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PANAMA CANAL ZONE

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BUREAU OF NAVIGATION
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PANAMA CANAL ZONE

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Foreword



SINCE warships flying the American flag have made the world of waters their cruising grounds and since they carry with them scores of thousands of seagoing Americans, the interest of the Nation in ports, far and near, has necessarily increased in recent years.

In order to furnish valuable information to officers and enlisted men of the Navy who visit these foreign countries—as well as to other travelers on official business—the Bureau of Navigation is preparing individual guidebooks of the principal ports in all quarters of the globe.

Although every effort has been made to include accurate information on the most important subjects connected with this port, it is realized that some important facts may have been omitted and that certain details may be inaccurate. Any information concerning omissions or inaccuracies, addressed to Guidebook Editor, Bureau of Navigation, will be appreciated. The information will be incorporated into revised editions.

Acknowledgment is made to the National Geographic Society for its suggestions, both as to editorial policy and interesting details concerning Panama Canal and its environs.

Acknowledgment is also made to Underwood & Underwood, New York, for the following photographs, which are copyrighted.

Introduction



THIS is a tale of the Panama waterway and the Canal Zone—a narrative of an epic struggle against disappointments and failures and misfortunes that were overcome only by the courage and resourcefulness of the American people.

Both romance and realism have their part in the construction of the story—the romance of the past and the realism of the present, the two being woven together in the making of the tale.

We go back through the centuries to the day on which Balboa reached the mountain divide on the backbone of Panama, and shading his eyes from the hot glare of the copper ball in the sky, gazed over the blue waters of the Pacific and called them the “southern seas.”

We travel over the route followed by the pack-train mules, whose necks were hung with silver bells that tinkled sweetly as the animals struggled over the rocky trails, weary under their burdens of Indian gold for the Spanish galleons in Limon Bay.

The tale carries us through the days of the Spanish Main, when Sir Henry Morgan and his bearded English buccaneers, in flowing sashes and garb that was scented with salt, landed from their pirate ships and ravaged the coast, looting Old Panama and despoiling the galleons of their tarnished gold.

We come down through the years to the day when De Lesseps, confident of success after digging the Suez Canal through the shifting sands of Egypt,

traveled to Panama, and, backed by a coterie of French financiers, attempted to wed the Atlantic to the Pacific as he had joined the Mediterranean and the Red Sea.

After sympathizing with De Lesseps in his hour of defeat we read on with quickened interest, for now there is something in the story that makes the blood of every American course faster through his veins, and quickens his pulse, and brings a flush of pride to his face, and makes him happy in the knowledge that he is a citizen of the United States.

We see a mighty Nation reach down from the North and pluck rock and soil from their resting places, and jar hill and mountain with blasts of dynamite, and build massive locks, until the task is completed and the dream of centuries has been realized at last.

During all this time we are perfectly aware that the other nations of the world are watching and waiting—watching to see whether the project shall fail; waiting to applaud should the project succeed. And, as we know, the time came for applause and it was rendered in full measure, for the world is generous in its admiration of any great service to humanity.

The greater part of this narrative will be taken up with the latter pages of the history of Panama and the Canal Zone—for there is written in them a story that fascinates the reader, if he be a foreigner, and especially justifies his feeling of pride in his country, if he be an American.

We read of the day in October, 1913, when President Wilson pressed a button in the White House in Washington, sending an electric current 2,000 miles to explode 40 tons of dynamite that shattered the Gamboa dike—last barrier to the waterway between the Atlantic and Pacific Oceans.

And we read, with a smile, perhaps—but always with a smile of complete understanding—that a drab little rowboat was the first craft to pass through the canal after the destruction of the dike. The American realizes the motive behind such an act, for because he is an American he knows of the innate dislike of his country for ostentatious pomp and ceremony, regard for which might cause careful selection of the ship to first traverse the waters of the canal. Was it not a typically American act? The undertaking had been successful after years of effort, and now that it was done the Nation refused to be greatly astonished or seriously consider that something in the nature of a miracle had actually been performed. “We started it and we finished it!” is a fair example of the comment on the building of the Panama Canal. National egoism? Perhaps. But it was the same spirit of egoism that enabled the American people to build a Navy and an Army that started and finished a many times more stupendous task during the course of the World War just concluded.

And now we proceed to the story of Old Panama and the building of the canal, a narrative of battles with fever and malaria, and landslides and native superstitions and other hindrances, and the spending of thousands of lives and hundreds of millions of dollars in gold and silver. It is one of the series of American services to mankind—beginning with the formation of a great Nation from the virgin wilderness of North America and ending with the successful conclusion of the war in Europe.

BLOOD AND GOLD



VASCO Nunez de Balboa, a member of a poverty stricken family of the Spanish nobility, led a more or less dissolute life during his youth, but when he grew older gave himself up to more

worthy pursuits and decided to follow the sea. He joined a trading expedition to the New World and established himself in Santo Domingo, and, after a period of adversity, became the governor of the colony at Darien.

Reports telling of the existence of a great ocean began to reach Balboa, and his curiosity being aroused, he organized an expedition to find the unknown sea. On September 25, 1513, the explorer arrived at a mountain on the Isthmus of Panama, and from the summit he gained his first view of the Pacific, being the first European to penetrate to the western coast of the New World.

Four days later Balboa reached the shore and took possession in the name of

the King of Spain, and gave the name "South Sea" to the vast expanse of water extending for thousands of miles toward the strange and unexplored regions to the west—and "South Sea" was later changed to "Pacific Ocean."

The Isthmus became a trade route between the Pacific and Atlantic Oceans, the highway of commerce passing overland from Panama to Porto Bello. Gold from the mines and treasure houses of Peru was carried on the backs of mules to Limon Bay and transferred to the holds of great galleons from Spain.

Historical accounts of those romantic days in Panama are filled with thrilling stories of fights between the Indian natives and the invaders who roamed the country in search of gold, practicing every form of cruelty and not hesitating to assume the rôle of ghouls, looting the sepulchres of Peru and the Isthmus in search of the precious metal.

After the gold had been placed in the galleons, it still had to be taken to Spain before the Spaniards could be assured of its possession; and much blood was shed and treasure ships were sunk and fortunes



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Rusted and Decaying Machinery Belonging Originally to the French.

changed hands in desperate battles on the high seas between freebooters and the sailors and soldiers on the Spanish craft.

Old Panama was established in 1519, and remained the principal city on the

Pacific coast until Sir Henry Morgan, then an admiral in command of a force of English buccaneers, sailed to Cuba and the mainland, and in 1671 he captured and destroyed the city.

The ruins of Old Panama still remain, and the visitor who travels that way will see the ancient gates and walls where the gallant soldiers of Spain fought the bronzed freebooters under Morgan, and died—some silent and some screaming—under the swords of the men in jackboots, whose leather coats were spattered with blood and stained with powder and whose pockets were heavy with “good red gold.”

Since the discovery of the Pacific the advisability of digging a canal across the Isthmus had been discussed and Charles V of Spain ordered a survey, intending to begin construction of the waterway. The governor of Darien, however, declared the project impossible of success and the plan was abandoned.

In 1551 another Spaniard, De Gomara, urged the building of a canal; but the Government of Spain had decided to devote its entire attention to gaining control of trade between Europe and



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America, and the death penalty was provided for anyone who should seek a better route from Porto Bello to Panama.

The discovery of gold in California in '49 greatly augmented traffic across the Isthmus, and during President Grant's administration the popular cry for action became so great that Congress passed a resolution providing for a survey of the Isthmus by officers of the Navy. A committee was appointed in 1872 to consider the report, but before definite action could be taken a concession was granted by the Government of Colombo, then in control of Panama, to Lieut. Lucien Napoleon Bonaparte Wyse of the French Army.

Lieut. Wyse sold his concession to French financiers, who engaged De Lesseps to construct the canal, and the company began operations in 1881 with every hope of success; but the mountains of the Isthmus presented more formidable obstacles than the sands of Suez, and the project was practically abandoned.

The French expended \$300,000,000 and failed. The Americans spent \$375,000,000 and succeeded, although only

\$30,000,000 worth of the excavating done by De Lesseps was available for the canal as finally completed. The failure of the French to finish the work of construction is ascribed to two reasons—waste of funds, and tropical diseases that killed hundreds and thousands of canal workers, both engineers and laborers.

THE EAGLE DIGS



SINCE the French embarked on the project to build the canal the United States had been looking on with friendly interest, knowing that a great service would be performed in the completion of the waterway, and perfectly willing to give France the credit provided she succeeded in connecting the two oceans.

When the De Lesseps venture met disaster it looked as if the canal would remain only a dream, possibly for centuries, exciting perhaps the imagination of engineers, but still making it necessary for ships to brave the stormy passage

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Pacific Fleet Passing Through Gaillard Cut

through the Straits of Magellan or around the Horn.

Congress and President Roosevelt, however, realized the great value of a Panama Canal to the United States, both in a naval and in a commercial sense, especially after the lesson taught through the voyage of the gallant U. S. S. *Oregon* around Cape Horn during the Spanish-American War.

Sixteen

The Nation, too, appreciated very keenly the fact that such a canal would decrease the distance by sea from New York to San Francisco by 8,500 miles and the distance from New York to Australia by 4,000 miles, and that the ports of the opposite coasts of North and South America would be brought closer together by a waterway across the Isthmus of Panama.

