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ARGENTINE

PAST, PRESENT AND FUTURE.

A LECTURE

BY

ELMER L. CORTHELL, DR. SC.

CONSULTING ENGINEER NATIONAL PUBLIC WORKS OF ARGENTINE.

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TWO YEARS IN ARGENTINE AS THE CONSULTING
ENGINEER OF NATIONAL PUBLIC WORKS.

Mr. Chairman, Ladies and Gentlemen:

In 1899, the Argentine Government, having conceived an extensive project of River and Harbor improvement, and made the preliminary surveys, requested the U. S. Government to recommend an engineer who would come to Argentine and assist the Government by his advice in forming and executing the plans.

I had the honor of being selected for this position. After carrying out a two years' contract with that Government, I have returned to my own country with some knowledge of the conditions and some experience in meeting them which form the basis of this lecture.

At the final general session of the International Navigation Congress at Düsseldorf, July 4th, this last year, when called upon to respond for the Argentine Republic, I used the following words:

"It may not be out of place to make a few comparisons between the two countries, which by a singular coincidence I have the honor to represent --one as a delegate to this Congress; the other as a member of the Permanent International Commission. One of these countries is the Argentine Republic and the other the United States of North America.

"Both are cosmopolitan, both have been populated largely from Europe; both had the task of supplanting savagery by civilization. The red races in each case had to give way to the Caucasian, or be assimilated with it. Both have great plains and immense river systems. The greatest river valley of the one is almost exactly equal to that of the other. Similar causes have produced nearly similar hydraulic conditions in each case. Both countries have temperate climates, both great mountain

ranges ; both some extent of arid lands and running waters for irrigation. Both immense areas of rich soils, made so by similar beneficent causes ; both have extensive pasture lands and millions of cattle, sheep and horses. In their cereals they are competitors with each other in the food markets of Europe—one is great and ambitious, the other smaller but earnestly devoted to progress and ambitious to fulfill its high destiny among the nations of the earth.”

By comparisons of the unknown with the known we appreciate and learn, and for that reason I shall compare Argentine with the United States in respect to some of its more important features, and you will see that the two great countries have much in common.

You must, if possible, imagine yourselves in a situation exactly opposite from yours in the United States in regard to the sun and the poles of the earth ; you must look north for warm winds and south for cold ones. Your winter will begin in June and your summer in December. The north side of your house will be sunny and the south side in the shade. As you travel north from Buenos Aires, the Capital, it will grow warmer ; as you go south you will at last reach the glaciers. Your north star will be changed to the southern cross, and in all these changes you will at first be lost. You must also locate yourself geographically, and recollect that the northern line of Argentine is in about the same latitude south of the Equator as Havana is north of it, and that the southern limit of Argentine corresponds to Labrador and Kamscatka ; and that Buenos Aires, Capetown and Melbourne are all in about the same latitude. Also that there are east and west differences. Buenos Aires is in about the same longitude as Cape Breton Island, east of Nova Scotia, and the circle of longitude along the most westerly boundary of Argentine nearly passes through Augusta, Maine ; and the course from the entrance of the River Plate to Liverpool is nearly a straight line. In order that the location of Argentine in reference to other South American countries may be appreciated, it should be stated that Buenos Aires is as far south of, say, Caracas, the present center of revolutionary and unstable South America, as the north end of Lake Winnipeg, in Manitoba, is north of Caracas, or as far as the northern part of Greenland is north of New Orleans.

With this orientation of ourselves on the Western Hemisphere, and with these remarkable differences in position, let me call your attention to a very remarkable similarity wherein will be seen and appreciated the beneficent work of the Great Creator long before at least the present race of mankind inhabited the two continents.

In a paper read before the American Association for the Advancement of Science, at Buffalo, Aug. 5, 1896, upon the delta of the Mississippi, I described the ancient conditions of that great river in substance as follows :

First, a deep shore line of the Gulf of Mexico, when the site of Galveston was far out in the waters and the coast was 100 miles inland from the site of New Orleans,—a wide and deep estuary 1,000 miles long, reaching into the heart of the continent to between St. Louis and Cairo, where, at Cape Girardeau, it met the ridge of the Ozark Mountains, stretching across the valley and holding back the ancient Great Lake, which covered Chicago 200 feet deep and spread over all the great Prairie States and received and distributed over its bed the immense sediments of the Missouri and other great rivers in the North. Then came the cyclic change lifting Florida out of the water and turning continental drainage north, cutting its way through the alluvion to Hudson's Bay. Then the breaking down of the Ozark barrier ; the draining of the submerged area ; the subsequent filling of the Estuary and the advance of the alluvial lands into the Gulf to their present line, 110 miles beyond New Orleans. A great and wonderful beneficence for the use and convenience of man by the Great Architect of the universe.

Had not my engineering experience upon the Mississippi River and its delta drawn my attention to this extremely interesting ancient history of the Great River of North America, I might not have been so deeply impressed by its remarkable similarity with that of the Paraná River in South America ; and for both histories I am indebted to Engineering investigators : Gen. Warren in the first instance, and Col. Geo. Earl Church, an American Engineer living in London, in the second instance, the latter probably better acquainted by personal contact with the geography and hydraulics of South America than any living man.

I am indebted to him and the Royal Geographic Society, of which he is a Director and a Correspond-

ent, for most of what follows in relation to this *ancient* history of the great rivers of Argentine and Central South America.

There are four great breaks in the mountain-fringed continent which we call its great commercial doorways. The Orinoco, the Amazon, the La Plata and the deep indentation of Bahia Blanca,—one in Venezuela, one in Brazil and two in Argentine. The three river basins occupy two-thirds of the entire area of South America.

The two with which we are most interested in this lecture are the La Plata and Amazon, which have areas respectively of about 1,200,000 square miles and 2,722,000. But if we deduct from the latter the valley of the Tocantins, which has no direct connection with it, the valley of the Amazon is 2,368,000 square miles; its principal branch, the Madeira, has a volume of discharge nearly equal to the Amazon itself, and at the falls, which I shall refer to later, it carries annually a volume equal to that of the La Plata, which has a minimum flow of about 534,000 cubic feet per second and a maximum of over 2,000,000—a river 80 per cent. larger than the Mississippi, the Father of Waters, if we compare their mean annual discharges, the former being about 288 cubic miles and the latter 156 cubic miles. The Paraná (“the mother of the sea” in Indian language), the principal affluent of the La Plata, is itself 46% larger than the Mississippi, its mean annual discharge being about 230 cubic miles.

What a river the La Plata must have been in ancient times, when it had a maximum discharge of 4,000,000 cubic feet per second, well up towards the modern Amazon, estimated to be 5,297,000, and greater than the ancient Amazon!

I have described the ancient conditions of the Mississippi—the Gulf of Mexico as a great estuary and a deep shore line extending well into the heart of the North American Continent. The same conditions existed in the contour line of South America in the La Plata estuary. It extended 1,400 miles into the Continent, and was 400 miles wide—eleven times greater than the Empire State. It was the great Pampean Sea, receiving the drainage not only of the present Paraná and its tributaries, but of the great Madeira River with its immense discharge of waters and sedimentary matters—the source of great alluvial formations, discharging into a sea two-thirds the size of the Mediterranean.

When, in the processes of Nature, the great underwater plains of rich soil had been formed during the comparatively short period of less than 100,000 years, a dam was thrown across the Madeira by the rivers Grande and the Parapití coming down from



Ancient Pampean Sea and Lake Mojos.

the Andes, and a deposit more than 170 feet deep occurred forming this dam, which produced the ancient Lake Mojos with an area of about 115,000 square miles, larger than that of the Great Lakes of North America combined, which is less than 94,000.

The remarkable action of these rivers and the changes caused by it is graphically told by Col. Church in his paper upon "Argentine Geography and the Ancient Pampean Sea."

"The Grande and the Parapití entered the plain with a northern trend to contest with the great river of the north the possession of the gap. They struck it almost at a right angle, and slowly pushed their rival eastward over against the Chaco base of the Chiquitos sierras. Here the final conflict must have taken place, as the Grande and

Parapití threw their dam across the outlet of the Mojos River, thus cutting off its exit into the ancient sea. No doubt the giant stream waged fierce war for thousands of years to keep its channel open, alternately sweeping away the barrier and again yielding to the ceaseless volume of sand and clay, which, visible to-day, confirms the victory of the Grande and Parapití. The dam having finally become permanent, the formation of the ancient Lake Mojos was assured. When it reached the level of the lip of Guajará-mirim, its waters commenced to tumble over it and carve their way to the Amazon. Since then huge volumes of alluvium have poured down the northern slopes of the Bolivian Andes; the ancient lake is now almost loaded with material, but it is not yet entirely obliterated. The muddy silt which covers the surface of the basin is so fine that, when an Indian goes up stream to the mountains, his friends ask him to bring back a stone that they may see what it is like.

“Since forming the dam, the Rio Grande has slowly been returning westward down the counterslope which its own alluvium creates.”

During the process we have described, the Ancient Lake and the Pampean Sea were connected and their relation was similar to that of the Black Sea and the Mediterranean. Traces of it are still observable, notably the great, low, flooded morass of Xarayás on the upper Paraguay River, and the ancient delta of the Paraná, including the Ybará lagoon. The Salina Grande was also an arm of it—a great inland fiord. The sea, moreover, must have covered large areas of Paraguay, Corrientes, Entre Ríos and Uruguay, and, before the uplifting of the country, it extended southwest to the rivers Chadi-Leofu and the Colorado, lapping round the southern slope of the Ventana range, until the curved rim, concave to the northeast, which connects this with the Sierra de Cordova, was sufficiently elevated to completely cut off its southwestern extension.

This range was high enough to lodge the glacial rocks coming from the Andes, one of which at Tandil is so poised and delicately balanced that the hand can rock it, but it cannot be dislodged. This range later prevented the entrance of the destructive sea, protecting the great area from its waves.

Then came another factor into the beneficent problem of the Creator. Instead of draining the

waters from the great deposits under the Pampean Sea, as He did in North America, He lifted the Andes higher, and with them their Atlantic slopes, until the latter were ultimately lifted to their present level, forming the "Plains of the Pampas," the soil of which is 50 feet deep and of surpassing richness—an area of 600,000 square miles, one-fifth the size of the United States and five times that of Great Britain. Thus by cyclic changes in the Northern Hemisphere, and by fluvial and sedimentary action and seismic changes in the Southern Hemisphere, have been formed the great interior agricultural regions of the United States and Argentina.

Let me now quote from Mr. Revy's work on "Hydraulics of Great Rivers" (Argentine rivers which he surveyed) where he compares the rivers as we now find them with others well known.

"Great as the volume of the Paraná River at its lowest summer level is, immense in comparison to the largest European river, and much larger than that of all the European rivers put together, it is but a small fraction of its flood volume during exceptional rises; and we can only wonder at the magnitude of the sources, which for months, nay for whole years together, pour forth inconceivable masses of sweet water, every drop of which has been raised by the power of the sun from the Pacific and Atlantic Oceans above the tops of the highest mountains of Brazil and the Andes.

"To convey an idea of the magnitude of the rivers which have been considered and analyzed in the preceding chapters, we have shown on Plate V several of the larger known rivers, such as the Danube and Thames of Europe, and the Mississippi of North America. They are all drawn to the same scale, and their relative size may somewhat be appreciated. The Mississippi is not unlike the Uruguay in dimensions and other features—we have similarity in width, depth, currents and fall, although the North American is the larger of the two. Comparing, however, the Paraná with the Mississippi, the former might claim the latter as his eccentric daughter under fourteen. The low water dimensions measure a river's greatness, although things of different natures and character do not bear strict comparison. What we, however, understand by greatness is possessed in an exceptional degree by the Paraná."

