he lost no time in doing so. Then the iron was returned to the fire and made ready for the next victim, and so the operation went on with great rapidity. The mark of the brand is indelible not only while the animal lives, but after his hide has passed through the hands of the tanner.



USE OF THE LASSO AND BOLAS

"Another weapon of the vaquero is the *bolas*, which consists of two balls joined by a leather thong six or eight feet in length; they are usually round stones, or balls of iron or lead, and in either case are covered with leather, which is attached to the thong. They are swung round the head until they attain great

velocity, and then hurled at the animal; they twist around his legs, and bring him to the ground, or, at all events, hamper his speed so that he can be overtaken.

"Another kind of bolas consists of three balls united by thongs to a common centre; they are more difficult to handle than the other sort, and are chiefly used for hunting the guanaco and ostrich on the plains in the southern part of the republic, and in Patagonia. Fred and I tried to use the bolas, the ordinary kind, but we found that it went generally in the opposite direction from what we intended. One of the guachos showed us how to do it, and set us to trying to 'bolear' a stake driven in the ground ten yards away. We didn't hit the stake a single time, but we should assuredly have brought each other down if we had not stood at safe distances apart. When a novice is practising, the guachos require that he shall be far out of any possibility of reaching them by a stray shot.

"'Now see how I'll do it,' said one of the guachos, as he started in pursuit of a steer that was escaping from the herd.

"While the animal was at full gallop the bolas went twining around his hind-legs, bringing him to a dead halt, but without injuring him in the least. The guacho repeated the performance two or three times in succession, and showed that he was thoroughly skilled in the use of the weapon, which he launched with terrible swiftness and unerring accuracy.

"The hunters in Patagonia generally carry no other weapons than the lasso and the bolas in their pursuit of the guanaco and ostrich. Wild horses are tripped up with the bolas and then secured with the lasso, and sometimes the leaden ball, hitting a horse fairly

on the forehead, will bring him to the ground as lifeless as though shot through the heart.

"When the repairs to the engines were completed a gun was fired by the steamer, and we galloped back to the landing. We steamed on until late in the evening, passing alternate stretches of forest and open ground, and on two or three occasions feeling the sand-bars with our keel. This mode of sounding was not to the liking of the captain and pilot, and so we anchored until morning.

"For the first two hundred miles of its course as we ascend it the Parana is a labyrinth of islands and channels; they are so numerous as to bewilder the novice, and even the old pilots say they are often perplexed by the multiplicity of ways open to them. The islands are covered with fruit trees, from which the markets of Buenos Ayres and Montevideo are supplied, and they overhang the water so that in some places a boat may be loaded without its occupant stepping on shore. The forests are gay with flowers in bloom, the air is filled with fragrance, little pools and nooks in the islands are covered with aquatic plants, and the luxuriance of vegetation is so great that we were continually reminded of the lower Amazon.

"If only the mosquitoes had let us alone we should have found the journey one of the most interesting we have ever made.

"The country is rapidly filling up with inhabitants, who come from all parts of Europe, as already mentioned, but there is yet an immense area that awaits settlement. We ask for the Indians, but have difficulty in finding them; at various times they have had quarrels with the settlers, but soon found it was better to remain on terms of peace. As the country

has been occupied with farms and cattle-ranches, they have found a scarcity of game which has led them to retire into the interior. They are rarely seen on the lower part of the river, except where they have hired out as herdsmen to the owners of the cattle estates, the only kind of labor they are willing to engage in.



COSTUMES OF PARAGUAY.

"But as we go on we find the river narrower, its banks higher, and the islands less numerous. Two hundred miles from the mouth of the Parana proper, and four hundred from the ocean, we came to Rosario, and remained several hours. The city surprised us by its extent and attractive features. In 1854 it was a wretched town with a few hundred huts, and perhaps three thousand inhabitants; now its population numbers fifty thousand, and it is next to Buenos Ayres in commercial importance. It is a

port of entry for ships of all nations.

"We saw steamers from half the countries of Europe, and especially from England, taking in their cargoes at Rosario. It has fine and well-paved streets, which are provided with gas and railways, and lined with houses that would do honor to any city of its size in North America; ships of any draught may lie close up to the high bluff on which it stands, and there is no occasion for building expensive docks. There are several railways running to the interior of the republic, and one of them is intended to traverse the Andes, and connect with the Chilian lines to the Pacific coast.

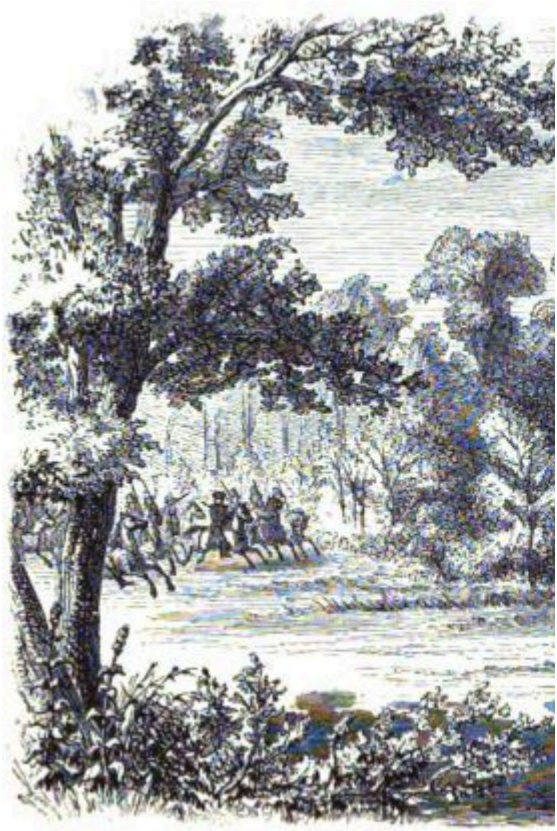
"The Salada, the first great tributary of the Parana from the west, joins the main stream about three hundred and fifty miles above its mouth. We made several stops at towns and cattle estates between Rosario and Corrientes, which is a prosperous place on the east bank of the Parana, just below its junction with the Paraguay River. It is a port of entry, like Rosario, and has a good deal of foreign commerce; many German and English merchants are established here, and are getting almost a monopoly of the foreign trade.



INDIA

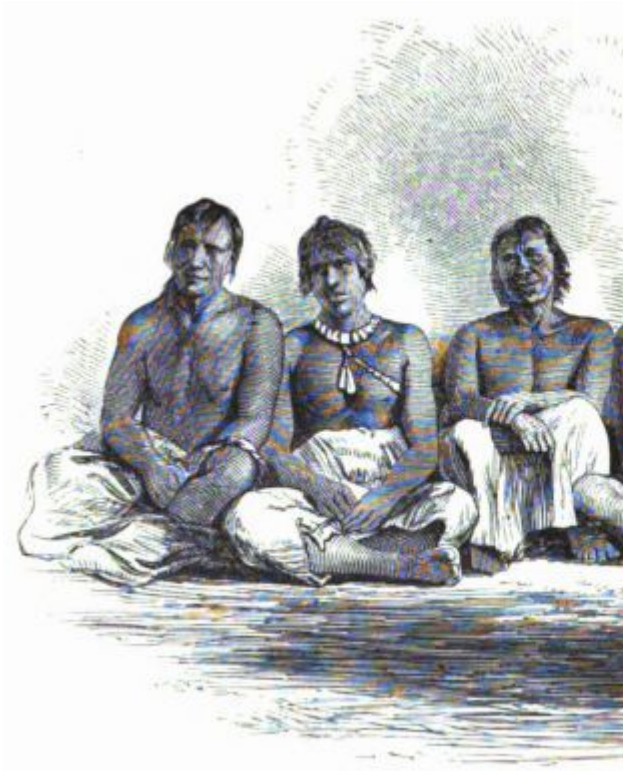
"At Corrientes we saw several Chaco Indians, who are the aboriginals of this region. The country on the west bank is known as *El Gran Chaco*; and though part of it has been settled, there is a very large region still in the hands of the Indians. Unlike their brethren lower down, they remain independent or nearly so; they do not disturb the whites unless first interfered with, and then they are ready for battle. Many a soldier of Paraguay and the Argentine Republic has fallen before their lances and arrows in the last fifty years.

"One day, when the steamer was running close to the west bank of the river, we saw a group of horsemen darting among the trees. Inspection with our glasses showed them to be Indians, and the captain confirmed our observation. As we went slowly on they got up a sort of race with the steamer, and gave us a good chance to see them. All were on horseback, men, women, and children; they had neither saddles nor bridles, but guided their horses with thongs, which were fastened around the lower jaws. They shouted and gesticulated for us to stop, but we had no business with them, as they had nothing which the steamer's people wanted to buy.



BATT

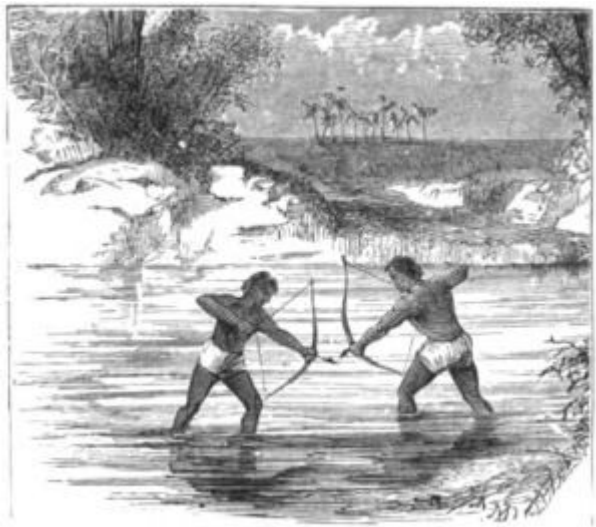
"They are formidable enemies in war, as they are fearless and skilled horsemen, quite the equals of the Comanches or other wild men of our western plains. In their fights with the Paraguayan troops they have been known to stand up on the backs of their horses to resist an attack; just as the attacking force was within shooting distance they dropped astride of their animals, and with wild whoops dashed forward, creating a stampede among the frightened horses of their enemies, and making a scene of wild disorder.



INDIANS OF THE LENQUA, RI

"Lieutenant Page of the United States Navy explored the Parana and Paraguay rivers and their tributaries in 1854, and visited some of these Indian tribes. He describes the Angaité tribe as a people of remarkable stature, many of them exceeding six feet in height, and all finely formed and athletic. The old Jesuits give wonderful accounts of the great age to which these people live; they say that if one dies at eighty he is said to have been cut off in the flower of his existence. Men of a hundred years old will mount fiery horses and subdue them, and some of these people have reached the extraordinary age of one hundred and twenty years! One of their chiefs, when

asked how old he was, said he did not know, but he was married and had a son when the church at Asuncion was built. As the church was then one hundred and five years old the warrior had a ripe old age, supposing, of course, he told the truth.



INDIANS SHOOTING FISHES.

"They are skilful with the lasso and bolas, and also with their spears and bows. The whites try to prevent their obtaining fire-arms, but somehow they manage to get them through traders, and are not slow in learning how to use them. They shoot fishes in the streams with their bows and arrows, and though a fish may be three or four feet under water they rarely fail to pierce him. As with most Indian tribes, the men engage in hunting and breaking horses, and leave all the drudgery to the women.

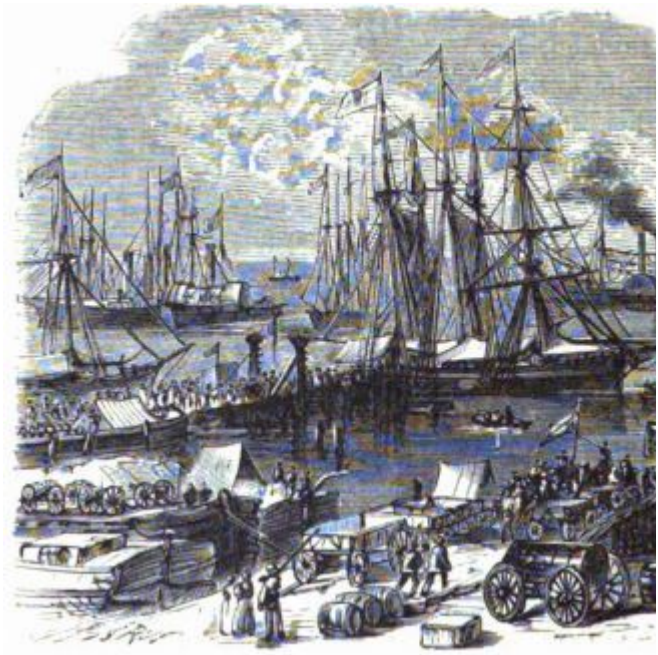
"Passing the mouth of the Parana, we ascended the Paraguay River to Asuncion, the capital of the republic and its principal city. It has suffered terribly in the wars which Paraguay has waged with her

neighbors, but is now fairly prosperous; if the country will not go to war again Asuncion may hope for a satisfactory future, as it has a good position, and is connected with the interior by a line of railway nearly two hundred miles long. We have heard many stories about the war which lasted from 1865 to 1870, and was very near making a complete ruin of Paraguay. Perhaps this is a good place to say something about it.

"General Lopez, who was then president and commander-in-chief of the armies, revived some old disputes with Brazil and the Argentine Republic concerning the boundaries between Paraguay and those countries. He began hostilities by capturing a Brazilian steamer which was passing Asuncion on a peaceful mission, and seizing two Argentine steamers near Corrientes. Then he surrounded that town with his army and threatened its capture, and he sent assistance to some revolutionists in Uruguay who were trying to overthrow the government of that country.

"The result of all this was that the three countries made war upon Paraguay, and they agreed not to stop fighting until they had completely conquered it, and made it powerless to go to war again. They carried out their programme completely; Asuncion was occupied, the army was defeated in several battles, and General Lopez was killed, in March, 1870. Then peace was declared, but it found the country prostrated, burdened with a heavy debt, and reduced in territory. Before the war the population of Paraguay was about half a million; it was estimated that 170,000 men were killed during the struggle, or died of disease consequent upon it, and that 50,000 women perished by famine and exposure in the

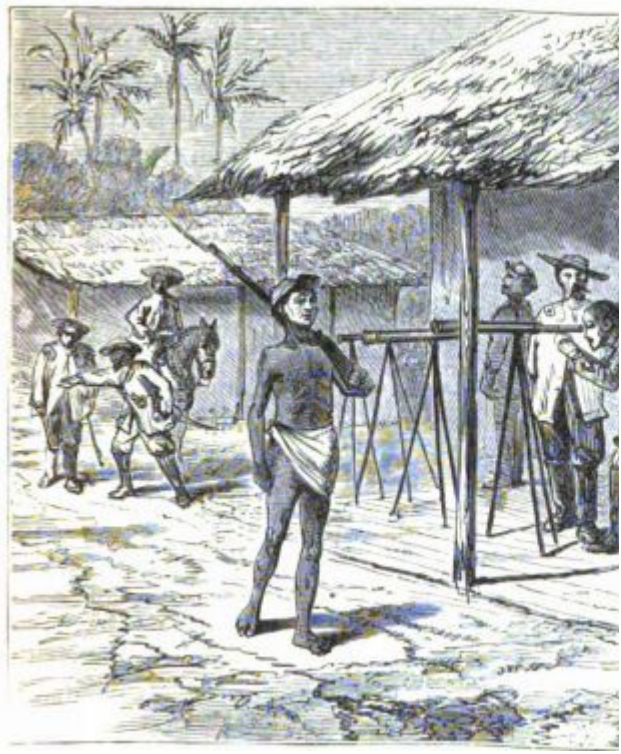
forests and swamps. And all this for the ambition and avarice of one man, General Lopez!



A RIVER PORT DURING THE WAR.

"A gentleman who was here during the war tells us that all business was suspended, and the river was occupied by fleets of war-ships and gun-boats, and defended by forts. The few ports on the river were converted into military stations, and the expenditure of money and credit, as well as the loss of life, on both sides was something enormous. There were countless scenes of horror, such as are witnessed in every war, and the stories of bravery and cowardice, honor and treachery, devotion and suffering, would fill volumes. Before the war ended the soldiers of Lopez were barefooted, and almost without clothing, and many of their enemies were in an equally sorry plight. This gentleman visited the headquarters of

Lopez one day, and found a soldier on duty there wearing nothing but a cloth around his waist and a cap on his head. Thus dressed, and with his gun on his shoulder, he paced in front of the general with the dignity of a Prussian grenadier.



HEADQUARTERS OF GENER

"From all I can learn, I judge that the Paraguayan people fought bravely and suffered terribly, and were overpowered by superior numbers. Lopez appears to have been a man of pleasant manners in social life, but he had no care for the good of his country, and sacrificed all its interests to his own purposes. Before the war broke out most of the commerce was in his hands; nothing could be imported or exported

without his permission, and the payment of a tax which went into his pockets. He provoked the war in hope of establishing a kingdom, and failed, as he deserved to fail.

"The country has few manufactures, and the principal industries are agriculture and the raising of sheep, cattle, and horses. In agriculture, the exported articles are tobacco and yerba maté or Paraguayan tea; beef, mutton, hides, and wool are the products of the grazing lands which find their way to other countries, and there are some shipments of timber and fruit.

"Of late years an industry of a new kind has sprung up on the River Plate and its tributaries, the shipment of frozen meat to England and the continent of Europe. On our way up the river we stopped at one of the estancias where this business was conducted, and had a chance to see some of its details. The manager kindly took us through the establishment, and explained the various processes.

"The animals to be slaughtered and shipped—whether cattle or sheep—are killed and dressed in the usual way. The beeves are divided into quarters, but the sheep are kept whole; in either case the meat is taken to a large room, where it is hung on racks, so that no two pieces shall come in contact with each other. This room is really an enormous refrigerator, and when it is filled the doors are shut tight, and the air within is cooled below the freezing-point by an artificial process.

"When the meat has been properly frozen, it is removed from the room and carried on board the steamer at the dock. This steamer has her hold arranged on the refrigerating system, with several inches of thick felt between double walls of planking,

so that heat is conducted away very slowly. When the hold is filled the cooling apparatus is set in operation, and the temperature is lowered to about 33° Fahrenheit; the apparatus is kept at work during the entire voyage, and until the steamer delivers her cargo in Europe. The meat thus remains perfectly fresh, although the ship passes the equator and remains for days and days under a tropical sun.

"Meat is very cheap in South America and very dear in Europe. The managers of the new enterprise claim that they have met with complete success, and will soon be able to feed the whole of Europe on beef and mutton grown on the pampas of South America. They have many prejudices to overcome, besides the opposition which the graziers and butchers of the Old World are making to the prospect of having their home industries ruined by these importations.



PARAGUAYAN MOTHER AND DAUGHTERS.

"We wanted to ascend the Paraguay to its head-waters, but circumstances did not permit, and we turned back from Asuncion. We went to the end of the railway, and had a delightful ride through a diversified country; forest, pampas, hills, valleys, mountains, and plains alternated rapidly, and gave us a succession of surprises. Numerous herds of cattle and horses told of the wealth of the country in live-stock, and if we had not seen the herds we should have known of the prevailing industry by the piles of hides that awaited shipment at the railway stations.

"We are in the land of *yerba maté*, or Paraguay tea, and have drunk nothing else at breakfast and other meals; of course, we have tried it frequently in our

journeyings in South America, but have never adhered closely to it until now. Perhaps you would like to know more fully about it.



A LANDED PROPRIETOR.

"Well, everybody drinks it, or, rather, sucks it, as the leaves are broken into powder while drying, and not preserved whole, like Chinese tea-leaves. Fred and I have provided ourselves with *bombillas*, as the tubes are called, after the custom of the European residents, and whenever the cup is circulating we come in for our share. The dry powder is poured into a cup or bowl and covered with boiling water; when it has stood long enough for the infusion to be drawn it is sucked through the bombilla, precisely as people in New York take lemonades through straws.



CUPS AND TUBES FOR MATÉ.

"The natives pass the cup and tube from one to another, but the European residents generally carry tubes of their own, and only the cup is passed around. The tube may be a reed or a straw, or of metal or glass, according to the fancy of the owner; ours are of glass, and we carry them in cases to prevent their being broken.

"Everybody drinks *maté*, and the Europeans who come here take to it with the greatest readiness. It has the same refreshing qualities as are found in tea and coffee; the chemists say it contains *caffeine* and *theine*, together with caffeo-tannic acid, and it is sometimes recommended by physicians for their patients. We are told that there is no part of the world where Chinese tea is consumed by the inhabitants in as great a proportion as is maté by the South Americans. It is taken at meals and between

meals; at all hours of the day and night, and also between those hours.

"And now for the plant. Its scientific name is *Ilex Paraguayensis*; it is a species of holly, growing on the banks of rivers in Paraguay and in the mountains of Brazil and Bolivia. It reaches a height of fifteen or twenty feet, and its leaves are four or five inches long, with serrated edges. The leaves are dried by artificial heat on a network of small poles, over a hard, earthen floor; when thoroughly roasted they are beaten with sticks until reduced to the powder I have already mentioned, when they fall through the network to the floor.