Congress authorized the expenditure of \$40,000,000 for acquiring the property and rights of the new company that had succeeded the De Lesseps organization, and the offer was accepted in 1903. The United States then proposed to give the sum of \$10,000,000 to the Government of Colombia for the privilege of building the canal, but the proposal was rejected by the Colombian Congress.

The natives of Panama had been following the negotiations with considerable anxiety, for they believed the United States would undertake to build a canal across Nicaragua if the controversy were continued much longer, and they knew in such event their opportunities for prosperity would vanish.



The logical outcome was a revolution, which was begun by the patriots of Panama, and when, during the course of the uprising the Colombians threatened to massacre the Americans in Colon, the captain of the gunboat U. S. S. *Nashville* landed 42 sailors and marines, who speedily restored order.

The revolution having succeeded, the United States, through President Roosevelt and Congress, recognized the new Republic, and a treaty was negotiated by Secretary Hay in 1903 by which our country paid \$10,000,000 to Panama, and in return was given the perpetual right to construct and maintain a canal across the Isthmus.

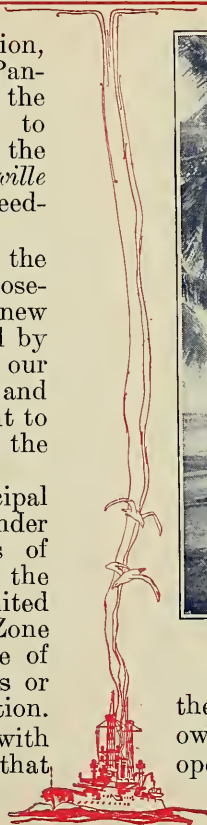
Balboa and Cristobal, the principal ports of the Republic, passed under American control, while the cities of Panama and Colon were retained by the local government, although the United States provided that the Canal Zone authorities should have the privilege of interfering should sanitary conditions or political disturbances warrant such action.

A treaty had been negotiated with Great Britain whereby it was agreed that



Palm Avenue from the Point, Cristobal

the United States should dig the canal, own and operate it when completed, and open it to the commerce of the world, and



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Negro Quarter in Colon Before American Occupation

the American people now entered into the task with the same courage and resourcefulness they had displayed in previous enterprises of a nature affecting the welfare of the Nation.

On May 8, 1904, the Canal Zone was formally taken over by the United States and from then until the oceans were joined in 1913, the workers in the Canal Zone engaged in the glorious task of writing a most brilliant chapter in the history of the United States. The American eagle was using its talons—and soil and rock flew

with a vengeance. Perhaps the eagle was breathing a bit hard, but still it was breathing when the Gamboa Dike was shattered almost 400 years to a day from the time Balboa discovered the Pacific Ocean. And then the American eagle smoothed its ruffled feathers and flapped its wings in triumph; and the British lion raised his tawny mane and gave a roar of approval and was inclined to lionize the eagle; the French rooster pointed to Suez and crowed; the Russian bear said he thought he could bear it; the German eagle screamed a word of comment to the Austrian eagle; the Turkish turkey gobbled; and all proceeded to benefit by the industrious digging of the American eagle.

But in telling of the final triumph of the American national bird we are getting ahead of our story, for there is much in the history of the building of the canal that is so interesting as to deserve attention; so we shall begin here with the story of the fight against yellow fever, and then proceed to the tale of the digging of the "big ditch."



ON YELLOW FEVER



CONTEMPORARY historians speak in measured tones of horror in discussing the black plague that swept over Europe during the Middle Ages, and the pestilences that have ravaged the Eastern

world since the early days of history, but the damage wrought by such epidemics is hardly more appalling than the harvest of death gathered by tropical diseases in Panama before the arrival of American sanitary engineers on the Isthmus.

Yellow fever was the most feared of the tropical diseases in Panama, and none knew the obstacles to progress presented by the malady better than the American Government, for the fever had swept our eastern and southern coasts during the previous century, and had spread also to the Spanish possessions, killing nearly 40,000 persons in Havana, over 100,000 in Spain, and many thousands more in Central America.

The fever not only struck down engineers and laborers engaged in digging

the canal but destroyed the morale of those who survived, and almost unbelievable stories have been told of orgies of crime in Panama during the fever seasons, before the United States gained possession of the Canal Zone.

Affairs soon took a turn for the better. Surgeons of the Army Medical Corps had found in Havana that yellow fever was carried by the bite of a species of mosquito, and Col. W. C. Gorgas, who was made chief sanitary officer of the Canal Zone, undertook to "clean up the place." He succeeded to such a measure that his name stands beside that of Maj. Gen. George C. Goethals, who finished the canal as head of the third Isthmian Canal Commission.

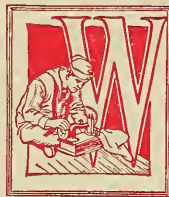
Col. Gorgas' success was made possible by the heroism of Jesse William Lazear and Maj. Walter Reed, Americans; Dr. Aristide Agramonte, Cuban; and James Carroll, Englishman; who conducted valuable experiments in Havana. Lazear died from yellow fever after letting himself be bitten by a mosquito carrying the germ of the disease, while Carroll contracted yellow fever but recovered.



Col. Gorgas established quarantines at the ports, fumigated houses, destroyed rain-water barrels and cisterns, and in Panama closed several popular old wells when he found their supply of water, for the most part, was obtained by drainage from the local cemetery. He cut thousands of acres of brush and grass, dug miles of drainage ditches, and covered the swamps with oil to exterminate the mosquito larvæ as they came to the surface. He laid sewers and built hospitals, and carried on his work so well that the yellow fever fled from Panama in 1905 and took with it malaria, another disease of the country. To-day the Isthmus is fully as healthy as the United States and in much better condition than many European cities, and the song of Gilbert, poet of Colon, no longer holds true in the Canal Zone:

“Beyond the Chagres River,
’Tis said (the story’s old),
Are paths that lead to mountains
Of purest virgin gold.
But ’tis my firm conviction,
Whate’er the tales they tell,
That beyond the Chagres River
All paths lead straight to Hell.”

FINGERS OF IRON



WORK on the canal had been progressing steadily since the transfer of the French concession to the United States, but the ever-present yellow fever had greatly impaired the efficiency of the Canal Zone workers.

Now that the menace presented by tropical diseases had been eliminated, the process of tearing millions of cubic yards of dirt and stone from the bed of the canal went ahead with astonishing swiftness, and the workers settled into the stride that is typical of Americans who see a difficult task before them and are determined to finish it, whatever the cost, in the shortest possible time.

Dredges used by the French company in their effort to dig the canal, and then abandoned, were repaired, scores of new dredges and steam shovels were brought down from the North, and all were set to work piling earth and rock in barges or flat cars that dumped their loads at sea



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or on low swampy ground conveniently near the canal.

There were literally thousands of fingers of steel digging into the soil, getting a good grip on earth and rock and then tearing it from the place where it had rested since the world began. And where dredge and steam shovel failed dynamite was brought into play, and the sound of explosions in the distance so resembled the mutter of thunder that the newcomer to the Canal Zone would glance hastily at the sky, half expecting to see black clouds banked on the horizon with streaks of lightning playing in and out, as a white thread is carried by the flying shuttle through the weave of black cloth on the loom.

Locks and dams and breakwaters and hundreds of miles of railroads were built, artificial lakes were created, and during all this time the fingers of steel kept boring into the earth, carrying on a desperate fight against time and landslides, until the canal had been practically completed and the drab little rowboat plowed through the waterway to prove that the American people had succeeded in their venture.

The rowboat was followed by a tugboat, and then, at the official opening of the canal in 1915, an imposing array of ships passed through the canal, and engineers and laborers were content to rest on their laurels for a day, and breathe deep sighs of satisfaction in the knowledge of a task well done. But the struggle was not over by any means. The finishing touches on the canal had to be made and there was the constantly recurring fight against landslides, which have continued until the present day and will probably challenge the ingenuity and patience of Canal Zone engineers for many years.

Any attempt to follow in detail the history of the building of the canal, from the day the United States took the project over until the waterway was completed, a half score of years later, would require scores of bulky volumes. So let it suffice to say that the estimated cost of building the canal was \$375,200,000, including \$20,000,000 for sanitation, \$7,382,000 for civil administration, and \$50,000,000 paid to the second French canal company and to the Republic of Panama for property and franchises.



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The Tug "Gatun" in Gatun Lock, the First Vessel to Pass through the Lock

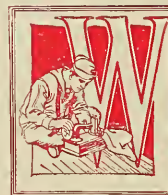
Since the American Government took over the work in 1904 there have been

Twenty-Two

approximately 278,570,372 cubic yards of material excavated and 30,856,744 cubic yards of dry and hydraulic fill placed in the locks, dams, and spillways. The work was accomplished by a force numbering, in normal times, 5,000 Americans, 4,000 Europeans, and 30,000 West Indian Negroes.

In the following pages we shall follow the route of the canal from one port of entry to the other, and see for ourselves the results of years of labor done in the American way and by and under the guidance of American citizens.