In order, further, to compare the Paraná River with others, it may be stated that its annual flow is double that of the Ganges, three times that of the Saint Lawrence, four times that of the Danube, and five times that of the Nile. We have records of *608 cubic miles* in one year.

There are differing conditions of importance between the Paraná and the Mississippi, explaining the causes of the greater discharge of the Paraná. While they both flow South, one flows from colder to warmer and the other from warmer to colder regions; and it is in the warmer regions in both cases that the rainfall is the greater. On the Mississippi, in the Northern regions, where we find the greatest drainage area, the rainfall is about 35 inches per annum; in the Southern, where the area is less, the rainfall is 60 inches per annum. With the Paraná there is a rainfall of about 60 inches in the Northern part, where the drainage area is greater, and about 40 inches in the Southern part, where it is less.

The length of the Paraná River is about 3000 miles; its navigable length, between Cuyabá in the North and the mouth of the Paraná in the delta of the La Plata, is 1825 miles. The Uruguay River, from San Javier to the delta of the La Plata, has a navigable length of 603 miles. The Paraná



Falls of Y-guazú.

River is made up of the two important rivers which unite at the City of Corrientes; the Paraguay and

the Alto Paraná. The length of the latter above Corrientes, to the falls of the Yguazú, is 365 miles, and it is navigable nearly to that point. These wondrous falls excel in beauty, as well as exceed in dimensions, the Niagara Falls.

The latter are 160 feet high, as a maximum, and four-fifths of a mile long, including Goat Island. The Y-guazú are 213 feet high in one leap and 106 feet in two leaps, and $2 \frac{1}{3}$ miles long, with, at times, an immense volume of water.

The view before you is from a painting by a well-known Bern painter, Mr. Methfessel, who was engaged to come to Argentine, visit the Falls and make a large painting for the La Plata Museum.

The gorgeous and varicolored foliage of the luxuriant subtropical vegetation, which abounds on all sides, adds a charm to the falls. They rank among the most beautiful and wonderful works of the Creator.

The remolinos, or whirlpools, below the falls equal the famous whirlpool at Niagara.

The Uruguay is an entirely different river, in every respect, from the Paraná. It is at times a mighty river rivaling the Paraná; at others it sinks into comparative insignificance. The Paraná is a great river at all times.

The Paraná is a type of a truly great river; the Uruguay represents a mighty torrent of extraordinary dimensions.

The Uruguay rises near the Atlantic Seaboard in Brazil, in the Sierra del Mar, then runs west to the highland of the territory of Misiones. These highlands prevent it from uniting with the Alto Paraná River at that point, which is only about 68 miles distant. Along 600 miles of its course from San Javier to Concordia, the bed of the river is filled with rocky ridges, which, at low water, prevent continuous navigation, but during the floods, which are quite sudden but not long continued, the river is everywhere navigable. The river rises, in floods, at Concordia about 46 feet. Compared with the Paraná, it is a clear stream, carrying very little sediment in suspension. The Paraná is an entirely different river. Its source being in the tropical and rainy region of Brazil, on the flanks of the Andes, its floods are much longer continued. At the confluence of the Paraná and the Alto Paraná at Corrientes, the rise of the floods is about 33 feet; at Rosario, 225 miles above Buenos Aires, it is from 19.7 to 23 feet or $23 \frac{1}{2}$ feet in extreme

floods. When these occur, the river is about 23 miles wide, covering the entire country with a depth of 6 to 10 feet, and extending to the highlands of the Province of Entre Rios.

The physical characteristics of the bed of the river are, consequently, entirely different from those of the Uruguay; the bed of the latter is stable, that of the former very unstable. The sedimentary matters carried in suspension, however, are very much less than those of the Mississippi; probably only one-tenth of the amount carried in the Mississippi in times of flood. For this reason the changes in the bed and banks are less radical; the most noticeable change is the movement of the islands



River Paraná from Grain Elevator.

and bars down stream. For example, the Island of Espinillo, in front of the City of Rosario, lying in the middle of the river and about 2 1/2 miles long, has moved, flanking, down stream about 2 1/2 miles in the last 50 years, and by this movement the advancing bar of the island has approached the river bank in front of Rosario and closed up the navigation channel.

The maximum velocity in great floods often reaches 6 1/2 feet per second, although usually it is much less, equal to that of the lower Mississippi.

Both rivers are susceptible of improvement by dredging, the one to Asunción, which is 842 miles above the mouth, and the second to Concordia, which is 230 miles above its mouth. In the Paraná there is nothing but sand to be removed throughout its entire length; in the Uruguay there are

several places where it is necessary to remove rock and gravel. But, generally, the channel can be deepened by hydraulic, or suction, dredging.

The National Government is under obligation, by the law passed by Congress for building the Port of Rosario, to make and maintain a depth of 21 feet at low water in the Paraná River from the head of the Delta to Rosario, and in the Delta of the La Plata to Buenos Aires a depth of 19 feet at low water, which is about 21 feet at mean high tide. It has been proposed to make and maintain a channel of the following dimensions: From the mouth of the two rivers, at the Island of Martin Garcia, at the head of the La Plata estuary, to Rosario, a depth of 21 feet and a width of 328 feet. Rosario to Santa Fé, 292 miles above Martin Garcia, 19 feet deep and 328 feet wide; Santa Fé to Corrientes, 10 feet deep, and the same depth to Asuncion. Santa Fé, or its seaport Colastiné, is the head of ocean navigation; above that point it is river navigation by steam boats.

On the Uruguay River it is proposed to make a channel 19 feet deep and 328 feet wide, from Martin Garcia to Concepcion del Uruguay, 137 miles above Martin Garcia, and thence 15 feet deep to Colon, and 9 feet deep and 8 feet over the rock to Concordia, which is 230 miles above Martin Garcia.

The low water plane, or zero, in both rivers is that of extraordinary low water, so that, generally, the low water does not reach this plane within about half a metre to one metre. Consequently, there can generally be depended upon from 2 to 3 feet more water than I have stated. Between Rosario and Buenos Aires, there are now no bars over which there is not 21 feet of water at Zero, although two of them need to be dredged and buoyed in order to make a straighter channel. This the Government is prepared to do.

As to the Port of Rosario: a contract has recently been made, under the Law of Congress, to make a modern seaport at this point, with all the latest and best facilities for handling cargo. The commerce of Rosario is at present 1 1/2 million tons per annum. It is a very important exporting point for cereals, and when the port is completed according to the plans adopted, it is expected to be an important importing port as well. There are ports below Rosario, such as Villa Constitución, San Nicolas and San Pedro, and above Rosario,

Diamante, Santa Fé, Colastiné and Paraná. On the Uruguay River, Concordia, at the head of steamboat navigation, is an important importing and exporting port for that section of the country. Its registered tonnage is about half a million tons, and the actual weight tonnage about 100,000.

The country between the Paraná and Uruguay rivers is practically isolated from the rest of the country, and its situation is very similar to the country lying between the Euphrates and the Tigris; for that reason it has been called the "*Mesopotamia Argentina.*"

There are at present in this area three railroad systems, the Argentine North Eastern, which runs from Corrientes, on the Paraná, to Monte Caseros, on the Uruguay, and from there to Santo Tomé, on the same river; the Argentine Eastern from Monte Caseros to Concordia, and the Entre Rios Railroads, the main line of which connects Paraná and Concepcion del Uruguay, with branches to Victoria, Gualaguay, Gualaguaychú and Villaguay. Within a few months a connecting line will be completed to Concordia, forming a link between the Argentine Eastern and the Entre Rios systems. It has been proposed to unite these three systems and to extend the Argentine North Eastern from Santo Tomé to Posadas on the Alto Paraná, passing through the colonies which the Government is establishing in that territory. Posadas is its capital. The Central Paraguay Railroad, which runs in a south-easterly direction from Asuncion, it is proposed to extend to Villa Encarnación, a small town on the opposite side of the River from Posadas; to change the gauge, which is 5 1/2 feet to the normal gauge of the other three railroads, which is 4 feet 8 1/2 inches; make a transfer by car float at Posadas; extend the Entre Rios Railroads to a port of deep water, either on the Paraná or Uruguay, and do a "through" business between Asuncion and this new seaport, which will be only a few hours distant from Buenos Aires.

With the Paraná River improved to Asuncion, and the Uruguay improved to Concordia; with the railway systems united and extended to a good seaport, this great interior district of the country will have an ideal system of transportation, and the shipper may take his choice, to ship by rail or by water, thus establishing a very useful and reasonable competition between water and railway, to the great advantage of the people.

In reference to the Rio de la Plata itself, it is an immense shoal estuary. It is the depositing ground of the great Paraná River. This estuary, in a not very remote period, extended above Santa Fé; this is shown by the comparison of old maps, of which 92 have been collected and copied and placed in the Library of the Ministry of Public Works. These maps date from the year 1529 to 1885. Even in this comparatively short period, remarkable changes are shown in the Delta of the Paraná, which is now a true delta, almost exactly in the form of the Greek letter Δ . It is 40 miles across its face; it



La Plata Superior and Delta of Paraná

slowly extends itself in the head of the estuary, and through the Delta nearly a dozen outlets of the Paraná River find their way. It is very much like the deltas of the Danube, Ganges and Mississippi.

The superficial extension of the Rio de la Plata exceeds 18,000 square miles; it is about 186 miles long and varies in width from 186 miles at the Ocean, between Capes San Antonio and Santa Maria, to 1.12 miles at the extreme point of the head of the estuary, at Punta Gorda.

To understand the physical conditions of the estuary, it is necessary to divide the Rio de la Plata into Superior and Inferior, or upper and lower. The Rio de la Plata Superior lies above a line extending between La Plata and Colonia, the Inferior below that line to the sea. Over a distance of about 25 to 30 miles between Martín García and the anchorage of Buenos Aires, there is a normal depth through the best channels of from 16 to 20 feet at low water.

The National Government has recently completed the dredging over the San Pedro bar lying in this region, increasing the depth of 18 1/2 feet to 21 feet, where there was formerly only 15 feet. In the Canal de las Limetas, or Nuevo Canal, by natural forces and by the constant movement of steamers, there has been obtained a depth of about 19 1/2 feet, or 21 1/2 feet at mean high tide. Opposite Farallon, a rocky point on the Uruguay shore and opposite Buenos Aires, there is, along the course of navigation, about 19 1/2 feet at low water. The Government has buoyed with luminous buoys the entire route from Buenos Aires to the mouths of the Paraná River, the Bravo and the Guazú, and has placed a floating semaphore below Martin Garcia for the benefit of navigation, recording constantly by signals by day and by night the depth of water in the channel. It is now proposing to connect this semaphore by a telephone cable with the telegraph cable of Martin Garcia, so that communication may be established between the ships lying at anchor (waiting for the tide, or passing near the semaphore), and the offices of the agents at Buenos Aires or Montevideo.

A careful study of the different conditions in the Delta of the La Plata shows that the only method of improvement in such a vast expanse of water is by dredging and buoying the best channels.

In the lower Rio de la Plata there are very serious conditions. A bar on which there is a least depth of 20 feet at low tide lies between the anchorage of Buenos Aires and Montevideo; the material in this bar is very soft and vessels plough their way through it on ordinary tides, but the great extent of the bar is the serious condition. Between the 24 feet curves, straight through this bar, there is a distance of 24 sea miles. To make a channel by dredging would require the removal of probably 10 1/2 to 13 million cubic yards; and it is very doubtful if, on such broad extension of water and in such soft material, a channel could be maintained. But it is hoped that the plan now proposed of anchoring five lightships in the line of navigation, and in the direction of the current, and which can be seen from each other, will have an effect upon the bar by the continued movement of deep steamers through it. The examination of the Rio de la Plata Inferior has been intrusted by the Government to the Ministry of Marine, which is

making very extensive surveys and examinations over the entire area.