"This powder is collected and packed in bags of hide; each bag holds about two hundred pounds of maté, and in this condition it is shipped to market. About five million pounds of maté are sent every year from Paraguay to other South American countries, but very little goes to North America or to Europe. The outside world has not yet learned of its virtues to any appreciable extent.

"'Do you sweeten it as you do Chinese tea?' I hear some one asking.

"Generally you do not. The natives almost never do, but some of the Europeans, who were accustomed to sweetened tea in their old homes, put a little sugar in the maté. Others put in a slice of lemon, just as the Russians do with their tea; Fred and I have taken our maté plain, and like it very much."

"During our return to Buenos Ayres," continued Frank, "we went a short distance up the Parana,

which is longer than the Paraguay River, but smaller in volume. Its banks are higher and more picturesque, but the country bordering the two streams appears to be pretty much the same. The river can be ascended a long distance; in the upper part it can only be navigated by boats of light draught, as it spreads over sand-bars, and is shallow in many places.



PARAGUAYAN CAR

"The Parana rises in the mountains back of Rio Janeiro, and its head-springs are not more than one hundred miles from that city. Several streams unite to form this river; where it leaves the mountain region it has a fall which is said, by many travellers, to be inferior to no other in the world, not even to Niagara. Here is the way it is described:

"'After collecting the waters of several rivers on both banks, and especially those of the Tieté and Paranapanema from the east, the Parana increases in width until it attains nearly four thousand five hundred yards, a short distance above the falls; then the immense mass of water is suddenly confined within a gorge of two hundred feet, through which it dashes with fury to the ledge, whence it is precipitated to a depth of fifty-six feet. It is computed that the volume of water per minute is equal to one million tons; the velocity of the flood through the gorge is forty miles an hour, and the roar of the cataract is distinctly audible at a distance of thirty miles.'

"If we can't have the pleasure of seeing the Guayrá or Salto Grande, as the cataract of the Parana is called, we will console ourselves with the reflection that we have seen Niagara, and are disinclined to believe it has any superior in the world. Any way, it is three times as high as the cataract of the Parana, and if anybody doubts that there is a million tons of water passing over the American and Horseshoe falls every minute he is at liberty to count them."



CARLO ANTONIO LOPEZ, FORMER PRESIDENT OF

CHAPTER XXVI.

RETURN TO BUENOS AYRES.—DIVIDING THE PARTY.—TWO ROUTES TO VALPARAISO.—FRANK'S JOURNEY OVER THE PAMPAS.—MENDOZA.—AT THE FOOT OF THE ANDES.





OLI
FROM THE BANKS OF THE PARANA.

On the way down the river Frank and Fred were occupied with their journals and letters, and with many consultations of the map of South America. The day before their arrival at Buenos Ayres Fred made a suggestion to his cousin relative to their future movements, and intimated that he thought it would be approved by the Doctor.

"I think so too," replied Frank, "and we'll go and ask him. It is a repetition of our scheme in Africa without half as many difficulties in the way."

Finding Dr. Bronson engaged in nothing more

absorbing than looking at the distant bank of the river, they unfolded their scheme.

"I have thought," said Fred, "it would be a good plan for us to separate at Buenos Ayres to meet again at Valparaiso. There are two routes from one city to the other; the first by steamer, through the Strait of Magellan, and the second overland. One of us, accompanied by Manuel, can travel across the country, and the other two can go by water. We can time our journey so as to meet at Valparaiso, and if either expedition is a few days in advance of the other it would be no great hardship, as there is enough of interest in Chili to enable the time to pass away pleasantly."

"You have anticipated what I was about proposing to you," said the Doctor, with a smile. "I have been considering the very scheme you have studied out, and approve it heartily. You may decide for yourselves which of you will go overland with Manuel while the other accompanies me on the steamer."

The youths retired for consultation. In half an hour they returned to the Doctor with the announcement that Frank would make the land journey, while Fred would accompany Dr. Bronson through the Strait of Magellan to Valparaiso.

The rest of the time on the Rio de la Plata was occupied with plans for the trip, and before they realized that the voyage was at an end they were anchored in front of Buenos Ayres.

While they are completing their preparations for the double journey to the great seaport of Chili, we will consider the routes they are about to travel.

We have already mentioned the steamers of the

English company that perform a fortnightly service each way between Liverpool and the ports of the east and west coasts of South America. Their time-tables can be relied upon—the accidents of the ocean excepted—and their arrivals and departures are as closely arranged as those of the magnificent vessels traversing the Atlantic between New York and the ports of England and western Europe. The regular fortnightly steamer bound southward was due at Buenos Ayres two days after the return of our friends from their trip to Asuncion, and promptly at the designated date the smoke from her funnels made a dark streak on the horizon to the eastward.


BOLIVIA
ARGENTIN
CONFEDERATION
(LA PLATA)
PERU
CHILI
Copiapo
Guasco
Coquimbo
Concha
San Felipe
Valparaiso
Quillota
SANTIAGO
San Fernando
Concepcion
Valdivia
Volcano of Aconcagua
Mendoza
San Luis
San Nicolas
Rosario
BUENOS AYRES
Tapalquen
PAMPAS
Colorado R.
Rio Negro
BAHIA BLANCA
Volcano of Antuco
Volcano of Villarica
Volcano of Osorno
Volcano of Corcobado
PATAGONIA
ATLANTIC



MAP OF CHILI, ARGENTINE CONFEDERATION, A

All the steamers of this line do not call at Buenos Ayres; when they do not visit the port the service is performed by an extra steamer from Montevideo. There are German, French, and Italian steamers, which ply through the Strait of Magellan, performing a service similar to that of the English company, but they only run monthly, and their accommodations are inferior to those of the old established line. Besides, their departures are largely governed by the exigencies of freight, and a passenger is liable to be detained an indefinite number of hours, or even days, for the shipment or discharge of cargo.

At the time our friends were in South America the railway from the eastward was completed and in operation as far as Mendoza, within forty miles of the base of the mountains, while the line from Valparaiso was open to Santa Rosa, among the foot-hills of the Andes. Consequently Frank had in prospect a journey between Mendoza and Santa Rosa after the primitive manner of travelling in the Andes. [3]



IN THE STRAIT OF MAGELLAN.

As the journey over the Andes was to be made in the saddle, Frank determined to travel in "light marching order." Manuel was sent to Mendoza immediately to make preliminary arrangements for the saddle and pack animals, while Frank remained in Buenos Ayres to make a few purchases, and to be with his friends until their embarkation on the steamer. They were duly seen on board, and with many affectionate words of farewell, and good wishes expressed on both sides, Frank returned to shore, whence he watched the steamer until watching was no longer practicable.

While Dr. Bronson and Fred are heading southward we will accompany Frank in his journey across the pampas and over the Andes.

In a direct line, as a carrier pigeon might fly,

Mendoza is six hundred and ten miles from Buenos Ayres, but by the windings of the carriage-road and the railway it is about seven hundred. By the old post route the journey required from six to nine days, but the railway carries the traveller from one city to the other inside of forty hours. When the line is completed from ocean to ocean the speed will doubtless be accelerated, and through trains will pass from Buenos Ayres to Valparaiso in forty-eight or fifty hours. Travellers who have no desire to spend a fortnight on the steamer, or study the scenery of the Strait of Magellan, will give preference to the railway route, and the cabin passengers of the English or other vessels between Buenos Ayres and Valparaiso, or vice versa, are not likely to be numerous.

The railway ride over the pampas was interesting enough at first, but Frank soon found it monotonous. One mile greatly resembled another mile, as there is not much diversity of scenery on the broad plains, with their carpet of grass and scanty patches of trees. Several times the youth found himself regretting the departure of the old customs, and wished that he could emulate the example of Lieutenant Strain, and gallop across the pampas with the government courier. But the perusal of Strain's narrative, portraying the hardships and difficulties experienced by that gallant officer, brought him to his senses, and he was quite contented to be journeying in a railway carriage.

Frank copied into his note-book the following description, by Sir Francis Head, of the aspect of the plains of Buenos Ayres:

"This region, bordering on the Atlantic, varies with the four seasons of the year in a most remarkable manner. In winter the leaves of the thistles are large

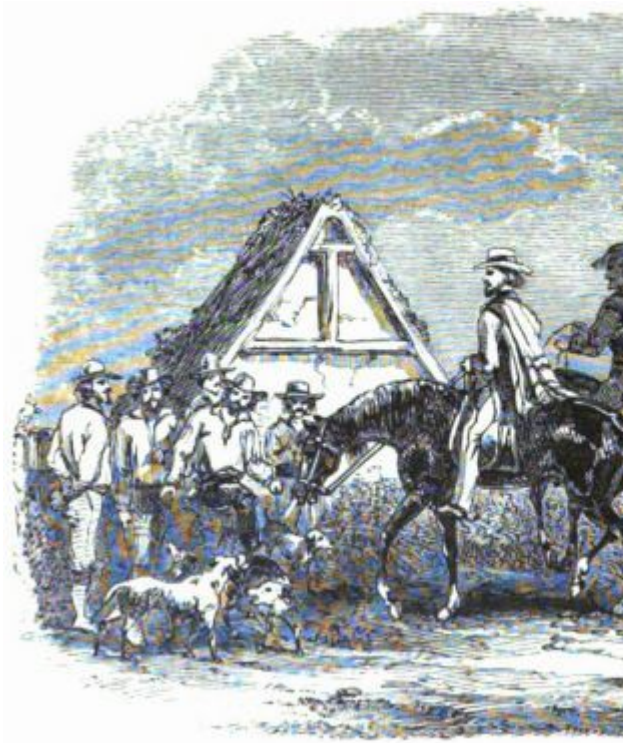
and luxuriant, and the whole surface of the country has the rough appearance of a turnip-field. The clover in this season is extremely rich and strong; and the sight of the wild cattle grazing in full liberty on such pasture is very beautiful. In spring the clover has vanished, the leaves of the thistles have extended along the ground, and the country still looks like a rough crop of turnips. In less than a month the change is most extraordinary; the whole region becomes a luxuriant wood of enormous thistles, which have suddenly shot up to a height of ten or eleven feet, and are all in full bloom.

"The road or path is hemmed in on both sides; the view is completely obstructed; not an animal is to be seen; and the stems of the thistles are so close to each other, and so strong, that, independent of the prickles with which they are armed, they form an impenetrable barrier. The sudden growth of these plants is quite astonishing; and though it would be an unusual fortune in military history, yet it is really possible that an invading army, unacquainted with this country, might be imprisoned by these thistles before they had time to escape from them. The summer is not over before the scene undergoes another rapid change, the thistles suddenly lose their sap and verdure, their heads droop, the leaves shrink and fade, the stems become black and dead, and they remain rattling with the breeze one against another until the violence of the *pampero*, or hurricane, levels them to the ground, whence they rapidly decompose and disappear; the clover rushes up and the scene is again verdant."

Stations were infrequent on the line of the railway, as the country is not densely settled. The rearing of cattle and horses is the principal industry, and

occasionally, as Frank looked from the windows of the railway train, he saw the guachos pursuing their herds, which generally manifested an unwillingness to remain in the neighborhood of the snorting, puffing locomotive. Sometimes the engine-drivers added to the fright of the half-wild animals by sounding the whistle, which rarely failed to create a stampede. They did not indulge in this amusement if the guachos were in sight, as the latter are not friendly to the railway, and would greatly prefer the old state of affairs. Naturally they resent the frightening of their herds, and the engine-driver who deliberately blows the whistle and alarms horses or cattle is liable to be roughly handled whenever the guachos can lay hold of him.

Some of the stations were the abiding-places of the guachos, and Frank embraced an opportunity to see the life of these denizens of the pampas. The result of his observation coincided with that of Lieutenant Strain, and he had no desire to remain among them.



ARRIVAL OF TRAVELLERS AT A G

Many of the guachos are descended from the best blood of Spain, and in spite of their rough ways they frequently display a great deal of courtly dignity. They salute each other with much formality, remove their hats on entering a house, are always polite to strangers passing through their country, though often quite the reverse to those who come to settle among them. Their houses are generally mud hovels of but a single room; beds and chairs are unknown, as the guachos and their families sleep and sit on the floor along with the dogs, which are generally quite numerous. Sometimes the skeleton of a horse's head is used in place of a chair, and the traveller is always bowed to it as though it were a velvet-covered

fauteuil. Few of the guachos can read or write, and evidently they do not place a high regard upon education.

For the first year of his life the guacho has no clothing whatever; he crawls around in the dirt, of which there is an abundance, as the floor is rarely swept, or he is hung to the rafters or the wall of the hovel, in a basket made of a bullock's hide. When he can walk he is provided with a lasso and practises upon dogs and chickens; when four or five years old he is put on horseback, and by his sixth year he has become useful in assisting with the cattle and horses. His lasso practice continues, and it is no wonder that he is proficient with it; throwing the lasso and bolas and riding on horseback complete his schooling, college course and all.

He goes out alone, often for days together, and hunts for whatever game the country produces. Meat and water comprise his entire bill of fare, and with this simple diet and constant exposure he becomes toughened in all his muscles and capable of enduring any amount of fatigue. Guachos have been known to pass thirty or forty hours continuously in the saddle; on long journeys they generally drive a herd of horses before them; when they have wearied out a horse under the saddle they lasso a fresh one from the herd and mount him immediately.

A guacho considers it a disgrace to be on foot, and will not walk a hundred yards if a horse is available. Frank was amused, at one of the stations, at seeing a man come out of a house, mount his steed, and ride to another house certainly not fifty yards distant. There he sprang to the ground again and entered the building, without the least thought that he had done anything absurd. In most countries he would have

saved himself the trouble of springing into the saddle for a ride of such brevity, but not so the guacho. Frank said afterwards that he was reminded of a certain city in the United States where it is considered improper and undignified to cross a street anywhere except at the corners of the blocks.

The most important town on the line of the railway is San Luis, or, to give its full name, San Luis de la Punta. It has a population of six or eight thousand, and is beautifully situated at an elevation of about twenty-five hundred feet above the level of the sea. It was founded by Luis Loyola in 1596, and has a considerable trade in hides, wool, skins, leather, and a few other things of less importance. Frank observed that nearly all the houses were one story in height, built of adobes or sun-dried brick, with earthen or tiled floors, and generally attached to a garden. Since the recent emigration from Europe began a good many Germans and Italians have settled at San Luis, and there are several Scotch and Irish herders living in the neighborhood.



A DANCE AT SAN LUIS DE I

Frank was invited to stop a day and attend a *tertulia* or dance, but he declined the honor. The dances at San Luis are noticeable more for their vigor than their refinement. The guitar is usually the musical instrument for the occasion, and the dancers whirl rapidly around the room, with very little attempt to keep step, as the shouts and laughter of the assemblage frequently render the music quite inaudible.

On arriving at Mendoza Frank was met at the station by Manuel, who led the way to the *fonda* where he had secured a room for his young master. He had succeeded in making the needed arrangements for

the journey over the Andes, though not without some difficulty. The proprietor of the fonda had recognized the advantage of keeping his patrons as long as possible, and interposed various hinderances to their prompt exit; fortunately, Manuel had brought a letter from a German shop-keeper at Buenos Ayres to a German shop-keeper in Mendoza, and thus was enabled to expedite matters.

Mules and their drivers had been engaged for the ride over the Andes to the terminus of the railway near Santa Rosa; they were drawn up in the court-yard of the shop-keeper soon after Frank's arrival, and, after being approved by him, were immediately despatched to the foot of the mountains, about forty miles distant.

Frank then took a ride through the streets of Mendoza, and viewed the lions of the place. They were neither many nor great, as the city was almost completely destroyed by an earthquake in 1863, when several thousands of the inhabitants perished. Traces of the devastation are still visible, but the town has been steadily recovering from the calamity, and is quite prosperous.

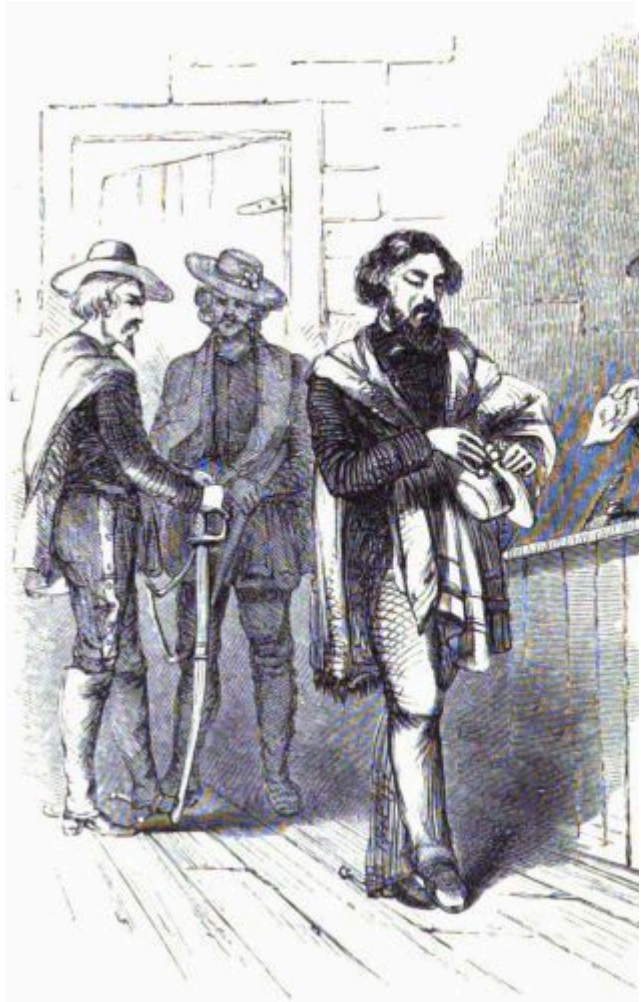
Frank was impressed with the long rows of poplars, which shaded the streets and grew close to the walls of the numerous gardens. The poplars are so abundant that as one approaches Mendoza he rarely sees anything of it until within its limits; the poplars conceal the city in every direction, and their shade is welcome to everybody in the hot hours of the day. There are many fruit gardens in and near Mendoza. The place is surrounded by canals, and there is one canal which passes through the city and supplies an abundance of water. Mendoza was long celebrated for its fruits, and formerly large quantities of

peaches, grapes, cherries, and kindred things were dried here for transportation to market. Since the opening of the railway several fruit-preserving establishments have been started, and are doing a prosperous business.

The city is the capital of the province of the same name. The province of Mendoza has an area of sixty-five thousand square miles, and about seventy thousand inhabitants, or a little more than one inhabitant to the square mile. The state of education may be known by the fact that more than fifty-five thousand of the inhabitants cannot read or write, and out of 17,216 children, between six and twelve years of age, in a given year, only 2132 attended school!

Most of the province is a plain; the greater part of this plain is fertile, but there are districts in the south where the herbage is too scanty for the support of cattle. Its western part includes a portion of the chain of the Andes; Aconcagua, the highest of the Andean peaks, is on the border of this province, and near it are several other mountains of great height and magnificence.

Frank had no desire to tarry in Mendoza after completing his arrangements for leaving. The fonda was dirty beyond description, in fact, Frank declared that in all his experience he had never seen a hotel which surpassed it in untidiness. Manuel had swept the room previous to Frank's arrival, and with great difficulty obtained the materials for a civilized bed. The place abounded in fleas, which have their advantages in conducing to early rising; our young friend was up before daybreak, and told Manuel to get things in readiness for leaving town as soon as possible.

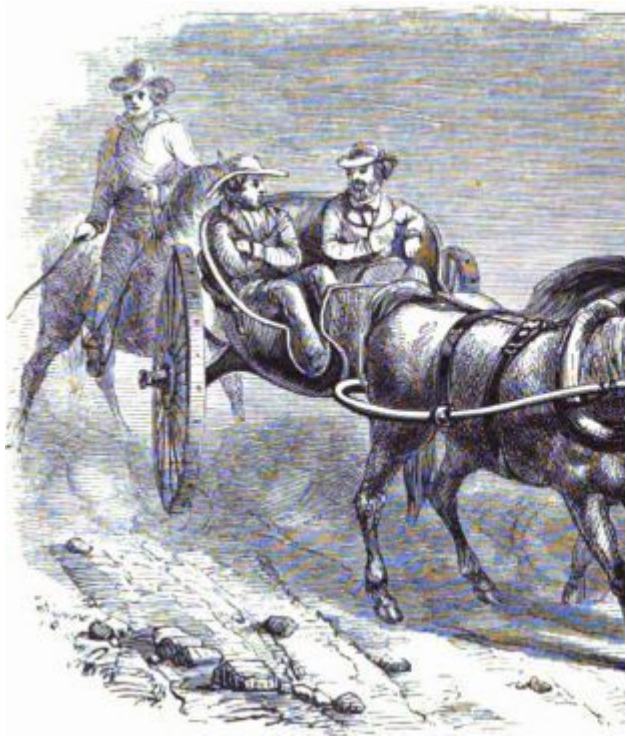


THE POLICE-OFFICE AT MEND

It was necessary to have a passport for the frontier between Chili and the Argentine Republic, and accordingly they paid a visit to the police-office, accompanied by their German friend. Frank presented the necessary papers, which he obtained at Buenos Ayres, and there could be no reason for his

detention; but it took fully half an hour to convince the police-master that no harm would come to either country by allowing the youth and his servant to pass into Chili. Tourists are so rare in this part of the world that the authorities cannot easily believe a man will undertake the hardships of a journey over the Andes, when he has nothing to gain by it and considerable money to pay out. Looking upon travel as purely a matter of business, they are quite in sympathy with the Chinese merchant who was invited to an English dancing-party, and wonderingly asked his host, "Can't you get your servants to do that for you?"