COLON TO BALBOA



WHEN the traveler is told that the Atlantic door to the Panama Canal is farther west than the Pacific door, he is inclined to be a bit puzzled, since he knows that the Atlantic Ocean is east of the Pacific. The anomaly is explained by the fact that the general direction of the waterway is from northwest to southeast,



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thus placing the Pacific port of entry about 23 miles farther east than the Atlantic port of entry.

The American port of Cristobal stands at the Atlantic entrance, and, provided the traveler visits the city before proceeding through the canal, he is given an opportunity to view, first-hand, something of the great work accomplished by American engineers along the 10-mile strip of Panama included in the Canal Zone.

Under the supervision of the Canal Commission the harbor facilities have been greatly improved, and the cleanliness of the town bears striking evidence of the thoroughness of the engineers in charge of sanitary work. The older city of Colon, which remains under the jurisdiction of the Republic of Panama, is separated from Cristobal by a narrow street. Cristobal was founded by the French in 1880, while Colon dates back to the middle of the nineteenth century when the Panama Railroad was built across the Isthmus.

Balboa is the American port of entry on the Pacific side of the canal, and near Balboa is the Port of Panama, which should not be confused with Old Panama,

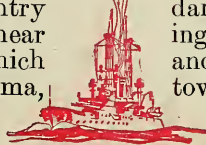
whose picturesque ruins rest in the jungle about five miles away.

The canal passes through Gatun Lake, the surface of which rises 85 feet above sea level, and dredged channels from each side carry the ships to the locks, raising them on a level with the lake. Miraflores and Pedro Miguel Locks stand on the Pacific side and Gatun Locks on the Atlantic side of the lake.

The entire length of the canal, including the dredged portions extending to deep water at either entrance, is 48.84 nautical miles, a little over 50 statute miles; and a boat requires from 10 to 12 hours' time in passing from one ocean to the other.

A depth of 35 feet is maintained in the dredged channels and a depth of 40 feet throughout the remainder of the canal, whose width accommodates two large boats side by side, and whose depth is beyond the draft required by any ship afloat.

Gatun is an artificial lake created by a dam across the Chagres River, necessitating the relocation of the Panama Railroad and the destruction or removal of several towns, one of them being Gorgona, with a



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Landing Pigs at Panama City

population of over 3,000. The great machine shops of the Canal Commission were maintained in Gorgona in addition to the homes of many American and foreign employees.

Miraflores Lake, also artificial, stands farther toward the Pacific, being formed by the construction of the Miraflores Locks and Dam—so Panama may be called a lake canal as well as a lock canal.

One of the principal differences between the Panama and Suez Canals lies in the series of massive locks necessary to the maintenance of the former, while the latter passes through comparatively level territory.

In going through the Panama Canal from the Atlantic to the Pacific a ship encounters the first series of locks at Gatun. The locks are three in number and extend for slightly more than a mile along the course of the canal. At the Pacific end of Gatun Lake the ship is lowered into Miraflores Lake. The Pedro Miguel Lock extends for three-quarters of a mile along the course of the canal. From Miraflores Lake the ship is lowered into the Pacific Ocean through the Miraflores Locks, which are slightly less than a mile long.

The entire series of locks is built in parallel chambers, making it possible for vessels to pass without loss of time. The



PANAMA CANAL ZONE

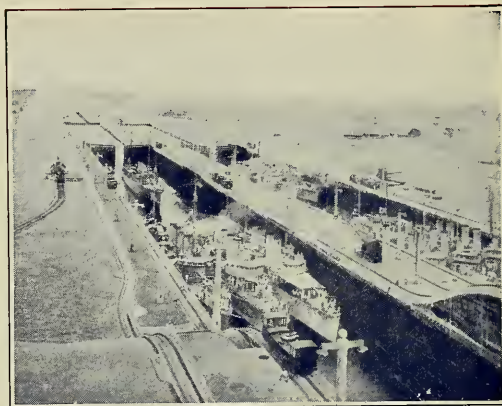
chambers are uniformly 1,000 feet long, 110 feet wide, and each have an average lift of about 30 feet.

There are intermediate gates in each lock so that the chambers may be shortened if necessary. The locks are massive concrete structures, controlled and lighted by electricity and equipped with electric locomotives, which not only tow all vessels through the locks but also act as traveling capstans to keep them clear of the lock walls. The gates are made of steel, 7 feet thick, 65 feet long, and from 47 to 82 feet high, weighing from 390 to 730 tons each.

Intermediate gates are used to divide most of the locks into chambers to conserve time and water during the passage of small vessels. The Miraflores Locks, which have the highest walls and the highest gates, are unique in that they have no intermediate gates.

The Gatun Dam, almost one-and-a-half miles long and half a mile wide at its base, is one of the many feats of engineering accomplished by the canal builders.

The dam is over 100 feet above sea level, and in reality is an artificial ridge,



Pacific Fleet Destroyers, Gatun Locks

uniting the high hills on either side of the Chagres Valley and impounding the waters of the river in a huge reservoir. The space between the walls on either end of the dam is filled with sand and gravel, while the top—upstream and downstream portions—is completely riprapped. The spillway, 120 feet long and 285 feet wide, is cut through solid rock near the center of the dam and is lined throughout with



concrete. A dam in the form of an arch has been built across the opening of the channel.

An eastern dam connects the Pedro Miguel Locks with the high ground to the west and at the south end of Gatun Lake; and dams also connect the walls of Miraflores Locks with the high ground on either side.

IN GAILLARD CUT



ANCIENT poets sang of wondrous feats of strength and endurance among the men of their respective nations; they wove tales of gossamer fineness about the mythical achievements of their forebears; they spoke of the pyramids and massive temples and moated castles as the height of human endeavor in building.

But their hymns of praise would become "puny whispers and gapings" were they privileged to look down through the centuries and see the men of a Nation, then unborn, snatch out the vitals of a mighty

mountain and set ships a-sailing on the roof of the world.

The world of to-day may well regret that Homer, ancient author of epic poems, does not live in the present as he lived in the past—for only the writer of the Iliad and the Odyssey could write fittingly of the struggle between man and mountain in the battle of Gaillard Cut, in the Canal Zone of Panama.

Before the Americans caught up the gauge of battle and entered on the war with Culebra, the French had tried to pierce the mountain, but succeeded only in wounding the upper surface, and then abandoned the fight, baffled and admitting defeat.

The mountain had won a temporary victory, and was fast binding up its injuries with the soothing bandages of tropical jungle, when the new antagonist presented himself and plunged immediately into the fray.

Culebra Cut, now officially known as Gaillard Cut, was to be nine miles long, of an average depth of 120 feet, and at no place less than 300 feet in width. The battle began, and for years the rocky



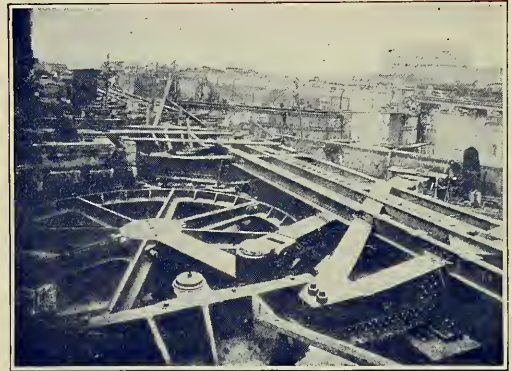
PANAMA CANAL ZONE



Pacific Fleet Destroyers, Gatun Lock

slopes echoed and reechoed with the roar of exploding dynamite, mingled with the sullen mutter of landslides as they were sent by the mountain into the cut—as if Culebra were alive and endeavoring to cover its scars with rock and soil, as the injured elephant slaps mud on the gaping wounds inflicted by the hunter.

It was estimated that 53,000,000 cubic yards of material would be removed before the cut was completed, but so numerous



Ponderous Gear Wheels and Metal Arms Which Open and Close the Gates

were the landslides that over 105,000,000 cubic yards of soil were removed by the thousands of men who swarmed ant-like through the channel, and dug away with steam shovels and dredges, and used over 6,000,000 pounds of dynamite every year in blasting rock and dirt and clay.

An artificial canyon now extends through the mountain, and filling the canyon is a broad stream of water, skirted by tall hills, and banks high in some places



PANAMA CANAL ZONE



The Completed Gaillard Cut at Empire, Looking North

and sloping in others, with here and there a deep gap that stands in silent token of another landslide overcome by engineers in worn and faded khaki and "West Indian laborers in blue overalls."

Ships passing through Gaillard Cut—or through any of the locks for that matter—are not allowed to proceed under their own power, but must be towed by electric locomotives operating on the lock walls.

Twenty-Eight

Upon arrival at the terminal port, the ship is visited by quarantine and boarding officers, mail and telegrams are delivered, and other business transacted. Provided advance information has been received, coal, oil, and other supplies are waiting to be taken on board, and if tolls and other charges have been paid in advance and a tonnage certificate obtained, the vessel may pass through the canal without further delay.

When the ship enters a lock the valves in a system of culverts in the side walls and under the floor are opened and the water enters, bringing the ship to the level of the next lock. After reaching the locks on the opposite slope, the ship descends when the water is lowered and then goes on its way to the ocean.

It usually requires three hours to pass a vessel through all the locks; an hour and a half in the three locks at Gatun and about the same time in the three locks on the Pacific side.

