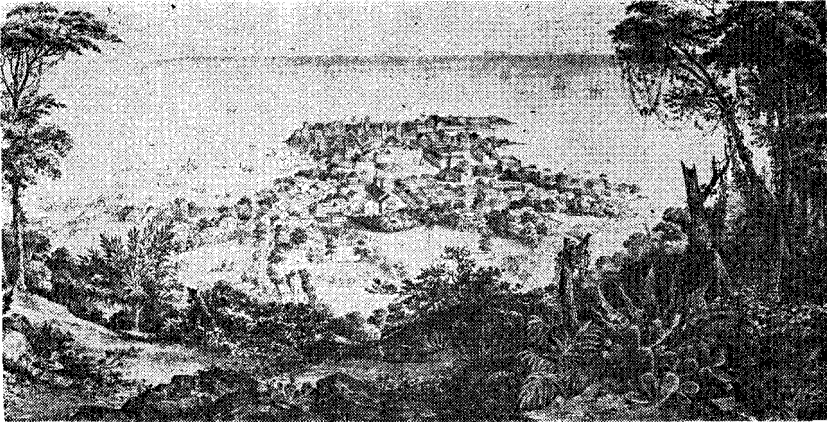


of downright treachery he was found guilty of treason to the Spanish Crown, in an unfair trial, and was beheaded in January 1519.

After thus disposing of his rival, Pedrarias sought to further explore and colonize the Isthmus. These efforts resulted in the founding of the cities of (Old) Panama, Nombre de Dios, Nata and lesser towns. Colonizing parties also were sent up the Central American coast as far as Nicaragua.

Trans-Isthmian Transportation Begins

The exploration of both the Chagres, emptying into the Atlantic, and of the Rio Grande, emptying into the Pacific, were



Official Panama Canal photograph
Panama City, 1855, from Ancon Hill

made in 1527 to determine how these waterways might be used to make interoceanic traffic easier. On February 20, 1534 the Spanish Crown ordered that more careful studies be made as to the feasibility of establishing interoceanic communication. The proposal was to use the Chagres, navigable as far as Cruces, and then connect with the waters of the Rio Grande. The plan was reported feasible, but it seemed doubtful whether any monarchs of the era could provide the means. At this time the conquest of Peru and of other West Coast regions contributed to the importance of Isthmian transit facilities. Again in 1616 the question of connecting the two oceans with an artificial waterway was revived by King Philip III. The explorations

he ordered were in the area of the Tuira River. But when the Council of the Indies argued that the power and security of Spain would be endangered if the Isthmus be opened to the traffic and commerce by ships of other countries, the King revoked his orders and forbade, under penalty of death, all further efforts to unite the two oceans.

Antonio de Gamma, who became Governor in 1529 intensified the efforts at constructing the Panama-Nombre de Dios road.

Difficulties

But serious problems were in the offing for the Spaniards. Negro slaves were being imported to relieve the Indians of labor in the fields and in the mines. The cruelty of their Spanish masters caused the Negroes to revolt. They deserted at every opportunity, all heading for the forests and mountains to resume a free life. The number of runaway slaves populating the wilds of the Darien grew daily and was increased considerably when a slave ship was wrecked off the San Blas coast. This occurrence added 300 slaves to the ranks of the runaways or Cimarrones, as the Spaniards called them. In due course of time the Negroes chose a "king." He was known as Bayano, and is described as being intelligent and crafty.

Emboldened by the increase in their numbers, the runaway slaves turned to haunting the Panama-Nombre de Dios road, making it the scene of their persistent depredations against transcontinental traffic. No longer was travel on the road safe. The Negroes would swoop down on mule trains or on travelers to rob and often to kill. They even dared to attack the units of the Spanish regulars assigned to serve as guards of the Royal treasure trains and convoys of merchandise using the road.

Finally, between 1578 and 1580, a peace treaty was signed with the Cimarrones. In this agreement they were declared free and allowed to establish themselves as settlers in the neighborhood of Nombre de Dios. They named their town Santiago del Principe. They were allowed to choose their own civil authorities and govern themselves, but the Crown maintained a small garrison of Spanish troops in their town. Later

another agreement was entered into with the Negroes who inhabited the banks of the Chepo River. They were provided with seeds, farming implements and some cattle to start them off on a useful life. In honor of "King" Bayano, the name of the Chepo River was changed to that of Bayano, the name it bears today.

Corsairs, privateers, buccaneers and pirates also contributed to the trials of the Spanish authorities. They attacked and pillaged the fleets of galleons returning to Spain loaded with

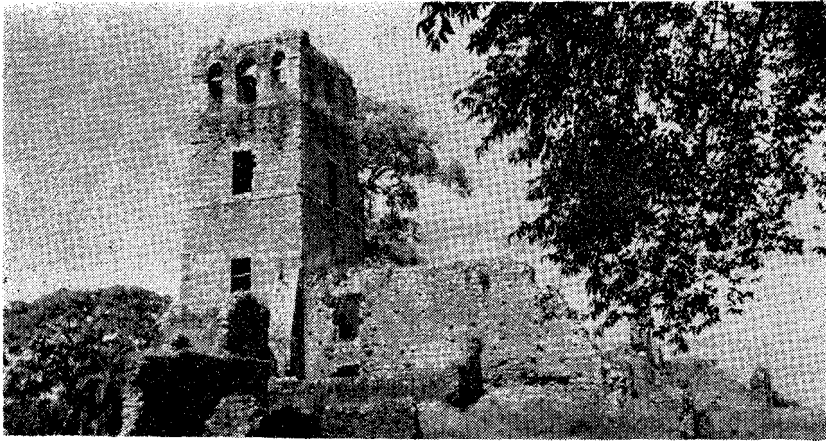


Photo Flateau, Panama

The Cathedral ruins, Old Panama. Razed by English Pirate, Henry Morgan.

the booty of the New World or arriving from Spain laden with merchandise for the incipient but fastidious American trade. Francis Drake was one of the boldest corsairs of all; his name and exploits are known even beyond the notoriety he deserves.

Probably the most bloody and tragic portion of the Isthmian story was enacted in 1666 when Henry Morgan, the English pirate (subsequently knighted), threatened, raided, sacked and tortured his way into the wealth of the land. His final objective was (Old) Panama City. Despite a street by street resistance the city fell, a shamble of fiery ruins. The valuables of the city itself, together with the priests and nuns had been transported for safe keeping to Peru. However heavy

ransom demands upon such fugitives as were captured in the countryside produced from hiding places enough loot to require 195 mules to transport it across the Isthmus to Morgan's ships.

In the latter part of 1671 the new governor of Panama arrived with orders to undertake the rebuilding of the city on the same site or any other which offered better defense facilities. The small peninsula which jutted into the sea at the foot of Ancon Hill was chosen and the work of clearing and preparing the ground got underway. On January 21, 1673, with formal ceremonies, the founding of the city was proclaimed and work on the erection of the defenses started. In the end the city was protected by a great wall armed with heavy artillery and pillboxes and protected further by a wide moat on the land side.