The estuary at this point is 46 miles wide, and five high towers on shore and others anchored within the area to be surveyed are necessary in order to cover this great Punto Indio bank.

These are the general physical conditions of the Rio de la Plata and its great tributaries.

The very important project of making a deeper channel of access to the Port of Buenos Aires and enlarging the port, to give it not only a greater area and more facilities, but greater depth in the enlarged part, is now before the Government, and the plans for it—made by myself—have been approved. There are alternative projects to meet the commercial necessities of the country; one is to deepen the present Port of La Plata and endow it with more facilities, where vessels drawing 24 or 25 feet may come in and go out at any stage of the tide; or to build a deep water port, with a depth of not less than 30 feet, on the seaboard outside of the difficult conditions of the Rio de la Plata. A concession has been granted, and the project submitted to the National Government, for an artificial port in the great bay of Samboronbon, which is nearly opposite Montevideo, and another concession for a port at Mar Chiquita, near Mar del Plata on the ocean, has also been granted.

In addition to the great drainage basin of the La Plata, there is further south the large rivers, Rio Negro and Colorado, which, combined, have a drainage area of 464,000 square miles. The channels are not susceptible of improvement for a large commerce, but they will in the future furnish water for an extensive irrigation and steamboat navigation.

The hydraulic conditions are great, but the mountains are greater and have exerted a powerful influence on the continent, not only its climate and its running waters, but upon mankind. On these lofty table lands lived the Incas and flourished their great empires. Among the clouds have fought for supremacy the Incas troops and the Spanish soldiers, and here, too, have the struggles for liberty taken place; here Bolivar and San Martin led their

troops to victory and continental freedom from the domination of Spain.

An orographic map of South America will show what immense areas are given up to mountain ranges and lofty summits. In their widest part the Andes are 500 miles in breadth. Some mighty



Orographic Map of S. America.

force seems to have pushed them and the entire continental line eastward and massed the ranges into a complex system of mountains, towering isolated peaks, and parallel, transverse and interlaced ridges without number. In Bolivia, not far north of the country we are describing, there are thirty-two peaks above 17,000 feet high, some of them reaching over 21,000 feet; and in Argentine is the lofty Aconcagua lifting its solitary crown to an elevation of 23,080 feet, rivalling the loftiest mountains of the world. And Famatina, in the Argentine Province of Rioja, rises to 20,680 feet, and the grand mountain Tupungato 22,015 feet high.

Between Argentine and Chili, between latitude 23 and 35°, the mountain passes, which are from 10,000 to 14,000 feet high, are blocked with snow

from May to August, and they are swept by violent storms.

The height of the Passes, all the way from 7 to 37° south lat., Northern Peru to Southern Argentine, shows the determination of Nature to oppose transit by man, piling up in his pathway these almost insurmountable obstacles. When it is considered that this immense barrier covers a sixth part of the circumference of the globe, its influence upon the development of the Continent is apparent. The general condition as far as civilization is concerned and the obstacles in the way of mankind are forcibly and most interestingly described by Col. Church, comparing them with the conditions in North America.

“The contrast between North and South America is remarkable. Nature was in her kindest mood when she created the former—gave it vast and fertile plains; low and readily transitable mountain ranges; extensive systems of navigable lakes and rivers, the latter not too difficult to bridge; great forests of the most useful timber; immense mineral wealth, including an abundance of coal and iron; a coast line offering numerous excellent harbours easily accessible from the interior, and a temperate, inviting climate over almost its whole area. It is a land where man seems to live with Nature on friendly terms, and where the wave of humanity, as it rolls westward, encounters no obstacle which it cannot readily overcome.

“How opposite to all this is South America! It lies mostly within the tropics. Its fertile plains, except those of the Argentine Republic, are difficult of access; it is a formidable task to scale and cross its mountain ranges. Its rivers, with rare exceptions, are of violent flow and full of obstacles to navigation, and its largest ones not within the limit of practical engineering to bridge. Its vast forests are hard to work and frequently impenetrable. Its mineral wealth, immense in nobler metals, includes but little coal and iron. Its coast has but few good harbours, and these are almost all mountain-locked. Its climate, although in many parts delightful, is uninviting over extensive regions. The forces of Nature are so vigorous that man can seldom count upon the unqualified control of them, and, in general, they confer generous reward only upon well-applied and persistent energy.”

The above is an introduction to his very important paper read before the Royal Geographical

Society Feb. 25, 1901, entitled "South America, An Outline of its Physical Geography," a paper of 74 printed pages. His conclusions are as follows:

"My analysis shows that, in general, man finds himself confronted by severe conditions in his struggle with nature in South America. Thus far, however, his efforts to develop and utilize its vast resources have made its commercial history an epic. The thought naturally presents itself, that had North America fallen to the lot of the Latin race in the European occupation of the New World, and South America to the Anglo-Saxon, the former might still have maintained its supremacy; for its more rapid progress may not be due so much to racial superiority as to advantageous geographical surroundings."

Having outlined the physical conditions and shown their importance and influence, let us review very briefly the history of man among these extraordinary physical features of a great continent.

Mountains and streams and soils and nature in general are always of interest, but man, his history, his ethnology and biography are of still greater interest to us, especially when human life and character have impressed themselves upon the country in which we are immediately interested.

I am tempted strongly to take you on an excursion in the wide field of American ethnology and examine the races and tribes that were found by our first ancestors when they came and began the development of both North and South America, but time compels me to limit myself to an allusion only: for a volume would be required to take up the subject of the savage tribes alone of America, 450 principal groups, and 2,000 if we separate them by dialects. And another volume would be needed to treat of the civilized Aborigines of the table lands of Mexico and Peru; of the Toltecs and Aztecs and of Quetzalcoatl and the Incas;—the pontifices who ruled over a vast population covering 40 degrees of latitude of South America from Northern Argentine to the Antilles. The barbarism of the savage and the civilization of the races of the table lands have nearly disappeared. You would have no better knowledge of that vast horde of wandering tribes that infested the great plains of the Pampas if I should mention their names.

Some few still exist; the census gives less than 20,000 as the total of Indians still existing in Argentina. Once numerous and brave, only about a dozen remain of the Paraguas—the descendants of the Agnas—and of the Tobas and Chinipis, who later occupied their country, a remnant only exists.

It is unnecessary to go into the history and the influence of the Incas; they have been described in the histories to be found in every library of the land. But it may not be generally known that, from the first arrival of the Spanish adventurers to the successful end of the great struggle for liberty in South America, there was always dissatisfaction, unrest and hatred of the conquering race. The seeds were sown in bloodshed, in the persecution by the Inquisition and in false commercial and governing methods of Spain and Portugal, the mother countries. The difference between North and South America in this respect was very great.

The symptoms of resistance against Spanish domination showed themselves in the dawn of the history of South America. Frequently the Indian tribes attempted to throw off the yoke of some more than usually severe and cruel oppressor. In the early days of the 18th century the revolution of the Tupac-Amaré was really a war of races rather than a political revolution, as it had for its principal purpose the extermination of the Spanish. In Venezuela in 1711 this same hatred showed itself in the proclamation of a Mulatto as King of the Mestizos. Half a century later the seed sown by Antequera bore fruit in New Granada, when an army of 20,000 was raised and commanded by Berber.

It is a significant and curious fact in the history of South America that, during the entire 18th century, the same causes were producing the same effects among people far separated from each other and of a character entirely distinct, scattered from the banks of the Paraguay River to the Colombian Mountains.

Those effects may have been the precursors of that great revolutionary movement that created our great Republic and drove the Bourbons from the throne of France and, later, shook to the centre the monarchical fabric of Spain herself.

We may, therefore, say that the struggle and the preparation of the ground for civil and religious liberty began earlier in South America than in

North America. In the British Colonies there was no strong sentiment against foreign rule until the imposition of the taxes required to furnish George the Third with revenue to pay off his debt of 148 million pounds sterling. Even Washington, in July, 1775, when he took command of the Continental army, declared that the idea of independence was repugnant to him. Only later, and soon, when the war was suddenly upon the Colonies, did events hasten and make inevitable the separation from the Mother Country.

It would be a subject of great interest to enter upon,— the three great leaders and heroes of American revolutions—

WASHINGTON—BOLIVAR—SAN MARTIN,

a triumvirate of liberators.

Of the two former you already know much, possibly of the latter, but you may not know that it was by his patriotism and generalship that the whole of southern South America was freed from the yoke of Spain—Argentine, Chili, Peru and Bolivia. His biography is a romance of most absorbing interest.



Statue of San Martin.

Born 1778, in Argentine, in Japeyú, his early education in Buenos Aires, completed in Spain;

served with distinction and great bravery in the wars of Spain. Early he was imbued with the doctrine of liberty for his native country ; spent a year in Great Britain in 1811, forming associations and a secret league devoted to the liberation of Argentine. Landed in Buenos Aires in 1812 ; soon in command of a regiment of Grenadiers ; selected soldier by soldier, officer by officer, imposed the most rigid discipline, forming so a rudimentary school for a generation of heroes that followed him, and producing nineteen generals and nearly all the great men of the struggle for independence. Placed in command of the army to reorganize it he marched to Mendoza, the nearest point to the Andes ; and, imbued with the idea that no liberty would be secure for his country until the Spanish armies were beaten and expelled from Chili, Peru and Bolivia and the whole of South America, he formed his plans for an invasion of Chili. He was the very incarnation of determined patriotism ; nothing, not even revolutions and discord behind him in his own country, could deter him from his great work. At this moment Napoleon fell, and Spain prepared an expedition of 15,000 men destined for the Rio de la Plata. In Chili and Peru the Royalists were victorious ; but in Argentine on the 9th day of July, 1816, at Tucuman, the declaration of independence was proclaimed, which, like our own, is sacred in the heart of every Argentine.

In the midst of these great and momentous events, San Martin recruited and drilled and clothed and provisioned his little army destined to conquer a continent, to scale high mountain passes and pour down upon an enemy largely outnumbering his own. His plans were known only to himself, and when asked by those high in authority what they were, he refused to tell and said *no* one should know them ; and should his pillow get an idea of his plans, he would cast it into the fire. He ostensibly made roads over certain passes and, when all was ready, led his army over another and very different pass and came down upon his foe and defeated him in Chacabuco ; and again on the plains of Maipú, routing the enemy completely and assuring the independence of Chili. Then, though anarchy was reigning in Argentine and his Government was calling upon him to return, his fixed and irresistible purpose of dealing the final blow to Spanish authority in Peru pushed him forward. With a fleet

hastily gotten together and commanded by Lord Cochrane, and with English and U. S. officers in command of the ships, he sailed from Valparaiso with his troops up the coast in December, 1818. He had only 4,430 men, Argentines and Chileans. The Viceroy of Peru had 23,000 soldiers awaiting this



View in the Cordilleras.

little army On July 28, 1821, as a result of his campaign, the independence of Peru was proclaimed in Lima and San Martin made dictator. In the meantime General Bolivar, after liberating Venezuela and Colombia, reached Quito and his forces, united with an Argentine division, routed the Spanish army in the battle of Pichincha; and then he hastened on to Guayaquil, anxious to finish by himself the Peruvian Campaign. Here let me quote a paragraph from the history of Argentine by the Hon. Martin Garcia Méron, the Argentine Minister at Washington.