In a light wagon, hired for the ride to the foot of the mountains, where the mules were waiting, Frank set out, accompanied by Manuel, who was seated at the driver's side and had a special eye for the baggage, that lay below him. The wagon was the property of an enterprising citizen, who had imported it from the United States since the opening of the railway, and he was contemplating a purchase of half a dozen similar vehicles during the following year. It had stout springs, and was well adapted to the roads around Mendoza, which are none of the best. Frank was given the choice of this wagon or a *birlocha*, and immediately chose the former. And what do you suppose a birlocha is?



THE BIRLOCHA.

It resembles an old-fashioned chaise, and is drawn by two horses, one between the shafts and one outside (on the left side), and fastened by a single trace of rawhide or half-tanned leather. The driver is mounted on the outside horse, and there are seats over the wheels for two passengers. In hilly country a man follows with a third horse, which is attached to the right side of the vehicle when a steep slope is to be ascended. Frank took a ride through the streets of Mendoza in one of these vehicles, enough to satisfy himself that the wagon was preferable for the drive across the plain between the city and the foot of the mountains. Had he been in the hilly region he would have chosen the birlocha, for its greater facility in

turning sharp corners.



THE PAMPA COACI

Just outside the walls they met a pampa coach containing two passengers, who were evidently travelling in style. The vehicle was a huge and clumsy affair, the rough roads of the country requiring that it should be very strongly constructed. It was drawn by four horses, and each horse carried a postilion, who was armed with a short whip or a bundle of stout thongs of rawhide. As they approached this nondescript concern its horses took fright at the apparition of the wagon, and reared and

plunged in a way that greatly interfered with their linear progress along the road. When the postilions had lashed them into good behavior they darted off at full gallop, and were soon inside the fringe of poplars that surrounds the city.

Before the railway was constructed, this style of carriage was employed on the pampas for those who could afford the expense and risk of coach and postilions. A passenger could carry an unlimited amount of baggage with the coach, and take his own time for it; by arranging for relays he could make very good time, but could not equal the speed of the government couriers, who went on horseback and made quick changes at the stations.

When the Indians are troublesome the coach is objectionable, on account of the increased danger arising from its use. It is obliged to follow the road, where it often raises such a cloud of dust as to indicate its locality and character to watchful Indians miles and miles away. While in the region of Indians, mounted horsemen always keep on the grass at the side of the road, and thus avoid making a dust-cloud. Then, too, the coach, with its baggage and the iron of its wheels, is a valuable prize to a people with whom iron is a scarce commodity.



OX-CARTS NEAR MENI

They met groups of guachos and other inhabitants of the country on their way to Mendoza, everybody, without exception, being mounted on horse or mule, or riding in a cart. The carts were the same rude affairs with which Frank was already familiar; the wheels consisting of single trucks or sections cut from logs, four or five feet in diameter. A hole in the centre of the truck admits the axle; there is no tire on the truck, and when it is worn too small it is thrown aside and a new one takes its place. The axles are never greased, and when a dozen carts are in motion across the plain the creaking is fearful. It is said the Indians take advantage of this creaking to guide them to trains moving along the road in fog or

darkness, and certainly it is as clearly audible as a fog-horn on the sea-coast. Whether the natives have ever circumvented the savages by the simple expedient of greasing the wheels is not recorded in the local chronicles.

Long before Frank reached Mendoza, on his way from Buenos Ayres, he had seen the magnificent chain of the Andes filling the western horizon, and from the plaza of the city it seemed as though he could almost reach the summits of the nearest peaks with a bullet from a rifle. The air is wonderfully clear and pure at Mendoza, and the consequent deception regarding distances reminded our youthful traveller of his view of the Himalayas from Darjeeling, and of the Rocky Mountains from Denver.

He was not the first to make the same mistake in the mountains near Mendoza. Read the following from Gerstaecker's narrative of a journey from Buenos Ayres to Valparaiso:

"One day we saw a fox approaching, and I determined to have a shot at him. Master Reynard came up the slope as carelessly as though he were only out for a quiet walk; judging the distance at about a hundred yards, just as he got scent of us, but appeared uncertain of the danger, I took a good and sure aim and pulled the trigger. The gun went off, but to my utter astonishment the ball struck the snow, as I plainly saw, some paces short of the fox; and Reynard, discovering all was not right, scampered off, leaving me to fire with as little effect as before.

"Having no idea what could be the matter with the gun, I went to the place where the fox had stood, and, counting the steps in going, was surprised to find that what I had thought about a hundred yards

was really two hundred and sixty! So deceptive was the pure and transparent snow as to distance.

"Indeed, on looking back, I saw that the spur of the mountain behind appeared not farther off than two or three miles, though I knew the distance to be much greater. Then I reflected that if the sight was misled in this way by the thin air in judging the distance of objects so close, what an enormous space must lie between the mountain-ridges, which really looked so far apart, and to what a height the mighty peaks must rise, when they were so gigantic even in appearance."



COMING TO TOWN.

As he approached the base of the mountains, Frank found them every moment becoming more lofty in appearance, and it was not unnatural that he should begin to wonder if there was really a way of passing over them to the other side. The plain and the mountains kept his thoughts fully occupied till he reached the end of the wagon-road and halted at the little village where the mountain-path begins.



EXERCISING THE MU

The mules and their drivers were there in advance; two of the animals were undergoing exercise in the plaza of the village, and manifesting not a little obstinacy, to the great delight of the whole population, which had turned out to witness the sport. Frank was by no means elated to learn that the

mule which displayed the greatest amount of "contrariness" was the one which he was to ride on the following day.

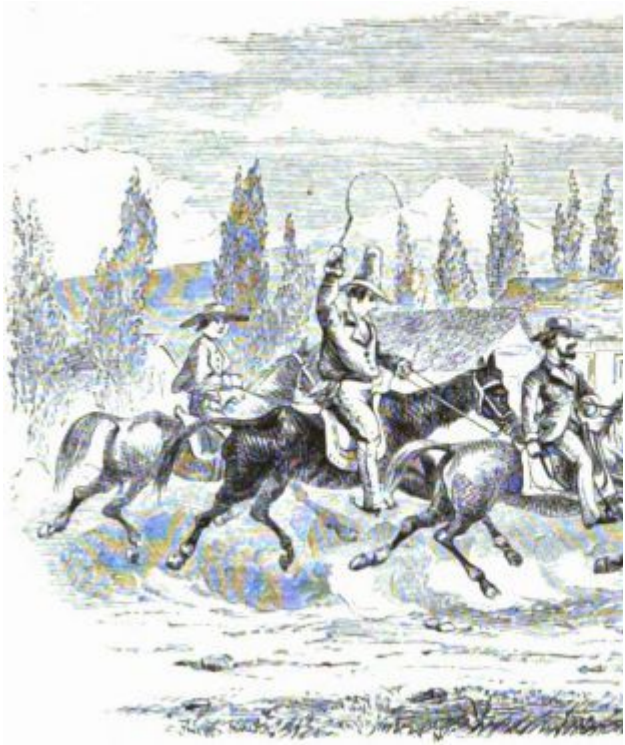
CHAPTER XXVII.

INCIDENTS OF A RIDE OVER THE ANDES.—CONTRACT WITH THE ARRIERO.—PASSES BETWEEN CHILI AND THE ARGENTINE REPUBLIC.—NIGHT SCENES.—DANGERS OF THE ROAD.—A PERILOUS POSITION.—USPALLATA.—AT THE CREST OF THE ANDES.

It had been arranged that in consideration of eighty dollars, half in advance, and the balance on completion of the journey, Il Senhor Don Francisco Bassetti (which is South American Spanish for Mr. Frank Bassett) and his servant were to be transported from Mendoza to Santa Rosa, with their baggage, the latter not exceeding two hundred pounds in weight, exclusive of blankets and clothing. The contract was taken by one Don Federico, an *arriero* who presented the most laudatory testimonials as to his efficiency and honesty. It was stipulated that Federico should provide an extra saddle-mule for Frank and another for Manuel, to be used in case of accident, and that he and the peon who accompanied him would attend to the saddling and all the care of the beasts. Federico was to provide food for the travellers similar to his own; any extra provisions they chose to carry would form part of the baggage, and be included in the allowance of two hundred pounds.

The peon was to do the cooking for the party, but no objection should be made if Senhor Don Francisco Bassetti chose to employ his servant Manuel in the preparation of his dinners.

Don Federico, the arriero, proved something less than fancy and his testimonials painted him, but, considered as a whole, he was not altogether utterly depraved. His first move was to reduce the number of extra saddle-mules to one, by suggesting that it was not probable the regular mules of Frank and Manuel would both be disabled at once. Therefore he thought one would suffice. He would have gone into a lengthy argument on the subject had he not been cut short by Frank, who insisted upon the terms of the contract. Next, he proposed to load the baggage on one of the extra saddle-mules, and when prevented from doing so, he suggested that it could be divided and carried behind the saddles of the travellers. Evidently he was bent on reserving one mule from the stipulated number. Frank and Manuel met him at every point; when he found it impossible to cheat them he submitted gracefully, and afterwards conducted himself very fairly. Later in the day Frank learned that the arriero came from Mendoza with the proper number of mules. One had become lame, and Federico was obliged to hire another to replace it. Instead of frankly stating his trouble, he had endeavored to "dodge" the difficulty by departing from his agreement.



A START UNDER DISADVA

Frank obtained lodgings at the house of a German, the only European resident of the place. His bed was a pile of hides in a corner of a room full of merchandise, and the youth spent a considerable part of the night in deliberating as to whether the hides were harder or softer than the floor. Don Federico was anxious to start early in the morning, and Frank accommodated him; he was up before daybreak, and the whole party had breakfasted and were in the saddle by sunrise.

Provisions for crossing the Andes are limited in variety, but that they are adapted to the wants of travellers there can be no dispute. They consist of

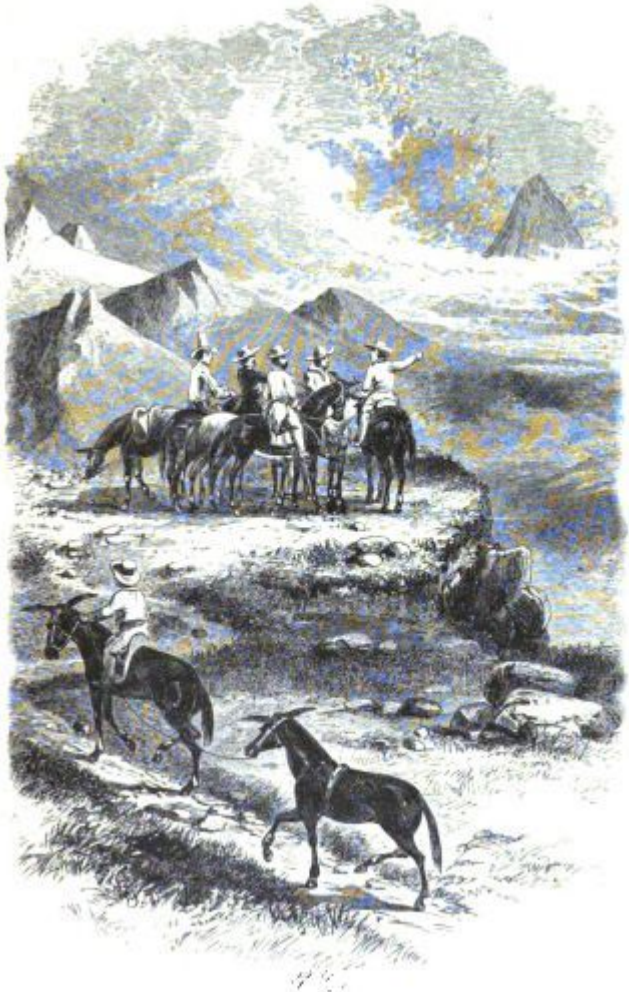
charqui, or jerked beef, reduced to a powder by pounding in a mortar or between two stones. It is baked or roasted before pulverization, and is therefore ready cooked. For preparing a repast of charqui, heat some water till it boils; throw in a few spoonfuls of the beef powder, one or two slices of onion, break in some bread or crackers, and let the whole simmer for ten minutes. Serve hot, and you have a dish that a king might envy.

"It would hardly answer for Delmonico's or other fashionable restaurants," wrote Frank in his note-book, "but with the appetite created by exercise and the air of the mountains I have never tasted anything more welcome than this simple preparation. It can be easily carried, is not readily spoiled, and, on the whole, is the very best thing one could have. I brought along some tins of preserved meats and vegetables; they proved acceptable, but were not at all necessary for our existence. In a bag slung at my saddle-bow I carried some crackers, and whenever hungry I proceeded to nibble one of them. Charqui soup, crackers, raisins, figs, and maté comprised my bill of fare on the journey after the first day out, with the addition of the flesh of a few birds and rabbits we killed on the way."

For the rest of the account of this trip over the Andes we will copy from Frank's journal.

"According to the geographers," wrote our young friend, "there are ten passes across the Andes between the Argentine Republic and Chili; they vary from six to fifteen thousand feet above the sea-level at their highest point, and each pass has its peculiarities. The pass of Los Patos (The Ducks) has the advantage of good pasturage all the way, and is much frequented by cattle-drivers, to whom time is

no object, but the great length of the route renders it undesirable for travellers and merchandise trains. The Planchon Pass lies along the Claro and Teno rivers; it is only six thousand feet high, and has been selected as the route for the railway between the two countries.



PASS OF USPALLATA.

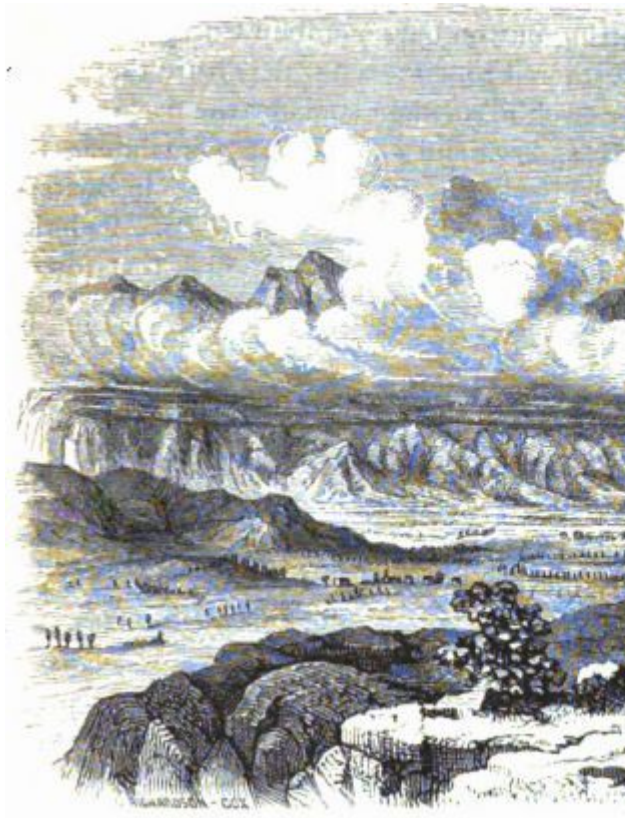
"The passes most used by travellers are Portillo and La Cumbre; the former is much travelled from the beginning of February to the end of April, and the latter from November to May. We are crossing by La Cumbre, which is also known as Uspallata Pass; it was one of the earliest routes known to the Spanish conquerors of Chili and the Argentine Republic, and is said to have been in use for centuries before their arrival.

"This pass has two roads, which are traversable at different periods, according to the state of the snow; the one generally used is 12,488 feet above the sea, while the other is 12,656 feet. At irregular intervals along the route there are *casuchas*, or refuges, which were built by the old Spaniards for the protection of couriers and travellers who might be caught in snow-storms. Under the Spanish rule the casuchas were provided with benches or shelves on which one could sleep; there were doors that could be closed, and a supply of food and fuel was kept in each building. But since the countries became independent of the Old World the doors and shelves of these houses of refuge have been burned, and the supply of provisions is not maintained. The casuchas are dirty, and so open to the wind that unless the weather is absolutely terrible it is preferable to stay outside. The traveller must rely upon himself for provisions, and if he has not a sufficient supply, in case of a long detention in the mountains, he must either starve or eat his mules.

"It had been stipulated with Federico that a supply of charcoal should be carried, as no fuel is obtainable on the highest parts of the mountains. Lower down there are trees and shrubs sufficient for cooking purposes, and there are patches of vegetation where

the animals can graze, but in the upper elevations the beasts must go hungry, unless a few rations of grain are carried for them. Federico was thoughtful regarding his mules, and provided for them more liberally than do many of the arrieros. We had a good supply of blankets and other coverings for sleeping purposes; the weather was fine, and there was a good prospect that we should be in Santa Rosa on the fifth day from setting out on our mountain ride.

"Among the people that gathered to witness our departure there were several afflicted with goitre, or swelling of the glands of the neck. I saw many cases of this disease in Mendoza, and at different points along the road; to all appearances it is identical with the goitre one sees in Switzerland, and its origin is as mysterious here as in the Old World. Federico said that nine tenths of the victims were women; he added that few of them objected to it, as it was 'excellent for displaying jewelry.'

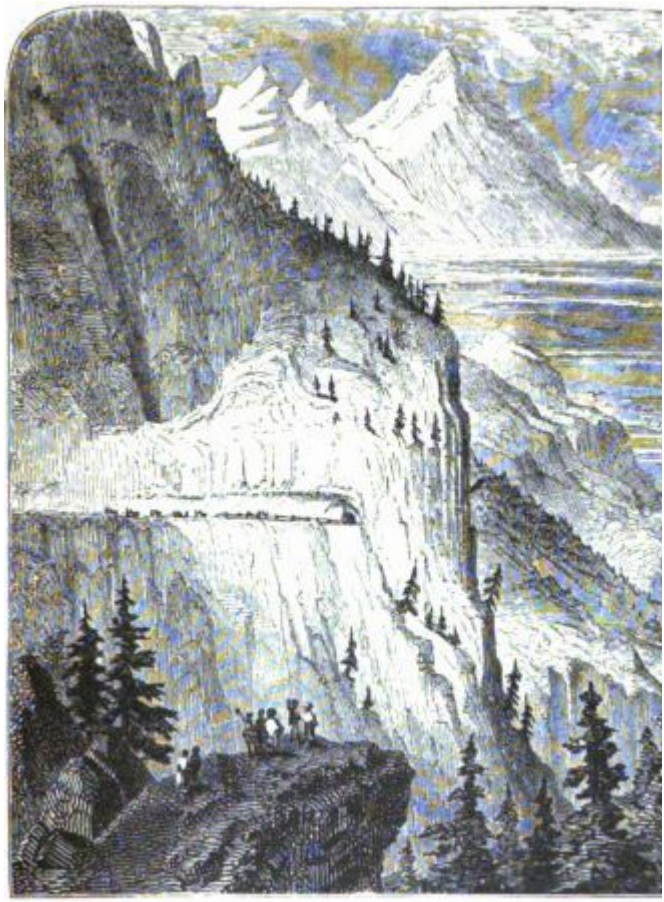


NEAR THE BASE OF THE

"We rode out from the little village in as much 'style' as we could command, in spite of the restiveness of the mules, and their tendency to use their heels whenever an opportunity was afforded. Federico said they would get over it in a little while, but for the present we must put up with their eccentricities. Before starting we witnessed the performance of a young colt which had been taken in tow by the arriero of a party bound for Mendoza; it surpassed any of our mules in its kicking propensities, and I was satisfied that our beasts were by no means the worst behaved in the country.

"Almost immediately after leaving the village we struck into the valley of a river flowing from the mountains, and from this point our road was almost a continuous ascent. Up and up we climbed, passing two or three mining establishments, apparently abandoned, and an occasional hut whose occupant sold food and forage to the mule trains, and took advantage of the little patches of grass near his residence. After several hours of this kind of work along zigzag paths we reached the highest point of the Uspallata range, and halted to give our animals a breathing-spell, and to observe the scenery.

"This spot is called 'El Paramillo,' and the view it affords is magnificent. To the eastward the plain and the intervening hills were spread like a map before us, and we could trace the course of the rivers and ravines for many and many a mile. North and south and west were the Andes; their great peaks seemed to pierce the sky, and their caps of purest snow reflected in almost blinding clearness the rays of the sun. Though we had gained an elevation of thousands of feet, the mountains towered far above us, and I realized more than ever before the awful grandeur of the Andes. Below and around us were yawning chasms, and as Federico pointed out the route by which we were to continue it seemed as though an eternal barrier stood between us and the opposite side of the great chain of the Andes.