Popular and religious feasts broke the monotony of life in economically depressed Panama, but though celebrations lacked the splendor of other times the enthusiasm was the same, the wealthy celebrating within the premises of their ample salons while the poor turned to the streets and public plazas for their entertainment.

But it was an ambient of misery, ignorance and favoritism which prevailed everywhere. In Europe the situation was approaching that significant popular explosion that was the French revolution, destined to produce an absolute transforma-

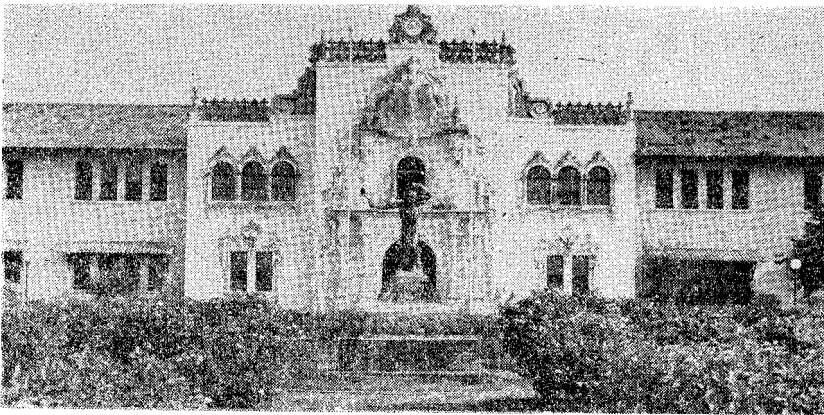


Photo Plateau, Panama

Normal School, Santiago where Panama's school teachers are trained.

tion in the political ideas of the times. In the New World, the North American Republic was rising like a luminous star, as a result of the efforts of George Washington and other determined battlers for human liberty. The idea of independence was being born in the minds of many men who expected more from self-government for their respective territories.

Freedom in Ferment

The early 1800's saw the first attempts by the colonists to shake off the dominion of Spain. The dream of independence and freedom grew apace. Frequently the Isthmus of Panama served as the arsenal for much of South America. By 1821 the independence fever was at its height in Panama. Central America had just declared itself independent, the royalists in Venezuela had been pushed back and Cartagena had been conquered. The fact that a Panamanian was in command on the Isthmus prompted the Isthmians to act and emancipate themselves from Spain by their own efforts.

The plan of the Panamanian leaders was to encourage desertions among the members of the Spanish forces. Soon, barely enough men were left for the indispensable services of the garrison. On a single night sixty Spanish soldiers deserted with their arms.

The people and their leaders invaded Cathedral Plaza and demanded that the City Council be convened to decide the future fate of the Isthmus. Shortly thereafter the governor and Military Commander, the Bishop of the Diocese, other officials and notable citizens assembled in the City Hall. A motion was approved in which the territory of the Isthmus declared itself free and independent of Spanish rule. The Panamanians also resolved to throw in their lot with Colombia (Nueva Granada), the neighboring nation to the South, which had only recently been snatched from Spain.

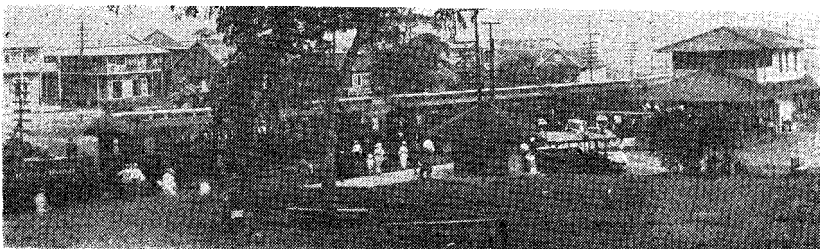
Thus Panama became independent without the firing of a shot or the loss of a single life. The rest of the Isthmian communities confirmed the action of Panama City and the entire Isthmus was free to determine the future course of its national life.

The Panama Railroad

In 1840 the first steamers began plying between England and the West Indies. Arrangements were concluded to make Chagres a port of call. In 1844 the first steamship to navigate in Panamanian waters dropped anchor in the port of Chagres. It was a unit of the merchant fleet of the Royal Mail Steam Packet Company. Almost simultaneously the Pacific Steam Navigation Company acted to extend its run along the South American coast to include the Port of Panama on the Pacific side. The establishment of these two British steamship lines on either side of the Isthmus soon brought new life to the economy of Panama and the situation improved modestly.

At the beginning of 1849 a pure Liberal administration assumed power in New Granada and immediately decreed the abolition of slavery and capital punishment; established the principle of trial by jury and declared the press free. It also acted to expel the members of Jesuit Order and those bishops who resisted accepting the law. During this administration the contract for the building of the Panama Railroad was signed and work commenced.

The United States Congress had enacted legislation whereby the government was authorized to enter into contracts for the establishment of steamship lines between the United States



Official Panama Canal Photograph

Panama Railroad Station, Culebra, 1914

and the Isthmus of Panama. Two steamship lines were established, one running from New York, via New Orleans, to Chagres and the other connecting Alta, California, and Oregon with Panama.

With the gold rush to California drawing travelers from the Eastern areas of the United States in large numbers, the ships calling at Chagres and at Panama had to be increased in number. Thus by 1851 new steamship lines were operating ships to the Isthmus from the United States. There were 32 steamers making the run between Panama and California at that time and 15 plying between the Isthmus and New York and New Orleans. In addition to these, there were an undetermined number of sailing ships.

Thousands of emigrants thus arrived each month on the Isthmus to cross from Chagres via Gorgona and Cruces to Panama, there to await ship connections. This steady stream of visitors inevitably influenced the economic life of the country and every industry flourished.

With the establishment of steamship communications between the Isthmus and the outside world, the use of mule trains as the connecting link between the two ports to carry the cargoes discharged by the arriving ships proved insufficient and deficient. Some speedier means of transportation was necessary. This need was already evident in 1837 when Colonel Charles Biddle, an American citizen, sought and obtained a concession to span the Isthmus with a railroad. Incapable of carrying out the concession, he allowed it to lapse. In 1845,

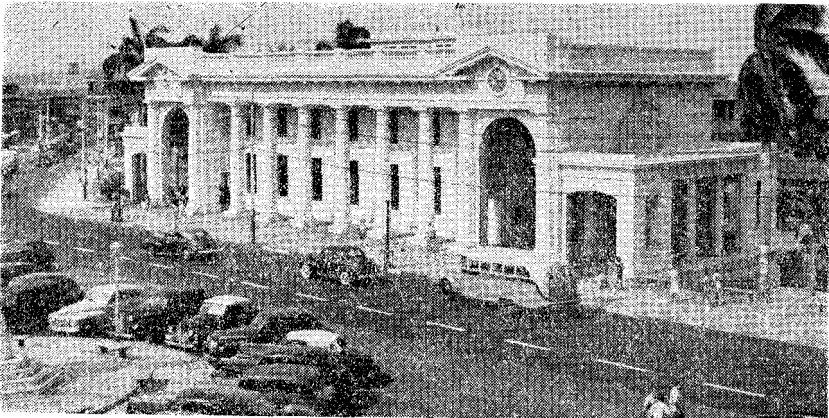


Photo Fleteau, Panama

Panama Railroad Terminal, Panama City

Mathew Klein, also an American, was granted the right to build a railroad. He also failed and his contract lapsed. Then in 1850, William Aspinwall, John Lloyd Stephens and Henry Chauncey organized the Panama Railroad Company and obtained a concession. Their plan was to operate the railroad in connection with the steamship line they controlled in the Pacific.