“There he went to find San Martin, whose purity of character and noble unselfishness formed a marked contrast with the impetuous ambitions of his glorious rival. The two liberators had a conference July 26, 1822, the details of which were kept secret; but it is a well-known fact that San Martin comprehended that, in order to accomplish South American independence and avoid the scandal to the world of a break with Bolivar, caused by the latter's thirst for glory, it would be best for him to depart from a scene where his great presence had no place.”

The story of self-abnegation and the rest of his life is told in a word. He resigned the dictatorship of Peru; passed to Chili, to Mendoza, to Buenos Aires, to Europe, where he resided four years in Brussels on a very modest pension. Once more, in 1829, he returned to the La Plata, stopping at Montevideo, but learning that anarchy prevailed in his own country and deaf to the entreaties of his friends to come to their help, he took a steamer back to Europe, saying "No, General San Martin will never spill the blood of his fellow citizens; he will draw the sword only against the enemies of America." And, without even seeing Buenos Aires, he sailed for the last time to his voluntary exile, dying suddenly August 19, 1850. He was free from those theatrical qualities which appeal to the multitude. In this great character predominated those moral qualities which entitle San Martin to a prominent place in South American history. Inflexible in the discharge of duty, a rigid disciplinarian, everything was subordinated to the high mission to which he had devoted himself, and he never sacrificed his cause to ambitious or personal vain glory. *He was the incarnation of an idea.* His modesty, his pure and elevated character, the simplicity of his life and the nobility of his principles give him rightfully a position by the side of the great heroes of history.



Plaza Victoria and Statue of Belgrano.

In the vicissitudes of the epoch under consideration, when European wars and the disasters of nations reflected themselves directly and indirectly

upon the people of the River Plate and led slowly to the formation of the Republics of Uruguay, Argentine and Paraguay, many notable and great men as well as despots and bloody tyrants and political demagogues appeared upon the scene and the pages of history. No name more illustrious, contemporaneous with San Martin, is seen in the records of that time, more brilliant and more important in results, than that of General Belgrano. His generalship, diplomacy, statemanship and exalted patriotism give him a most distinguished position in the annals of independence: as General Mitre has well said in the opening sentence of his History of Belgrano: "This book is at the same time the biography of a man and the history of an epoch." His statue is before us as we stand in the archway of the National Government Building and look out upon the beautiful Plaza Victoria. General Belgrano was really the author of the national flag. The white and the blue are the colors of the *Patrios*, the regiment of native Americans at the time of the overthrow of the Spanish Viceroy, on the 25th of May, 1810.

Coming to later times, new and illustrious names appear,—men who were true patriots, who would not stoop to fraud or unbecoming political act, and who, amidst the errors of their time and the temptations to do evil, came out pure as gold tried in the fire. One of these men is the author of the history of Belgrano,—General Mitre,—still living,—the general who led the forces of Buenos Aires in the last struggle for a United Republic, and who may be called the Father of his country—for under his wise governorship, his skilful generalship and wisdom as President, Senator and a public man always before the people, the country has been strong, united, prosperous and peaceful.

The sincerity of his motives, the purity of his life, public and private, his self-abnegation, his rigid honesty, his lofty ideas of public office, administering it always as a public trust, his modest and simple life, all explains why the entire nation recently honored his 80th birthday, and why the statesmen of the Republic sit at his feet to learn, and to follow his wise counsel.

I have refrained from developing the political history of the Republic, or giving its earlier history—the discovery of the River Plate—by de Solis, in 1515, giving the name of

his second officer, Martin Garcia, to the now well-known island at the head of the Estuary, or the discovery in 1526 of the Paraná River, by Sebastian Cabot, and all the subsequent and checkered history of the Spanish Portuguese rule in the River Plate countries. That they have passed through many trying periods, when the patriotism of the leaders has been severely tested, goes without saying. The heterogeneous elements, the ambitions of designing men, the lack of integrity in the early days of independence and the opportunities which selfish men had easily in their hands to enrich and raise themselves in political station, gave varied and not always envious political changes to decades of Argentine history, not necessary to inflict upon you now. Suffice it to say that the country has passed safely through those terrible ordeals. The principles of the 9th of July, 1816, in the Proclamation of Independence, and those laid down May 25, 1853, in the Constitution of the United Provinces, form the basis of the Republic—14 Provinces (States) and 10 Gobernaciones (Territories),—principles which all hold sacred and which are almost exactly similar to our own.

The world, and especially its republics, owe more to Buenos Aires than is generally known or recognized. The brief but eloquent summary of this period of its history by General Mitre shows how great has been its influence in the development of American national life.

“On the same day when the Chieftain Ramirez was routed and slain, and that Varrera fled, seeking the sepulchre of his brethren, and the farmers of Salta rose en masse to obey the order of the dying Gúemes, General San Martin, on the tenth of July, 1821, was triumphantly entering Lima; and Bolivar, the conqueror of the north of Ecuador, was going at the head of the armies of Colombia, to meet the Argentine liberator in order to seal the independence of the New World, already irrevocably assured by the occupation of Lower Peru, liberated by San Martin.

“Here ends the history of the independence of the Argentine Republic. If she was the precursor in chronological order, she was also the first to give the signal for the great insurrection, which emancipated the Spanish-American Colonies from the Mother Country. It conquered its independence by its own efforts and without foreign help; it fought eleven consecutive years; it expelled its

enemies from its territory, taking possession of their fortified places and conquering their squadrons upon the seas; it hurled back triumphantly upon the land the nine Royalist invasions which endeavored to subjugate it. Its revolution is the only one which was not overcome, while all the others were, from Chili to Mexico.

“Devoured by anarchy, it struggled with its arm to arm, and at the same time carried its liberating arms to Paraguay, to the Banda-Oriental, to Peru, upper and lower, and its banners arrived victorious at the boundaries of Ecuador in the struggle for the independence of Colombia.

“Simultaneously its internal revolution took form, and, upon concluding its second evolution within its own organic elements, the United Provinces of the Rio de la Plata, now in peace and reorganized according to the plan of an embryonic federation, which was to be the law of the Constitution in the future, had sketched out their political map, tracing upon it with the sword of independence the inviolable line of its frontiers.

“It only remained for Jujuy, emancipated from Salta, to resume its federal autonomy, and to rise above the horizon the fourteenth star of this new National constellation. The Spanish power conquered, disorder dominated, and its organic elements reorganized and reconstituted, the Argentine Republic, which, even in the midst of anarchy, had contributed so much to secure its own independence and that of other South American nations, was about to initiate a new propaganda of principles, which, like its armies, should spread over the entire South America.

“Buenos Aires was the initiator and the herald of this new Pacific development. This province departed from its primitive plan of organization and gave up the impossible task of uniting the nation politically by means of revolutionary congresses and governments of irresponsible dictators, which had shown themselves impotent to constitute and to unify the country. Concentrating itself within its own organic forces, it put in practice the idea of creating the type of a federal state arranged on a constitutional plan, which should serve as a model to other provinces in the future. This initiation took place under the administration of General Martin Rodriguez.

“General Rodriguez called to his council, in order to realize the work of reorganization, first, Bernardi-

no Rivadavia and then Manuel José García. These two statesmen carried it to a successful conclusion, with the co-operation of the same men who had fomented and sustained the revolution. Assuring independence and the re-establishment of order, they inaugurated the republican system in Buenos Aires, breaking forever with colonial traditions; and they laid the foundations of a real republican government which responded truly to liberty and progress. A limited legislative power was created, renewable on the base of universal and direct suffrage. The powers of the Executive were determined by its duration and making it responsible. Institutions of credit were established, and immigration and popular education were promoted. The income and the estimate of expenses were for the first time organized. The sciences and the arts were cultivated, absolute amnesty proclaimed and public opinion was given participation in the Government, and an extensive reform was carried out in all political and social institutions. In this manner was created the nucleus of Argentine, creating the power of a republican federal State and making possible its organization in the future."

Some eloquent words spoken by General Mitre at the unveiling of the statue of Belgrano, in the Plaza Victoria in 1873 will illustrate the influence of a great patriot upon his country, and will reveal the character of a patriotic people, who were taught and led by such men as General Belgrano.

"The author of this book (History of Belgrano) in pronouncing the judgment of posterity before the monument, said with a legitimate pride, and with republican humility, that it could be assured that never had a glory more pure or more modest been modelled in the bronze of immortality.

"The war, he added, was a simple accident in the laborious career of the precursor of our independence and the founder of our first public schools, which, in their turn, taught lessons from the revolution and left it as a legacy to posterity. He accepted the strife like a task placed upon a laborer, and he accomplished it with fortitude, with abnegation and with humility, as well in victory as in defeat, without withdrawing from any sacrifices or asking for himself the crown of the conqueror.

“ General Belgrano is one of those historical figures, who, either with a flag or a sword, can also be represented with the pen of the writer, or with the book of law in hand, or blessing with both the head of the child reading its first primer; because he was a man of action and a man of thought, and because while he fought for his beliefs, he scattered along the furrow of life fructifying seeds of instruction and virtue.

“ He was not a man of the genius of San Martin, nor a statistician of the breadth of Bieytes, nor a jurisconsult of the knowledge of Castro, nor an orator of the consequence of Castelli, nor a writer of the temper of Monteagudo, nor a thinker of the depth of Moreno, nor a politician of the character of Rivadavia, all his contemporaries, his companions, his friends of the epoch of the revolution; but he had all of their qualities in the midst of a memorable epoch, with a soul grand and pure and a character elevated and simple; and for these reasons he is one of our great men of the past, and of the present, as he will be of all future generations.

“ His greatness, principally civic and moral, did not result from a superiority of genius over the common level, nor is it exclusively united to the grand political and military cause in which he was a modest actor.

“ It consists in the harmonious union of his high moral qualities, which did not pretend to exalt themselves before public rights; in the equilibrium of soul, which did not leave itself to be degraded by pride, nor to be a vassal to egotism; in the authority with which he commanded; in the humility with which he obeyed; in all of which he was the representative of the generous aspirations of all times, and which aspirations he served in the name and interest of all, thus extending his life to posterity, in which he was a humble and persevering apostle, combatant and laborer; and he moistened with his sweat the field of human labor, in battles, in the councils of government and in the pages of literature, and even on the rustic bench of the primary school, dying in obscurity and poverty.

“ He is an ideal type of the modest hero of democracy, which does not shine forth as a meteor but brilliant as a star, unquenchable in the horizon of the country, as shine the names of Washington, William Tell, William of Orange, Hampden and

Lincoln, who were not great geniuses, and who in the name and in representation of the good and memorable of all times and all countries, have been acclaimed great with the applause of human conscience and of universal morality."

The orator, in thus formulating the history and judgment in the presence of the Statue, saluted it saying: 'General Belgrano, in the name of all present who honor thee at this time, from the La Plata to the Andes, in the name of future generations which bow themselves with respect and sympathy before thy noble image, I, thine humble historian and one of thy grateful sons, salute thee, great and Father of our Country, the precursor of our independence, the genius of labor and of all moral and civic virtues, conqueror of Tucuman, Salta and Piedras, conquered at Vilcapugio and Ayohuma, you will live in the memory and in the heart of men as long as the Argentine flag shall wave in the breeze, and while the name of our country pronounced by millions of free citizens, shall make thy bronze vibrate with their acclamations'. Of him it can be said, as of Hampden, 'he was great without pretending it; he found glory without seeking it and in the pathway of duty.'

I stated in my remarks at Düsseldorf that the country was ambitious and determined to fulfil its destiny among the nations of the earth. I cannot close the political subject of my lecture without confirming this statement by the words found at the close of Mr. Mérou's history of Argentine, which he brings down to 1870.