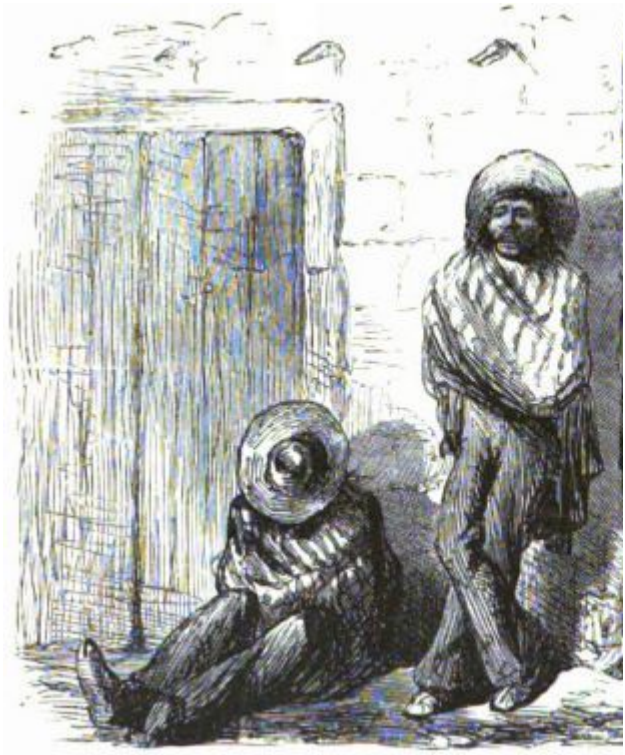


A DANGEROUS ROAD IN THE MOUNTAIN

"From the crest of this ridge we proceeded over a table-land and along a gentle descent for about fifteen miles, till we reached the rancheria of Uspallata, where we passed the night. It consists of a series of adobe houses built around a court-yard; several of these houses are divided into rooms for the accommodation of travellers, and as soon as Manuel could secure one of them it was delivered into our custody. It was the Eastern khan or caravansary over

again, and I fancy that the idea must have been brought from Spain by the early settlers, and originally obtained from the Moors during their residence in the Peninsula.

"My room contained a chair and a table, but no other furniture. On one side there was a shelf of adobes four feet wide and two feet above the floor, which was intended for a bed, but there was not even a rawhide upon it. I was expected to supply my own bedding, and with the aid of my overcoat, blankets, saddle, and saddle-gear, I had a very comfortable couch under the circumstances. I was too weary to be particular, and, five minutes after lying down, was oblivious to all outward things.



PEONS AT REST.

"Manuel piled our personal belongings in one corner of the room, and slept on the floor near them. Our mules were turned into the clover-fields which surround the buildings, and afford good pasturage for cattle and mule trains. Federico told me he was obliged to pay a sum equal to about twenty cents of our currency for each animal; he and his men had all the work of collecting and managing their beasts, and the proprietors had nothing to do except to collect the money. They must make a fine revenue from the place, as each room yields a dollar a night when occupied, and everybody is or has his own servant. But perhaps they are so heavily taxed by the government that their profits are materially reduced. The governments in this part of the world do not permit a private citizen to make money rapidly except in rare instances.

"We obtained beef and eggs and a loaf of bread for supper, so that we were not obliged to draw upon our mountain provisions. Manuel made an excellent omelette from the eggs; he cut the beef into small pieces, through which a long stick was thrust, and then held the meat over a fire until thoroughly cooked. I opened a can of oysters that I brought from Buenos Ayres, and prepared a savory stew in a kettle borrowed from the kitchen of the rancheria. Oysters, fresh beef, bread, maté, and the hunger of a famished wolf! what more could be required for an excellent meal?

"In the morning we had breakfast (identical with the supper, but without the oysters), and were ready for the road at an early hour. When I went into the court-yard of the rancheria there were at least a hundred mules, all mixed up in the wildest

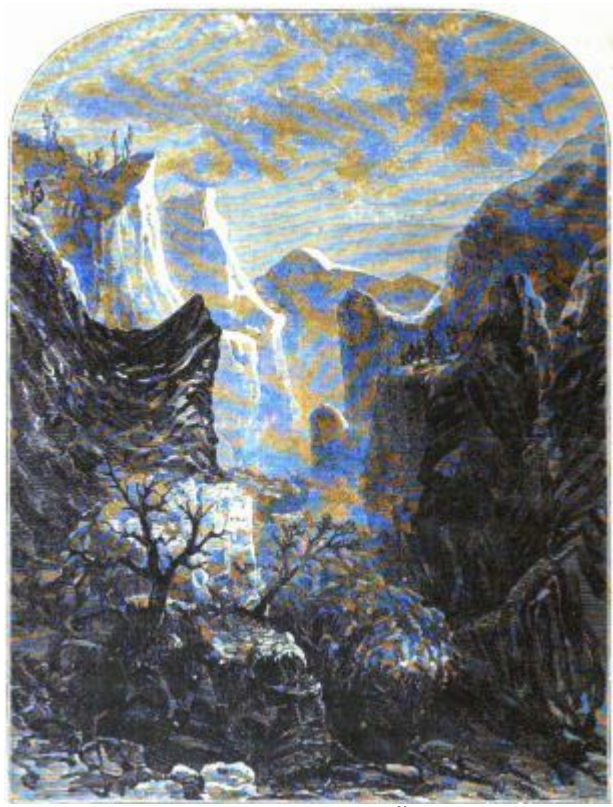
confusion. There were half a dozen trains, some bound east, and the others west; the arrieros and their peons were busy saddling their animals, and as soon as one had received his cargo he was allowed to wander among the herd at will. There was a chorus of braying which surpassed a Chinese band of music or the noise of a boiler factory, and the lack of accord was emphasized by vigorous kicks on the part of the animals. How I wished to photograph the scene, and phonograph it too, at the same time!

"I wondered how it would be possible to separate the animals of the different trains, but soon found out.

"As each arriero completed his saddling he led out his *madrina*, or bell-mare, and tinkled her bell. Instantly his mules followed her, separating themselves from the rest of the herd without the least difficulty. Federico told me it is the bell rather than the mare which forms the attraction, as the mules will follow the bell on a strange mare but will not follow their madrina with another bell. When the mules are turned out to graze they always keep near the madrina, and their manifestations of devotion to her are constant. When she is in danger they have been known to form a circle about her and, with heels outward, make a vigorous defence.

"My saddle-mule was a perfect 'amadrinado,' in the language of the arrieros, or thoroughly trained to follow the madrina's bell. If I fell behind the train at any time, and especially if the bell could not be heard, the beast became restive, and was evidently much alarmed. If I dismounted, for even a minute, it was necessary to keep a strong hold of the bridle, and there would generally be so much kicking and plunging that I needed the aid of the arriero or a peon to mount again.

"The table-land of Uspallata continues for eight or ten miles, till the valley of the Pichiuta River is reached. We ascended this valley, for several miles and then turned across an intervening ridge to the Mendoza River; the Pichiuta is a clear, sparkling stream of excellent water, and there is plenty of pasturage and fuel along its banks, while the water of the Mendoza is muddy and has a brackish taste.



A MOUNT CAÑON.

"Here let me remark that there is a wonderful difference between the rivers of the eastern and

western slopes of this part of the chain of the Andes. On the Chilian side the streams are nearly all clear and pure, while on the Argentine side they are mostly muddy, and so impregnated with salt and lime as to be unfit for drinking or cooking purposes. The banks of the small streams are nearly always covered with an incrustation of impure saltpetre, and sometimes the water is so bad that cattle are poisoned by it.

"On the ridge between the two rivers we had our first real dangers of mountain travelling. There are several *laderas*, or places where the road is cut into the side of a mountain, and so narrow that two loaded mules cannot pass. There are spaces where the path is widened a little, and it is customary for trains, moving in opposite directions, to watch for each other and avoid meeting in the narrow and most dangerous spots.

"One of our baggage-mules was ahead, and right in one of the laderas he met a train coming the other way. I feared he would be thrown from the path into the great chasm, a thousand feet below, and you may be sure my face was full of anxiety.

"To my surprise and delight the mule planted his four feet close together, and turned around in a space not more than a yard wide! Then he trotted back to join us, and I wanted to get down and hug him for his display of intelligence.

"Federico told me to allow everything to my mule, and under no circumstances attempt to guide it in a dangerous spot. 'The mule knows every ladera on the mountains,' said he, 'and exactly where to place its feet. Never hurry it in the least, and never touch the reins no matter how much you are tempted to do so.'

"This was good advice, and I remembered it, at any rate, most of the time. Once I forgot myself when the mule stumbled on a ladera, and for a few seconds was balanced on one foot on the edge of a fearful abyss. The side of the mountain was almost perpendicular for five or six hundred feet below me, and there was a wild torrent dashing along its base. Instinctively I threw out my hands to grasp the reins. Federico was just behind, and shouted for me to sit still; his voice recalled what he had told me, and my hands dropped to my side as though I had lost all strength. One foot of the mule actually went over the edge of the rock, but the other held its position, and I was safe!



SNOW-SLIDE ON THE TRAIL.

"One of the perils of the road are the snow-slides. Masses of snow accumulate on the slopes of the mountains, and suddenly, without a moment's warning, sweep downward into the valley below. Men and animals on any part of the trail crossed by the avalanche are carried along with it; sometimes

they are crushed to death and buried far out of sight, and sometimes they escape without serious injury. Generally, however, the snow-slides are fatal to those who happen to be caught in them, and the arrieros naturally hold them in great dread.

"I think I hear some one asking why I did not get off and walk in the perilous places. The arrieros say it is more dangerous to walk than to ride, and certainly they ought to know. In the first place, I was ignorant of the road, and that is a very important consideration; and, secondly, the mule is accustomed to this kind of travel and I am not. He never takes a step without determining beforehand exactly where his feet are to be planted, and not until one foot is firmly in position does he venture to lift another. Besides, he has twice as many feet as I have, and, therefore, should be doubly sure-footed.



HANGING BRIDGE IN THE ANDES.

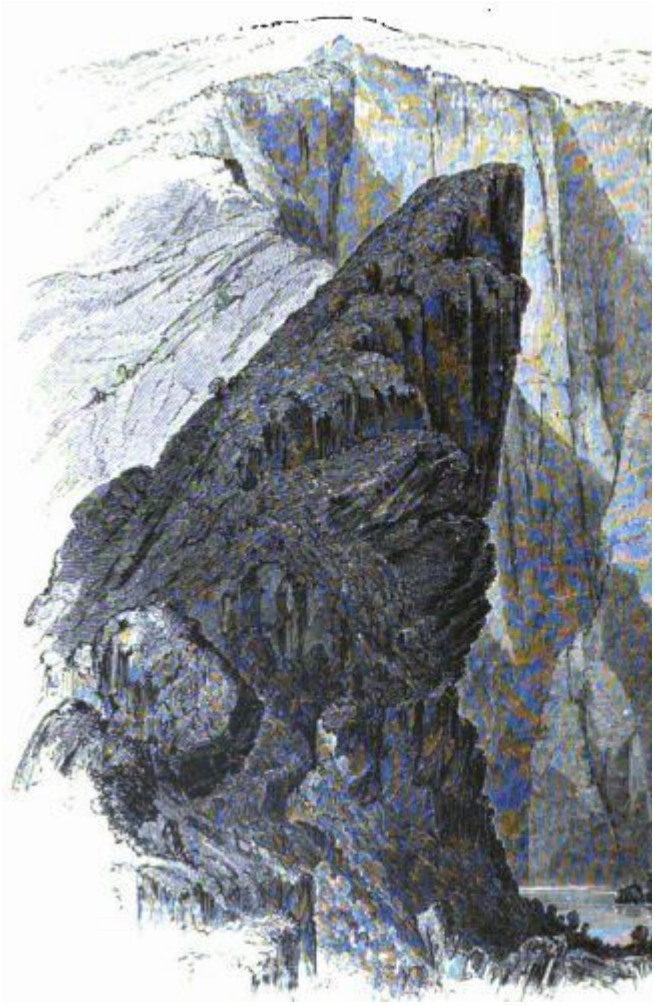
"Some of the torrents have been spanned with rope-bridges, which are secure enough, but very shaky. The mules hesitate to cross these structures, but they generally do so after a great deal of persuasion, which is mostly physical.

"The second night of our mountain journey was spent at the 'Casucha de las Puquios,' at the edge of a marsh where there was fairly good pasturage for our weary animals. We had a supper of charqui soup, made in the manner I have described, together with a partridge and a rabbit broiled over the coals. The rabbit was shot within a hundred yards of our camp, and the partridge about a couple of hours before we reached it. Game is not abundant in this region; rabbits, partridges, guanaco, and foxes are the

principal products of the chase around Uspallata, and Federico says he has frequently made the journey without seeing a single wild bird or beast.

"Not long after our arrival a train of twenty mules came in from the westward and camped close to us. The drivers fraternized with our men and joined them at supper, and there was a general exchange of information concerning the condition of the roads. There is universal hospitality among the arrieros, and when one party meets another there is an immediate proffer of food, cigarettes, or anything else that may possibly be wanted. Every time we met a train the arrieros would stop to chat a few moments, and then, with an '*Adios!*' and a graceful wave of the hand, hurried on to overtake their charges.

"Soon after starting the next morning we passed 'The Inca's Bridge,' a natural causeway over a stream which flows about forty feet below it. The bridge is sixty feet long and averages about the same in width; and Mr. Darwin thinks it was formed by the river breaking through underneath. Lieutenant Macrae, of the United States Navy, made a careful examination, and thinks it was formed by the concretion of the water from several calcareous springs in the hillside, which went on forming shelf after shelf till they reached across. On a shelf under the bridge there are two warm springs which have been hollowed out into baths. I tried the temperature, and found it 97° Fahrenheit; I wanted to take a bath in one of the springs, but was fearful of catching cold after immersion in the warm water.



DEEP CHASM IN THE MOUNTAINS.

"The arrieros do not wash their hands or faces from the beginning to the end of a journey; I had been strongly advised to follow their example, and was warned that I would suffer if I did otherwise. I dipped my hands in the warm water, and then yielded to the temptation to wash them; I was paid

for my rashness by one of the worst cases of chapped hands I ever experienced. I retained the impurity of my face, and on reaching Santa Rosa my complexion was darker than that of any of my peons, and soiled enough for a street gamin of New York.

"From the Inca's Bridge we ascended the valley of the Cuevos River for some distance, and then began a steep ascent. It was a steady struggle, and as we rose higher and higher I could see it was very trying to the strength of our mules. They panted for breath, and after a few minutes' exertion it was necessary for them to take a rest of nearly equal length. At Mendoza, and also in the lower country and on the table-land, I had observed that the arrieros and peons were very cruel to their animals, belaboring them severely for their insubordination, and calling them a great many hard names. But in the dangerous parts of the journey the whole state of affairs was changed. The mules were docile, and quite the reverse of obstinate, while the drivers were models of gentleness. They used neither whip nor spur, but spoke softly, and permitted the animals to suit themselves in going on or resting. For a good deal of the way our advance was very slow.

"We stopped frequently, for five or ten minutes at a time; at noon we halted for an hour where there were a few shrubs on which the mules could nibble, but nothing which would make a satisfactory meal. We passed the night—the third of the journey—in a casucha, which Federico said was two thousand feet below the summit of the pass. The wind blew fiercely, and made the casucha, doorless though it was, preferable to the open air. I ordered the peons to clear it of dust and rubbish, and we spread our beds on the floor; we got along fairly well, and were

up early enough to be off as soon as daylight permitted us to see the road. It wasn't a place for late sleeping, and a snow-squall that came on during the night added to our discomfort. It was only a squall though, not a storm, and did no real harm.



A VICTIM OF THE STORM.

"Near our camping-place there were many skulls and skeletons of cattle; Federico said they were the remains of a large drove which were caught in a storm and perished here on their way to Chili. The great perils of the mountain passage are in the snow-storms, which sometimes detain the traveller for weeks in one spot. They rise suddenly, and the

experienced mountaineers cannot be tempted to venture out when such storms are liable to come.

"From here to the summit the road was like a series of zigzags directly up the side of the mountain. It was trying to the nerves to look down, and I soon found the best thing was to fix my gaze on the top of the mountain, or to the first visible angle of the path above me, and keep it there. At times we ascended at an angle of forty degrees, and I am not sure but that it was sometimes forty-five or fifty degrees. Certainly I have never climbed a steeper road, and never want to do so.

"Hurrah! here we are at the top. We can toss a stone into Chili with one hand and into the Argentine Republic with the other. We are more than two miles in the air, and as we look away to the westward we can see the dark mass of the Pacific Ocean forming the curving rim of the horizon.

"We are at the crest of the Andes, and the South American continent is at our feet."



A CHILIAN OX-CART.

CHAPTER XXVIII.

DOWN THE WESTERN SLOPE OF THE ANDES.—A LONG IMPRISONMENT IN THE SNOW.—"THE SOLDIER'S LEAP."—SANTA ROSA.—SANTIAGO.—ARRIVAL AT VALPARAISO.



TH

Several condors were wheeling in the air above the little party, but, besides these huge birds of the mountains, there were no visible signs of animal life. In the last half-hour of the ascent Frank had felt the effect of the rarefied atmosphere of his great

elevation. He breathed with difficulty, and as he took the air into his lungs its lightness was very unsatisfying. There seemed to be a heavy pressure upon his chest, and several times a faintness came over him which threatened to end in unconsciousness. He tried to think of other things, and in this way preserved his senses, and kept from falling out of the saddle.

But if the youth suffered from the rarity of the atmosphere while making no exertions, what must it have been with the animal he rode? The breath of the mule came quick and fast, and was expelled from the nostrils with a loud sound; the animal could hardly take a dozen steps without halting to rest; and it was the same with all the other beasts of the train. Frank declared afterwards that he never witnessed a more notable instance of patience and perseverance on the part of the much-derided hybrid than in that ride over the Andes. He forgave the animal for his eccentricities and insubordination near Mendoza, and promised never again to despise a mule.

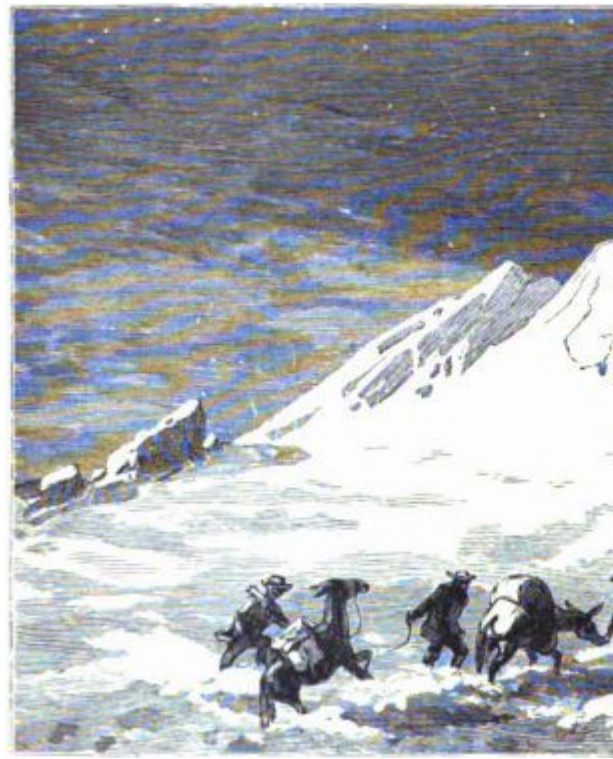
Before beginning the descent it was necessary to make a careful adjustment of the saddles, to prevent their slipping forward, as the road is quite as steep as the one up which they had just been climbing. Every strap was tightened and fastened, and when all was ready, and the mules had fully recovered their breathing powers, the column began its march into Chili.

"Down, down we went," wrote Frank in his journal, "along a series of zigzags cut into the steep slope of the mountain at an angle of nearly forty-five degrees. The vast area before us, bordered by the distant ocean, was broken into mountains and valleys, dotted with forests and stretches of open country,

sprinkled with towns and villages, and seamed and streaked with the tortuous paths of rivers which have their sources on the sides of the Andes, and are fed from the melting snows. The contemplation of such an expanse of the world's surface lying at my feet told more plainly than my sufferings with the rarefied air the great elevation I had attained. I was at a height of more than two miles, and the summits of mountains that would be considered lofty almost anywhere else were far below me. The ocean seemed near and far; its horizon appeared at an almost limitless distance, and at the same time I could half believe that a stone thrown from my hand would fall on the shore.

"We halted at the first hut, and remained an hour for lunch and rest. While we were waiting, Federico told me how he was once caught at this very casucha in a *temporale*, or snow-storm.

"It was rather late in the autumn, and he was going alone from Mendoza to Santa Rosa, having been hired by a merchant of the former place to take an important message over the mountains. He had passed the summit in safety, and reached this casucha just at sunset, when he saw a temporale sweeping down from the north. He dismounted in front of the casucha, and just as he had loosened his saddle and thrown it to the ground the mule sprang from him, dashed down the path, and was out of sight in a moment. The storm came, and he entered the building for safety; he afterwards ascertained that the mule tumbled over a precipice, and was killed by the fall into the chasm below.