Work on the railroad started in May, 1850, under the direction of Engineer George M. Totten and, on the 27th day of January, 1855, the last rail completing the trans-Isthmian line was laid in its terminal station in the City of Panama. The railroad was built at a cost of \$8,000,000 and its construction and operation sealed the doom of Chagres and Portobelo as ports on the Atlantic littoral of the Isthmus. Panama City also suffered economically, but not to the point of ruin, because the transit of merchandise and passengers through the territory produced more or less steady employment for the Panamanian workers and afforded local commerce a modest turnover.

The old paved highway that had carried traffic from one ocean to the other since long before the Pilgrims made their famous landing on North American shores was destined to fall into disuse and eventually to be reclaimed by the ever waiting

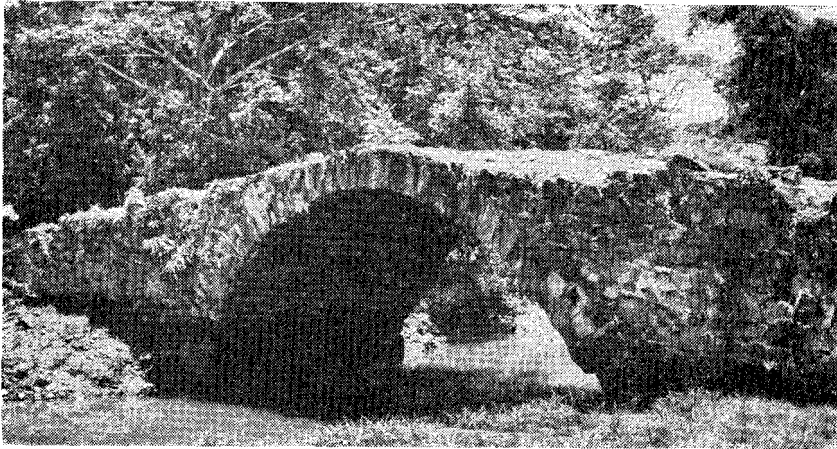


Photo Plateau, Panama

The King's Bridge

On the ancient road that began at Old Panama City and ended at Porto Bello. Across it donkeys and slaves carried many millions of dollars worth of Peruvian gold, and other produce, bound for Europe.

jungle. Small portions of it, however, are still visible. It is said that \$85,000,000 in silver and some \$280,000,000 in gold from California fields, had been transported over this road and by river boat. Within five years after its completion the new railroad had carried another \$300,000,000, not to mention the thousands of passengers and millions in produce. There are few more profitable investments on record than this railroad. Every dollar invested in the beginning days, in later years had a redemption value of nearly \$50, and meanwhile it had earned another \$50 in dividends! Now property of the United States Government the Panama Railroad is auxiliary to the Canal. The popular assertion that its building cost as many lives as there are ties under its tracks is a gross exaggeration. According to a Canal employee who spent his vacation counting these ties they total 94,326. The official estimate of deaths during construction is 6,000. The lignum vitae used for ties is so hard that spikes may not be driven into it. Hence it is bored and the rails are bolted on. Ships use this wood in the making of bearings. Despite constant rains and omnivorous insects, many of these ties, laid a century ago, are still sound.



Photo Flateau, Panama

Native dress, Panamanian women

The building of the Canal made necessary the relocation of the Panama Railroad as the area traversed by the original line was destined to be submerged under Gatun Lake. Accordingly in 1907 work started on the laying of the new line under the supervision first of Ralph Budd, the Panama Railroad Company's Chief Engineer and later, by Lt. Frederick Mears who took over the job from Engineer Budd in the middle of 1909. The new road was completed in 1912.

The building of the railroad, together with the gold rush had brought a great many English-speaking people to Panama. To provide them with news the *Panama Star*, forerunner of the *Panama Star and Herald* of today was started in 1849. The *Aspinwall Courier* was launched in Colon four years later.

Birth Pangs of the Canal

In 1834 the Congress of New Granada authorized the government of Panama to enter into any arrangement it deemed convenient for the construction of a waterway or road across the Isthmus. In 1835 the Baron de Thierry, a Frenchman, received a concession to build a canal. But he lost interest in the project and never attempted to make it a reality. Colonel Charles Biddle favored using the channel of the Chagres to Cruces and a railroad from that river port to Panama. But he encountered difficulties with his government before he started, and his concession lapsed.

In June, 1942, the New Granada Congress voted to annul all outstanding canal concessions.

Proposals continued to be made throughout the period between 1842 to 1878 by French and American interests. Early in 1878 Napoleon Bonaparte Wyse obtained a concession from the Colombian government (New Granada had been reorganized into the "United States of Colombia") for the building of a canal and undertook to enter into an arrangement with the Panama Railroad Company which held the right to compensation if any canal was built affecting its right of way. The French thought it best to buy a controlling share in the Panama Railroad.

The French Canal Company started operations with a

capital of 400,000,000 francs. It was allowed eight years in which to finish the job.

Count Ferdinand de Lesseps, president of the company, arrived at Colon and in January of 1880 held formal ceremonies at the mouth of the Rio Grande (the present Pacific entrance to the canal) inaugurating the surveys. In 1881 the French technicians began to arrive and, after that, every ship brought more men and materials and work on the canal got underway. The following year work on the excavation to create the Culebra was started.

In time the French changed their plan from a sea level type of waterway to a lock canal, with five locks on the Atlantic side and five on the Pacific. Gustave Eiffel obtained the contract to build the locks; he undertook to have them ready by the latter part of 1891.

By December, 1888, however, the financial situation of the company was in such disastrous condition that the French government was forced to step in to save what could be saved of the heavy investment in the canal by the French people. The company passed into the hands of a receivership. On February 4, 1889, the old company was formally declared dissolved.

As was to be expected, the dissolution of the company and the paralyzation of work threw the Isthmian economy into



Photo Plateau, Panama

Panama Government buildings, Panama City

chaos with almost 15,000 employees—laborers and technicians—idle. Only a bare force of watchmen or property guardians was kept whose nations were affected, but large numbers stayed on hoping for a revival of work, meanwhile ekeing out a bare existence as best they could.

Following the collapse of the old company whose concession would expire in 1893, the receivers sought an extension for another ten years. Colombia agreed but stipulated that a new company be organized and work resumed immediately. The new company was organized and work resumed by October



The American Embassy, Panama City

1894. The new company completely abandoned the sea level project and definitely adopted the lock type canal.

But the going was rough for the new company. By 1898 its representatives were endeavoring to interest the United States government in acquiring the French rights and properties on the Isthmus. An offer was formally made to President McKinley in December, 1898.