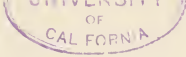
"The Argentine Republic came out of this campaign (1870, with the dictator and tyrant of Paraguay) strengthened and united. The sentiment of Nationality, ^{crystallized} by common sacrifices, was from that time forth an indestructible fact and a promise of days of prosperity and greatness, of a country united, free and powerful. We can contemplate the problems of the future with tranquillity, consecrating ourselves with all of our intelligence and forces to build up with a broad and generous spirit and a disinterested love for truth and justice (following the traditions received from our forefathers and realizing their noble ideals), one of the greatest, most prosperous and most illustrious Nations of the Earth."

The U. S. Government at a critical period in the history of South America (1818) presented fearlessly and firmly its pronounced views, and prevented a

coalition of European powers for the purpose of compelling the American colonies of Spain to return, and thus re-establish Spanish domination in South and Central America and Mexico. Much to the surprise of the British Minister of Foreign Affairs, our Minister, Mr. Rush, boldly combatted the proposition by the statement that the decided views of his Government were, that the American Colonies of Spain should be completely emancipated from the mother country, and that in its opinion there could be no other outcome of the struggle which Bolivar and San Martin were engaged in on the Andean plains.

As a concession to the American Minister, Lord Castlerough, the British Premier stated that Buenos Aires (Argentine) among all the insurrectionary colonies had given the best proof of its capacity to exist as an independent nation, and its commerce had the greatest importance at the time, and the best promise for the future. Our Minister in Paris, Mr. Gallatin, aided by Lafayette, in 1819 used his influence for the acknowledgment of the independence of the American Colonies of Spain. Our Government in 1818 was the first power of the world to recognize Argentine as a Nation, by granting an "exequatur" to a Consul General appointed by that Government. This same country having proven by its works its right to exist, now stretches out the hand to its benefactor of nearly a century ago, and asks the interchange of products and its co-operation in its efforts to fulfill its high destiny among the nations.

It is pertinent here to remark that the principle enunciated in 1818, five years before the message of President Monroe, proclaiming the "Monroe Doctrine" with such quiet but firm determination, viz.: that *America* is and shall be the undisturbed home of *Americans*, has persisted until the present day, and if attempts have been made at any time to impair the sovereignty of any American nation, there has always been a Grant or a Cleveland to frustrate them. President Roosevelt has recently clearly defined this much misunderstood principle, or so-called "Monroe Doctrine," when he said: "The nations now existing on the Western Continent must be left to work out their destinies among themselves," and "America, North and South, is no longer to be regarded as the colonizing ground of any European power." Thus, it has happened that while the



Dark Continent has been partitioned among these powers, no hand as yet has been laid upon any part of America.

A correct interpretation of this "Doctrine" is absolutely essential to a complete understanding and cordial accord between us and the other countries of North and South America.

An incorrect knowledge of it, particularly among the South American people, has engendered a popular antagonism to it as being unworthy of themselves to accept without their consent the suzerainty, or tutelage, of the United States, especially as their social and commercial affiliations are with European countries from whom our Government has politically protected these republics for nearly a century.

Truth and fairness required the statement here that Lord Castlereagh in 1818 did not express the real view of the British people and that in 1823, the very year of President Monroe's Message—Canning who was then Foreign Minister quietly opposed the "Holy Alliance," which was headed by Alexander of Russia, supported by France and Germany, and which had for its object the Coercion of the Spanish American Republics.

Canning desired their independence and suggested to President Monroe that the pronouncement would come better from him than from Great Britain, viz: "There is to be no interference by European potentates in the domestic affairs of the Western Hemisphere" and Canning promised to support President Monroe—who subsequently wrote to our Minister in Paris quoting Canning's despatch and saying he should follow his advice, but adding "but what will happen if Canning is not as good as his word."

All of which is a very interesting side light upon the origin of the "Monroe Doctrine".

Let us now take a bird's-eye view of the present Argentine, a country one-third the size of the United States; a climate salubrious and comfortable; of immense plains formed by nature, as I have already shown, for the use of man—plains where the railroads find no natural obstacles worth mentioning in the way of their good alignment and construction; where we have, I think, the longest railroad tangent in the world (186 miles), between Junin and La Cautiva, on the Pacific Railroad; plains covered with the cattle of the great estancias,

thousands of them of the best breeds in one estancia, and sheep by the millions, and great fields of wheat, corn and linseed, the principal agricultural products of the country. An "estancia" might be called a "ranch" on the great plains of our Western States. Their size varies from about three thousand acres to seven hundred thousand acres; probably twenty-five thousand acres might be considered an average size.

As might be expected, the business of cattle raising requires expert men similar to our cowboys; they are called "gauchos." They are fearless riders and masters of their trade. The horses they ride are generally rather undersized, but wiry and of great endurance. They are much like the best class of Mexican horses.

As the cattle roam over great ranges, which are unfenced, it is necessary to brand them, as we also do on our great plains.

The homes of the gauchos on the estancias are not elegant, to say the least, but in the comparatively mild climate of Argentine they do not need as much protection from the weather as in many of our cattle districts of the far West. They are a contented people, and while they do not have the facilities for entertainment which a city population has, they nevertheless have their own fun on feast days and whenever their arduous and roaming life will permit.

As might be expected of a country stretching through so many degrees of latitude and rising along the circles of longitude from the level of the sea to the highest Andes, there is a great variety of climate and generally an abundant rainfall. Buenos Aires is on the same parallel south of the Equator as Wilmington, North Carolina, is north of it. Snow is almost unknown, and scarcely ever is ice or frost seen. The climate in the summer is tempered with the great body of water of the River Plate.

The rainfall of Buenos Aires averages $35\frac{1}{2}$ inches per annum, about equal to that of the Northern States of the United States. At Asunción, Paraguay, it is 53 inches, about equal to that of New Orleans. The temperature is remarkably uniform. The mean temperature in June and July, 1899, the coldest months, was 54° (F.), and in January and February, the hottest, 76° ; the annual mean being 62° . In 20 years the mean was 63° ; summer, 77° ; autumn, 65° ; winter, 54° , and spring, 63° ; mean of

January, the warmest month, 79°; of July, the coldest, 52°. The extreme, or extraordinary, limits were 107°, and very rare 104°, frequently 95° and in winter 23°, which occurred but three or four times. In February, 1900, the heat rose to 103°, but the period of intense heat was only eight days. Such conditions are extremely rare.

The *agricultural, industrial and commercial* features are those of greatest interest, and yet, to give you an adequate idea of them, I must give you figures, and they are not always interesting; but an intelligent audience prefers them to any "glittering generalities" desirous of knowing what Argentine really is and has.

The population of the whole country is now about 5,000,000; its present rate of growth per decade is about 40 per cent. The United States is 20 per cent., Germany 16 per cent.

The Province, or State, of Buenos Aires is as large as Illinois, Indiana, Maryland, Connecticut and Massachusetts combined, or two and one-half times as large as New York State, 120,000 square miles, and mostly plains, with 750 miles of coast line. It has 1,200,000 inhabitants, 10,000,000 head of cattle, 80,000,000 sheep and 2,200,000 horses. In 1901 it raised 762,000 tons of wheat and 1,360,271 tons of corn, a respectable showing; and the value of agricultural and pastoral products was \$740,000,000. The wheat area of the Republic, mostly in four provinces, Buenos Aires, Santa Fé, Córdoba and Entre Ríos, is about 8,500,000 acres. 80,000,000 to 100,000,000 bushels of wheat are exported. The total area under cultivation in the Republic in 1901 was 17,500,000 acres. The increase over 1891 was 136 per cent. The crops were: wheat, 1,964,000 tons; linseed, 490,000 tons; corn, 2,134,000 tons. The total of arable land is 253 million acres, of which 240 million do not need irrigation.

In the whole Republic there are over 30,000,000 head of cattle. The annual increase is 25 per cent. 5,600,000 horses and 120,000,000 sheep; (in the U. S. there are 62,000,000.) The annual increase in Argentine is 33 per cent. 3,000,000 carcasses were sent to Europe in 1901.

One of the important industries of the country is the "Saladeros," which from its name signifies salted or jerked beef and extract of beef, etc. Nearly \$40,000,000 are invested in them. Brazil is the principal market. Over 1,000,000 head of cattle were killed for the Saladeros in 1900. The meat-

freezing factories exported 100,000 tons of meat in 1901. An important factor in the Argentine meat trade, and it may be said in the meat trade of the world, is the successful result of continued efforts to send chilled meat to Great Britain. The River Plate Fresh Meat Company started this trade in 1901, exporting in that year 29,919 quarters of beef; and from Jan. 1st to May 31, 1902, 5 months, it exported 38,148 quarters.

Since that date the imports into Great Britain have rapidly increased, and recent dispatches from London relate how this factor in the London meat market is alarming the Beef Trust of the United States and the Australian shippers. Argentine is placing its chilled meat in London at a considerably lower price, and is competing successfully with meat from the United States.



Flock of Sheep.

As might be expected, the Wool industry is very important, about one-half million bales shipped to Europe being the export product in the year 1901-1902,—31,000 to U. S. and 28,000 to Great Britain.

Argentine is a protectionist country, and its resources for conducting the Government are largely raised from the Custom dues. In 1899 the imports free of duty amounted to \$14,769,933 (gold), and those subject to duty \$102,080,738 (gold). The exports were \$184,917,531 (gold). The United States imports three hundred millions per annum of sugar, hides, linseed, jute, hemp, wood and fruit, and thirty-six millions of wool and woolen articles. All of these are produced by Argentine, yet only

six million of the 336 millions come from Argentine, or two per cent.

The United States exports, including cereals, meat and live stock, about 920 millions, and only 10 millions of this go to Argentine, or about one per cent; while Argentine's purchases of the same articles in England were 39 millions, and 60 millions from other countries.

Reciprocal trade would open the United States to Argentine wool and treble the production in a few years. There should be direct lines to that country from the United States, and the time should be reduced from about 27 days to 15 or 18 days. We should ship to Argentine our manufactures, our coal, pine wood, petroleum, etc., and we should receive from Argentine its wool, hides, grease, dried fruits, hard wood for tanning and dyeing, etc. Now, for want of return freights, steamers load at U. S. ports for Buenos Aires, and return via Liverpool to New York, frequently via South Africa.

In reference to wool, I have already stated that in the entire United States there are only about 62 million sheep, while there are 120 million in Argentine. It is a well known fact that the ranges in the far West of the United States, which are absolutely necessary for sheep-raising, are rapidly being reduced by the extension of our population westward, and the cutting up of great areas into smaller farms. Not only do the smaller farmers as they go West wage constant war with the sheep herders, but the cattle raisers do the same; so that the time is sure to come very soon when we will need the wool of Argentine. What this country should do with a great agricultural country like Argentine, capable of immense productions, is to receive its raw materials, and ship to it our manufactured goods.

It is proper in closing this part of the subject, to quote a short paragraph which appears in the Argentine Year Book, recently published, from the pen of Mr. Ronaldo Tidblom, Chief of the National Dept. of Agriculture and Live-Stock Industry. In closing up a long and very important article in that Year Book on the agriculture of Argentine, he makes the following statement:

“Nature has undoubtedly endowed Argentina with advantages for agricultural and pastoral farming not to be found in any other country of the world, and it is not too bold a forecast to say that if the country continues to improve her natural

gifts in the same degree in which they have been cared for and improved up to the present time, the day will come when the Argentine farmers will have absolute control of the world's food markets."

The money of the country is on a paper basis, and the minimum value of a dollar was fixed in 1899 at 44 cents gold, or 127 per cent. premium. The market value of a gold dollar expressed in paper money varies now between \$2.27 and \$2.34, and the gold dollar of the United States is at a 4 per cent. premium over that of Argentine.