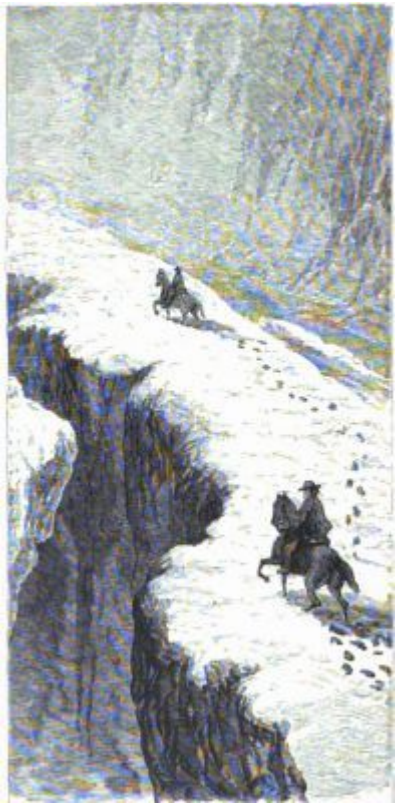


TRAVELLING IN THE S

"All night the snow whirled around the little dwelling, and in the morning the drifts reached to the top of the doorway. Road, cliff, and chasm were obliterated, and it would have been certain death to go on. There he remained day after day; the storm continued, and was so violent that, for much of the time, he could not see a dozen yards away. The hut was without a door, the cold was intense, and his little store of charcoal was of no use to give warmth to the wind-swept building.

"He was threatened with death by starvation, as his stock of provisions was small. He ate as little as possible consistent with supporting life; hour after

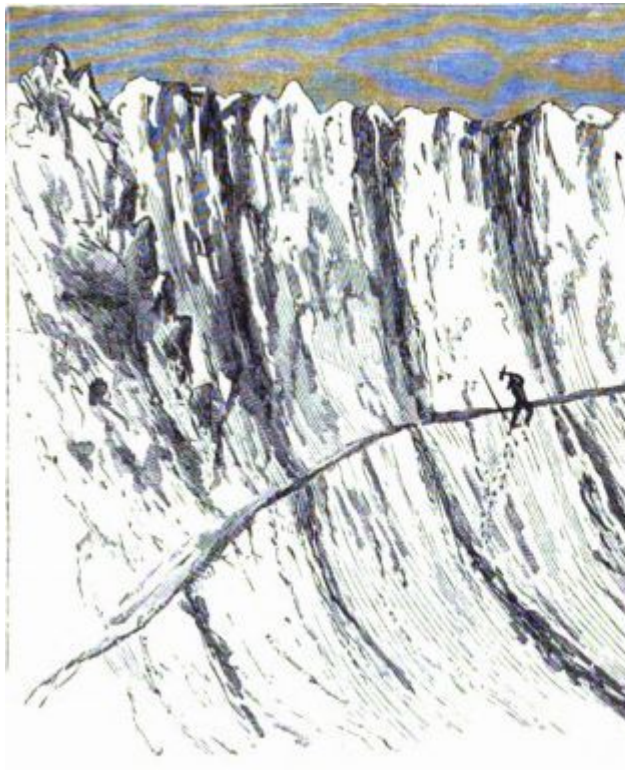
hour he sat and gazed at his possessions, wondering whether they would hold out until he could venture to descend from his mountain prison. On the seventeenth day the last mouthful was consumed, and on the morning of the eighteenth he had the option of dying for want of food or risking his life among the cliffs and chasms which lay beneath him and the wide stretch of forest and fertile land visible below.



A NATURAL HIGHWAY.

"Enfeebled by his privations and trembling with the cold, he crawled from the hut and began the perilous descent. Slowly he crept forward, feeling with a stick

every foot of the path, hugging closely against the cliff, standing sometimes on the edge of precipices, where another inch would have carried him sheer downwards for thousands of feet, cutting a pathway through the drifts, picking his way over streams covered with ice that threatened to crumble beneath him, fainting at times from loss of strength, and lying helpless for minutes which seemed like hours. He finally passed below the snow-line and reached the smiling valley, where he found relief.



CUTTING STEPS ALONG THE

"He tells me that once during this journey he actually slipped over the edge of a precipice, but caught with his hands on the rock, and saved himself from death.

I drew the story from him with considerable difficulty, and his face was ashy pale as he narrated his experiences in those dreadful eighteen days. Since that time no amount of money could tempt him to venture over the mountains in the season when the temporales may be expected."

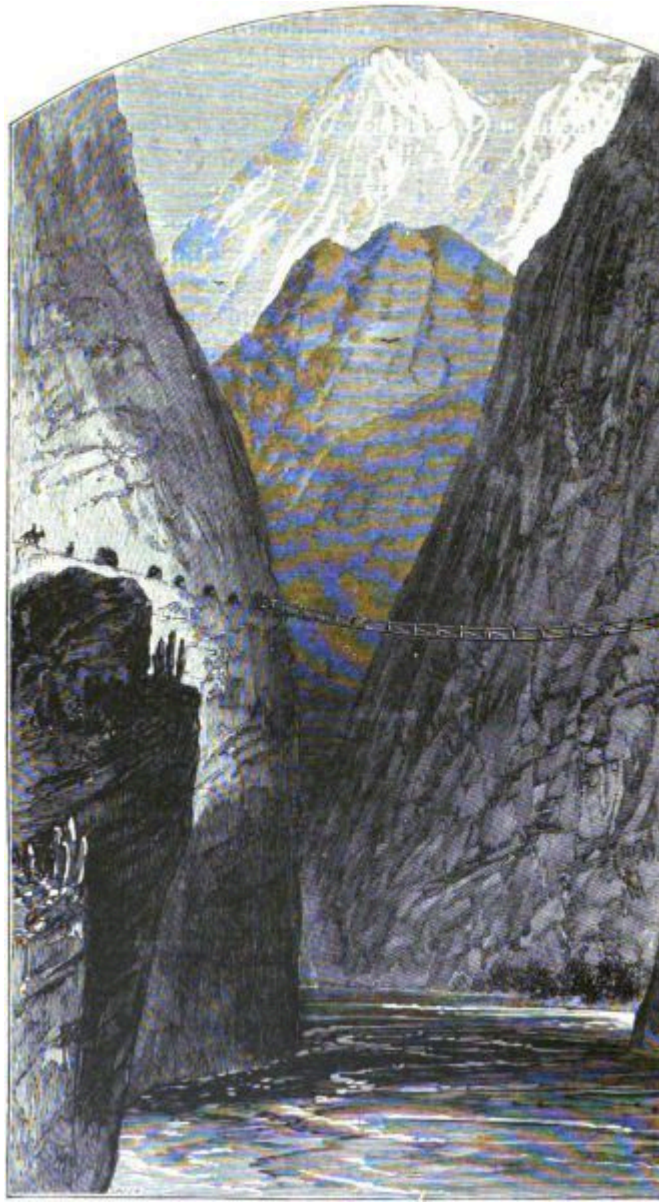
"We halted for the night," continued Frank, "at a hut called Guarda Vieja, or 'Old Guard,' where we found scanty herbage for the mules and poor shelter for ourselves. The animals were fed with the last ration of grain that had been brought for their use. Federico said there was no further need to keep it, as the next forenoon would take us to an abundance of food for man and beast. We supped heartily, and rejoiced to think we should sleep the next night in Santa Rosa, unless prevented by accident.

"Near this place was the scene of one of the battles in the struggle which made Chili independent of the mother country. Revolutionists, under General San Martin, crossed the mountains from the Argentine side, and were exhausted with the fatigue of their long march and privations, while the Spaniards were fresh, and had a good position. The battle resulted in the defeat of the Spaniards, notwithstanding the advantages in their favor.

"Descending from this point, we found the road in some places a mere shelf on the side of the mountain, hanging over a furious torrent that rushes along far below. In one place the sides of the chasm are not more than fifteen feet apart; this spot is called 'The Soldier's Leap,' and the tradition is that, in the battle I have just mentioned, one of the Spanish soldiers escaped from his enemies by springing from one cliff to the other.

"At one place we crossed a chasm by a suspension

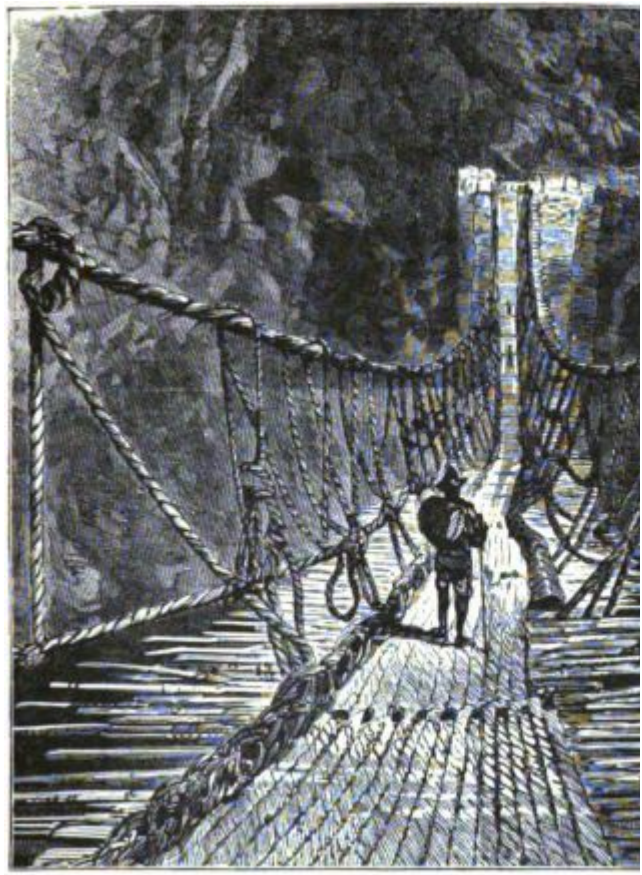
bridge that shook beneath us at every step. When the wind blows up the valley the bridge sways so much that its passage is absolutely dangerous, and the traveller must wait till the blast is over. There was just a gentle breeze when we arrived, and Federico said it was safe enough to venture across, but we must be careful where we placed our feet.



BRIDGE OF THE APURIMAC.

"It was almost identical with the bridge of the

Apurimac, described by Mr. Squier in his work on Peru, as it was constructed of the same materials, and was about one hundred and fifty feet wide. There were four cables—two of twisted withes of a very tough and flexible plant, and two of braided rawhide. The latter were smaller than the others, and served partly for supports and partly to prevent a passenger from going over the side. The floor is of sticks and canes laid transversely, and also parallel with the length of the bridge, so that it looks like a sort of very coarse matting.



LOOKING ACROSS THE BRIDG

"I got down and walked over the bridge, partly through Federico's advice, but largely from my own inclination. I was uncertain what the mule might take into his head to accomplish during the transit, and did not regard it a good place for experiments. But the mules really behaved admirably; nothing could exceed their docility, and the most antiquated cart-horse was never more demure than they. A mule knows pretty well when and where to indulge in hilarity; he realizes that a swaying bridge a hundred feet above a mountain torrent is not to be used as a quadrupedal dancing-hall.

"Turning a bend of the road beyond this bridge, we saw, far up a gorge, a stream that came out of a cavern, like an enormous spring. This is the one mentioned by Lieutenant Strain as having its source in the 'Lago Encantada,' or Enchanted Lake, more than a mile away. It was a mystery for a long time to the Indians, and a puzzle to several scientific visitors, what became of the water that flowed into the lake, as it had no apparent outlet. There was evidently a complete closing of the gorge which formerly drained the lake, by the fall of a vast mass of earth and rock, through the action of an earthquake; the water forced a subterranean passage and the mystery was explained. The Indians regard with awe everything they do not understand, and therefore concluded that the removal of the water was due to supernatural agencies.

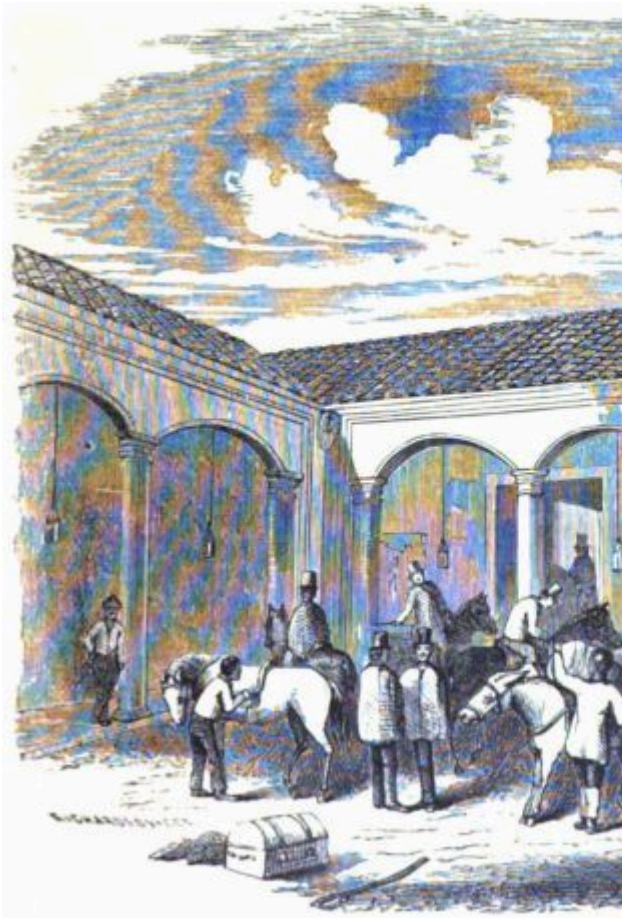


BY THE ROADSIDE.

"We soon entered a cultivated region, where the warm air was a pleasant relief to the chilliness of the upper elevations of the mountains. The descents were rapid, but no longer perilous, the bridges more substantial, and the roads wider. Grass and trees abounded; farms and farm-houses dotted the country; signs of population were everywhere evident; and the perils of our travels among the snow were things of the past. The houses grew into villages, and finally, just at sunset of the fifth day of our journey, we drew up in front of the posada at Santa Rosa and made our last descent from the patient and weary mules.

"Santa Rosa is a long and rather straggling town with about five thousand inhabitants; like most Spanish-American towns, it has a large plaza, where the principal business is centred. A noticeable feature of

the place is the stream of pure water, from the mountains, flowing in nearly every street; it comes from the melting snows of the Andes, and the supply is unfailing. The plaza was thronged with people when we arrived, and some of them looked curiously at the stranger within the gates. There was not the least sign of rudeness, but, on the contrary, an air of politeness which one does not always find in such an out-of-the-way spot as this.



COURT-YARD OF THE P(

"The lodgings of the posada were passable and endurable; they were excellent by comparison with the casuchas and open air of the mountains, but when contrasted with a good hotel, in a civilized land, they did not amount to much. Manuel found me a room which had a bed in it, and also a table and two rickety chairs. The bed was a rawhide stretched across a frame, when green, and then allowed to dry, so that it seemed quite as hard as a pine floor, if not harder. On the rawhide lay a thin mattress filled with straw; there was a pair of sheets on the bed, but no pillows, and I sent Manuel in search of some.

"He returned with the announcement that all the pillows in the house were engaged, but I could have some the next night if I spoke for them at once. As I was to leave in the morning I declined the engagement, and used my overcoat and one of my blankets on which to rest my head during the night.

"At dinner we said farewell to charqui, as the meal consisted of fresh beef stewed with onions and potatoes, with an abundance of *Chili Colorado* (red peppers), followed by one of those mysterious compounds known as a Spanish omelette. Bread was fresh from the oven, and, though dark and tough, it was not to be despised; during and after dinner the maté-pot was produced, and I drank freely of the refreshing beverage. I slept soundly in spite of dreams of home, Mendoza, the Andes, the pampas, the Amazon, Fred and the Doctor, and all sorts of things at once. It was a relief to wake and know exactly where I was.

"Before going to bed I settled with Federico, giving the balance of what was due him, and making a small present in addition. The train was to leave at

eight o'clock; Manuel called me at six, in time for breakfast, and with plenty of leisure to reach the station before the advertised hour.



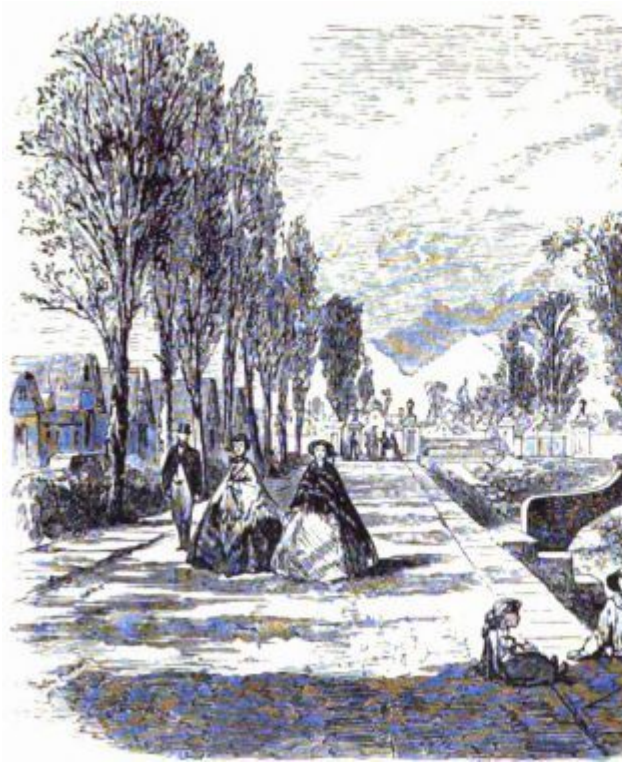
A PEDLER OF FORAGE.

"Truth compels me to add that I saw little of the country between Santa Rosa and Santiago, as I intrusted my ticket to Manuel and slept nearly all the way. I have an indistinct recollection of glimpses of fig and orange orchards, farm-houses and villages, vineyards and wheat-fields, level plains interspersed with rolling or hilly country, and above all the towering peaks of the Andes, and the lower summits

of the Cordillera. I do not wonder that I slept, as I had a good deal of fatigue to make up for.

"Santiago, the capital of Chili, with its population of two hundred and odd thousand, seemed to me like a return to Paris or New York. Here is a city with broad and regular streets, lighted with gas, lined with spacious sidewalks, and equipped with horse-railways; with great squares ornamented with fountains and statues; with hospitals, schools, asylums, and other public edifices by the dozen and almost by the hundred; with a great cathedral; with handsome bridges over the river that supplies it with water; with banks, commercial houses, post and telegraph offices, insurance companies and other paraphernalia of trade; with a public library of forty thousand volumes and many rare manuscripts; in a word, with all the attributes of a great city. From the railway station I went directly to the hotel, and was welcomed with so much politeness by the proprietor that I was almost ready to exclaim with Shenstone:

"Whoe'er has travell'd life's dull round,
Where'er its stages may have been,
Must sigh to think he still has found
The warmest welcome at an inn."



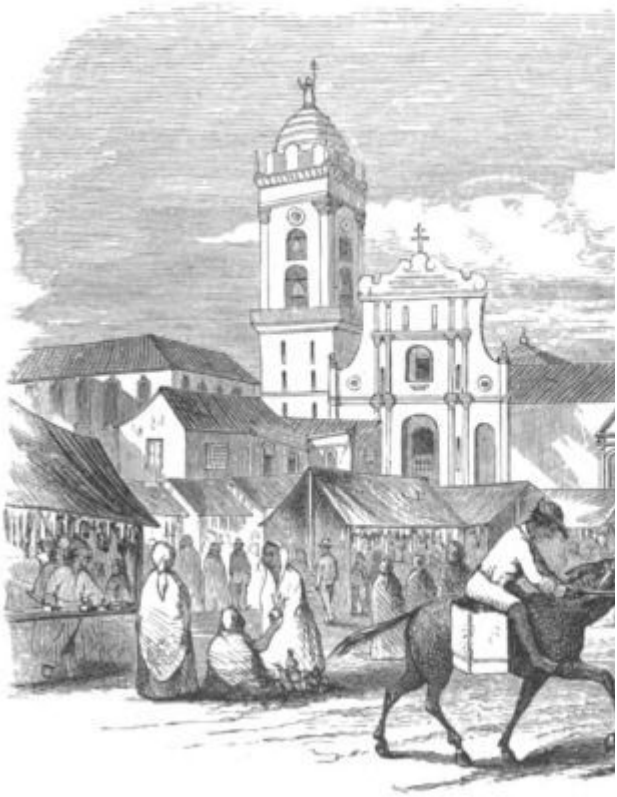
THE ALAMEDA.

"The Alameda, or promenade, is beautifully shaded, and a favorite resort of the population. Most of the dwellings are low, on account of earthquakes, but they are surrounded by spacious court-yards and furnished with great liberality. The city seems to exist in spite of disadvantages. It has had numerous earthquakes, many of them disastrous, in the period covered by its history, and on several occasions it has suffered from inundations. But it has a delightful climate, the thermometer averaging 68° in summer and 50° in winter, so that it is never very warm nor very cold. Heavy and frequent rains fall in winter, and any one who is not fond of rain should not come

here in that season.