Then the era of American interest in the Panama route dawned. The Spanish-American war, which resulted in the spectacular dash of the U.S.S. "Oregon" around Cape Horn to take part in the blockade of Cuba, aroused American public

opinion to the pressing need of a means of passage from one ocean to the other nearer to the United States.

In January, 1902, the American Interoceanic Canal Commission expressed the opinion that Panama route was the more practicable and feasible compared with the route through Nicaragua. Then followed the Spooner Act—approved June 25, 1902—which authorized the government to build a canal either at Panama or Nicaragua. The battle of the routes then began, with the friends of the Nicaragua route doing everything possible to discredit the Panama route and intensify prejudice against it.

But Panama also had its friends who acted to impress Congress favorably toward Panama. They circulated among the Congressmen a postage stamp showing a volcano on the shores of Lake Nicaragua in violent eruption, which they contrasted with pictures of the flat arch in the ruins of the Convent of Santo Domingo in Panama to demonstrate how free the Isthmus was of seismic disturbances when such an arch could have remained in position for more than two centuries. Gradually, interest was weaned away from the Nicaragua project.

Negotiations for a treaty between the United States and Colombia were successfully completed on January 22, 1903. The treaty's ratification by the United States Senate followed on March 17, 1903. It was then up to Colombia to complete the agreement by ratifying it.

But the treaty was received with hostility in the influential quarters of Colombia. By April indications were that it would not be ratified by the Colombian congress, scheduled to open its sessions in June. At length the Colombian Senate voted to suspend further discussions and adjourned.

Colombia wanted more money from the United States. The situation before the Colombians was: In 1904 the concession which the French held would expire. As there was no chance of the Canal being finished by then, this meant the forfeit of the concession. Every stick of French Canal property on the Isthmus—for which the United States was ready to pay \$40,000,000—would then revert to Colombia. If they waited one

year more, they could receive \$50,000,000 for the canal. The temptation was great.

News of the rejection of the treaty was received with consternation by the people of Panama. But few were surprised. The outcome had been expected. The Panamanians knew the Colombians were playing for high stakes and would hold out to the last. They deeply resented, however, the indifference which the Colombians displayed toward Panama's interests as they played fast and loose with a matter so vitally important to the economic life of the Isthmus.

Therefore, long before the treaty was actually rejected, the Panamanian leaders had begun to plan for the secession of the Isthmus. They wanted more voice in the handling of Isthmian affairs, which too long had been exploited for the exclusive benefit of the governing clique at Bogota.

The chief conspirator was Senator Dr. Jose Agustin Arango, supported by the members of his immediate family at the start. Later, other Panamanian leaders joined the movement and by September, 1903, steps were being taken to ascertain what the attitude of the United States would be if the Isthmian people decided to revolt.

Dr. Manuel Amador Guerrero, who became the first president of the Republic of Panama, went to New York to feel out the situation and ascertain what Panama could expect from the United States. He received little encouragement. Disillusioned, he was preparing to return to Panama when he met Philippe Bunau-Varilla, the former chief engineer of the new French Canal Company. Knowing the interest the French had in defeating the Colombians, Amador acquainted him with the nature of his mission and the discouraging results. Bunau-Varilla promised to help and set to work to put all the influence he had into play, convinced that the only solution for the problem created by Colombia would be the independence of the Isthmus.

Amador returned to Panama very much heartened. Bunau-Varilla was promised that, should the revolution succeed, he would be appointed Panama's Minister Plenipotentiary, em-

powered to negotiate the treaty. It was October 27th when Amador returned to Panama.

During the early morning of November 3rd word reached Panama that an unexpected contingent of 500 Colombian troops had landed in Colon. The Panamanians were thrown into panic. They knew if these troops crossed the Isthmus to the capital, all would be lost and heads would begin to roll.

The leaders contacted Colonel Shaler, Superintendent of the Panama Railroad and communicated their fears. He agreed to help. When the Colombian officers asked for transportation for the men, Shaler informed them that he would arrange for the dispatch of the men later in the afternoon. Meanwhile he placed his luxurious parlor car at the disposal of the Colombian generals, to transport them to the capital ahead of the troops. The offer was accepted and the generals were thus separated from their troops. They were received with full honors by the troops of the garrison under General Esteban Huertas, on arriving in Panama. By five o'clock that day they were prisoners, under guard, at the Panama Police Station.

In the intervening hours the people were armed and a volunteer force organized. The Proclamation of Independence

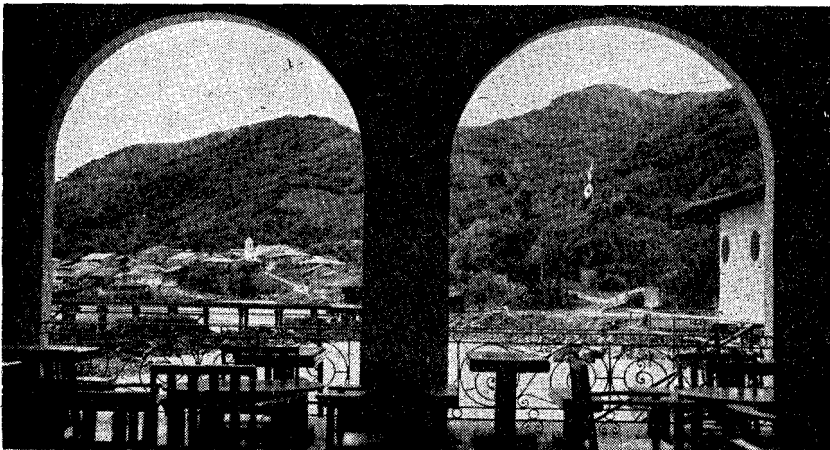


Photo Plateau, Panama

Pavillion, Taboga Island

This entrancing island, twelve miles off Panama's coast in Panama Bay is a favorite recreation center. The Canal builders were sent there for recuperation after an illness. It is alleged that Hawaii's world famous Pineapple first budded in this Pacific Eden.

was signed by the members of the Municipal Council that same evening and the next day the people were convened in Cathedral Plaza to adhere formally to the movement.

Finally, after two days of anxiety in Colon, where the Colombian troops threatened dire action unless they could get transportation to Panama, the officer in charge agreed to re-embark his troops and return to Colombia. They sailed on the morning of November 5th.

The recognition of Panama by the United States came on November 13th, followed immediately by the other leading powers of the world, and the Republic of Panama became a legal fact. On November 18th Bunau-Varilla signed the Panama Canal Treaty on behalf of Panama. Ratification of the instrument by Panama's government followed on December 2, 1903.

To consolidate the Republic, delegates to a National Convention were elected and installed as a Constituent Assembly on January 15, 1904. One month later they approved the National Constitution.