Railways have had an extensive development. In 1867 there were 355 miles; in 1880 there were 1563; in 1890, 5,862; in 1900, 10,601, of which 1,243 belong to the Government and 9,358 to foreign companies. In length of line Argentine stands ninth on the list of countries, but as compared with the United States the mileage is about 5 per cent. The paid-up capital is \$550,000,000 (gold). The total receipts in 1900 were \$40,000,000 (gold). Comparing the railroads of Argentine with those of the rest of the world, we find that in Argentine the length of line per one thousand inhabitants is 3.46 kilometers, while it is 4.86 in the United States, 0.93 in Germany and 1.70 in France.

The great Southern, the Western and some other lines are still making extensions, and the Southern has crossed the Neuquen River and is looking for a pass to cross the Andes.

There are three gauges—5 feet, which is really the standard, 4 feet 8½ inches, and a narrow gauge, usually about 3'3" (1 meter).

The total length of telegraph lines is 28,000 miles, of which 12,000 belong to the Government. Compared with the United States, the Western Union alone has 192,705 miles of poles and cable.

One of the most interesting railroad lines now in construction is the Transandine, which, upon leaving Mendoza, follows the Mendoza River to its source and climbs to the summit of the Pass of the Andes, 3,900 meters (13,000 feet) above sea level. The Abt system of adhesion up to 2½ per cent., and then Rack to six per cent. is employed.

Some very interesting views can be had of the approach from the Argentine side. Lofty mountains, rugged slopes, rushing rivers and the Puente del Inca (the Incas' bridge), a natural bridge formed evidently by the river breaking through a great deposit of cemented material, caused by an

avalanche. The railroad is not completed, and some of the most difficult work is yet to be done .



First Tunnel out of Mendoza.

Speaking generally of the Railroads, they are well constructed, though good ballast on the great plains is lacking. The cars are like American cars, but the first-class day coaches are much more luxurious than ours. All the long distance trains have comfortable sleepers; a buffet and dining car goes with all through trains.

In regard to the industries of the country, while the main products are agricultural and the export as well, important industries are slowly developing. While sugar is an agricultural product, the 40 sugar mills may be classed among the industries. In 1870 Argentine imported 22,000 tons, but in 1899 exported 58,000 tons. There are \$52,000,000 invested.

There are over 60 breweries in the country. The annual product is about 440,000 gallons.

There are 182 distilleries; the alcohol is made principally from corn. The annual product is about 3,000,000 gallons.

Milling is a very important industry. The first flour mill was built in 1850 in the City of Cordova; the first steam flour mill was built in Buenos Aires in 1845. In 1895, by the census of that year, there were 659 mills,—234 worked by steam, an

303 by water; the total amount of flour made was 383,147 tons. The country now exports about 80,000 tons, all in bags and mostly to Brazil, valued at about \$3,000,000 (gold). At present the Brazilian market is giving a preference to United States flour because it arrives in barrels, which must lead to the same method in Argentina, although the wood suitable for barrel staves is very limited.

The Wine industry is one of the most important. The soil suitable for grapes covers an immense area, extending from the Northern to the Southern Provinces along the slopes of the mountains. Mendoza and San Juan, west of Buenos Aires, are, however, the best adapted to vine-growing. In 1900 there were 89,000 acres in vines valued at about \$10,000,000 (gold). The transportation of the wine by rail in 1901, in Mendoza alone, amounted to 160,000 tons, and the stock of wine in the wine establishments (bodegas) was 33,000,000 litres (871,000 gallons).

The Dairy industry a few years ago had practically no existence, and nothing at all was done with the milk of the millions of cows in the country. Now, large dairies are springing up in all the pastoral parts of the country; the neatest and most tempting places to enter in the City of Buenos Aires, are the white-painted, scrupulously clean places for drinking milk, scattered all over the city, the milk being sent in from the great "estancias." These dairies are being built in the most approved style, and they prepare pasteurized, maternized, sterilized and all other kinds of milk preparations. The exports of butter alone in 1901 were 3,322,391 lbs. In the year 1895 it was only 880,000 lbs.

Iron and Steel industries are important, although there is practically no ore or coal in the country. In 1895 there were 154 iron foundries and 156 repair shops, with a capital of \$15,000,000. Every class of machinery is now manufactured, even to small engines and boilers.

Matches: the tax alone in 1899 amounted to 2,000,000 dollars.

Tobacco: the excise tax on which and its products in 1901 amounted to \$4,200,000 (gold).

Four million dollars (gold) are invested in textile manufactures employing 6,200 persons; canvas factories one million (gold), employing 2,000 persons and making 5,000,000 yards, and ten million dollars in hat factories employing 700 hands.

As to mining, there are valuable copper mines containing gold and silver, also rich veins of gold, with recent discoveries of iron ore, but these various products have not been developed to any great extent, due to remoteness from railroads and the roughness of the country, making the exportation very costly. These minerals include gold, borax, copper, marble, silver ore, lead ore, etc.

After this cursory and possibly uninteresting statement of statistics, it is a relief to turn to the beautiful and a really great City of the World—Buenos Aires—and give you a brief outline of its most important characteristics. First, a little history and more dry figures to give an adequate idea of its size and general features.

Its early history is full of trouble. Founded in 1535, destroyed and rebuilt; and then from 1650,



City of Buenos Aires.

when there were 400 houses, it grew slowly under the old Spanish regime, and later, under dictators and bad rulers, it slowly advanced in spite of an unstable Government. In 1852, when the noted Rosas was turned out, it had 76,000 inhabitants. Chicago was just then passing through the hard trials of a little Western town, and had not more than 20,000 people. In 1864 Buenos Aires had 140,000 inhabitants, and Chicago about the same;

in 1869, 178,000. But Chicago had already started on its phenomenal growth and reached over 300,000. In 1887 Buenos Aires had 400,000, and Chicago 1,000,000.

In October, 1902, Buenos Aires had 864,513, and it is growing at the rate of about 40 per cent. per decade. It is destined to reach the million mark by the year 1906. It is now the largest City in the World, South of Philadelphia, if we except Chinese Cities.

Comparing its present rate of growth per decade with some other cities, we find the following: Greater London, 20 per cent.; New York, 37 per cent.; Chicago, 54 per cent.; Phila., 23 per cent.; Greater Berlin, 19 per cent.; Buenos Aires, 40 per cent.

The City is on the right bank of the River Plate, a sloping bank 50 or 60 feet above the level of water, rising up to considerably greater elevations in the centre of the city. It is about 120 miles from the sea at Montevideo. Its area is one of the greatest in the World, 44,830 acres; Paris has only 19,280, Berlin, 15,625, Hamburg, 15,681, and Vienna 13,690. It would be a good day's journey to go around the City, as its perimeter measures 39 miles.



Palacio del Congreso.

As far as the natural conditions permit, the streets are laid out in the form of a chessboard, and are generally about 360 feet apart from centre to centre. In the central part of the City the

streets are narrow ; it is difficult for three carriages to pass. There are, however, a few 33 feet wide, and one or two avenues about a hundred feet.

The finest, and said to be the best-lighted street in the World, is the Avenida de Mayo, which is in the centre of the City as to the numbering of the houses North and South. It has a fine asphalt pavement and double electric lights in the centre. It was cut through the blocks a few years ago from the Casa de Gobierno (Government House), near the port, to the 13th street, somewhat less than a mile. At the other end there is being built a beautiful Capitol building that will cost about 5,000,000 dollars (gold).



Plaza Libertad.

There are 72 parks and small areas outside the main streets, with a combined area of about 1,400 acres. These parks are more tastefully laid out and more neatly kept than can be found in any other country in the world, Paris excepted. In fact, in many respects the City, in its streets, lights, parks and structures, resembles Paris, except that there are more one story residences than in Paris. The prevailing style is Spanish, with a patio (a kind of open area) and the rooms all facing it, and in this patio a garden and fountain, when the proprietor is able to have it; if not, pots of flowers very much like the ordinary city house in Mexico. The style of the houses of the wealthy may be seen on Avenida Alvear.

The pavements are wood (nearly all hard, suitable wood of the country), asphalt, granite blocks, macadam and rubble. No city has better pavements in the central part. In the outskirts, however, much of the pavement is very bad and uneven, merely rubble, but immense sums are being expended in substituting rubble for granite blocks and asphalt.



Avenida Alvear.

There is no city anywhere with more lines of street cars; in fact, with the exception of two streets, there is a line in every one of the principal thoroughfares. And leading out to the pleasant suburban towns, Belgrano, Palermo and Flores there are electric lines similar to those in American cities, using the overhead trolley. In fact, all the equipment from rails to trolley comes from the United States. Very extensive changes are being made in all parts of the City, substituting horse-cars for electric. There are now 275 miles of street car lines, which carried, in 1900, 116,447,982 passengers.

There is a project and a national concession for a system of underground electric tram lines, connecting the three main railway stations with the Plaza Victoria and, in one direction, extending by a surface line far out in the country. If underground

lines pay in any city in the world, they will in Buenos Aires, for the conditions are especially adapted to their easy construction, the material being suitable for tunneling, and a great mass of people crowded into the "Centre" with its narrow streets, where the present surface movement is often extremely congested. A United States citizen has the concession.

In 1868 there was a terrible epidemic of yellow fever due, in a large part, to unsanitary conditions, but immediately afterward the city began a very extensive system of water and drainage works costing 33 millions of dollars (gold), discharging the sewerage 15 miles distant, and the storm waters by great intercepting sewers, now being completed, into the river in front of the city. The City Water-works take their water above the city, where it is never contaminated. These works were designed by Messrs. Bateman and Parsons, Engineers, of London, and the main construction was carried out under their supervision.



Water Works Building.

The water of the River Plate is good but muddy, and it is clarified in settling basins before being delivered to the distributing reservoir built on one of the highest points of the city. This distributing reservoir is a work of art, covered with glazed tiles over pressed brick. These works all

together have made Buenos Aires one of the healthiest cities in the World, as the death rate proves.

Ten years ago, upon the completion of the main works, the mortality per 1,000 was 30 ; now it is 16 1/2. This compares very favorably with other large cities. London has 19.2, Glasgow 21.6, Liverpool 26.3, Manchester 24.1, Dublin, 30.4, Paris 20.1, St. Petersburg 24.7, Vienna 20.7, Madrid 30.1, Rome 17.6, Venice 22.8, New York 19.7, Philadelphia 17.7, Brussels 17.9. Boston 19.0 and New Orleans (white) 17.9.

The Government is soon to extend the works at a cost of 5 millions (gold).

The climate, taking the whole year round, is very equable and very agreeable. The parks are always green ; vines and palms and a species of banana plants are seen everywhere, and flowers all the year in the open. It has a semi-tropical country in the North and in Paraguay from which to procure the plants, where the *Victoria Regia* and other beautiful plants grow wild.

In reference to education, the primary education is compulsory from the age of nine to fourteen ;



Cathedral.

secondary education from fourteen to nineteen is optional, as also the university, or higher education, from nineteen to twenty-five or twenty-six. No man can enter into any of the professions, includ

ing engineering, and take a prominent position in the Government without being a graduate of the National University, and having taken the course outlined in the above division of ages.

In 1900 there were 450 thousand pupils in the public schools, which are free to all, and free to people of all religions. Although the Catholic religion is the national religion, neither it nor any other religion is allowed to be taught in the schools.

In the National University there are four faculties—law, and social science, medicine, exact physical and natural science, and philosophy and letters. In 1901 there were 3,562 students in the University.

In reference to religion, everywhere in Argentine under the Constitution all may worship God freely, according to the dictates of their own conscience. While the Government itself, like the Government of Great Britain, Germany, Switzerland, etc., recognizes an established Church and assists in its maintenance, it also often assists in benevolent and educational work undertaken by other denominations.