"Aside from the earthquakes, and also the wars in which Santiago has suffered, one of the most tragic days it has ever known was the 8th of December, 1863. On that day three thousand people, mostly women, were in the church of La Campania; a cry of fire was raised, and there was a rush for the outer air. The doors opened inwardly; the assemblage pressed against them, and no persuasion could induce them to fall back and allow the doors to be swung on their hinges. Panic-stricken, they crowded forward; the fire increased; suffocating smoke filled the place; and two thirds of that three thousand were burned, trampled, or smothered to death. The memory of that terrible day is still fresh in the minds of the people, and will be long preserved.

"I rode past the church where this calamity occurred, but did not care to enter it, as there was nothing interesting in its architecture, and I have no feeling of morbid curiosity. I was more interested in the streets and the houses, the long rows of tall poplars that lined the streets, and the flower-gardens visible at almost every step. The poplar was introduced from Mendoza; the inhabitants say that along with the poplar came the goitre, as not a case of the disease was known until the exotic shade-trees were planted and began their growth in their new home.



A STREET SCENE.

"In the middle hours of the day I found the streets almost deserted, but they are busy enough in the morning and towards sunset. Daybreak brings a crowd of peons from the country with vegetables, fruit, chickens, milk, and other edibles for sale; their shouting is loud and continuous, as they cry their wares from house to house or walk up and down the market-places. A great quantity of freshly cut *alfalfa* (a variety of clover) is brought from the country and sold for feeding stock. It is piled on the back of mule or horse so that the animal is completely covered; you might easily imagine yourself looking at a

haycock which had suddenly acquired the power of locomotion. There are droves of pack-mules; trains of carts with their wheels cut from a log, and creaking as if in dire distress; priests in sombre black, and men and women in variegated garments, all combining to form an animated picture. As the sun rises above the Andes and ascends in the heavens the crowd thins away, and long before noon there is an almost painful air of stillness over the whole scene.

"Santiago lies in a valley between two ranges of the Andes chain, and about eighteen hundred feet above the level of the sea. Consequently it has both sunrise and sunset over the mountains; the former on the great range and the latter over the western Cordillera. There is an interesting period of the sunset—beginning when the city first comes under the shadow of the western mountains, and ending when the last rays leave the snow-capped mountain peaks in the east. The colors of the rainbow are perceptible in a sunset under favorable conditions; the tints change with the shadow, and we have yellow, vermilion, violet, green, purple, and other hues, in succession and combination, closing with a bright blaze and halo from the crests of the mountains. The last light of day comes reflected from these mountains in the east, and not from the west, where we are accustomed to see it in other cities and in other parts of the globe. Nature seems to be reversed in this most southerly capital of the continent.

"I found the markets not unlike those of Lima. The products of two zones are attainable in this Andean situation, though there are fewer tropical fruits and vegetables than in the capital of Peru. There are strawberries, grapes, figs, peaches, pears, quinces,

apples, nectarines, cherries, apricots, plums, oranges, lemons, citrons, and chirimoyas—the latter far inferior to those of Lima. The fruits mostly in demand and largely consumed are water-melons and musk-melons; both are delicious, and grow to a great size, and they are as cheap as they are good.

"But I fear I shall weary you with this description of the city, and, besides, I must be moving to Valparaiso to meet the steamer bringing Dr. Bronson and Fred. The time-table says the voyage occupies twelve days; it is now ten days since I saw them leave Buenos Ayres, and to-morrow will be the eleventh day. To-morrow I will go to Valparaiso by the railway; it is a ride of four hours, or perhaps five, if the train is not in a hurry, and then I can get everything in readiness to welcome them to the soil of Chili."

Frank went by the train the next morning, and soon after noon he arrived at the seaport. He found a bustling, active city, with a population of more than one hundred thousand, of whom less than three fourths were native Chilians. According to the statistics Valparaiso contains 15,000 German inhabitants, 7000 British, 4000 French, 2000 Italians, and 500 Americans, and a great deal more than half its commerce is in foreign hands.

The city is on a bay which opens towards the north so capaciously that it was formerly swept by all winds from between north-northeast and west-northwest; ships anchored with springs on their cables, and were ready to put to sea at any moment to avoid the chance of being driven on shore. A mole, which was incomplete at the time of Frank's visit, gives more security, and when finished will make a fairly good harbor for Valparaiso.

The name of the city indicates "Vale of Paradise," but

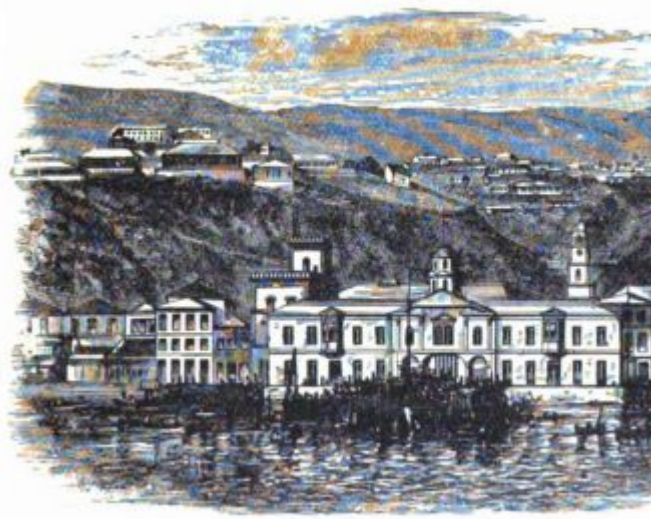
Frank was unable to see where the appearances justified such a pleasing title. The bay is bordered by rugged hills, that, for more than half of the distance around the semicircular beach, leave only room enough for a single row of houses near the water. The fronts of some of these hills are so steep that you may almost step to them from the back windows of the upper stories of the dwellings.

Facing the other half of the bay is a triangular plain of sand, formed by the *débris* of the streams flowing from the hills, and the washings of the surf on the shore. The city is built on this sand, along the narrow beach, and up the sides and over the tops of the hills. It forcibly suggests a struggle for position where nature is in a repellent mood.

"Valparaiso makes me think of Algiers," wrote Frank in his note-book, "but I miss the grand archways of the *Boulevard de la République* and the old castle which once sheltered the Dey and held his treasures. I think of Beyrout, with the Lebanon range in the background, but the Lebanon is dwarfed almost to insignificance by the mighty Andes; I think of Quebec, but the heights of Abraham and the walls of the old-time stronghold of France in America are not faithfully reproduced; and, finally, I remember Gibraltar, nestling at the base of the famous 'Rock.' There is a resemblance to all these places, but when we study Valparaiso in detail we find many points of difference.

"Valparaiso has suffered from earthquakes; twice it has been nearly destroyed by them, and there is hardly a week in the year without a shock. For this reason the houses are mostly of one or two stories, especially in the resident portion, and every inhabitant is ready to flee to the open air at a

moment's warning. I don't want to become a permanent dweller in this city until earthquakes are done away with."



CUSTOMS GUARD-HOUSE, VALPARAIS

The city has theatres and churches, schools and hospitals, a custom-house and a government palace, great warehouses for the reception and storage of goods, street railways, gas, steam fire-engines, fine shops, poor hotels, and a fairly good police system. It has a large and increasing commerce, and is destined to grow in wealth and grandeur as time goes on, unless the earthquakes make an end of it—a contingency not pleasant to contemplate. It was bombarded by the Spanish fleet in 1866, and, though few lives were lost, there was an immense destruction of property, of which nine tenths belonged to foreign merchants.



SPANISH-AMERICAN COS

About three o'clock on the afternoon of the day following Frank's arrival the flag on the custom-house signalled the approach of the English steamer. Our young traveller, accompanied by Manuel, engaged a boat, and as the great ship came to her anchorage he was rowed alongside, and exchanged greetings with his old companions and friends.

We will now make a flying leap over the Andes, and accompany Dr. Bronson and his nephew in their voyage from Buenos Ayres through the Strait of Magellan.

CHAPTER XXIX.

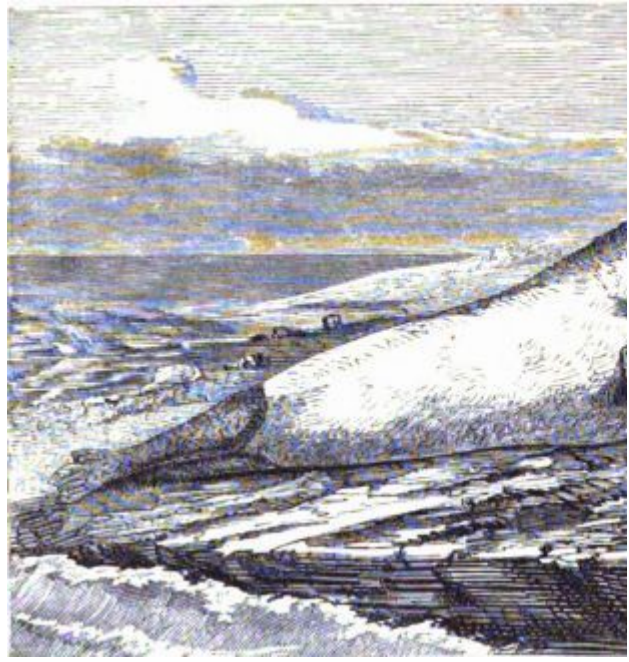
STRAIT OF MAGELLAN.—FALKLAND ISLANDS.—A PENGUIN CITY.—SANDY POINT.—HUNTING THE OSTRICH AND GUANACO.—PATAGONIAN GIANTS.

The voyage southward from Buenos Ayres was uneventful, as the ocean was calm and the steamer kept well out to sea. There was an agreeable change in the temperature; it became delightfully cool on the day following their departure, and continued so until the coast of Patagonia was sighted, near the entrance of the Strait of Magellan.

Fred was disappointed with his first view of Patagonia. He knew it was a desolate region, but was hardly prepared for the total absence of all vegetation on the shore which he scanned through his glass. It was the shore of the Red Sea without its warmth of sunshine, and the rosy tints for which its name was given. Coming from the rich verdure of the Amazon and the Rio de La Plata, he found the gray, barren landscape of Patagonia doubly forbidding, and his desire for a journey through the country was by no means great.

The entrance to the Strait of Magellan is about twenty-two miles wide; the northerly, or, rather, the northeasterly, point around which the steamer took its course is called Cape Virgens, and the southeastern Cape Espiritu Santo. Almost due east, and about three hundred miles distant, are the Falkland Islands, which belong to Great Britain, and are of more political than practical value. There is excellent pasturage on the islands, and considerable numbers of cattle and sheep are raised there, but the

climate is not favorable to agriculture.



SEAL OF THE FALKLAND I

Fred wanted to visit the Falklands, not so much to examine the country as to see the seals and penguins, which are killed there in great numbers. As he was unable to make the journey, he contented himself with a description given by a fellow-passenger.



PATAGONIA AND TIERRA DEL FUEGO.

"The penguin is a funny-looking bird," said the

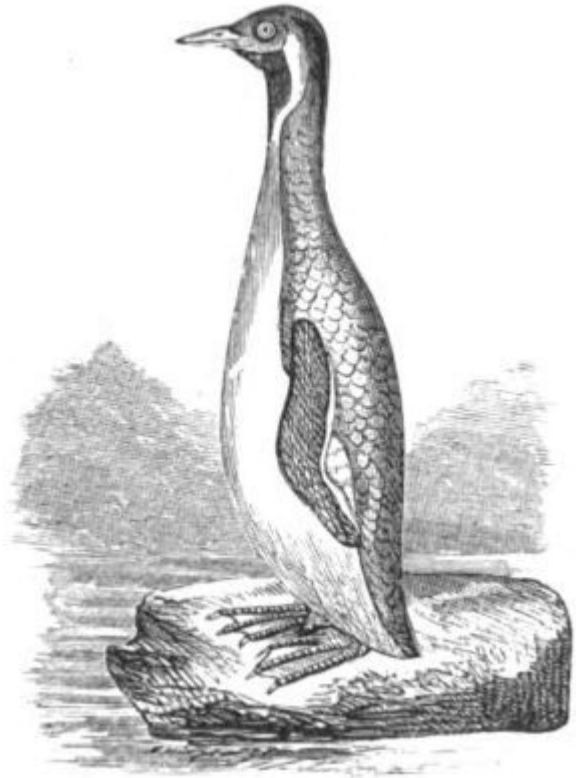
gentleman, "and his breeding-place is as funny as he is. In the first place, he can't fly; he has two wings, like any other bird, but they are very short, and only useful for helping him over the ground when on land, and for paddling him about in the water. He doesn't use his wings much, though, in the water, as his broad feet are webbed like a duck's, and propel him very rapidly.

"When I first came to this part of the world I was on a schooner in search of penguin oil. We went to one of the rocky islands where the birds make their home, and found a city of probably a hundred thousand penguins."

"A hundred thousand in one city!" exclaimed Fred, in astonishment.

"Yes, a hundred thousand at least," was the reply, "and I've seen a penguin city five times as large as that. There was a space of fifty or sixty acres covered with birds about as thick as they could sit together; it was laid off into squares by streets running at right angles, and a surveyor couldn't have made the lines straighter than they were.

"And not only do they lay the ground out into squares, but they level it off and pick up all the stones and shells lying around, so that it is as smooth as a lawn. Then the birds go in pairs, and each pair picks out a place for a nest; it isn't a nest at all, but simply a spot on the ground. The hen lays one egg, and only one; the male bird brings her food from the sea, or if she wishes occasionally to have a swim he sits on the egg during her absence. He takes such good care of her that she is always plump and fat, and for this reason the penguins are sought and killed during their breeding season.



THE PENGUIN.

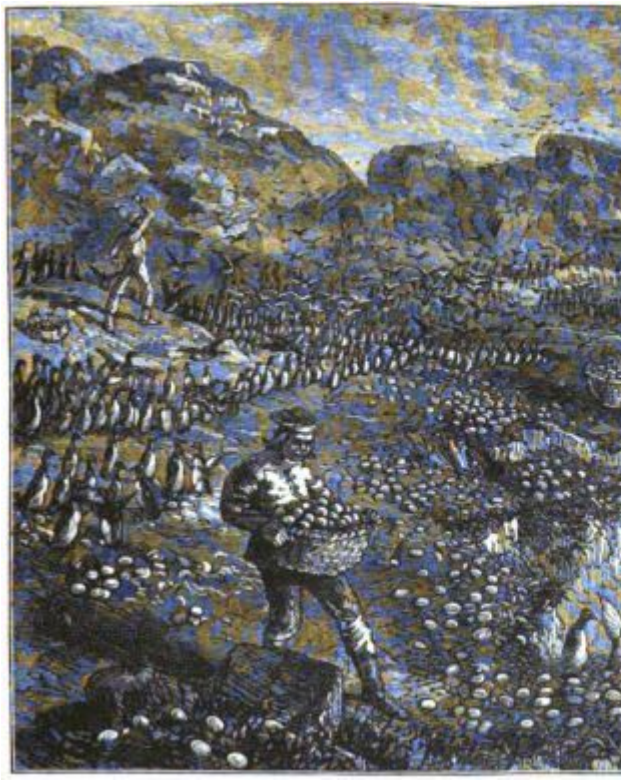
"They walk up and down the streets like soldiers, standing erect all the time, and waddling along on their feet. The fun of the thing is that they divide themselves off into classes, according to their plumage and also according to the stages of their incubation; one class never disturbs another, but whether they keep order without the aid of a policeman or not I am unable to say."

Fred asked how large the ordinary penguin is.

"There are several varieties of these birds," said his informant, "the largest being the Emperor Penguin,

which weighs twenty-five or thirty pounds, and I have known them to tip the scale at very nearly forty. The old birds are so tough and fishy that a dog won't touch them, but the chickens are good eating. I have tried the eggs, but didn't like 'em, as they resembled a hen's egg cooked in lamp-oil. Penguins only go on shore during the breeding season; for the rest of the time they live in the water, and some varieties of them are frequently found on or near cakes of ice two or three hundred miles from land."

While this strange bird of the southern hemisphere was under discussion the steamer passed between the two capes we have mentioned, and entered Possession Bay; then she passed through the First Narrows, where the cliffs are not more than two miles apart. On the right was Patagonia; on the left lay the island of Tierra del Fuego, 'Land of Fire,' presenting an aspect quite as forbidding as that of the mainland of the continent. Desolation everywhere, and a leaden sky that threatened wind and rain.



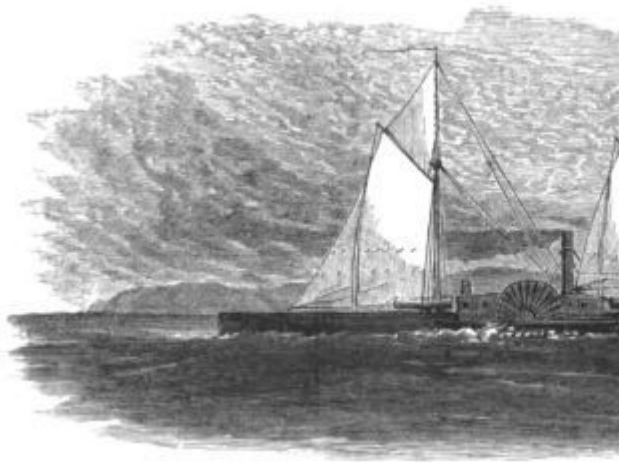
THE HOME OF THE SEA-

From the First Narrows, which are about nine miles long, they opened out into a broader stretch of water known as Philip's Bay, and then came to the Second Narrows and to Elisabeth Island. Wild birds were numerous, and in some places the shores were covered with them; in the narrows the water all around the steamer was alive with gulls, and a dozen other varieties of sea-fowl. Among them Fred recognized the shag, coot, and cormorant. The gentleman who had told him about the penguins pointed out a settlement of those birds on the shore, but too far away to enable them to see much of it.



THE CORMORANT.

From the Second Narrows the course of the steamer swept to the southward until she passed Cape Froward, the most southerly point of the continent; at Cape Froward there is a sudden bend to the northward, and this course is continued to the outlet of the strait into the Pacific Ocean, at Cape Pillars, three hundred and fifteen miles from Cape Virgens.



A STEAMER ENTERING THE STRAI

The navigation of the strait is easy enough for a steamer, but very difficult for a sailing-ship. The water is deep, and there is no danger of being left on sand-bars, but the tides make strong currents in various parts of the strait; several of the passages are tortuous, and require a quick change of helm even for a steamer; and the openings between the cliffs are liable to gusts of wind that make it dangerous for a vessel relying on her sails alone. The narrowest place is about one mile across, and is in "Crooked Reach." This point is the great terror of sailing captains, as a strong wind generally blows there, and changes its direction at frequent intervals.

"This strait bears the name of its discoverer," wrote Fred in his note-book, "or, at any rate, it is near enough to identify him. On the 21st of October, 1520, Fernando Magalhaens, a Portuguese navigator, entered the strait from the Atlantic, and on the 28th of November of the same year he emerged into the broad and peaceful ocean which he named 'Pacifico.' Thus the Strait of Magellan and the Pacific Ocean

were first navigated by one and the same individual. He may also be called the first circumnavigator of the globe. He sailed over the Pacific Ocean to the Philippine Islands, where he was killed in a fight with the natives; on a previous voyage he had been eastward to the longitude of the Philippines, and thus had been completely around the world, though not in a continuous journey."

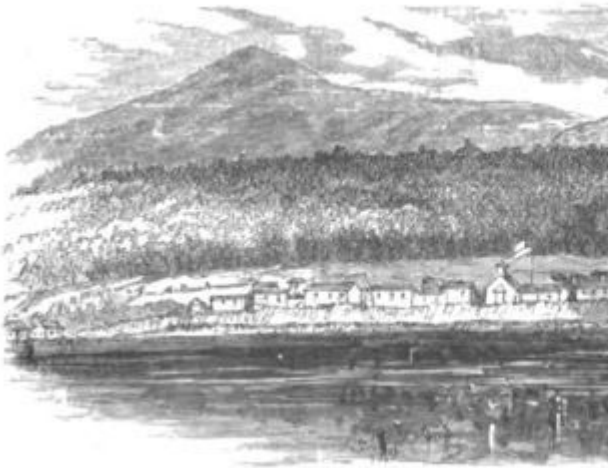
A hundred miles from the Atlantic Ocean the steamer came in sight of Punta Arenas, or Sandy Point; it is best known to English-speaking people by the latter name, which is a translation of the former. The steamer was to remain here several hours, and our friends embraced the opportunity to go on shore.

Sandy Point was originally a convict settlement of the government of Chili, and was officially called "La Colonia de Magellanes." It was founded in 1851, and for some years contained only the convicts and the garrison that watched over them; when steamers began to navigate the strait the government, seeing that the place was destined to be of commercial importance, determined to establish a free colony there. Grants of land were given to German and Swiss settlers; several hundreds were brought there from the Old World; but the character of the country is unfavorable, and the colony has never prospered.

From Cape Froward to and beyond the neighborhood of Sandy Point there are forests of beeches and other foliferous trees, and the hills and level ground back of them are covered with grass. Agriculture is limited, and the colonists who went to the Strait of Magellan to make homes and become rich have been sorely disappointed.