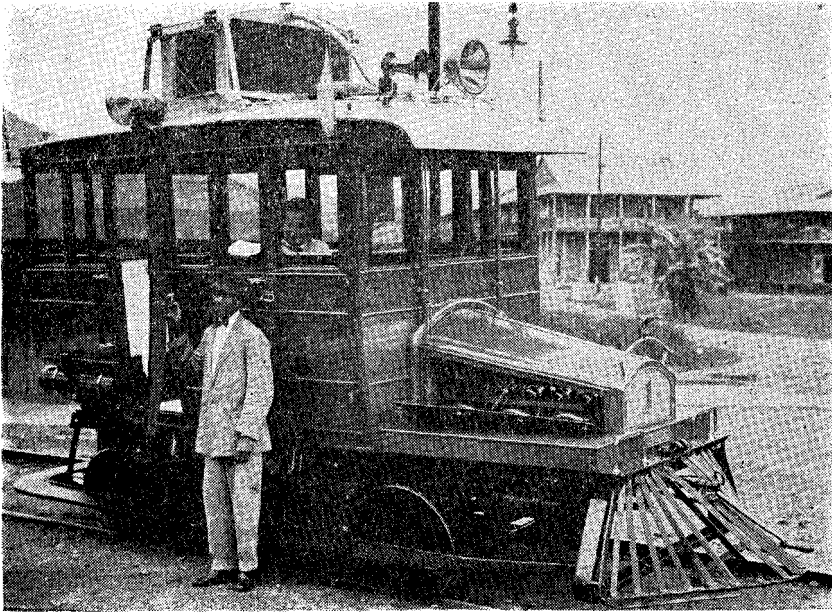
The United States then acted to acquire possession of the French Canal properties. On February 23, 1904, the treaty with Panama was ratified by the United States Senate, and the exchange of ratifications took place in Washington on February 26th. The deeds to the properties of the French Canal Company were signed in Paris, transferring the property to the United States and, on April 23, a general meeting of the company's stockholders ratified the transfer. The canal property of the French on the Isthmus was taken over by Lt. Mark Brooks on behalf of the United States.

There was no ceremony. No triumphal arches were erected as when de Lesseps arrived in 1880 to start work on the old French canal. No champagne flowed and no pretty speeches were heard. Lt. Brooks simply took over as representative of the United States government and marked time until Governor Davis arrived.

Then work on the building of the waterway started, the French materials were surveyed to determine what portion could be used and technical staffs were organized preparatory to making "dirt fly."

In 1905 the "most advantageous type" of canal had not been determined. Eventually the 85-foot lock canal was chosen and on June 29, 1906, Congress gave its approval.

The second Isthmian Canal Commission passed out of the



Official Panama Canal photograph

Motor Car Number One

Alias "The Yellow Peril," or "The Brain Wagon." This famous railway motor car carried Colonel Goethals to every nook and corner of the Canal during the construction era—and often at inopportune moments.

picture through resignations. In April, 1907, President Theodore Roosevelt appointed the third and last Commission with Colonel George W. Goethals as Chairman. It included three other Army officers, one Navy officer and two civilians. A few months later President Roosevelt increased the authority and power of Colonel Goethals, making him responsible only to the Secretary of War and the President.

Comes Colonel Goethals

The untiring, efficient and fair-minded Colonel George W. Goethals, who directed the Canal's army of workers, was a dis-

ciplinarian first and foremost. He found time to receive most of those with complaints that ranged from job troubles to domestic difficulties. All were received with courtesy and fairness regardless of race or rank. All were given a patient hearing. Problems that could be solved immediately were so disposed of. Anyone insisting upon presenting his grievances direct to "The Old Man" was promised an audience with the Colonel after he had given a stenographer the essence of his complaint. Many a case ended when the plaintiff upon reading his own story had realized its insignificance.

Though Goethal's authority was great he never thought himself above consulting his advisers. His autocratic powers were never misused, yet he required that every man give all that he was supposed to give to the job. He was an army man

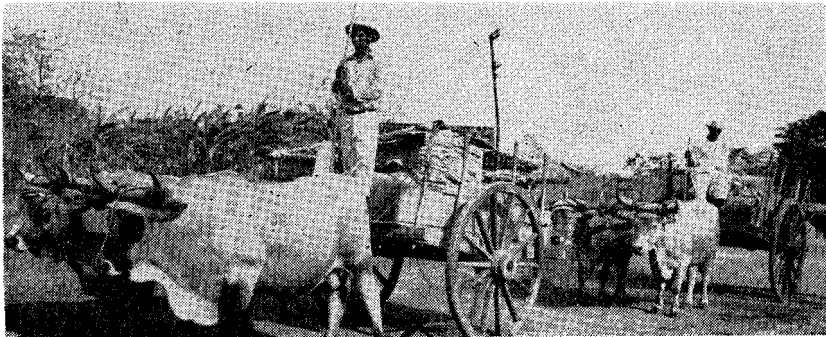


Photo Plateau, Panama

Ox Carts are common in Panama's interior highways

but upon taking charge he made it clear that there was to be no militarism, nothing to indicate that the Army was in command. "Every man who does his duty will never have cause to complain of militarism," was an early public utterance, after his arrival in March 1907.

The laboring force that dug the Canal was composed of men of many nationalities and races. They came (negroes) from the islands of the West Indies — Jamaica, Barbados, Martinique, Guadalupe, Trinidad. Spain, Italy, Greece, France and other countries furnished their quota. But relatively few Panamanians were employed mainly because with public works programs and private building construction underway in the



A Mud Plastered House

Typical dwelling of Panama's self-reliant and highly respected interior Indian.

Republic, better remuneration was available to the natives in their own territory.

Battling the Bugs

Another important figure during construction days was Colonel (later General) William Crawford Gorgas. It was his boundless energy, patience, zeal and experience that speedily established a high degree of sanitation in the Canal Zone and the neighboring cities of Colon and Panama City. If the mortality rate of the French era had continued during the 10 construction years under the Americans it would have approached 80,000. As it was, only 6,839 succumbed to disease. Most of these deaths occurred before the completion of Dr. Gorgas' sanitation program, that changed a pesthole into a paradise. Deaths from malaria dropped from 7.45 per thousand in 1906 to zero, eight years later. The battle against "bugs" was waged from every conceivable angle. In a single year 120 tons of pyrethrum powder, 330 tons of sulphur and 2,600,000 gallons of kerosene were used. In Cuba, Dr. Gorgas had learned that the mosquito was the transmitting agent of malarial and yellow fever germs. He waged an unrelenting war against these pests, including the propagation of their natural enemies such as spiders, frogs, lizards and fish. Along with this fight were measures to dimin-

ish typhoid, cholera and dysentery. Hospitals of the highest order, with research laboratories, were established. Mobile units went from these hospitals to dispense quinine and other medicines to workmen on the job. A mental hospital was started at Corozal, quarantine stations were initiated, together with a model leper colony at Palo Seco — still in operation.

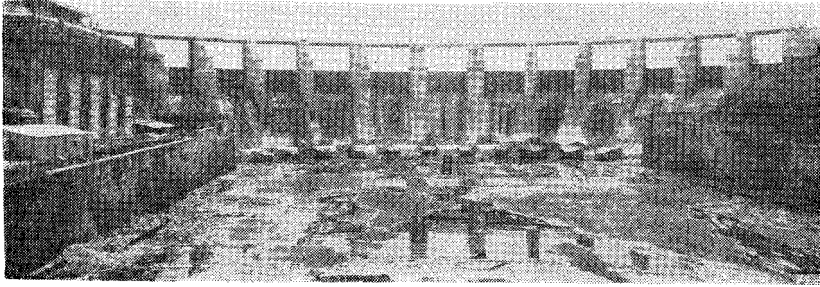
Gorgas found in President Amador of Panama (also a physician) a staunch and cooperative aid in carrying out his disease-prevention program in Panamanian centers. Houses were fumigated, dug wells were sealed and all potential breeding places of mosquitoes brought under control.