Ships can pass through the canal in ten or twelve hours, the time varying in accordance with the size and speed of



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the individual craft. Sometimes inter-ocean traffic is delayed by landslides similar to that which halted *H. M. S. Renown*, carrying the Prince of Wales on his visit to the west coast of the United States and the Antipodes, in the spring of 1920. The canal force has become so accustomed to handling landslides, however, that the obstructions are speedily removed unless they are greater in size than usual.

The landslides have largely decreased in recent years, and while some work still remains to be carried out on the canal, it is entirely completed according to the original plans.

Inter-ocean traffic via the Panama waterway has been proceeding for several years, and during the fiscal year 1919 vessels to the number of 2,025 passed through the canal, 860 traveling from the Atlantic to the Pacific and 1,165 from the Pacific to the Atlantic.

Tolls are levied on the basis of the cargo and passenger capacity of each vessel entering the canal. On loaded commercial vessels the toll is \$1.20 per



A Steam Shovel Buried in a Rock Slide

net canal-ton, plus \$1.20 per 100 cubic feet of deck load, provided the sum of these charges does not exceed an amount equivalent to a charge of \$1.25 per ton on the vessel as measured for American registry. Tolls at the rate of 50 cents per displacement-ton are levied on naval vessels, other than transports, colliers, hospital ships, and supply ships.



CANAL AND NAVY



WHEN the U. S. S. *Oregon* started on its historic voyage from San Francisco round South America and full-steam ahead up the east coast to Cuban waters at the outbreak of the Spanish-American War, the American people were brought to a keen realization of the fact that a canal through the Isthmus of Panama was needed to assure the speedy concentration of the fleet in times of emergency.

More than two months elapsed between the time the U. S. S. *Oregon* steamed out of San Francisco Bay and the day she joined the fleet, the voyage requiring six weeks longer than it would have taken had the Panama Canal been in existence. The U. S. S. *Oregon* would have traveled only 4,600 miles had she found a canal across the Isthmus, whereas she sailed 13,400 miles in the dash through the Straits of Magellan.

Fortunately the delay did not have a deleterious effect on the fortunes of the

fleet, since it was in so excellent a condition as to practically assure a victory without the help of the U. S. S. *Oregon*; but the American people considered what would have happened had the main fleet been cruising in the Pacific, with the Spanish fleet sailing along the Atlantic coast, and because of that consideration, the need for a canal became very obvious to the American Government and people.

Now that the waterway has been built, the Nation's first line of defense is in a better strategic position than ever before. Both the east and west coasts are protected by mighty fleets which can be concentrated in a comparatively short time to meet any menace on either flank of the continent. The fleet could be mobilized at either entrance of the canal, and with a cruising speed of 15 knots could reach the center of the Pacific coast in 9 days and the center of the Atlantic coast in 5 days. In the pre-canal days fleets stationed opposite the middle of each coast were, from a cruising point of view, as far apart as opposite sides of the world. Now they are as near as if one fleet were off Buenos Aires and the other off the port of New York.



PANAMA CANAL ZONE

The importance of fortifying the canal to prevent its capture by land or sea became apparent as soon as the work of digging the waterway was started, and the present defenses, consisting of large forts at each end of the canal and field works for mobile troops, are regarded as being practically impregnable to naval attack.

Guns, mortars, and howitzers have been planted between Toro Point on the west side and Margarita Island on the east side of the Atlantic entrance, and also on the east side of the Pacific entrance to the canal. Massive steel and concrete forts have been erected to house the guns and, in short, the canal has been so completely fortified that a hostile force, attacking by sea, would very probably find that the Panama Canal had been turned into another Gibraltar, Heligoland, or Dardanelles.

The possibility of bombardment from the air has also been taken into consideration and airplanes and anti-aircraft guns are stationed at various places along the canal to serve in case of an attack by the air forces of an enemy. The operating



U. S. S. "New Mexico" in Pedro Miguel Lock

machinery in the locks is placed within the square center piers and under a thick concrete ceiling, as a precaution against bombs, while the Gatun dam is so massive and the locks' gates so numerous that a hostile air squadron would find itself confronted with a difficult assignment were it ordered to shatter the dam and let the water out of the lake, turning the canal into a dry channel.



PANAMA CANAL ZONE



Ruins of St. Dominic's Church, "The Church of the Flat Arch"

A permanent garrison is stationed in the Canal Zone to defend the waterway in case of an attack by land, and these troops, supported by the guns in the forts, are in a position to withstand a formidable landing force until reinforcements could arrive at the scene of operations.

Thirty-Two

The canal is now guarded by some 8,000 officers and enlisted men, and watched day and night by sentries, and lighted at night by electricity to prevent enemy spies from blowing up the locks, while searchlights sweep the sea and the air as a precaution against surprise attacks by warships, airplanes, or dirigibles.

Every foot of the waters around the canal has been mapped, and a hostile fleet would find itself decimated soon after the range finders in the forts passed their message to the guns and "steel messages of death" began to pay their respects to the visiting enemy.

A ROMANTIC AGE



VERY noble and very loyal" was the title given to the city of Old Panama by the King of Spain in 1521, and the words of praise still remain true even though nearly four centuries have passed—for Old Panama is noble in the sense that the ruins of Greek and Roman temples and



PANAMA CANAL ZONE

the remains of Indian and Egyptian cities are noble, and the years have mellowed the ruins of this ancient town and made them more restful to the eye than modern cities.

Old Panama passed from the roll of living cities long before the American Revolution, and the jungle has encroached, and for centuries the only residents were coral snakes and vipers, and color-splashed parrots, and grimacing monkeys, and wild deer with velvety eyes, and occasional hunters and travelers, and bewhiskered jaguars that set the forest life to rustling with their screams at night.

Old Panama, in the heyday of Spanish rule on the Isthmus, contained hundreds of splendid mansions and thousands of other dwellings, and the population is said to have numbered from 30,000 to 50,000. The city was surrounded by thick walls as a protection against buccaneers and hostile natives; and the people grew rich on the fruits of barter and plunder, and the rulers of Spain gloried in the extent of their possessions and the wealth of their subjects.

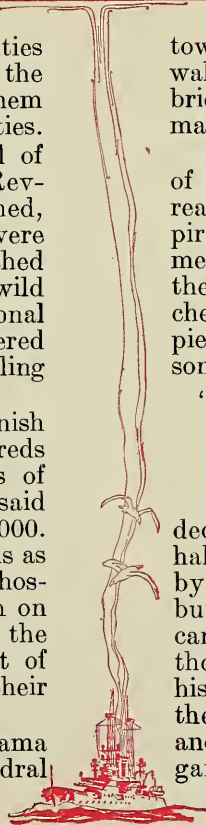
Now all that remains of Old Panama is the vine-caressed ruins of the cathedral

tower, and scattered bits of crumbling walls, and the scarred stone arches of two bridges, and a few odds and ends of masonry.

The story of the capture and looting of Old Panama by Morgan and his men reads like a typical tale of the days when pirate ships sailed the Spanish Main and men were made to walk the plank, while the freebooters drank their tot of rum, and cheered the black flag, and counted their pieces of eight, and roared their maudlin songs:

“Sixteen men on a dead man’s chest,
Yo-ho-ho and a bottle of rum!
Drink and the devil have done for the rest,
Yo-ho-ho and a bottle of rum!”

We go toward Old Panama by a decisively unromantic trolley, which runs half the distance from the new city, or by a still more unromantic automobile; but when we arrive in the ruined city we can imagine ourselves as departing from the present; we turn back the leaves of history and shove the sands of time from the bottom to the top of the hourglass, and picture ourselves as being among Morgan’s men in the attack on Old Panama.



PANAMA CANAL ZONE

The vanguard of Morgan's buccaneers under Capt. Bradley, landed near the Chagres River in 1670 and attacked Fort San Lorenzo, an outlying position of defense for Old Panama. A garrison of Spanish troops and numbers of heavy carronades were stationed in a ditch outside the fort, and they repulsed the English for a moment, and many of the attacking force were killed or wounded.

One of the pirates received an arrow through his body, but instead of giving up the fight he plucked the arrow out, tied some burning cotton around it, placed it in his musket and fired it into the fort, starting a fire which resulted in the explosion of the powder magazine. The palisades were burned and the slaughter continued until, at the storming of the fort in the morning, only a handful of the gallant Spanish defenders remained alive.

Morgan arrived with his fleet and started up the Chagres River with 1,400 men. Scores died of starvation or were shot by the Indians, but the remainder pluckily struggled on until they reached the "Hill of the Buccaneers" and viewed Old Panama in the distance.

Meanwhile the alarm bells had rung in the city, swords were being sharpened, powder gathered, and bullets molded, while the inhabitants mobilized to defend themselves against the raiding pirates.

Sunrise on the morning of January 28, 1671, saw the beginning of the battle between the English and Spaniards. The attacking force advanced on the open plain before the city and were charged by the Spanish cavalry, but before the horsemen could reach the buccaneers they were fired upon and fully half of them tumbled from their saddles. The dead and dying were thrown in heaps with the wounded horses, whose screams rose even above the din of battle, and whose steel shod hoofs lashed out and exacted their toll of death from the ranks of the men who had ridden them into the fight. The ground was splashed with "red of a deeper hue" than that in the eastern sky where the morning sun was painting the horizon with many shades of color, and the yells of the combatants and the death rattle in the throats of the dying made a weird contrast of sound with the sea breezes that whistled around the ramparts of Old Panama.



