PANAMA CANAL
REVIEW
BICENTENNIAL EDITION 1976
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From the Governor of the Canal Zone on the 200th anniversary of the United States

Governor HAROLD R. PARFITT

IN 1976, AS WE CELEBRATE the Bicentennial of the United States, the construction of the Panama Canal stands out as one of the greatest milestones in the history of the nation.

It not only opened the way for westward expansion, it also gave the maritime world one of its most important links in the lanes of international commerce.

Among the great peaceful endeavors of mankind that have contributed significantly to progress in the world, the construction of the Canal stands as an awe-inspiring achievement.

To fully appreciate the magnitude of this unprecedented engineering feat, it is necessary to remember that its successful completion in 1914 involved digging through the Continental Divide; constructing the largest earth dam ever built up to that time; designing and building the most massive canal locks ever envisioned; constructing the largest gates ever swung; conquering devastating landslides; and solving environmental and health problems of enormous proportions.

As we look back over 200 years of history, it is fitting that we pay tribute to the builders of the Canal, to those men and women of many nationalities whose initiative, determination, and devotion to duty were responsible for its successful completion.

Since it opened on August 15, 1914, the Canal has become a main thoroughfare of world commerce with over half a million vessels making the interoceanic transit.

This outstanding record was made possible by a dedicated work force of Americans and Panamanians, who continue today, as they have done in the past, to operate this vital utility for the benefit of all the nations of the world.

H. R. Parfitt

AMERICAN REVOLUTION BICENTENNIAL 1776-1976

At left:
A giant container ship passes through Gaillard Cut, site of devastating slides during construction of the Panama Canal.

Our Cover

The ditch grows wider each day

The ditch grows longer they say

The slides and the floods, the rain and the sun

Are obstacles big in the race we have run

But the end of the job is in view

Our dreams all soon will come true

But what of the town

That the waters will drown

Oh, what will become of you, of you?

THIS SONG, WHICH WAS printed in the Fourth of July program that appears in the center of the front cover expressed the feelings of thousands of workers in 1913 as the day drew near when the Canal would be completed.

The song was about Gorgona, a construction-day town, doomed to be "drowned in a day by the world's highway" as the chorus of the song said. The employees marked their last Independence Day in Gorgona with a banquet at which Col. George W. Goethals was the guest of honor. The dinner featured roast duck and a varied musical program including a song called "Patriotism, Politics and Possibilities."

Morale was high as everyone had a well justified feeling of great accomplishment. They had tackled a job that had stymied men for centuries. They had succeeded and they were enjoying their triumph but there was a certain sadness at the passing of the little towns along the line.

Special recognition is given to Nan S. Chong, Panama Collection Librarian and Beverly C. Williams, Chief of Readers' Services at the Canal Zone Library, for research assistance.

Roosevelt Medal

Theodore Roosevelt had seen this pride, this great esprit de corps when he visited the Isthmus in 1906 and had said, "I shall see if it is not possible to provide for some little memorial which will always distinguish the man who has done his work well on the Isthmus." So in 1908, copper pipe collected from old French excavators, bronze bearings and 200 pounds of tin found in an old French warehouse were sent to the Philadelphia Mint to be cast into "Roosevelt Medals."

The Roosevelt Medal on the front cover was presented to Robert W. Claw for service between 1904 and 1914. He was one of the few men to earn the medal and the maximum number of 2-year bars, having served the entire construction period.

Souvenir Shovel

Another farewell function marking the closing of the Gorgona shops was a smoker where souvenir shovels were given as favors. These shovels and the star-shaped device which is inscribed "The I.C.C. Won't Let Me" were cast from scrap at the Gorgona foundry. I.C.C. stands for Isthmian Canal Commission.

Identification Tags

Scattered over both sides of the cover are brass identification tags which were issued by the Accounting Department of the I.C.C. Employees presented these to receive their pay and to gain access to various construction sites. Even Fido had his own identification tag. The dog license at lower left on the front cover was issued at Empire, another construction-day town. The photo type identification disc attached to the key ring was issued in 1918.

Fire Department

The first paid fire company was established in 1906 and badges, like the silver colored one on the front cover, were issued to 320 volunteer firemen who supplemented the regular force of 27 paid members.

Athletic Medals

At Ancon on the Fourth of July, 1908, gold, silver, and bronze medals were awarded in each athletic event. The one lying on the program was for the pole vault.

Commemorative Medal

"THE PANAMA CANAL OPENED 1914 GATEWAY TO WORLD COMMERCE" is engraved on the face of the silver commemorative coin-medal in the upper left corner of the front cover. It was privately struck by the National Commemorative Society. On the reverse is a portrait of Goethals.

Other items on the front cover are postage stamps honoring Stevens, Goethals, and Gorgas, a matchbook cover advertising the Tivoli and Washington hotels, a snapshot of a group visiting Gaillard Cut; and a box of damp proof matches made in Sweden "expressly for the Panama Canal," a brand still sold in the Canal retail stores.