The steamer anchored in front of the little town, and hardly had her anchor touched the bottom of the bay

when a steam tender came alongside, bringing the captain of the port and the agent of the steamship company. Dr. Bronson and his nephew were invited to go ashore in the tender; they had made a bargain with a boatman, but, as the waves were dancing merrily in consequence of the brisk wind blowing down the strait, they accepted the invitation, and paid the owner of the boat for doing nothing. In a quarter of an hour they were landed at a little wooden pier, and had leisure to study the most southerly town of the western world.



CHILIAN SETTLEMENT AT SA

"It didn't take us long to see the whole of Sandy Point," said Fred, in the account of their visit, "as the sights of the place can be exhausted in a very little while. There is a beach in front of a high ridge of hills, and some rising ground intervening between beach and hills. The town straggles along this beach, and back on the rising ground behind it; it consists of a fort, a church, some government barracks, a custom-house, and one or two other public buildings, together with a lot of one-story houses disposed in

lines to form streets. It has a population of eight or nine hundred—possibly a thousand—and presents a woe-begone appearance, like that of a half-deserted village.

"There were Germans, Swiss, French, and Italians among the people we met in the streets; the rest were Chilians and Patagonians, together with some Fuegians who had paddled over the strait from their native shores. The Europeans were much like the same people elsewhere, and we paid no particular attention to them; we were more interested in the Patagonians and Fuegians, and I prevailed upon some of them to stand to be sketched under promise of half a dollar each for their trouble. Their countenances are not prepossessing, and by no stretch of the imagination could they be called handsome. In fact, I consider them about the ugliest people I ever saw.



PATAGONIAN DRESS.

"The Patagonian dress is a poncho or mantle of guanaco skins, which hangs from the shoulders and has a hole in the centre for the head; sometimes it is gathered at the waist by a belt, especially when the wearer is on horseback, and in cold weather those who can afford it have a smaller garment of nearly the same sort underneath a larger one. The men pluck out their beards when they have any, and as the dress is the same for both sexes it is next to impossible for a stranger to distinguish men from women in a group of natives. I made a sketch of a girl who was said to be about twenty years old; she

was considered a belle, but I do not believe any belle of New York would be jealous of her good looks.



A PATAGONIAN BELLE.

"This Antipodean Langtry wore a guanaco robe which was by no means new; her black hair was greasy and unkempt at the sides, but cut rather short on the top of the head; her nose was broad and flat; and her mouth extended almost from side to side of her face. Her eyes were black and piercing, and her self-satisfied smile as she stood for her picture told that she knew how handsome she was.

"I hear some one asking about the height of the

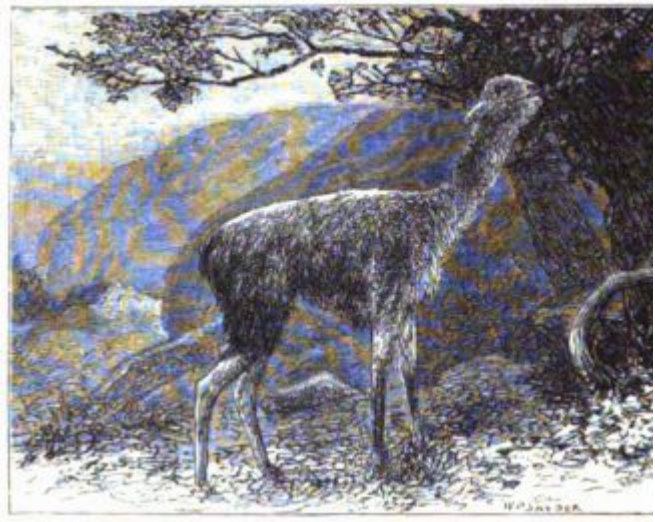
Patagonians, and if they are really the giants they were represented in the school-books of forty years ago. They are not giants in the ordinary acceptation of the term, but are certainly above the ordinary height. The governor of Sandy Point personally measured the height of a great many Patagonian men, and his experiments covered several years of his residence there. He reports the average height as between five feet eleven inches and six feet.

"Mr. Beerbohm, the author of 'Wanderings in Patagonia,' says the Indians he travelled with possess extraordinary strength, and he tells the following story as an illustration of what they can do:

"'An Indian was leading a horse towards the camp by a lasso, when the animal for some reason or other stopped suddenly short, and obstinately refused to stir from the spot. After a few coaxing but ineffectual tugs at the lasso, the Indian gave a short grunt of impatience, and then taking the lasso over his shoulder, bent forward, seemingly without effort, and dragged the horse by main force about twenty yards, notwithstanding its determined attempts at resistance.'

"From the same writer and from other sources," continued Fred, "I learned a good deal about the country and the people of Patagonia, which consoled me for my inability to make a journey through it, and indulge in hunting the ostrich and the guanaco. Formerly hunting was possible within a few hours' ride of Sandy Point, but at present the game has been killed off or driven to the north, and those who would have sport cannot find it nearer than fifty or sixty miles away. This is too far to go when we wish to continue on our journey with a steamer that remains only a few hours in port.

"Patagonia is a desolate region, comprising an area of about three hundred and fifty thousand square miles; its northern boundary is the Rio Negro, and there have been disputes between Chili and the Argentine Republic concerning the right to the country. It has been finally agreed that Chili may have the west coast and the country along the strait, while the republic may possess the region bordering on the Atlantic. Several colonies have been made in Patagonia by the two claimants, but none of them have succeeded.



THE GUANACO.

"The population is very small, considering the area; some authorities place it as low as three thousand, and none higher than ten thousand; the latter figure is probably excessive. The plains are covered with a few shrubs and scanty grass, or with nothing at all, and the valleys are the only places where cattle and horses can find sufficient grazing to keep them alive. Some of the northern tribes have herds of cattle and sheep, mostly stolen from the Argentine Republic,

but the southern natives have no cattle and but few horses. Notwithstanding their desolate character, the plains support countless numbers of ostriches and guanacos; the feathers of the former and the skins of the latter are articles of commerce, and their flesh serves as food. When the Indians are unsuccessful in hunting these animals they live upon horse-flesh, and many of them prefer it to any other article of food.

"We met at Sandy Point a guacho from the Argentine Republic who had spent several years in Patagonia, and made a living by hunting. He had a troop of dogs which he used in the chase of the ostriches and guanaco, and he told us that it was his plan to start out with two or three Indian attendants, and be absent for weeks at a time. When he saw an ostrich he sent his dogs after it, and followed close behind on horseback; with dogs and bolas he rarely failed to bring down his game, and the same was the case with the guanaco. He had from six to a dozen horses; when one was wearied he quickly changed the saddle to another. When he had gathered a sufficient quantity of ostrich feathers and guanaco skins to pay for the journey, he came to Sandy Point, and he had arrived there only the day before we met him.

"He told us that his greatest annoyances came from the wild horses and the Indians. His own horses had been attacked by the wild ones on several occasions, and he once lost all except those that he and his attendants were riding at the time. He said the wild brutes display a great deal of intelligence in attacking a herd of tame ones; they form a circle about the latter, and attempt to drive them away, and if they are very numerous there is great danger of their success. He said the best way to defeat them was to single out the leader of the attacking force,

and pay no attention to the rest. If you can kill the leader the rest can be driven off without much trouble, but as long as the head of the herd is unharmed there is no safety.

"The Indians are usually peaceable, but they had a habit of coming to his camp, and literally eating him out. They stayed as long as there was anything to eat, and had no modesty about asking for what they wanted. He always endeavored to keep as far from them as he could, partly because they 'ate him out of house and home,' and partly because game was always scarce and shy when they were about.

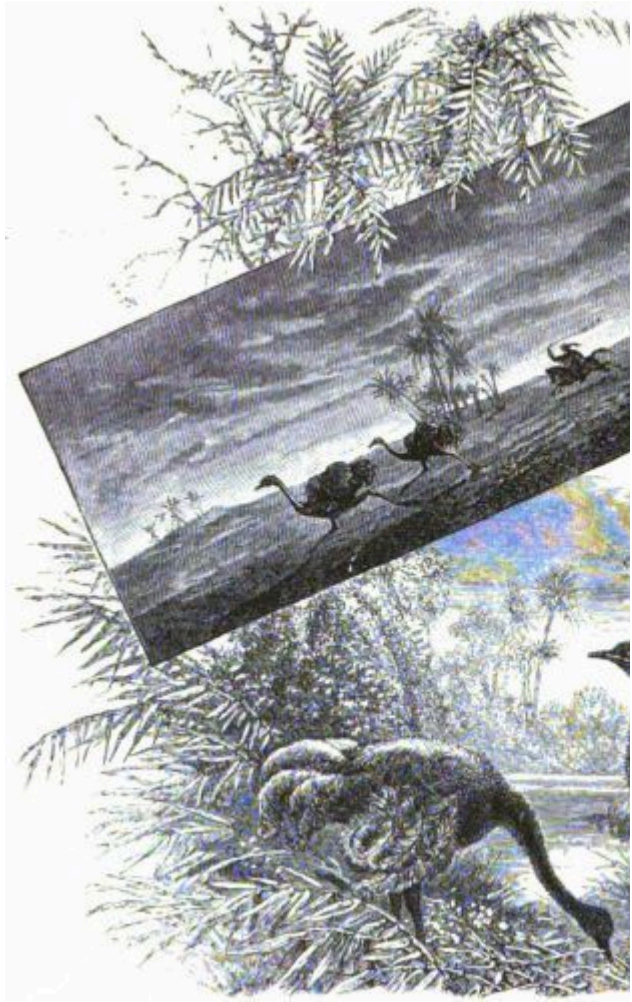
"In addition to ostriches and guanacos, there are plenty of armadillos, pumas, foxes, and skunks. Our guacho generally killed pumas when they came in his way, but did not go around in search of them. He said the flesh was good eating, and tasted like veal, but it varied somewhat in quality, according to the age and condition of the animal. The puma lives on the ostrich and guanaco; he is very powerful, and can kill a guanaco with a single blow of his huge paw. He is as cowardly as he is strong, and when attacked by a hunter he rarely resists unless slightly wounded and 'cornered.' The guacho said he had frequently ridden close up to a crouching puma and killed him with a blow from a bolas, or a shot from a revolver.



SEEKING SAFETY.

"I asked about the ostrich, and he said there were two kinds in Patagonia, that of the north being larger and darker than the one inhabiting the south. While he was talking I turned to Mr. Beerbohm's book and found the following:

'"The ostrich of southern Patagonia (*Rhea Darwinii*) is smaller than the "Avestruz Moro" (*Rhea Americana*), as the species which frequents the country near the River Negro is called by the natives. The color of its plumage is brown, the feathers being tipped with white, whereas the moro, as its name indicates, is uniformly gray. The *R. Darwinii* are extremely shy birds, and as their vision is remarkably acute, it is by no means an easy matter to catch them unless one has very swift dogs to hunt with.'



THE OSTRICH AND HIS HU

"The guacho said the ostrich of America has the same peculiarities that he is credited with in Africa. He doubles on his pursuer, and sometimes he will drop flat on the ground, and endeavor to escape by lying perfectly motionless until the dogs have passed. In some conditions of the wind this trick succeeds, but

if it is blowing the scent towards the dogs they find the unhappy bird and make short work of him.



SKELETON OF THE OSTRICH.

"The ostrich makes his nest by scooping a hole in the ground under the shadow of a bush, and lining it with a few wisps of dry grass to make it soft for the chickens. There are from ten to forty eggs in a nest; they are laid by several hens and not by one, as with most other birds, and it is a curious fact that the male bird sits on the nest, hatches the eggs, and looks after the young. If the weather is fine he sometimes grazes an hour or two in the evening in

the vicinity of the nest, but he never goes far away; when it rains he never leaves the nest, and he has been known to stay there six or seven days without feeding.

"After the hatching season the ostriches lay their eggs all over the plains without any regard to hatching them. These eggs are a prize for the hunters; many a meal has been made of them, and, as our guacho said, many a life had been saved by this habit of the great bird. They keep perfectly fresh for months; one ostrich egg contains as much as ten hen's eggs, so that it makes a good dinner for one person. This is the way to cook it:

"Break a small hole in the top of the egg and remove some of the white. Beat the rest of the contents up together, and when you have done this thoroughly, set the egg on its end in the ashes, a little way from the fire, so that it will roast. Stir the contents frequently to prevent burning, and turn the egg occasionally to keep the shell from cracking. Fifteen minutes will cook it thoroughly; add pepper and salt, if you have any, and your dinner is ready.

"I will close this bird talk by quoting a bill of fare given by Mr. Beerbohm, of a dinner on the plains:

"Soup.—Rice and Ostrich.

"Broiled Ostrich Wings.

"Ostrich Steak.

"Roast Ostrich Gizzard.

"Ostrich Eggs.

"Custard.—Ostrich Eggs and Sugar.

"More Ostrich, if wanted."

CHAPTER XXX.

MUTINY AT SANDY POINT.—TIERRA DEL FUEGO.—MISSIONARY ENTERPRISES THERE.—CAPTAIN GARDINER.—CRUISE OF THE "WATEREE."—SIDE-WHEEL DUCKS.—UP THE PACIFIC COAST.—THE MEETING AT VALPARAISO.—THE END.

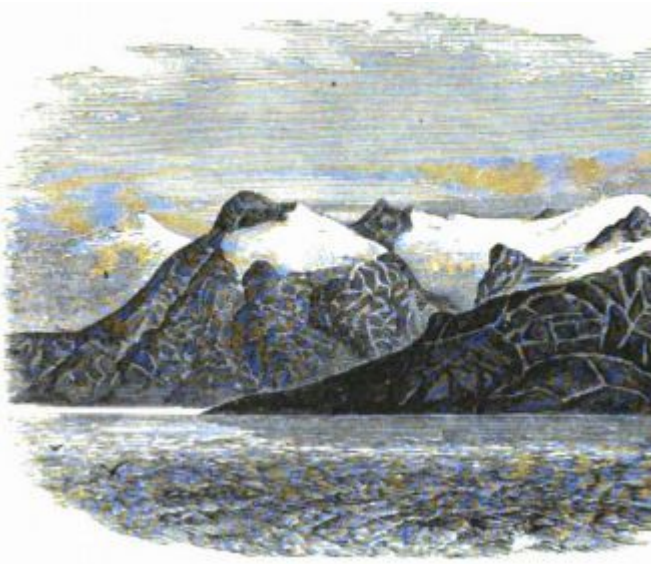
Sandy Point has not been without its tragedy, in spite of its youth as a colony. In November, 1877, the convicts and soldiers mutinied, and for two days the place was a scene of bloodshed and robbery. About sixty of the officers, soldiers, and colonists were killed and many others were wounded; the arrival of a Chilian gunboat, on the third day, put an end to the revolt and restored order. The mutineers fled to the pampas, where many of them died of starvation and exposure, and the remnant of the band was captured near the mouth of the Santa Cruz River. Many of the buildings in the town were burned, and the destruction of property was estimated at half a million dollars.



CAPTAIN SMILEY.

Dr. Bronson inquired for Captain Smiley, an American who was once famous in this part of the world; he learned that the captain died some years before, but not until he had reached very nearly the hundredth year of his age. An officer of the United States steamer *Wateree* described the captain as known to everybody from Uruguay round to Chili, and says he rendered numerous and invaluable services to vessels shipwrecked anywhere within a thousand miles of the strait. One sea-captain who was wrecked on the eastern coast of Patagonia declared that Smiley scented the disaster six hundred miles away, and came to his assistance. He once rounded Cape Horn alone in a fifty-ton schooner, and his life was full of extraordinary experiences in the

southern hemisphere.



MOUNTAINS AND GLACIERS IN MAGELLAN'S

As the Doctor and his nephew returned to the steamer they met a boat-load of Fuegians on their way to Sandy Point, from the other side of the strait. Fred had considered the Patagonians very low in the scale of humanity, but on seeing the Fuegians he was inclined to rank the Patagonians among the *crême de la crême*. Though the weather was cold, they were not more than half clad, and the few garments among them were the merest apologies for clothing. The boat was a frame of wood covered with seal-skins sewn together, and was far more attractive to the eye of the stranger than were its occupants.

The inhabitants of Tierra del Fuego are of the same race as the Patagonians, but smaller; they live near the sea-coast, as the most of their food is obtained from the water in the shape of shell or other fish, seals, aquatic birds, and a certain edible weed that is

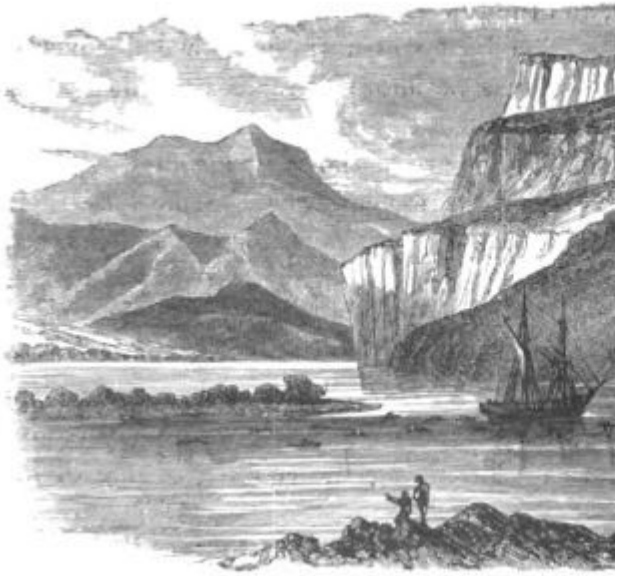
thrown up by the waves. They are reputed to be cannibals, and the crews of ships wrecked on their coast have been killed and eaten by these savages. They do not confine their cannibalism to shipwrecked mariners, if all stories are true; Captain Smiley said he once visited a Fuegian chief, with whom he was on friendly terms, and found him superintending the cooking of one of his wives!

Missionaries have labored among the Fuegians, but to very little good result. The first effort was made after the return of Admiral Fitzroy's expedition, which is described in Darwin's "Voyage of the Beagle." Four Fuegians were taken to England, where one of them died, and the others remained for three years and were educated. One of these natives was named "Jemmy Button," in consequence of his having been bought from his parents for a button cut from an officer's coat; he was intelligent, and gave promise of future usefulness, and it was thought a good plan to send him to his native land accompanied by a missionary.

Jemmy received many presents from kind-hearted people before starting for his old home, and when he arrived there he was cordially welcomed. The ship's carpenter built a house for the missionary and Jemmy; a garden was made and seeds were sown; the natives who flocked around the ship were well treated; and everything seemed to promise favorably.

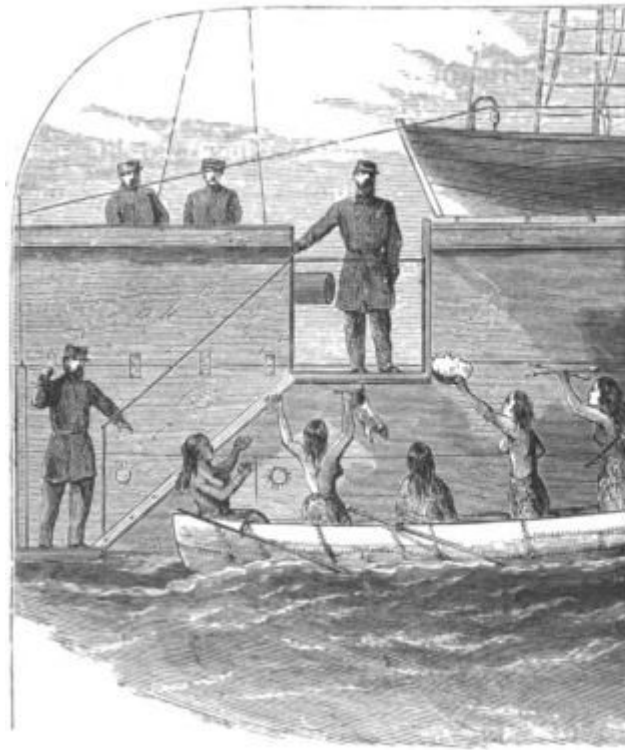
Hardly was the ship out of sight before the natives robbed Jemmy of all his treasures, and reduced him to his original condition of a savage. All his fine clothes were destroyed, and he was compelled to dress—or, rather, to undress—like his own people; it is probable that the missionary would have been killed had not the ship looked in again after a week's

absence, to see how things were getting along.



JEMMY BUTTON'S SOU

The next visitors to Tierra del Fuego found that the effect of civilization on Jemmy had not improved his morals. Captain Snow, who commanded a ship which touched at several places on the island, says Jemmy's tribe was the worst he saw, and had to be constantly watched to prevent thefts. They stole everything they could lay their hands on, and a few years later they massacred the crew of a ship that was sent there by the London Missionary Society, the very ship that Captain Snow formerly commanded.