PANAMA CANAL ZONE



Cathedral of Panama

The desperate Spaniards attempted to drive a herd of 2,000 wild bulls over the

buccaneers, who cut some of them down and stampeded the others, and many Spaniards lost their lives under the hoofs of the bellowing, longhorned cattle, and others escaped only to fall under hails of leaden bullets from the muskets of the buccaneers.

The Spanish horsemen were joined by foot soldiers and they, too, fought until 600 of them were killed; and then the remainder broke ranks and ran panting into the city, where they spread panic among the defenders.

Don Juan Perez de Guzman, the Spanish governor, after trying vainly to rally his men blew up the powder magazines, and red flames began to lick at the walls and roofs of wooden houses—and “Old Panama was dying.”

Morgan's men soon stormed the batteries standing near the bridges, and entering the city, endeavored to check the flames, but the sea breeze of the morning had continued and was now sweeping the fire through the streets and a few hours later only blackened stones and timber and glowing coals marked the site of Old Panama.



PANAMA CANAL ZONE



The Panama Railroad Station, Panama City

All through the night the buccaneers roamed the streets in search of loot, occasionally abandoning the hunt to run down and kill stray natives, who stared at them with frightened eyes from shadowy retreats in buildings or near the shattered walls.

The buccaneers succeeded in their hunt for gold, and being laden with the heavy metal were unable or unwilling to continue in pursuit of the few Spanish soldiers who had escaped from the city and were seeking refuge in the jungle.

Thirty-Six

Morgan remained in the ruins of Old Panama for a month, devoting his time and the time of his men to searching for gold which he suspected might have been hidden before the city fell. Although much treasure was produced the buccaneer admiral was not satisfied with the results of the hunt, and tortured the prisoners in an effort to make them divulge the location of the stores of gold and other treasure.

After the city and vicinity had been stripped of everything of value, Morgan marched his men back to Fort San Lorenzo, boarded his ship with all the gold, and sailed away, leaving his men without a leader. And quite probably—very probably—they considered themselves better off without any leader than with one of Morgan's type.

The buccaneer admiral sailed back to the West Indies, where he purchased a pardon from King Charles II, became lieutenant governor of Jamaica, and caught and hanged many of his former comrades. Having seen such a sorry end to such a daring expedition, we turn over the pages of history to more recent chapters, let the



sands of time run as usual, leave the days of romance behind, and arrive at the prosaic present, which will in all probability be regarded as an age of romance by our successors. And now we proceed to the city of New Panama.

THE NEW PANAMA



THE New Panama is hardly as new as the word implies, since it was founded in 1673, two years after Morgan destroyed the old city, but retains the title the same as New York keeps the first word in its name long after the founding of the city.

The traveler entering Panama by railroad, passes under the high arched bridge near the old station where, in 1901, a force of revolutionists was decimated by fire from a machine gun operated by an American soldier of fortune in the Colombian Army. Incidentally, the soldier of fortune later became a foreman in the canal service, where he expended his excess

energy by operating drills instead of South American machine guns.

Leaving the train at the new Panama station of terra cotta and concrete, the traveler is immediately importuned by swarms of native cab drivers to visit the various sections of the city in their little two-seated buggies and doubtful looking automobiles.

It was the cab drivers who were responsible for the term "spiggoty" being applied to the natives of Panama. When the Americans first arrived on the Isthmus the cab drivers would shout "Me speak it, the English!" This soon changed to "spickety," and then to "spiggoty," and the American habit of applying nicknames soon settled the fate of the Panamanians. They were "spiggoties," they are "spiggoties," and they always will be "spiggoties" as long as Americans stay in the Canal Zone.

Following the Avenida Central, the principal thoroughfare of Panama, we proceed from the railway station to the Cathedral Plaza, passing through the outskirts built since 1904 and grouped around the old suburb of Santa Anna, whose



PANAMA CANAL ZONE



The Cathedral Plaza

main attraction is the church of Santa Anna, formerly the chapel of a Spanish nobleman.

Several blocks beyond Santa Anna Plaza the traveler passes a street shrine with candles always lighted, and enters

Thirty-Eight

the older portion of Panama. The houses have walls from two to three feet thick, and narrow windows with heavy shutters, which enabled the builders to turn their domiciles into block houses during attacks on the city.

When the traveler reaches the Cathedral Plaza he has arrived at the "heart and soul of the Republic of Panama." It was on the Plaza that the people proclaimed their independence from Spain, and years later from Colombo, and Panama has as much regard for the place as the American people have for the Washington Monument or Boston Common or the Liberty Bell.

An effort was made after the second revolution to change the name of Cathedral Plaza to Independence Plaza, but was received with as little enthusiasm as would a suggestion that the American people change the name of Mount Vernon, or adopt a new title for "The Star Spangled Banner" or "Dixie."

While the Panamanians insisted on retaining Cathedral Plaza, they have not been so careful to preserve other monuments of Old Panama.



PANAMA CANAL ZONE

The cathedrals and churches, some of which date back to the seventeenth century, have been renovated and painted until they appear as modern structures. A tin roof has been placed over the quaint tile roof of the chapel on Taboga Island; it has been proposed to tear down the old church of St. Dominic's containing the famous "flat arch" that has withstood earthquake and storm for 200 years; and the picturesque ruins of the Jesuit monastery have been turned into an apartment house.

Other "improvements" in Panama have been in better taste. A government palace, including the Treasury building and the National Theater, has been erected on the site of the old Colombian barracks; a new National Institute stands on the other side of the city, near Ancon, and scores of other splendid structures, both public buildings and private residences, have risen since Panama gained its freedom in the early part of the century.

The ground floor of the palace of the Bishop of Panama stands across the Plaza from the Cathedral and houses the offices of the national lottery. On week-



The Panama Lottery and Bishop Palace

days men and women, old and young, rich and poor, gather around the lottery offices to buy and sell tickets; and at noon on Sunday the grand drawing takes place and some ticket holders are richer—and many are poorer and wiser—as everyone knows who bows before the Goddess of Chance.

Early on Sunday evening the Panamanian Republican Band marches to the Cathedral Plaza and the little brown musicians play martial airs and the drummer thumps his bass drum and feels very important; and the high and the low,



PANAMA CANAL ZONE



Ancon and North End of Panama, from Ancon Hill—
Pacific in Distance

from president to peddler, stroll through the square and twirl their mustaches and buy boutonnières of fragrant flowers from the flower women, who wear gaily-colored dresses, and stand on the corners and offer the bouquets for sale with a bit of a

Forty

wistful look in their eyes. And the diminutive brown policemen stroll around with a self-satisfied air, and occasionally arrest a drunken laborer on a week-end spree and hale him off to durance vile, where he languishes until Monday. The brown policemen resume their walk around the Plaza. And the band plays through the twilight and into the evening time, and around the "witching hour" of midnight a majority of the residents have composed themselves to slumber, heeding the advice of the Bard of the Avon, that "sleep knits up the ravell'd sleeve of care"—while the drunken laborer wonders how he can unknit the bars on the window of his dungeon cell.

Bullfighting was popular in Panama until a few years ago, and now cockfighting has taken the place of the Spanish sport, and baseball is making a bid for popular favor.

From Panama we proceed to Balboa—and Ancon, joined with Balboa—around the inland base of Balboa hill, and the headquarters of the Panama Canal Government. Balboa-Ancon is one of the finest residential cities in the world, and



PANAMA CANAL ZONE

the only stores are Government-operated commissary stores and restaurants.

The streets are wide, well lighted, and very clean, while the houses of wood or concrete are airy, with wide, well-screened porches. The Ancon Hospital, largest structure of its kind in the Canal Zone, has accommodations for 1,500 patients and maintains dispensaries to care for minor cases.

A bus line operates from Fort Amador to the Tivoli Hotel, via the Balboa Club House and the Administration Buildings, and a trolley line runs from La Boca, at the coaling docks, to the Tivoli Hotel, via Panama City, with a branch as far as the Sabanas.

Ships entering the harbor of Balboa-Ancon either lie at the dock or moor to buoys opposite the piers at Balboa, or anchor at the breakwater near Flamenco Island, since there is no anchorage in the harbor itself.

The population of Cristobal, the American port of entry on the Atlantic side of the canal, is comprised largely of Americans employed by the Government in the operation of the waterway.



Produce Boats in the Harbor at Panama

There is a commissary store in Cristobal, a commissary restaurant, Y. M. C. A. clubhouse, and other places of interest to



PANAMA CANAL ZONE

visiting Americans. The harbor improvements, the dredging, repair shops, and coaling station are rapidly increasing the importance of the town.

Cristobal is considered a suburb of Colon, formerly known as Aspinwall, which stands on Manzanillo Island, a low body of land, skirted at two or three places by coral reefs.

Although twice visited by destructive fires—once in 1885 and again in 1915—Colon has each time been rebuilt, and now has a population of about 26,000 souls. Together with all other towns in the Canal Zone, Cristobal has been thoroughly “scrubbed” by the American sanitary engineers; the streets and alleys are clean and well paved, and a modern system of waterworks has been installed. The swamps in the vicinity have been drained and the bushes and the grass burned, as part of the health program of the Isthmian Canal position, and the few mosquitoes still remaining in Colon find it very difficult to exist.