True to his reputation for finding a humorous angle, even to tragedy, the Yankee pioneer faced the probabilities of death with a grin on his face. This attitude is reflected in the *Year Book* of the Society of the Chagres, credited to Grantland Rice. A facetious News Note stated that the price of coffins was to be doubled because of a scarcity of lumber. In response a consoling comment was offered to the effect that the Panama Canal had opened an up-to-date crematory, the satisfaction of whose service was "guaranteed or money refunded to patrons on demand."

An Enormous Project

The French Company was paid \$40,000,000 for its properties rights, \$10,000,000 went to Panama and \$20,000,000 for sanitation while the cost of construction was \$305,148,000. The peak of employment records show 40,000 on the pay roll during the years 1912 and 1913. The Canal fails to pay even a three per centum of simple interest on the investment. That, however, is characteristic of highways, schools, libraries, and most public enterprises, not to mention the pyramided billions poured into armaments.

One of the larger tasks was the construction of a dam to hold the waters of the Chagres and other rivers thus creating Gatun Lake on whose surface ships ride over smaller hilltops from one set of locks to another. This dam was constructed at Gatun. Its bowed crest is one half mile thick at the base tapering to 500 feet at the top. It is one and one-half mile in length and its slopes provide space for an 18 hole golf course. Few



Official Panama Canal photograph

Spillway, Gatun Dam

From a military standpoint this is doubtless the world's most strategic dam. The dwarfed human figures on the cat walk indicate something of its enormity.

spots in all the world were more carefully guarded during World War II. Had enemy bombs destroyed this dam the lake would have been lost, making the locks useless. After repairing the dam approximately two years would have been required to again fill the lake—85 feet deep, covering an area of nearly 200 square miles. This, despite the fact that the mighty Chagres delivers 80 billion cubic feet of water annually. The possibility of creating a dam sufficiently strong to hold back the tremendous pressure of such a lake was doubted, affirmed and debated in North America by parlor engineers, editors and uninformed Congressmen. This man-made mountain rests on thousands of tons of rock towed from Porto Bello in scows. On top of this was piled literally millions of tons of earth from the big cut, mixed with a constant stream of muddy silt from the river's bottom. A fourteen-gate spillway regulates the level of the lake.

The Culebra Cut—subsequently named Gaillard Cut in honor of the engineer who directed the digging—was a spectacular portion of the huge task. Most of the earth used in constructing Gatun Dam, the whole area at the foot of Ancon Hill in Balboa, new fills on the changed Panama railroad route, the Colon breakwater and the Fort Amador causeway came from the "V" shaped slice taken out of Culebra mountain. It is said that a city block 19 miles high could have been builded with the material moved out of this cut. It has been estimated that to move it all at one time would have required the concen-



Official Panama Canal photograph

Culebra Cut, 1913

Looking north from the East bank midway between Culebra and Empire. Observe the temporary service bridge.

trated power of enough railroad locomotives to reach from San Francisco to London, England. There were in constant use 140 such engines dragging long dirt trains from cut to fills. Dynamite was used at the rate of 6,000,000 pounds annually, most of it in the big cut. The Cut was an enormous "V" nine miles long and 500 feet deep with a base 300 feet wide at the narrowest place. So heavy were the sides that, with no counterbalancing weight in the center, "islands" had a habit of raising in the bottom of the channel. The removal of these and the dirt from slides greatly increased the task. These slides that buried locomotives, steam shovels or anything in their path, have been a threat all through the years. Their probability of occurrence has been greatly diminished by reducing the height and weight of the cut's sides with hydraulic pumps whose forty inch stream of water, emerging with tremendous force, drives earth and rock into the channel where they are sucked up by great dredges and transported for dumping elsewhere.

Most obvious, and of sustained interest, to the casual observer is the Canal locks located at Miraflores, Pedro Miguel

and Gatun. There are in all of these, dual chambers permitting the simultaneous passage of ships in either direction. These chambers, if placed end to end would form an open tunnel three miles long, 110 feet wide and 80 feet deep. Two Washington monuments might be laid end to end in each of them. Their concrete walls taper from 60 feet thick at the base to eight feet at the top. Within each wall there are three tunnels. The upper