A very important work of this kind is the Argentine Evangelical Schools, initiated, promoted and carried on by Mr. William C. Morris. The report of 1901, just issued, shows there were 1,820 pupils in various departments; in the previous year there were 1,076. This school is really a National school and is assisted in a measure by Congress, although largely dependent upon private subscriptions, which are made to it by not only Protestants, but leading Catholics as well. It is devoted entirely to the education and care of children of the poor, who cannot enter the public schools for want of suitable clothing.

The general style of the city is cosmopolitan, in buildings, in stores, in residences, in dress, in habits and customs of the people. It is made up of many nationalities. According to the Census of 1895, there were in the country about 3,000,000 Argentines (all children born there of foreign parents are Argentines) and about 500,000 Italians—by far the largest number of immigrants—and they are far better than the immigrants of the same nationality that come to the United States. Some of the best and most intelligent people in all kinds of business and industries, especially in agriculture, are Italians. Next come the Spaniards, about 200,000; next the French, somewhat less than

100,000 ; next the English, 22,000 ; next the Swiss, 15,000, and lastly the North Americans, as we are called, 1,400. These figures refer to the year 1895 ; the number of foreigners in the country December 31, 1899, was 1,199,808, an increase of 20 per cent. on the returns of the year 1895.

Immigrants in 44 years....	1,935,077
Italians “ “	1,198,550
Spaniards “ “	361,079
French “ “	162,636
British “ “	34,031
Austrians “ “	31,698
Germans “ “	27,834
Swiss “ “	24,873
Belgians “ “	19,082

The history of the lighting of streets in the city is very interesting, and shows that the city keeps pace with others in this respect. The first record of public lighting was in 1778, when the city had lamps in the shape of a tin of horse-oil with a wick ; then came tallow dips, then oil lamps ; then came gas in 1885, and in 1888 electricity began to replace it in part ; and on December 31st, 1900, the city was lighted with 889 arc lamps, 318 incandescent of 16 cp., 14,084 gas lamps, many with the Welsbach burner, and 8,590 kerosene lamps, and there were 36 electric light stations, with a capital of 9 million dollars (gold), and with a capacity of 23,300 electric horse-power.

In addition to telegraph lines, there are four Cable Companies working with Europe and the United States, keeping up a close connection with all parts of the World. The service is very good and prompt ; its time of transmission between Buenos Aires and London, “ via Galveston ” and Western Union lines and cables, is about 60 minutes, and with New York 30 minutes. When we consider the distance and the route, we are astonished at the working of this line, which crosses over the Andes 12,000 feet above the sea level, tunnels under the snow and avalanches and reaches the Pacific Ocean, only to take successive leaps by loops along the coast to Tehuantepec, in Mexico ; over the Isthmus, across and under the waters of the Gulf of Mexico, to Galveston, speeding then its swift flight over the poles of the Western Union to New York City ; and then, without stopping to rest, plunges into the

depths of the Atlantic Ocean and talks to the receiver in London in 60 minutes after it left the operator's fingers in Buenos Aires. By a wonderful invention of recent years, this message has passed from ocean to land many times and back to ocean without stopping, through a "human relay,"—a machine worked by a human.

It is an interesting fact that the difference in level between the highest point on land of the lines of the Central and South American Telegraph Company and the lowest point of its cables in the Pacific Ocean, is about 31,000 feet—six miles.

This Company has three underground cables which cross the Andes and work uninterruptedly, notwithstanding that they are covered with snow, in some places at great depth, for about eight months of the year.

The telephone service is in the hands of private companies; the capital invested is over \$10,000,000 (gold); there are about 11,000 subscribers. There are no really long-distance lines, except one recently opened to Rosario.

The house-fronts, when kept in repair and painted, are neat and architecturally beautiful. The words "repair" and "painted" must be explained. There are no wooden houses, which these words might imply; they are almost always made of rough brick, covered with what is called "revoque," a covering of plaster or "staff," and sometimes artificial stone. The better class of houses generally have a base of granite, marble or other natural stone three or four feet high, and then brick covered with "revoque." Sometimes the natural stone extends to the second story, and then invariably comes the artificial covering; after a while—two or three years—this begins to discolor and flake off, requiring painting and repairing; after ten years it begins to become an "eyesore," and at the end of twenty years it must all come off at very considerable expense. An instance to be cited is the American Church, Methodist Episcopal, which was built 25 years ago, but for five or six years past it has presented such a dilapidated appearance that it has become necessary to remove the revoque from the sides and front from the base to the steeple, and renew it at a cost of \$10,000—a large sum for a poor church.

A question came up recently about the Congress Palace just mentioned, as to what should be the external covering of this grand structure. Fortu-

nately, the commission of engineers to pass upon this and other questions decided upon a marble covering, and their decision was approved by the Government.

One of the finest constructions now being finished, after standing uncompleted for ten years, is the beautiful Theatre Colon, which by the kindness of Mr. Meano, the architect (who is also the architect of the Congress Palace), I am able to show you from some slides he has sent me.

The means of locomotion about the city are abundant—street cars everywhere, and a very good and economical cab service. There are few coupés, no public hansoms and only one or two private ones; but the street carriages are two-horse victorias which carry four people. The private turnouts are equal to those of any city of the United States, especially the horses, which are of the best imported stock. The "Corso" and the approaches to it on a Saturday or Sunday afternoon are very attractive. It is in the beautiful park of Palermo, one of the suburbs, broad avenues, beautiful shrubbery, lakes and shady drives, and immediately in front the broad river Plate, whose further shore is beyond the horizon.

The people show great taste in the arrangement of their stores, and particularly the shop windows; from a butcher's shop to a confectioner's and a lace store, the fine French taste is visible everywhere. A walk along Florida, the principal shopping street, a fine asphalt street with no street cars in it, is one of the delights of Buenos Aires, and one never tires of it. If, for a fortnight, you miss this promenade, you hardly know the street, for the appearance of the stores has greatly changed in the meantime, by a complete change of the decorations.

The manner of living is Continental, not even English—a cup of coffee with a roll in the early morning; breakfast at 11 to 12:30 (which is a meal in courses), and dinner at 7.30, the principal meal of the day. This is the custom among all classes, high and low; and there is another custom (it is strange how soon you fall into it):—tea or coffee or *matte* (a species of steeped herb [*yerba*], pressed into a peculiar little gourd used as a bowl and drawn out of it with a hollow silver tube called a *matte stick*). This 4 o'clock drink is as necessary as any meal. In the Government House (*Casa de Gobierno*), the Government provides tea or coffee

for all of its officials and employes, and little rooms are seen in various parts of the building where it is made and served from, always accompanied with some kind of delicate biscuit.

Perhaps some current prices may be of interest, remembering always that, to get the price into American money, you must take only four-tenths of the price, to allow for the discount.

Foreign letter postage is 15c. per 1/2 oz. (6c.)

Domestic letter postage is 5c. per 1/2 oz. (2c.)

Telegrams each of first ten words, 5c. (2c.), and the successive words 3c. (1.2c.). Telegrams in any other language than Spanish, double price. Address and signature are counted as in Europe.

The usual fare for a victoria is a dollar (40c. gold), whether you take it by the course or by the hour.

The foreign debt of the National Government in 1900 was \$338,771,614 (gold), and the internal debt \$3,322,500 (gold). There are thirty different loans, the interest on which ranges from 3 1/2 to 6 per cent. ; the total interest charge per annum in 1900 was \$22,349,900.84 (gold). It requires annually, to pay the interest on the total debt, \$18,661,864 (gold) and \$11,695,218 (paper).

The total revenue of the Government in 1900 was \$62,045,458 paper and \$37,998,704 (gold).

It is generally known that in 1890 a terrible financial crash came upon the country, at the time of the Baring failure; since then it has had to struggle to carry the load imposed by the disasters of those days; however, perhaps not more disastrous than happened to Chicago in 1893, as many will attest who were caught in the Columbia National Bank failure and others.

What language is spoken? Spanish, which is the national language; but, as might be expected in a cosmopolitan city, French, Italian, English and German are spoken almost everywhere, particularly French.

As English money and Englishmen have done more than any to develop the country, have built, own and run nearly all the railways, many of the great estancias and other businesses, particularly commercial, the English language is very generally used in railroad and navigation circles.

With these general characteristics of the country and the Capital City, I must give you a brief *résumé* of the ocean commerce, which has done so much for the country, and, situated as it is at these

antipodes of the world, so necessary. First, a few dry facts and then the description of commercial facilities.

In 1899 the value in gold of goods imported was about \$117,000,000, exported \$185,000,000. Of these \$44,000,000 imports came from Great Britain and \$15,000,000 from the United States; Italy comes next with \$14,000,000 and Germany next with \$13,000,000, then France with \$11,000,000 and Belgium with \$9,000,000. But exports show a different distribution, for France took \$41,000,000, Germany \$29,000,000, Belgium \$24,000,000, Great Britain \$22,000,000, the United States \$8,000,000 and Italy \$5,000,000. Of the foreign trade Buenos Aires had 87.2 per cent. of the imports, Rosario 8.8, La Plata 1.2 and Bahía Blanca 0.80. Of the exports Buenos Aires had 55.5 per cent., Rosario 18.4, La Plata 2.30 and Bahía Blanca 2.00. These ports are mentioned, as some information about them is needed to explain the commercial situation. Of all the goods reaching the River Plate Countries 80 per cent. comes to Argentine.

In 1885 the National Government began the construction of very large docks at Buenos Aires; hitherto all the business had been done from the anchorage, about 12 miles from the city, the intervening space being a great mud bar, the water from



Riachuelo, 1901.

a depth of 25 feet gradually shoaling to the shore line at the city. This was so flat that it was necessary often to transfer the passengers and goods

from the lighters, with which they had come thus far from the vessels, to small boats and to great wheel-carts that went out a long distance in the water to meet the lighters.

The new docks are very extensive, and lie along the immediate front of the city and connected with it; they were designed by the well-known English firm of engineers, Hawkshaw and Hayter, and carried out under the supervision of Mr. James Dobson, the resident engineer. The concessionaire was an Argentine citizen, Mr. Madero; the contractors were the experienced English firm of Walker & Co., who built the Manchester Ship Canal. These men all deserve the highest credit for carrying through, under the financial difficulties of the period above mentioned, a great public work, costing \$38,000,000 (gold).



Entrance Darsena Norte.

In order to reach the docks from the sea, a channel had to be excavated in the mud foreshore from the anchorage. This channel (the North one) is at low tide 21 feet deep and 330 feet wide, and about $5\frac{1}{2}$ miles long from its intersection with a channel which already existed by previous dredging from the other end of the port, at the mouth of a small, sluggish stream called the Riachuelo, in which channel there generally is about 19 feet of water at low tide. The tide of 2 or 3 feet, depending largely upon the direction and force of the wind and very uncertain, permits vessels drawing about $23\frac{1}{2}$ feet to enter the port by the North

Channel. The new port was connected with the older port, and now both channels are being used, and the depths in them are about as I have stated.

The Government has recently begun the extension of the North Channel straight out to the anchorage, and later will deepen it to 22 feet. In the meantime the navigation uses a crooked channel beyond the intersection, which has been partly dredged, curving round from the South Channel to the anchorage. The depth of water in the north-



Darsena Norte, and docks, &c,

ern entrance basin of the Port is 21 feet, but in the four great docks 23 feet, with tidal gates so that the vessels at low tide may be afloat.