Colon is named in honor of Columbus, who landed at the port in 1502 (on his fourth voyage to America), and the statue

of Columbus is one of the places of interest in the town.

Colon is also the terminus of the Panama Railroad, whose 48 miles of rails extend across the Isthmus. The present road is the successor of the first Panama line, built over half a century ago, and its history is as closely connected with that of the canal as its steel rails are with the ties and rocky soil of the Panama roadbed.

THE FORTY-NINERS



FOR over three hundred years after Panama was invaded by the soldiers of Spain the only means of passage across the Isthmus was by canoe up the Chagres River and over the old paved road from Cruces to the City of Panama.

Conditions remained the same until the discovery of gold in California and the arrival of those members of the army of Forty-niners who elected to travel west by way of Panama instead of crossing the Indian-infested plains on their journey to the gold fields.



PANAMA CANAL ZONE

The Forty-niners found themselves in difficulties almost as soon as they landed on the coast, and many of them devoutly wished that they had selected the overland road across the plains instead of over the Isthmus of Panama. The travelers were paddled up the Chagres River in dugouts, and rode or walked over the old paved road, which had become little more than a string of mudholes. They passed through swamps, and were bitten by tropical snakes, and fought mosquitoes, and contracted yellow fever and malaria. Only the bravest kept on—the more timid turned back after a night or two on the jungle trail.

When the Forty-niners reached Panama City their difficulties increased, in spite of the fact that they had left the most dangerous part of the journey behind them. The city was crowded with other Forty-niners who had preceded them and had waited for weeks and months for ships to take them to San Francisco, where hundreds of vessels were rotting in the harbor while their crews struck out for the gold fields.



Statue of Columbus, Colon

Since Americans must engage in some sort of enterprise wherever they are, the Forty-niners started two rival newspapers, the *Star* and *Herald*, now combined as the *Panama Star and Herald*, and also engaged in trade among themselves and with the natives. Prices were raised until modern profiteering pales into insignificance when compared with the "gouging" practiced by the native trade



PANAMA CANAL ZONE



A Native Dug-Out on the Chagres River

pirates of Panama. Eggs brought from \$3 to \$4 a dozen, and the prices of other

Forty-Four

foods were proportionately high, while the landlords grew rich from renting sleeping space to the Yankees at \$3 and \$4 per hammock.

Complaints voiced by the Forty-niners reached the United States, and when California and Oregon were taken into the Union Congress authorized the establishment of a steamship line, operating along either coast, and American capitalists obtained permission from the Government of Panama to build a railroad across the Isthmus.

The building of the Panama Railroad was started in May, 1850, and the last rail was laid nearly five years later, in January, 1855. Engineers had estimated that the road could be built for a million dollars, but the difficulties that presented themselves were so numerous that the cost was \$8,000,000. Swamps had to be filled, trestles and bridges built, and practically all materials, except ties, were brought down from the North. Malaria and yellow fever carried off hundreds of workers, and a popular tradition states that a life was lost for every tie on the road. This, however, is obviously an ex-



PANAMA CANAL ZONE

aggeration, since the deaths did not number over a thousand, according to creditable accounts of the building of the railroad.

The venture was looked upon as a failure, and the stock of the Panama Railroad dropped in value; but even before the railroad had been completed more than \$2,000,000 worth of fares were earned, and in 10 years the road yielded nearly \$12,000,000 in freight and passenger fares, and stockholders were growing rich on dividends of 24 per cent. The Panama Railroad monopolized the California and Atlantic trade until the completion of the Union Pacific Railroad and the establishment of the Pacific Steam Navigation Co., a British corporation, operating its ships around South America; and then the line began to decay and continued so until the canal undertaking gave it a new lease on life. The new Panama Railroad travels on the roadbed of the old for only a portion of the distance across the Isthmus, but travelers can understand some of the difficulties encountered by the American railroad pioneers who succeeded where others might have failed, and whose



Jungle and Mountain, Panama

spirit was inherited by the American canal builders who succeeded where others did fail.

The railroad now runs from Colon to Panama on the eastern side of the canal.



A branch line extends from Pedro Miguel to Las Cascadas, crossing the waterway on a swinging pontoon bridge at Paraiso. The road formerly followed the course of the Chagres from Gatun to Gamboa, and ran for the greater part of its course on the west side of the canal.

Present passenger fares on the Panama Railroad are as follows: First class, 5 cents per mile; second class, 2 cents per mile; first class, round trip, \$2.50; second class, round trip, \$1.50. The minimum charge for special trains—consisting of engine, baggage car and one coach, seating not more than 60 passengers—is fixed at \$100.

CROCODILE POOLS



GREAT man-eating crocodiles inhabit the rivers of Panama, especially the Chagres, and in the night time or when the reptiles are molested by hunters, their sluggish croaking, accompanied by malevolent

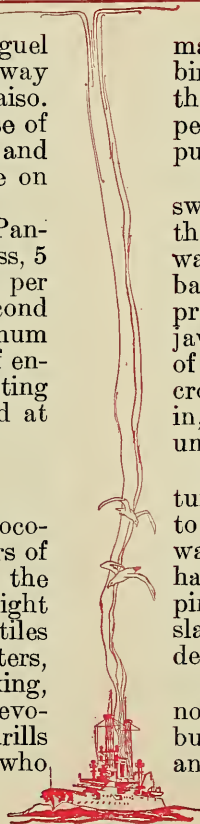
snaps of their great jaws, send thrills of disgust through human beings who

may happen to be near, and cause the bird and animal life along the banks of the stream to stir uneasily in recollection, perhaps, of past encounters with the repulsive creatures.

The crocodiles are in the habit of swarming in deep pools along the course of the river and lie with their snouts above water, or slip under the overhanging banks of the stream, in wait for their prey. The victim is seized in the wicked jaws or swept into the water with a blow of the reptile's tail, and drowned; and the crocodile buries its victims until decay sets in, and then proceeds to dine on what it undoubtedly considers a choice morsel.

Many white men and natives have returned to tell of stepping on what appeared to be slimy logs, half in and half out of the water on the banks of the pools, only to have the "logs" turn upon them, snapping, and waddling at them, webbed feet slapping the wet sand and tails ready to deliver a vicious blow.

And other white men and natives have not returned to tell of their experiences, but have fallen in the trap of the crocodile and gone to make a reptilian feast.



Children, women, and men have been killed by the crocodiles, and in retaliation hunting parties are organized, and then the echoes resound with the firing of guns and the death croak of the saurians as they lash the foul waters of the pools with their armored tails.

The best known crocodile pools on the Isthmus are at the "Bayano," about forty miles down the coast from Panama Bay. The pools in Alligator Creek, as it is called, range from 10 to 25 feet in length. Other reptiles are represented on the Isthmus, among them being small boa constrictors, fer-de-lances, and coral snakes, while lizards ranging from 3 and 4 inches to 6 feet in length, crawl around fields, swamps, villages and the ruins of old cities. The lizards are harmless, and the natives hunt and eat them, considering them quite a delicacy.

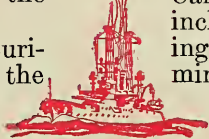
The waters on either side of Panama, and in the Isthmus itself, literally swarm with edible fish and man-eating sharks, and also furnish excellent sport in the hunting of crocodiles.

The leaf-cutting ant is one of the curiosities of Panama. Travelers around the



Huge Alligator on the "Bayano"

Canal Zone frequently discover trails an inch or two wide crowded with ants carrying bits of green leaves, which serve as miniature sun shades for the insects as





Native Life in the Banana Belt

they hurry along the trails. The ants store the leaves until a fungus grows upon

Forty-Eight

them. The fungus is eaten, and then the leaves are discarded and new supplies brought to the "warehouses."

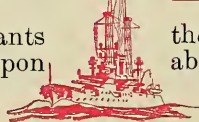
Red ants have taken up their residence in practically all houses in the Canal Zone, and food is seldom safe from their depredations. Scorpions and tarantulas are plentiful and greatly feared by the natives, but do less damage than small ticks, known as "red bugs," which burrow under the skins of human beings and animals. The "red bugs" work as much injury among the horses and cattle on the Isthmus as the cattle ticks did among the cow herds on the western plains some years ago.

ORCHID HUNTERS



DEEP in the jungle of Panama the life of men, and birds, and animals is much the same as it was centuries ago, and when the traveler wanders off the beaten paths of the Canal Zone and plunges into

the tropical undergrowth he finds himself abruptly cut off from civilization and car-



PANAMA CANAL ZONE

ried back to the days of primeval forests and primitive men.

Among the most adventurous walkers of the jungle trails of Panama are the orchid hunters, who sometimes risk their lives in search of the valuable plants. The Holy Ghost orchid, one of the most beautiful of the flowers of Panama, blooms only once in two years, and then the petals open and disclose a delicate growth resembling a small waxen dove, which nestles in the blossom, as does its living prototype, in its nest of twigs and grass.

The orchid hunters search particularly along the Atlantic side of the canal, since there the flowers are more plentiful than in other parts of Panama. Collectors have been so energetic in their search for the more rare and beautiful specimens that few of the wild plants are to be found, except in the depths of the jungle.