FUEGIANS VISITING A WAR

Most of the missionary work in Tierra del Fuego was through the efforts of Captain Allen Gardiner, formerly of the British navy. Captain Snow says "Gardiner was a brave and upright man, zealously religious, but wanting in wisdom and prudence. He deemed himself called upon to go about the world and bring a few of the heathen from darkness to light. Four times did he belt the earth, visiting the Zulus in South Africa, the islanders of the Pacific, the inhabitants of interior South America, and numerous other places. Twice he was in Patagonia and twice in Tierra del Fuego; the last time he went there was in a passing ship, taking two boats, a surgeon, a lay

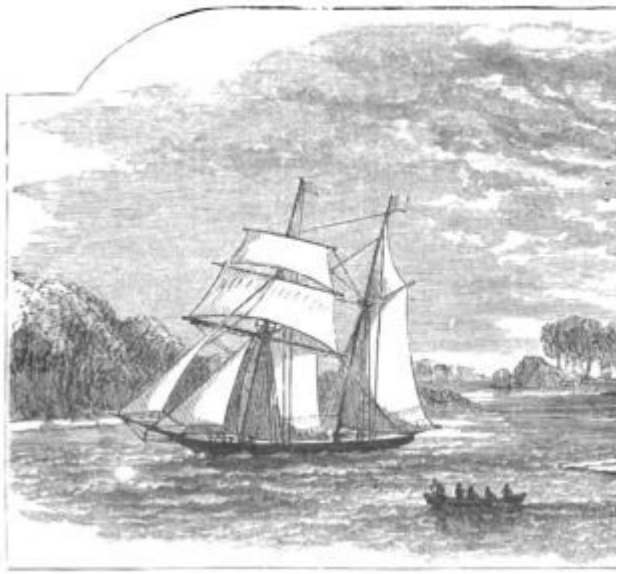
teacher, a carpenter, and four fishermen from Cornwall, with six months' provisions."

Captain Gardiner's first effort in Tierra del Fuego was at Banner Cove, Picton Island, where he tried to establish a station. The natives plundered him of everything, and he left in order to save his life; he returned to England, where he lectured, and obtained sufficient money to make another trial of the inhospitable land, under the circumstances narrated in the preceding paragraph.

Here is what he writes concerning his arrival at Banner Cove:

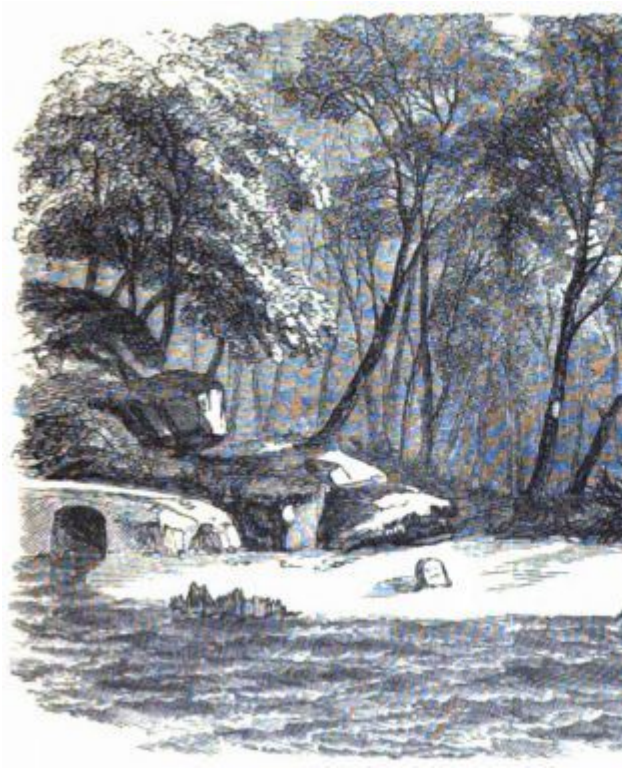
"On Friday, the 6th of December, 1850, we erected our tents, and on the 7th we constructed a strong fence of trees around our position, leaving only one small opening. This night and the next day the number of natives increased. Their rudeness and pertinacious endeavor to force a way into our tents, and to purloin our things, became so systematic and resolute that it was not possible to retain our position without resorting to force, from which, of course, we refrained."

The natives became so hostile that Captain Gardiner and his party abandoned the place, and attempted to go along the coast to a more favorable spot. Three of their boats were lost in this journey, together with a considerable part of their stores, and they were in great distress. One by one the members of the party died of hunger and exposure, some of them at Banner Cove, and others at a point which has since been known as Starvation Beach.



THE "ALLEN GARDINER" IN BA

A few years later a ship was built in England for missionary work in Tierra del Fuego, and named the *Allen Gardiner*, in honor of the lamented missionary. This was the ship which the natives plundered, after murdering her crew; she was recovered by Captain Smiley and taken to the Falkland Islands for repairs, and afterwards made several voyages to the "Land of Fire," but without advancing the condition of the natives to any noticeable extent.

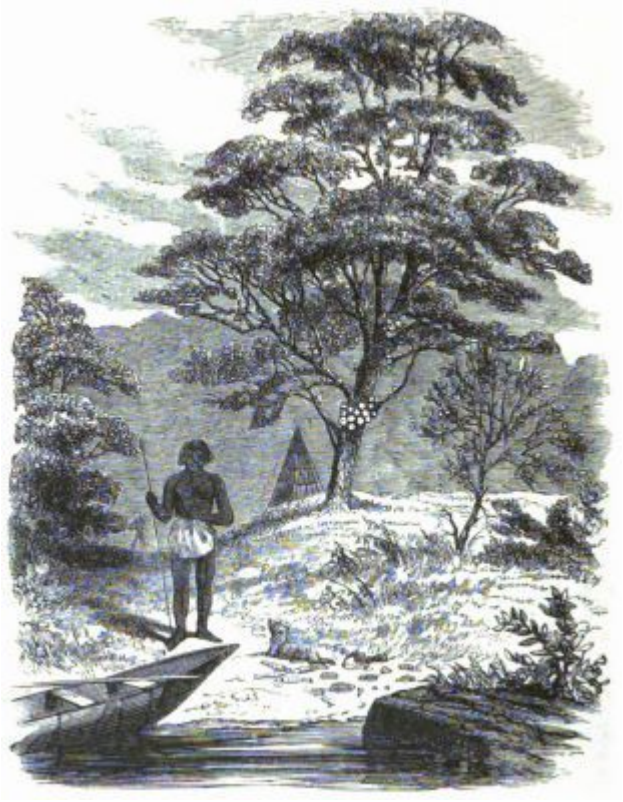


STARVATION BEAC

The Fuegian is about as inhospitable as his country and climate can well make him. The region is subject to heavy rains and severe cold; the snow-line on the mountains is only four thousand feet above the sea, and Mr. Darwin says it is difficult to find an acre of level ground in the whole country. The lowland is covered with peat swamps and forests of beeches, and some of the scenery is quite pretty, but the general aspect is forbidding and desolate. There are glaciers along the sides of the mountains, and there are fresh-water lakes in the interior, frequented by great flocks of ducks and other aquatic birds. Along the coast are islands which are the resort of fur seals,

and occasionally a rich haul is made by enterprising sealers.

The natives live in conical huts or wigwams built from the branches of trees over holes dug in the ground. In addition to shell-fish and other sea products, they live on a fungus that grows on the beech-trees. A picture of a Fuegian and his food is given on the next page. The reader will observe the fungus growing in a cluster a few feet above the base of the tree and just where the limbs diverge. It is an article of food not adapted to the European palate, but the natives seem to be fond of it—perhaps because they are obliged to be.



A FUEGIAN AND HIS FOOD.

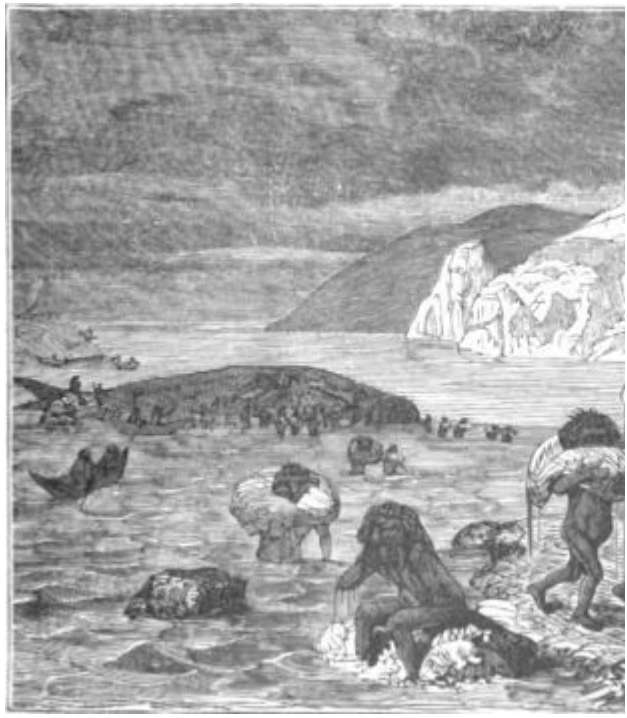
"Why was the country named Tierra del Fuego?" Fred inquired, as he watched the coast of that forbidding region while the ship was steaming away from Sandy Point.

"It was so named by Magellan," replied the Doctor, "in consequence of the numerous fires he saw along the coast."

"But we have seen no fires there," said the youth; "and I wonder if there were more inhabitants then than now."

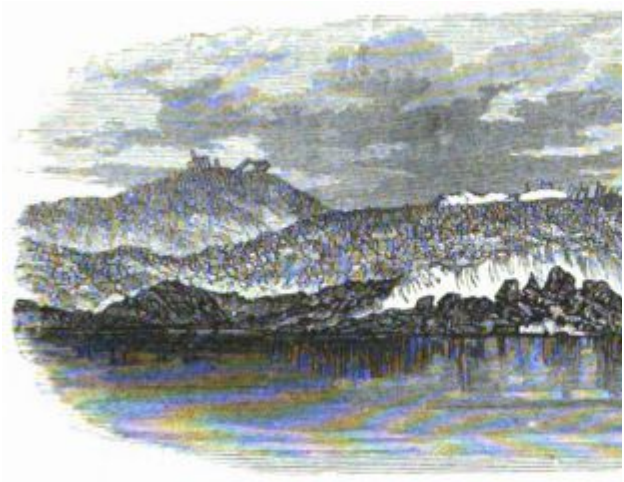
"I cannot say as to that," Dr. Bronson answered. "No census has ever been taken in Tierra del Fuego, and from present appearances none is likely to be. Nobody wants the country, as it is absolutely worthless for all practical purposes. It would be a dear purchase at ten cents a square mile.

"Captain Snow and others who have visited the country estimate the inhabitants at not more than two thousand. They are the lowest in the scale of barbarism of all the people of the world; they live in small tribes, and among them might makes right. If one native gets more property than another he is quickly relieved of his superfluous possessions and reduced to the common level. You have a good illustration of this state of things in the case of Jemmy Button. His friends in England had loaded him with presents previous to his return, but he was not allowed to keep them twenty-four hours after the ship which brought him had departed. The same treatment is visited upon the missionaries, and upon every one else who falls into their power. They have no Vanderbilts among them, and possess no ideas concerning the foundations of fortunes and families.



A FUEGIAN FEAST

"Mr. Darwin says their greatest idea of happiness is to have the carcass of a whale drift upon the coast where they can secure it. They remove the blubber in large pieces; then they cut holes in the centre of these pieces and thrust their heads through them, as a guacho puts on his poncho, in order to carry the stuff away; men, women, and children join in the labor of securing this supply of food, and they have an abundance to eat as long as it lasts. Unlike the natives of the Aleutian Islands, they have no means of catching whales, as their inventive genius has not been equal to devising anything useful."



RUINS AT PORT FAM

Three hours after leaving Sandy Point the steamer passed Port Famine, which owes its name to a melancholy incident in its history. In 1584 a Spanish colony was founded there by Sarmiento; out of three hundred men who formed the colony all but two died of starvation within four years. In the early part of this century the Chilian government made a convict settlement there; the convicts revolted, killed their guards, and then seized a trading schooner and sailed away, after killing its crew. They were afterwards captured and properly punished by the government authorities.

One of the officers of the steamer called Fred's attention to a "side-wheel" duck, whose performance in the water resembled that of the steamer from which it takes its name. This bird is said to be found only in Patagonia; it does not use its wings for flying nor its feet for paddling, but when pursued it rushes through the water with great speed by means of its wings. The officer said he had never seen one of these ducks attempt to fly; an examination of its

wings showed a cartilaginous projection at the elbow, but when in motion its movements were so rapid that the mode of propulsion could not be distinctly defined. The feet could be seen trailing behind; and there was a sort of mist at the side of the bird, while the wake in his rear was exactly like that left by a paddle steamer.

Mountain peaks were visible on both sides of the strait. In many places the cliffs were almost perpendicular, and hundreds of feet in height. There were many little harbors opening out from the strait, but Fred was informed, by the officer who had called his attention to the ducks, that many of the harbors were useless, as the water was too deep to permit ships to anchor. But where anchorage is possible the shelter is perfect, the surrounding mountains completely shutting out the winds. The geologists say these harbors are probably the craters of volcanoes that were extinguished ages and ages ago.



BORGIA BAY.

They passed near Port Gallant, Borgia Bay, and other harbors which are marked on the chart, but without making a pause at any of them. Before the days of regular steam navigation it was the custom for those passing through the strait to leave the names of their ships, with short records of their cruises, at the different anchorages. A favorite place for thus informing those who followed them was at Borgia Bay, where sometimes dozens of boards could be seen fastened to the trees. The historian of the cruise of the *Wateree* says that one captain recorded his vessel as a "whaling skuner."



INSCRIPTIONS AT BORGIA BAY.

The *Wateree* explored many of the channels between the mainland and the islands along the west coast of Patagonia, and continued that work up to the Bay of Castro, where she was the first steam-vessel of war ever seen. One of the bays along this route bears her name, and is distinguished by a curious mark on a cliff in the form of the letter "H."



"H" CLIFF, WATEREE BAY.

During her explorations the *Wateree* ran short of coal and was obliged to take wood from the forests along the shore. This was tedious and discouraging work, especially as the wood was either green or water-

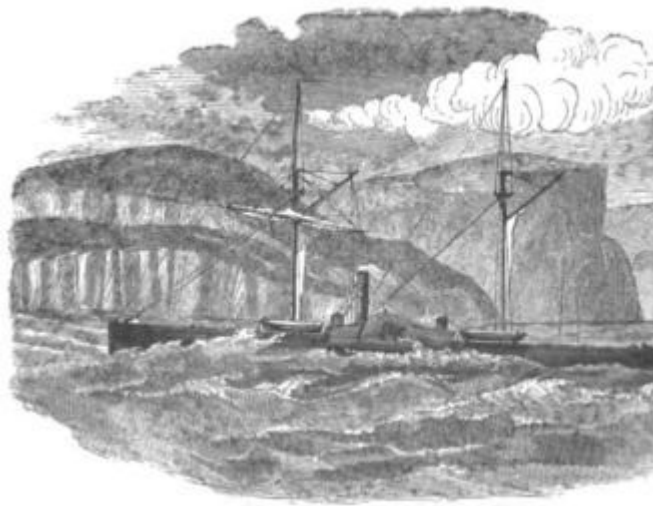
soaked, and required a great deal of coaxing to make it burn. Imagine the surprise and delight of the officers when they were visited at a little Chilian village by an enterprising Yankee, who said he had a hundred cords of perfectly seasoned wood a few miles away, which he would sell at a low price. They went there at once and bought his wood, which helped them to the next port, where coal could be obtained.



THE YANKEE WOOD-DEALER.

There is an abundance of bituminous coal along the western coast of Chili, and as far down as the strait. There are veins of coal at Port Famine, and others

near Sandy Point, but the quality is poor. The best of the Chilian coal-mines are at Lota, where many thousands of tons are mined every month. The Chilian coal is sold in all the ports of the west coast of South America as far north as Panama; the veins are large, the mines are easily operated, and the supply may be considered inexhaustible.



NEAR THE COAST OF PATAGONIA.

Passing from the Strait of Magellan to the Pacific Ocean, the steamer headed northward towards her destination at Valparaiso. Fred had occasional glimpses of the coasts of Patagonia and Chili, but for the greater part of the way they were generally out of sight of land. In some seasons of the year the steamers follow the sheltered route among the islands—it affords inland navigation for nearly three hundred miles—but when fogs prevail the captains consider it safer to take the open ocean.

The lofty peaks of the Andes were almost continuously visible on the eastern horizon, after the

steamer passed the latitude of the volcano of Corcovado. Towards the strait the mountains are less elevated than farther to the north, few of the peaks of the last hundred miles of the chain reaching above ten thousand feet in height. Aconcagua, the highest mountain of the Andean range, was in full view on the last day of the voyage, and formed a magnificent landmark, which directed the mariners to their destination in the harbor of Valparaiso.

As the steamer came to anchor, Fred peered anxiously over the rail at the many boats that were dancing on the waves. From one to another he turned his gaze, and was about giving up the search for a familiar face when he saw a handkerchief waving in the stern of one of the approaching craft.

Another glance, and then another, and the youthful face was radiant with smiles. Out came Fred's handkerchief to wave a response to Frank, who had come to meet him. As soon as the latter was permitted to board the steamer he sprang up the gangway, and the three friends were once more together.

The End.

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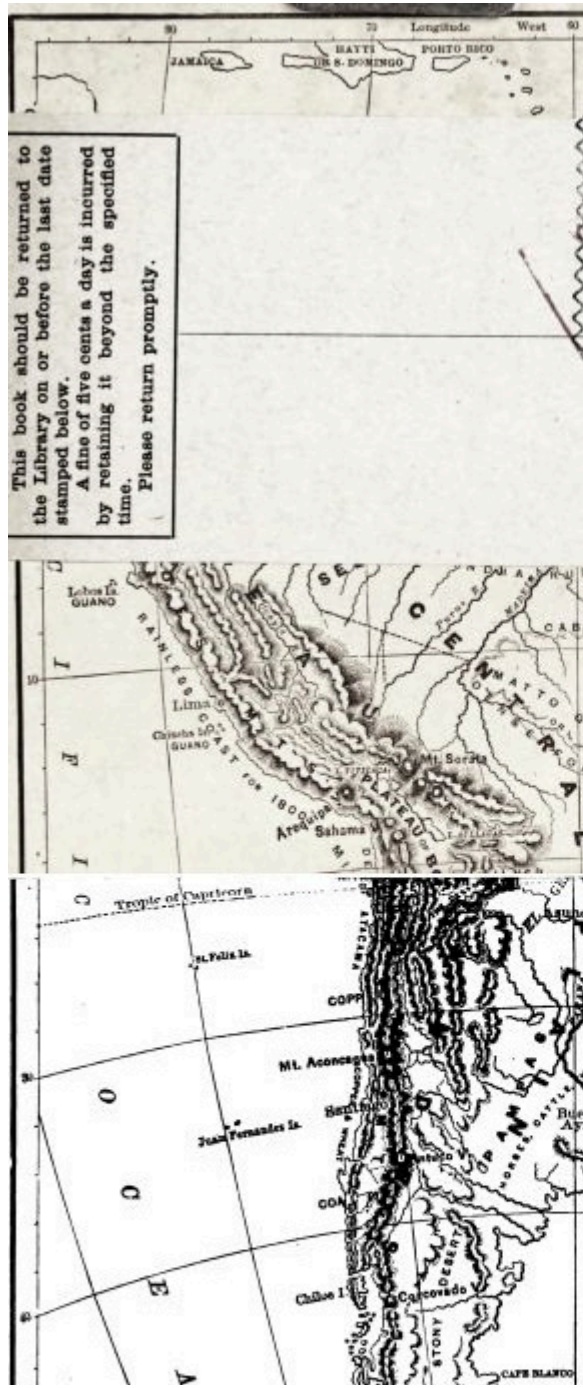
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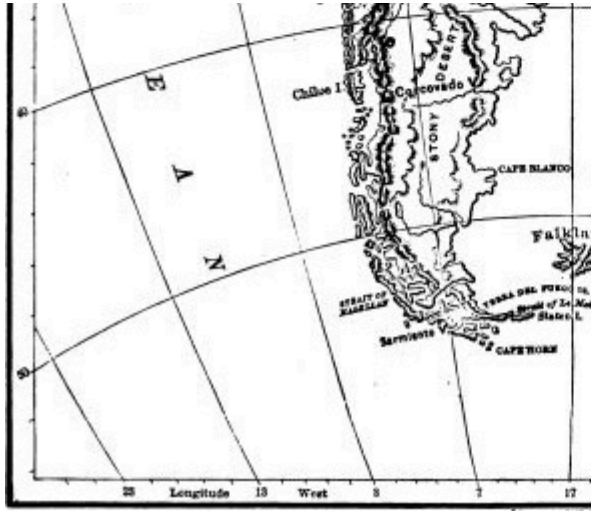
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[2] "British Guiana," by Rev. H. V. P. Bronkhurst.

[3] As this book goes to press the author is informed that work on both sides of the Andes is being vigorously prosecuted by the Chilian and Argentine governments. The engineers promise to have the line in operation in 1886, unless hindered by difficulties now unforeseen. The entire length from Buenos Ayres to Valparaiso by the route surveyed will be 1023 miles, and the estimated cost is thirty million dollars.

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