The I.C.C. Band

The I.C.C. Band was organized in 1905 and the insignia at lower left on the front cover was worn on the khaki uniforms. Concerts were given once a month.

The Locks

The yellowed photograph on the fold is described on the back as "Gatun Locks during construction—bridge and crane used for gate erection."

Commissary Books

Also on the fold is a commissary book. These coupon books were used in lieu of money in commissaries, hotels and clubhouses during and after

HAROLD R. PARFITT
Governor-President

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Lieutenant Governor

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THE PANAMA CANAL REVIEW

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the construction of the Canal. An open book showing the coupons is at bottom left on the back cover.

Patent Medicine

"Two worldwide wonders, the Panama Canal for universal commerce and Hostetter's Stomach Bitters for dyspepsia, indigestion and malaria" is the advertisement on the postcard, at the top of the back cover, which was typical of patent medicine promotion during construction days.

Opium Bottle

The small bottle, called an "opium bottle," contained a Chinese medication which still can be bought today. The bottle dates from the late 1800's, the French Canal construction period.

Ancon Cemetery

Also illustrative of the ravages of disease on the Isthmus is the snapshot, on the back cover, of the Ancon Cemetery, which was later relocated.

The Swill Ticket

Malaria and yellow fever are well known as diseases which took their toll but cholera was also a problem. In an intensive effort to stamp out cholera, the Canal Health Department required that all swill, which was composed of food scraps from the clubhouses, hotels, and mess halls, be cooked before being fed to hogs. Tickets were issued to farmers entitling them to purchase prescribed amounts of cooked swill.

Hog Farm

Since little was available on the Isthmus, the Canal had to operate a hog farm, as indicated by this shipping tag, bakery, dairy, mattress factory, and numerous other plants and services.

Panama Canal Toy

On July 9, 1912, a patent was issued for a Panama Canal puzzle which has a drawing of Miraflores and Gatun Locks inside a small box. The object of the game is to roll each of three small balls through the gates of the locks. Tiny metal strips represent the locks.

Ashtray

"WE DONE OUR DAM'DEST" is inscribed on the right rim of the ashtray and "The Society of the Chagres Annual Dinner, 1915" on the left rim. This society was composed of I.C.C. and Panama Railroad Company employees who had earned the Roosevelt Medal with two bars prior to the opening of the Canal.

Postcard

The tinted postcard shows members of the Third Isthmian Canal Commission. From left to right (with Goethals in center) are: Lt. Col. William L. Sibert, Joseph C. S. Blackburn, Rear Adm. Harry Harwood Rousseau, Joseph Bucklin Bishop, Col. Harry F. Hodges, Col. William C. Gorgas, and Lt. Col. David Gaillard.

French Coin

A reminder of the long hard valiant years of digging by the French is the French coin at top right on back cover. On it is engraved "Decret du 30 Avril 1880."

Tourist Brochure

The Canal has always been a popular tourist attraction. In lower right of back cover is a 1913 brochure distributed by the Panama Railroad Company. It offers "reserved seats in observation cars" for a close-up look at the construction work.

Museum Items

All of these items, except for several from the private collection of Adrien Bouche, of the Transit Operations Division, are in the Canal Zone Library-Museum.

To create the cover, these articles were arranged on a sheet of plate glass which was suspended over an American flag. Cover design by Willie K. Friar, cover photograph by Don Goode.

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Credits: Photos inside front and back cover ore by Don Goode. Centerspread photos by Arthur L. Pollack.

ADDRESS DELIVERED BY COL. GEO. W. GOETHALS, U.S.A., AT CRISTOBAL, C.Z., JULY 4, 1911, AT THE EXERCISES IN CONNECTION WITH THE CELEBRATION OF THE DAY BY AMERICANS ON THE ISTHMUS OF PANAMA.