In the forests we find mahogany and cedars, and great ceiba trees that tower above the surrounding forest as the steel masts on the warship tower above the deck. The trunks of the trees are interlaced with vines and creepers, some of



Rude Life of the Natives—A Hut in the Jungles of Panama

them so thick and tough and pliable that machetes must be brought into play to clear a path before the travelers can proceed on their way. And there are coconut palms and banana trees and hun-



PANAMA CANAL ZONE



Original Inhabitants of Panama, the San Blas Indians
dreds of other varieties of plants and trees,
all going to make up a carpet of green that
covers a great part of the Isthmus.

Fifty

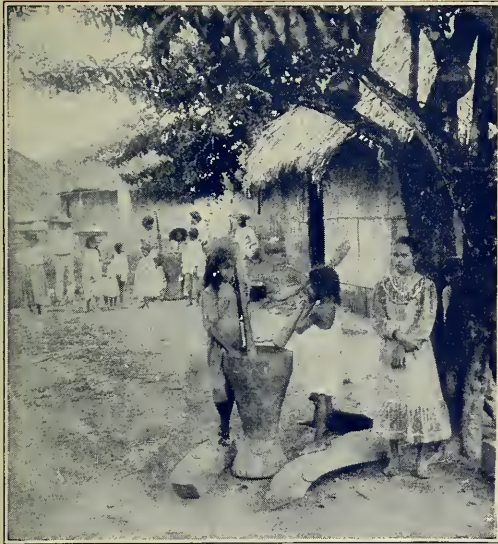
The animal and bird life of the jungles is almost as varied as the plant and tree life, and the brilliant plumage of the birds contrasted with more sombre coloring of mammals lends a pleasing contrast to the bright green of the tropical foliage and the sometimes blue and sometimes brown water of the streams winding through the unexplored reaches of the distant portions of the Republic.

There are large and small parrots with Joseph's coats, and brightly-colored humming birds, and black buzzards which flock also around the Canal Zone, and blue herons, and white cranes, and awkward pelicans, and song birds whose sweet trills-o'-morning would set a prima donna to weeping were she to attempt to rival them.

And there are armadillos and little deer, hardly bigger than small dogs, and tapirs and anteaters, and in the most remote portions of the jungle there are black jaguars, and wild hogs, and colonies of grimacing, chattering, black-and-white monkeys, whose screams fill the air by day and night.

The Atlantic side of the Isthmus of Panama, from about fifty miles east of





Children Pounding Rice in a Native Village

Colon to the boundary of South America, is occupied by the San Blas Indians, the descendants of the natives who were tortured by the Spaniards in their eternal search for gold, jewels and silver.

The Pacific side is governed by another tribe of Indians, the Chucunaques, who, with the San Blas Indians, take particular pride in keeping their race free of admixture with foreigners. Members of the San Blas tribe are short and well-built, many of them resembling Japanese, although there is no established relation between the two. White men may visit San Blas towns during the daytime, but when night falls they are ordered to leave, and if they refuse, are often killed or taken captive, and hurried out of the Indian country.

BATHING BEACHES



BOTH the Canal Zone and the Republic of Panama abound in places where travelers and Government employees and natives may splash and bathe to their heart's content.

One of the most popular surf bathing beaches lies at the mouth of the Chagres River. There is no regular means of transportation to the beach, but boats can be hired, and the visitor usually



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The New Lighthouse on Toro Point

finds that he has been well repaid for his time and trouble when he plunges into the surf and basks in the sun along the sandy shore. The beach has its landmarks in the ruins of Fort San Lorenzo, which was

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built by the Spaniards in the sixteenth century.

The island of Taboga, which lies about twenty-five miles by water from Balboa, also affords excellent swimming, and is a popular health resort for residents of the Canal Zone. There is a small hotel on the island where meals can be obtained, and a launch leaves Balboa twice daily for Taboga, and starts on the return trip about two hours after departing from the mainland. The fare is about sixty cents each way.

Boats are usually available for trips to Taboguilla Island, where a broad, sandy beach invites the visitor to go for a swim in the salt water. The tide reaches 14 feet on Taboguilla, and boats must anchor off the shore since there are no docking facilities.

Men in uniform are given special rates at the Government-operated hotels in the Canal Zone—the Washington at Colon, and the Tivoli at Ancon. The Washington charges \$3 to \$4.50 for one person and \$4 to \$7 for two persons in a room, and the corresponding rates at the Tivoli are \$2 to \$4 and \$3.50 to \$6.50. The European plan is in vogue at both hotels. The Gov-



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ernment on June 30, 1919, was also operating the Hotel Aspinwall, 11 line restaurants, and 4 labor messes.

Laundries operating at both ends of the canal are prepared to handle ships' and passengers' laundry at reasonable rates, and vessels in transit through the waterway may forward their laundry on arrival and receive it at the port of departure. Laundry received at either the Ancon or Cristobal laundry before 9 a. m., except on Sundays and holidays, will be placed on the 5 o'clock train the same day, and, barring accidents, the train will cross the Isthmus in two hours.

A system of trading by "commissary books" is followed on the Isthmus, and the customer who makes purchases at the commissary stores is not permitted to pay with cash but must present a coupon book. The value of the "commissary books" ranges from \$2.50 to \$20, and they are arranged on the order of mileage books.

Post offices are located in all the principal towns in the Canal Zone—16 in number—13 of them being money order stations. Canal Zone postage stamps

must be used on all letters except those mailed on board ship. Postage on letters from the Canal Zone to the United States and its possessions is 2 cents an ounce or fraction thereof; foreign countries, 5 cents for the first ounce and 3 cents for each additional ounce or fraction thereof. The parcel-post rate between the Canal Zone and the United States is 12 cents a pound or fraction thereof.

GOLF AND TENNIS



LUBHOUSES and playgrounds are maintained in the Canal Zone for the purpose of providing the canal employees and their families with the same amusements enjoyed by their fellow citizens in the United States, and visitors are given every opportunity to avail themselves of the recreational facilities.

The Panama Club, having a 9-hole 2-mile course, on the Sabana, east of the city of Panama, stands close to the shore of the bay and within a short distance of



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the tramway, and is also accessible by automobile via a macadamized road. The club's initiation fees to residents of the Isthmus amount to \$25, and monthly dues are \$3. Visitors who remain less than three months are admitted to the club by invitation and upon the payment of \$10 a month.

The Balboa Clubhouse has added a new motion-picture room to care for the increased patronage which has grown beyond the capacity of the original hall, while new soda fountains and serving tables have been installed in all the five "gold" clubhouses.

Navy and Army clubhouses have been established by the Y. M. C. A. at eight post and garrison houses, and both sailors and soldiers enjoy the privileges offered by the Canal Zone clubhouses.

Tennis is very popular on the Canal Zone, and matches may be carried out under fleet arrangements, the same being true of baseball and other sports and amusements.

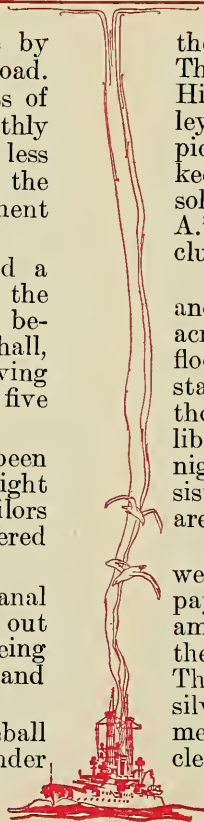
Balboa has a stadium and baseball grounds, and, too, swimming pools under

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the supervision of competent instructors. There is a Canal Clubhouse on Ancon Hill, adjoining Balboa, with bowling alleys, reading room, pool tables, and motion pictures. The Ancon Baptist Church keeps a reading room open to sailors and soldiers, while Balboa has two Y. M. C. A.'s, the Army and Navy, and the Canal clubhouses.

The Navy maintains a submarine base and Naval Air Station at Coco Solo, just across from the bay from Colon, and the floor of the large balloon-hangar at the air station is sometimes used for dances. Although there are no accommodations for liberty parties remaining on shore all night, the transportation facilities, consisting of carriages and some automobiles, are usually good.

In the month of February, 1919, there were approximately 23,000 persons on the pay rolls of the canal force and the Panama Railroad Company, about 3,000 of the entire number being American citizens. The workers are paid either in gold or silver—those on the "gold roll" being mechanics, skilled artisans of all classes, clerks, and the higher officials, while those



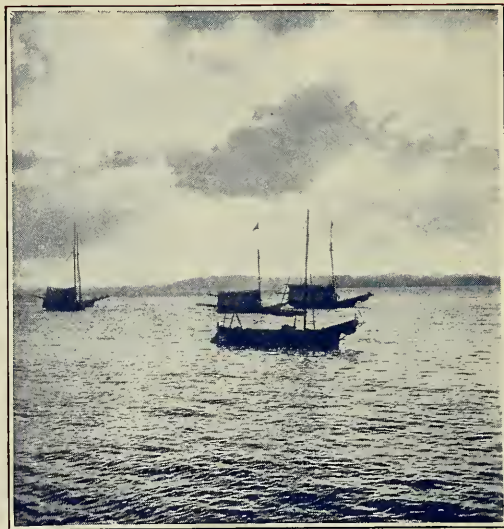
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on the "silver roll" include, principally, the common laborers, practically all of whom are foreigners or natives of Panama.