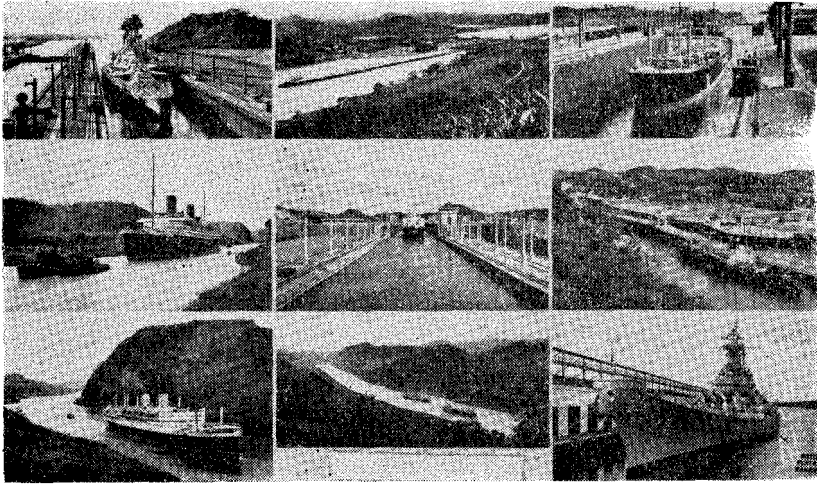


Photo Fleteau, Panama

Typical Canal Views. The Battleship "Missouri" is seen lower right

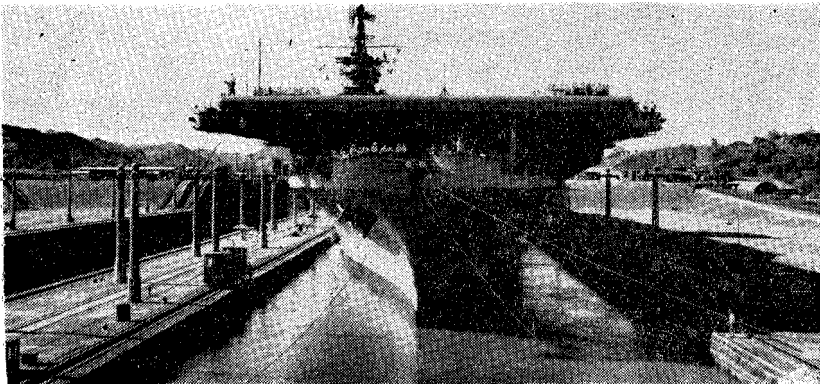
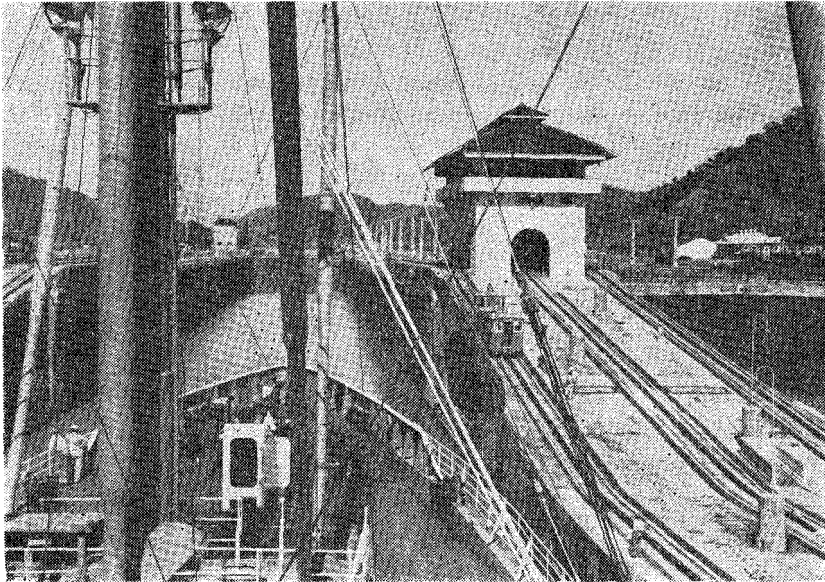


Photo Fleteau, Panama

The "Flat top" Kearsarge fills a locks chamber to a negligible margin with its deck riding above the light posts



Official Panama Canal photograph

The Pedro Miguel Locks

Taken from the deck of a transiting freighter. Below the operation tower may be seen a "donkey engine." This is electrically driven on a cog rail. From four to six of these engines pull and guide ships into and out of the lock chamber. The companion chamber, right, is almost empty.

is for lock machinery, the next is for electrical wiring. The lower tunnel, for drainage in filling and emptying the lock chambers, is comparable to the Hudson river tubes, with plenty of room for a freight train to pass through. Water is retained in the chambers by two gates at either end. These gates are 65 feet wide, seven feet thick and range in height from 47 to 82 feet. There is a total of 92 of them, weighing from 300 to 600 tons each. Their hinges are relieved somewhat by the fact that the lower half of each gate, being partially hollow and water-tight is submerged in water which has a buoyant effect.

A third set of locks was planned, and work on them began in 1940. They were to be duplicates of existing locks with an enlarged capacity. The fact is that most large ships throughout the world, including the "battlewagons" and "flattops" have been tailored to fit the locks of the Panama Canal. The "Third Locks" project was abandoned early in World War II partially

because of that war with its demand for men and materials and partially that the whole question of altering the Canal warranted further study. Such studies have been made by hundreds of engineers whose findings are available for officials in Washington. Among the recommendations made is a sea level Canal.

Chronology shows a dramatic story of the final stages of work: On September 26, 1913, the first lockage took place in Gatun. The tug "Gatun" was lifted from the lower chamber to the 85-foot lake level in an operation lasting almost two hours. But for the occurrence of a slide at Cucaracha, the Canal could have been opened the next month.

On October 10, President Wilson, seated at his desk in Washington, pressed a button and blew up the Gamboa dike, letting the waters of Gatun Lake into the Culebra cut.

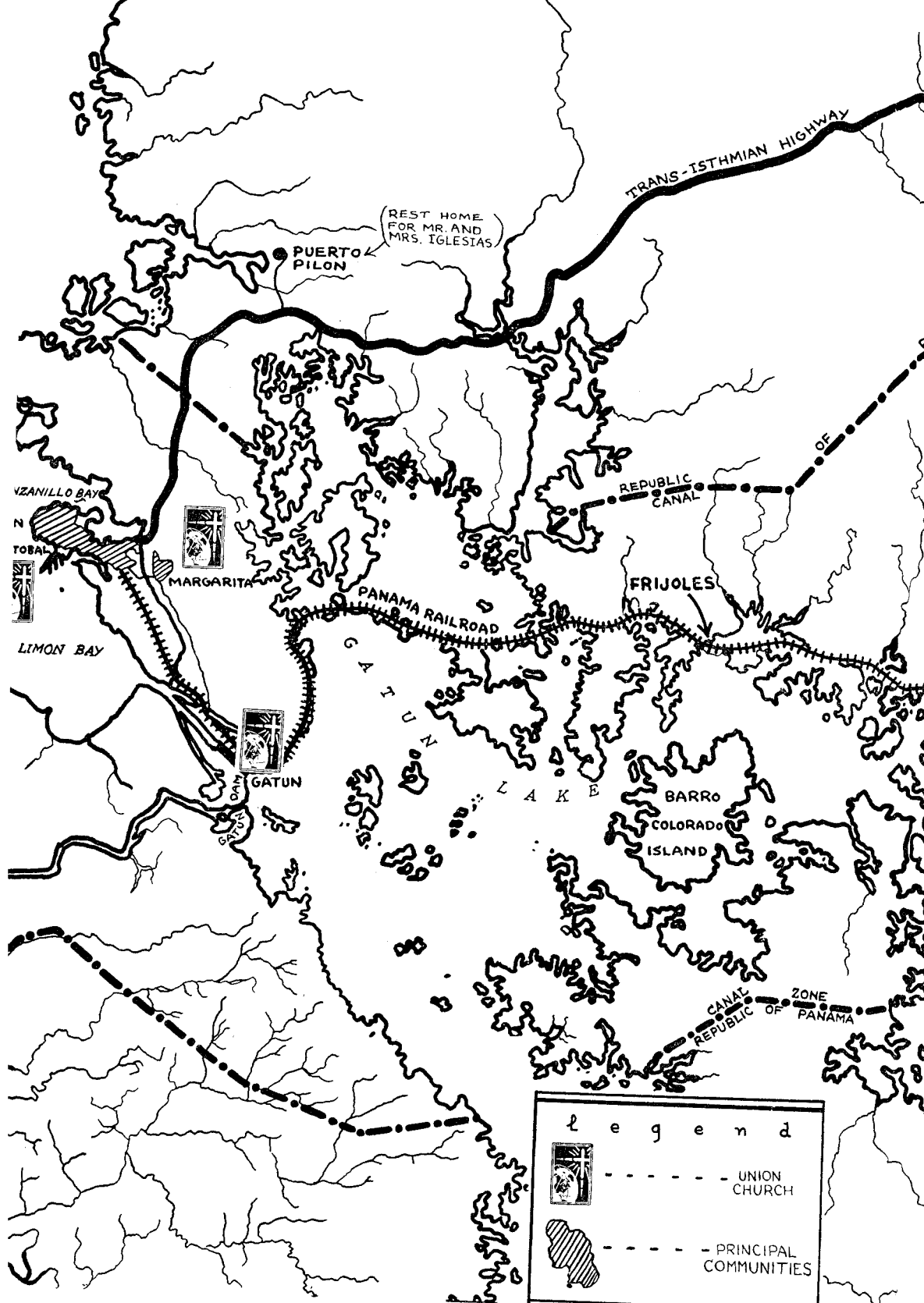
On June 8th, 1914, the S. S. "Alliance" of the Panama Railroad Company tested the Gatun locks in both directions; on June 11 the S. S. "Ancon," a larger ship than the "Alliance," also made the test. On June 18th the Grace liner "Santa Clara" was used to test the towing mules of the Miraflores and Pedro Miguel locks.