The works are built in the most substantial manner—masonry walls founded on what is called “tosca” (loess), the hard substratum that is found in this part of the country. The four docks, or basins, are from 620 to 750 yards long, and are all 170 yards wide, connected by passageways 22 to 27 yards wide, over which passes by hydraulic turning bridges, the foot, vehicular and rail traffic. A sea wall in front protects the entire port. On the city side are three and four-story brick ware-

houses, 24 in all, with a total frontage of 11½ miles. Sheds, cattle yards, railroad tracks, hydraulic cranes and capstans and other important appurtenances give the port modern facilities for handling cargo.

When the docks were opened at the Southern end in 1899, the registered tonnage of vessels arriving and departing at the Port of Buenos Aires was 3,800,000; in 1901, 8,661,299, more than 100 per cent. increase. There are only twelve ports in the world of greater tonnage, and none of them show such phenomenal growth.

In 1880, about the time that the works were proposed, the tonnage was 644,570, and the plans were made for 2,000,000 tons only.



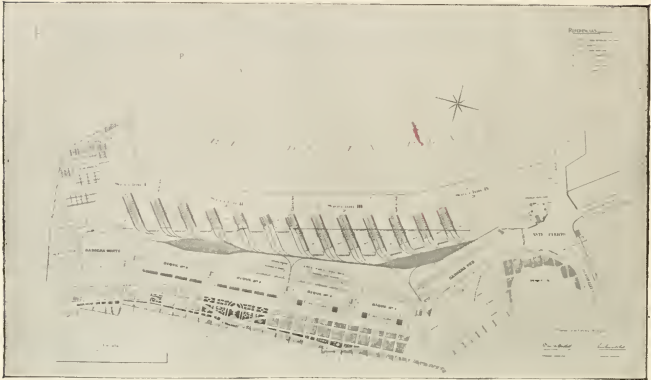
View of the Docks.

The extraordinary growth of the commerce has made it necessary to make an enlargement of the facilities, and this was one of the works intrusted to me during the last year of my stay in Argentine. I am able to show you the general plan of the actual port with the proposed enlargement, which will have free access from the sea and a depth of 26 feet.

The plan also provides facilities for "inflammables"—coal, petroleum, gasoline, naphtha and some explosives.

The Standard Oil Company of New York is now arranging to bring bulk oil in tank steamers to Argentine, and the Shell Transport Company is preparing to make a specialty of the importation of fuel oil from Texas and the Dutch East Indies.

The work of enlargement of the port is divided into sections, so that it can be carried out section by section, as the increase of commerce will require. The general plan also includes the protection and deepening of the entrance channels.



Port of Buenos Aires and Plan of enlargement.

One of the principal ports of the country is Rosario. Ocean navigation reaches it, and, for that matter, reaches Colastiné, the port of the city of Santa Fé, the capital of the Province. The registered tonnage of the Port of Rosario in 1899 was 3,000,000, of which more than 2,000,000 were over sea vessels, about 700 per annum. The merchandise entered and cleared was about 1,650,000 tons; 67 per cent. of the exportation was wheat. In the busy months there are often over 30 vessels seen at one time along the wharves and the barranca, where the wheat is loaded in bags, sliding down from the high cliff 60 feet above the vessel, in what are called "canaletas." The imports amount to about \$10,000,000 (gold), and the exports to \$30,000,000.

The National Government is making a great port of Rosario, endowed with all modern facilities for handling cargo. It sent out to Europe and the United States a full report with all necessary data, submitting the project to capitalists and contractors, with the request for propositions to build and operate the port. It will cost from \$10,000,000 to \$12,000,000 (gold).

The contract, after an examination of and report upon the projects presented by a Board of which I had the honor to be President, has been let to the well-known and experienced firm of contractors, Mess. Hersent, of Paris, associated with Schneider and Co., of Creusot, the Krupp of France. The works of construction were inaugurated by the President of the Republic on Oct. 26th, 1902.

The plans of the work have been based on the data above mentioned.

Some important problems had to be solved in connection with the improvement of so great a river as the Paraná, the bed of which is subject to such important changes, and also its islands and banks.

The front line of the proposed wharves is over 2 1/2 miles long. The masonry piers must go down into the tertiary sand below the scour of the river, and their foundations will be from 60 to 80 feet below the low water level.

The importance of this work, furnishing a modern seaport to the second city of the country, can scarcely be over-estimated. In my report on the project made in Sept., 1900, I used the following words, which two years of subsequent study have corroborated:

“It is safe to say that the establishment of a first-class port at Rosario with suitable channels of access, will revolutionize completely the commerce and industry of this Republic.”

I can now show you some interesting views of the more important buildings of the city.

La Plata port and city were built by the Provincial Government, when, in about 1880, the National Government came to Buenos Aires to occupy it as the capitol of the nation. It is an excellent port; it is built on the shore of the Rio de la Plata, about 35 miles from Buenos Aires, and cost about \$14,000,000 (gold). The opening of the national port at Buenos Aires has driven most of the commerce from La Plata, but it is capable of being made, with a comparatively small sum of money, deep enough, in its entrance channel (five miles long) and in its port areas, to accommodate vessels of 26 feet draught at low tide; it now has 21 feet.

The remaining port of importance and rapidly growing is outside of the River Plate, in the South, Bahía Blanca; it is the principal shipping port of agricultural products by the Great Southern Railway, the largest system in the Republic. This port

is in an estuary of the Ocean, and is a protected harbor; in fact, the terminal of the Railway is about 35 miles from the open ocean. The Railway is building a steel pier, 1640 feet long, with spacious



The Dock, Keel and Bilge Blocks.

warehouses and 19 miles of siding; and there will be, when all works are completed, over half a mile of wharf frontage, supplied with electric cranes.

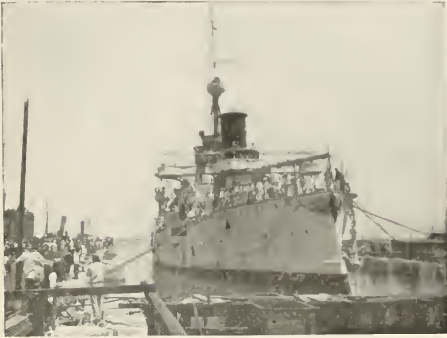
The National Government is building in this



The President inaugurating the Dock.

Estuary at Puerto Militar, or Puerto Belgrano, a system of dry docks and basins on a large scale. The first dry dock, one of the best and largest in the world, is completed and now in use. It was designed and built under the immediate supervision

of the well-known Italian Engineer, Chev. Luigi Luiggi, who had charge of similar work at Genoa.



The San Martin in the dock.

This dock, built of first class materials and upon the most modern methods, can take the largest naval or merchant ships of the World, as it has a useful length of 713 feet and an entrance width of 85 feet, and a depth over the sill of 32 1/2 feet at



U. S. Battleship Iowa entering the dock.

mean high-tide, 22 feet at low tide. It has intermediate gates, so that two or three small vessels can be docked at the same time or separately.

I cannot here go into details of construction which were fully given in a paper on the subject submitted by Mr. Luiggi to the IX International Navigation Congress at Düsseldorf, July, 1902. He has very kindly given me over 30 lantern slides, of which I can show you a few to give you a general idea of the dock. The plans, photographs and, possibly, a relief model of the dock will be exhibited at the World's Fair in St. Louis, in 1904.

In October last the U. S. Battleship Iowa, the flagship of the South Atlantic Squadron, was docked at Puerto Militar.

You will be interested to know that at Buenos Aires, there is a large business with New York by means of five steamship lines, and through New



Entrance Government House.

York with Chicago and other cities, from which are shipped a large amount of agricultural machinery of all classes, from cultivators and plows to great steam threshing machines of the J. I. Case Co., of Racine, Wisconsin. Not only from Chicago, but from all manufacturing districts, the trade of our country is increasing. You see our machinery everywhere, and it is everywhere considered equal to any—Baldwin Locomotives, Jackson and Sharp Cars, and Harlan and Hollingsworth's. The American freight car of 25 and 30 tons is replacing the

old Belgian, French and English 7 and 10-ton cars. If the American cars are not all made in the United States, they are copied from ours. The most approved bridges are from the United States. I have been over several and examined one on the Transandine Railway, built by the Phoenix Bridge Co., of Philadelphia, excellent bridges and giving entire satisfaction. The Boston Bridge Co. sent out some very good bridges. The horse-cars by John Stephenson and Co., of New York. Electric cars by the J. G. Brill Co.; and the Westinghouse Co., is doing well there. Large quantities of Southern and Oregon pine are imported. From the U. S. comes all the kerosene used in the country. I might go on enumerating many other



Prensa Building.

United States products. I can well say that the prospects of American trade with Argentine are exceedingly good.

The Argentine Government is determined to improve the great rivers of the country by methods which have been found to be best in other countries under similar conditions. The results of our experience upon the Mississippi are being closely watched, studied and applied. The reports of the Mississippi River Commission are of great value to that country. I may further say that the engineers, and the methods pursued by them are equal to

those of any country. Every Government Engineer, to take a prominent position, must have a diploma from the Engineering Department of the National University. The graduates of this excellent school are as well equipped for their work as those from any school in the world; this I know by experience, for four of them (young men) have been associated with me as my immediate assistants, and in my position as Consulting Engineer of the Government, I have been brought into close relations with many other engineers, and I have the highest opinion of their ability.

I will now select at random a few subjects of special interest, and a few views.

The Government Building—Casa Gobierno—sometimes called the “Casa Rosada” from its light



Sarmiento School.

rose color, and in which was my office, is one of the most prominent buildings in Buenos Aires.

It stands in a prominent and central position, facing the Ave. Mayo, and looking out on the other side over the port and the River Plate.

One of the finest structures in Buenos Aires is the “Prensa” Building, devoted entirely to that morning paper. I know of no newspaper offices in the world that can compare with this in elegance and convenience in all its interior appointments.

The leading newspapers of Buenos Aires are equal to any, both in editorial ability and in telegraphic news from all parts of the world.

The Sarmiento School gives me an opportunity to call to your attention this, one of the most learned and best of Presidents, who, when he was Minister at Washington, became so enamored of our country, and particularly our educational methods, that he engaged a large number of our young lady teachers to go to Argentine as Normal School Teachers. Many of them are there yet, after nearly twenty years' service, a service that has reflected honor upon themselves and their country.

An institution of importance is the Jockey Club, for by its influence the Argentine blooded stock of horses has been made equal to any in the world, and its domicile is one of the finest and most expensive of any club house in existence, and its stand at the race course at Palermo is a beautiful structure.

Some views of Recoleta, the principal Cemetery, will show you the general method of burying the dead.

It is proper for me to say that considerable of the statistical data was obtained from "The Argentine Year Book," just issued for the first time (1902), and that some of the hydraulics are from a contribution to that work written by myself. The Annual can be obtained from the Moorgate Publishing Company, of London.

I cannot close this lecture without introducing you to the President of the Republic, General Roca, under whose wise administration the country has prospered and by whose determined purpose to maintain the peace the impending war with Chili has been happily averted and a permanent peace established, based on the arbitration of the troublesome question of the international boundaries.

You may properly ask me why I have brought before you the subject of Argentine. I can easily reply—First, because in two years of close relations with the country, and especially, with the Government officials, I formed a very favorable idea of the character of the people and of the possibilities of business and profitable enterprise for our own people there. And second, because the high officials of the Government and leading men of the Country desire to have the "Norte Americanos," as we are called, come to Argentine with their business energy, integrity and ability, and their capital as well, to help build up and move forward to its high

destiny that great country of South America, so like our own in its climate, soil, rivers, Coast line and other general features.

If I have succeeded in interesting you in Argentine, and in giving you more knowledge of it than you had before, I shall be satisfied with my efforts and feel that I have done a service to that country and to my own.



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