The "gold roll" employees are paid in United States currency, while the "silver roll" employees receive their wages on the basis of Panama currency or its equivalent.

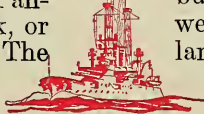
American money is widely circulated in the Canal Zone, and, of course, the various denominations need no explaining. The Panama coins are as follows: The peso, 50 cents in American money; the medio-peso, or 50-cent piece, worth 25 cents in American money, and the size of the American half-dollar; the dime, worth 10 cents in American money, and almost identical in size with the American quarter; the 5-cent piece of silver, about the size of the American dime; and the 2½-cent piece—of nickel—worth 2½ cents in American money and about the same size as the American nickel.

Almost everyone in the Canal Zone speaks English, and while Spanish is the official language of the Republic of Panama, the majority of the people speak, or at least understand, some English. The



Sunset on the Caribbean Sea

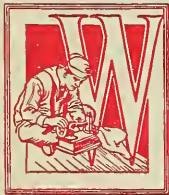
negroes are mostly Jamaicans brought over from the West Indies during the building of the canal, and they use a weird dialect that is as puzzling as a lost language to most travelers.





Loading Bananas on Panama Railroad Train

THE CANAL POLICE



WHILE the native policemen represent the "strong arm of the law" in those portions of Panama outside the Canal Zone, they are backed up by the American police force in the zone itself. The canal police were organized, under direction of President Roosevelt, by George R. Shanton, one of the "Rough Riders" of Spanish-American War fame.

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Col. Shanton and his successors selected their personnel, as a rule, from the ranks of the men who have seen service in the armed forces of the United States, believing rightly that the veterans are better able than recruits from civilian life to keep the lawless under proper supervision.

Criminals have found that conditions in the Canal Zone are hardly favorable to their "occupations," and following the imposition of heavy prison sentences on those of their number who regarded Panama as a frontier of the older type and acted in accordance, they have, for the most part, left the canal strictly out of their itineraries. Although Americans, Jamaicans, Spaniards, and natives live on the canal, there is very little mixing of the races, each living to themselves, and as a result racial friction has been largely avoided.

The respect of the natives and Jamaicans for the police has become very marked, and the ability of the men in khaki to keep order among the foreigners as well as among the members of their own race, speaks well for the police administration of the Canal Zone. The



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canal police have a remarkable esprit de corps, and they are as proud of their records and their efficiency as the Texas Rangers or the mounted police of the Canadian Northwest.

FISH AND GAME



TRAVELERS who desire to "go a-hunting" in Panama, should call on the executive secretary of the Panama Canal, whose offices are located at Balboa Heights, and obtain copies of the official leaflet

containing the full text of laws and regulations governing hunting and the carrying of firearms in the Canal Zone.

Although the law requiring hunting permits is very strict, a provision is made allowing persons engaged in the naval or land forces of the United States to hunt on the public lands of the Canal Zone without permits.

The rules and regulations should be obtained and read, however, to avoid violations of the laws enacted for the protection of watersheds and game preserves.



Panama from the Old Sea Wall Leading to Chirigui Prison

All hunting is prohibited on the watershed of any reservoir within that part of the Canal Zone lying west of the Canal line between the Carabali River and the Cocoli River, and within that part of the Canal Zone lying east of the Panama Rail-

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Administration Building and Residential Quarters,
Balboa

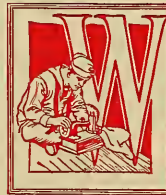
road between Frijoles and the Chagres River to the coast. The restrictions do not apply to the "east-named region" on Sundays and holidays. Fire-hunting at night and hunting by means of spring or trap are prohibited, and rules protecting birds' nests are in force.

Among the favorite fishing grounds of Panama are those in Panama Bay, where bonita, jack, corbena, red snapper, and several other varieties of fish swarm at various seasons of the year. Fishermen usually go out in motor sailers or steamers,

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which run at slow speed while the followers of the noted Walton troll with spoon hooks, which are used with either hand line or rod and reel. The fish in Panama Bay range from 4 to 60 pounds in weight and are often found close to the islands. Tarpon fishing is one of the favorite sports at the Gatun Spillway, where tarpon are found in comparative abundance.

A MASTER BUILDER



WE HAVE read of the success of the canal project and the difficulties overcome by the American engineers in charge of the venture, but little has been said of the man under whose direction practically the entire work was done, and this tale would be incomplete without a chapter devoted to the achievements of Maj. Gen. George W. Goethals, master builder of the Panama Canal.

Gen. Goethals was born in Brooklyn, N. Y., on June 29, 1858, of Dutch parents, and graduated second in the West Point



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Class of 1880. He devoted his attention for the next 20 years to building dams and irrigation ditches in the West, fortifications on the Atlantic coast, and was also instructor in engineering at West Point, chief engineer of the First Army Corps in the Spanish-American War, and a member of the General Staff of the Army before going to the Canal Zone.

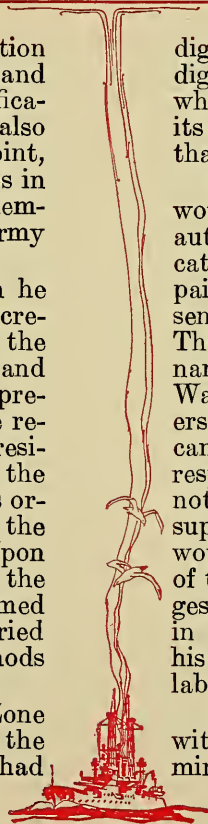
Gen. Goethals was a major when he accompanied William H. Taft, then Secretary of War, to Panama in 1905 for the purpose of planning fortifications, and upon his return to Washington he prepared such a masterly report that he received favorable attention from the President and the Secretary. And when the third Isthmian Canal Commission was organized Maj. Goethals was appointed the Chairman and Chief Engineer. Upon being promoted to lieutenant colonel, the new chairman of the Commission assumed command in the Canal Zone, and carried out many changes in plans and methods to facilitate the work of construction.

Col. Goethals started his Canal Zone career with a determination worthy of the undertaking, and where the eagle had

digged and screamed before, it now just digged and saved its screams for the day when the canal should be completed, and its cry could be one of realization rather than of anticipation.

Every day in the week Col. Goethals would travel along the canal route in an automobile with flanged wheels and cow-catcher, resembling a switch engine and painted the regulation yellow of the passenger coaches of the Panama Railroad. The automobile was given the picturesque name of "Yellow Peril" and "Brain Wagon" by the canal workers, and shirkers immediately became busy when it came speeding down the track toward their respective stations. Col. Goethals was not content to leave the work of personal supervision to his very able assistants, but would travel here and there, from one end of the Isthmus to the other, offering suggestions, giving orders, all with the view in mind of increasing the efficiency of his army of engineers, mechanics, and laborers.

The master builder was quite popular with his men, not only because they admired his capable way of directing the



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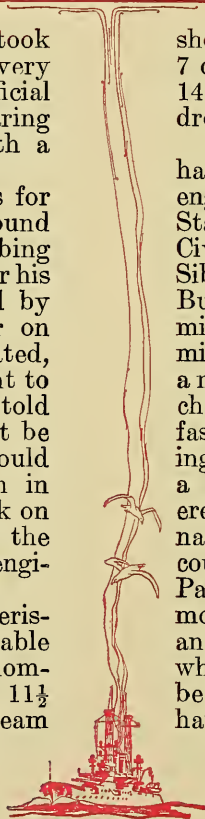
digging of the canal, but because he took a personal interest in them—and every canal worker, whether he be high official or lowly laborer, was sure of a hearing when he went to Col. Goethals with a grievance.

The respect of the canal workers for Col. Goethals increased when they found that he would not permit any disturbing element to dictate his policies or censor his plans. The point is best illustrated by the following incident: An engineer on one of the dirt trains became intoxicated, ran over a negro laborer, and was sent to the penitentiary. The railroad men told Col. Goethals that the engineer must be released by a certain day or they would stop work. "The man will remain in prison and every man who quits work on that account will be dropped from the rolls," stated Col. Goethals. The engineers did not strike.

In addition to his other characteristics, Col. Goethals possessed the desirable trait of being able to do his work economically. In 1908, for example, it cost 11½ cents to load a yard of material with steam

shovels, while in 1912 it cost between 6 and 7 cents. The cost of drilling in 1908 was 14 cents a yard, while in 1912 the cost had dropped to between 11 and 12 cents.

Col. Goethals was fortunate also in having the assistance of many of the ablest engineers and executives in the United States, among them being Col. Gaillard, Civil Engineer Rousseau, U. S. N., Col. Sibert, Col. Devol, Col. Hodges, and others. But it is safe to say that the canal project might still be uncompleted or the expense might have been greatly increased had not a man of the type of Col. Goethals been in charge. He is a master builder, who fashioned the great canal with the same ingenuity that an empire builder fashions a great nation. Monuments may be erected to Maj. Gen. Goethals and his name will go down in history, but he could do well without such honors, for the Panama Canal will stand as a mighty monument to his ability and the courage and perseverance of the American people, while the waterway will very probably be in use when the histories of to-day have crumbled to dust.



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MEMORANDUM

These blank pages should be used to note items of interest to which you will want to refer

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