On August 14, 1914, the liner "Ancon" of the P. R. R. made the complete transit of the canal from ocean to ocean. It continued to a point five miles off shore through the channel which had been dredged to deep water. Thus was the Panama Canal opened to the commerce of the world, quietly, without fanfare, efficiently operating without hitch.

On the occasion of the 35th anniversary of the Canal's opening the press reported some impressive totals concerning its use. Virtually every maritime flag had used the Canal. Almost 200,000 ships had transited this waterway carrying 685 million tons of cargo composed of every commodity of which the physical texture of modern civilization is builded. Some idea of the gross income to the Canal from all this shipping is indicated in the following paragraph from *The Panama Star and Herald* on January 12, 1950. "A total of 5,084 ocean-going, toll-paying ships that transited the Canal during the 1949 calendar year paid total tolls of \$22,486,663.82."

A Unique By-product

The world's largest "zoo" covers an island in Gatun Lake. Not an inch of its 3,609 acres is without interest to naturalists. It is a mecca for scientists from all over the world who would study its tropical flora, insects, birds and animals. Many a scientific volume has resulted from such studies. There are over 50 species of mammals, 250 of birds, literally thousands of the insect world and tropical flora beyond possibility of description. Tourists tramping the network of marked trails of the dense jungle usually are so noisy as to be the ones seen, rather than the animals who are quietly concealed nearby. Now and again someone reports having been suddenly confronted by a curious, but harmless tiger or puma. The population of this tropical jungle in miniature is protected from destructive hunters. This measure tends to keep the animals less fearful of human beings and hence more observable. It also maintains the balance of nature's food supply, rationed by the jungle's own laws. The inhabitants of this unique zoo are fortunate in that their ancestors chose Barro Colorado mountain, some 450 feet of whose peak was not submerged by the rising waters of Lake Gatun. The name remains from the days when Morgan's men camped at the foot of this high hill enroute to Panama City. Doubtless the scouts of the gold caravans on the old King's road watched for signs of danger from this hilltop. And perhaps those same caravans were sighted from similar vantage points by the cohorts of the outlaws who would prey upon them.



REST HOME FOR MR. AND MRS. IGLESIAS

PUERTO PILON

TRANS-ISTHMIAN HIGHWAY

VIZANILLO BAY

N
TOBAL

LIMON BAY



MARGARITA



GATUN

PANAMA RAILROAD



GATUN LAKE

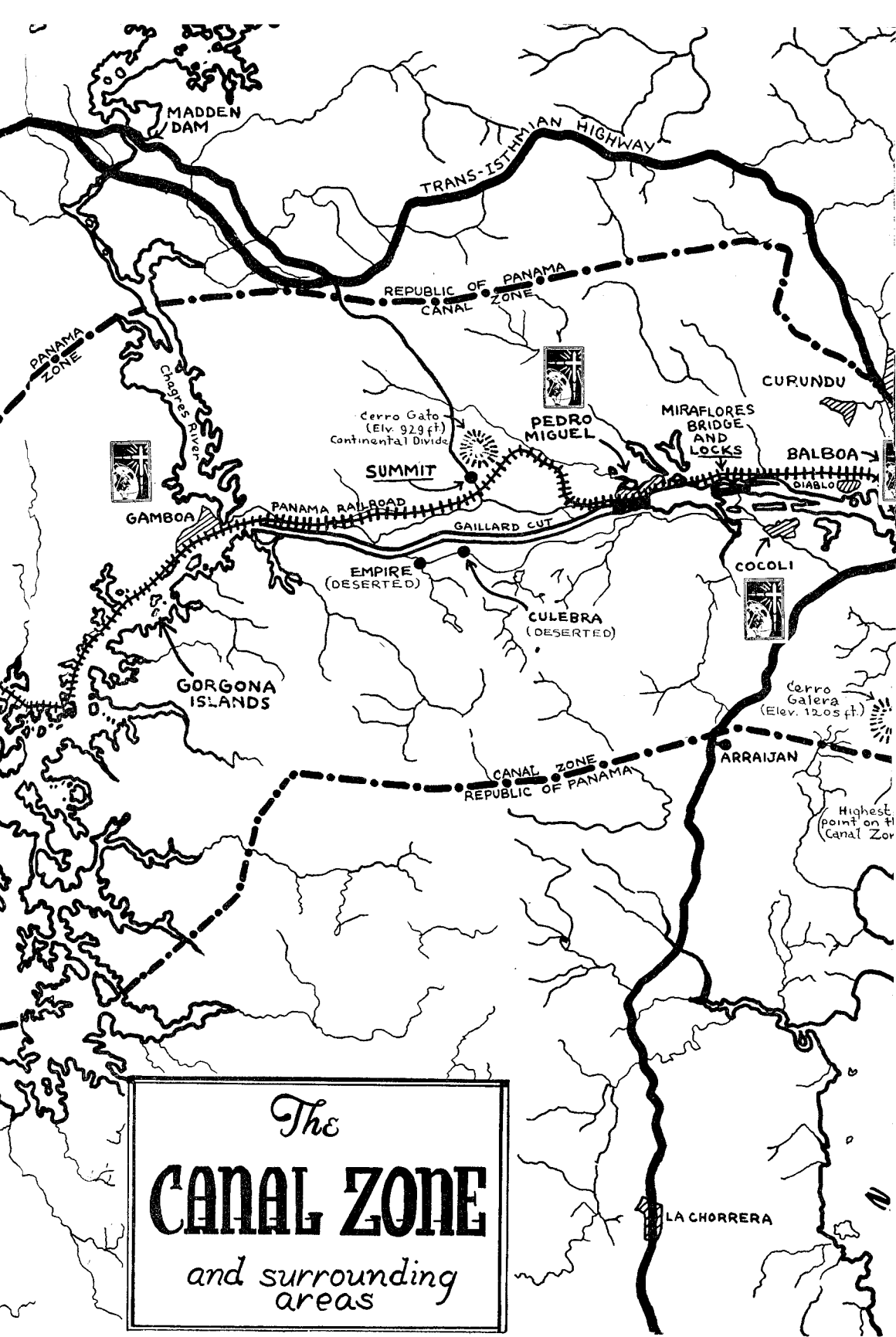
REPUBLIC CANAL

FRIJOLAS

BARRO COLORADO ISLAND

CANAL ZONE
REPUBLIC OF PANAMA

Legend	
	--- UNION CHURCH
	--- PRINCIPAL COMMUNITIES



The
CANAL ZONE
and surrounding
areas