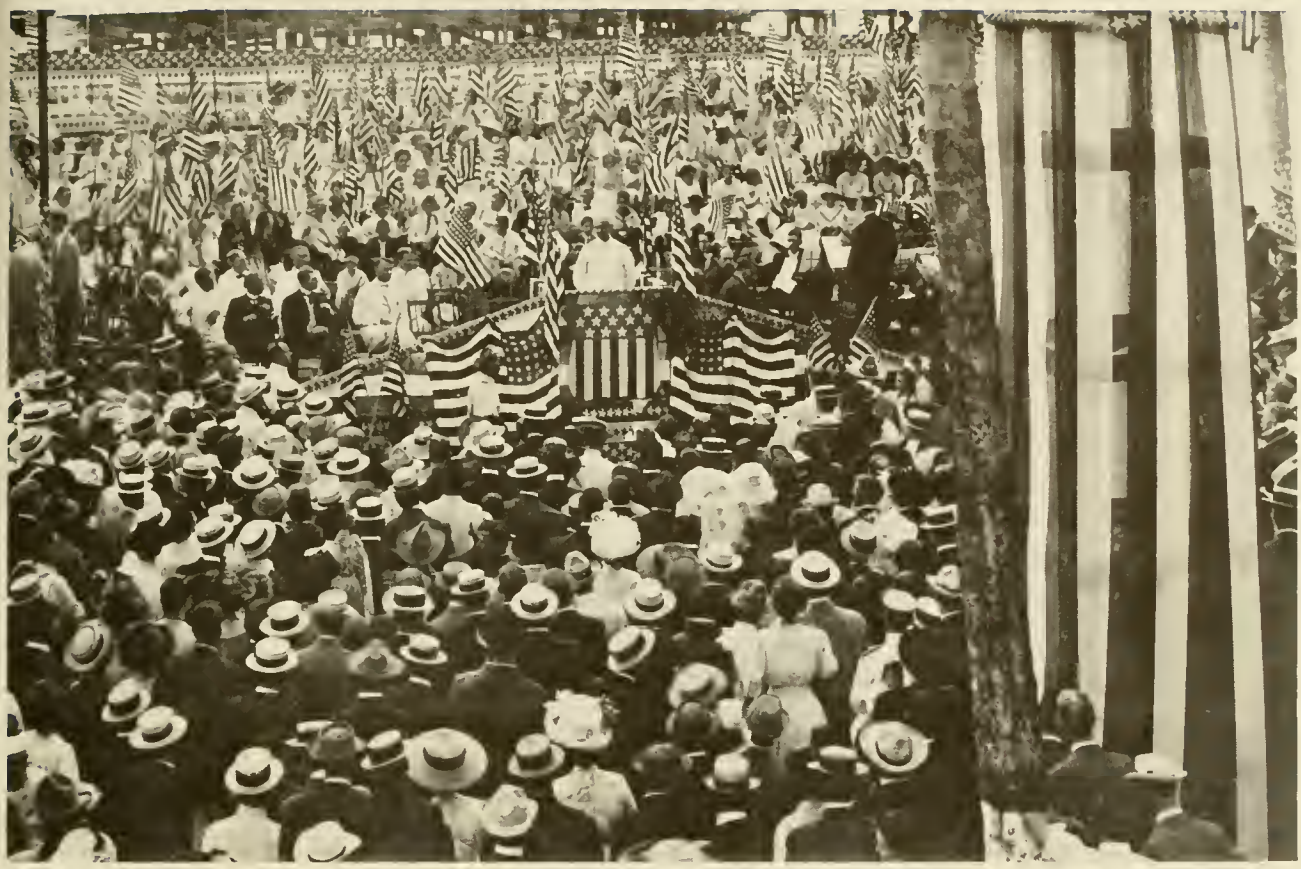
This is the sixth formal celebration of the Fourth of July by Americans on the Isthmus of Panama. There was no observance of the day in 1904, because Canal work had scarcely begun at that time. In 1905 the black shadow of pestilence, which was hovering over the Isthmus, was at its deepest tinge when the anniversary of our nation's birth to freedom arrived. There were, or had been, in hospital stricken with yellow fever, more than 100 Americans, a third of whom were gathered into the final harvest of death. Those who had escaped were in no mood for jubilation of any sort. The one desire of the large majority was to flee as quickly as possible from what they believed to be an accursed land. Their fright-dimmed eyes could not see so far into the near future as to catch the first glimmer of the coming dawn of a veritable day of freedom for the Isthmus—the day that was to mark its lasting deliverance from the scourge of centuries, and convert it from a valley of death into a land of health and comfort.

Yet a visible sign of the coming deliverance was held up before them on July 4th, 1905. On that day an abundant supply of pure water was turned into the new mains, constructed by Americans under the streets of Panama, and the event was celebrated by a solemn high mass in the cathedral. This was the forerunner of the transformation of the cities of Panama and Colon from the leading pest holes of the earth into the best paved, best sewered, and best watered cities in Central America. It was also the first formal demonstration that the onward, irresistible, and uplifting march of American progress had penetrated the tropics. Surely there could be no more suitable day for the celebration of an event so momentous as this than the birthday of American freedom.

Since 1905, every succeeding Fourth of July has been celebrated with fitting observances, and with patriotic enthusiasm, by the Americans on the Isthmus. To my mind, no citizens of the United States anywhere, either within the borders of the Republic, or in other lands, have higher claim to a voice in the great national chorus of pride and rejoicing on this day, than is possessed by the workers on the Canal. They constitute the advance guard in the new era of progress upon which our nation has entered. The American Republic of today is a greater and grander one than that which our forefathers founded 135 years ago. It has expanded from a little group of 13 sparsely settled States, with a population of barely 2,000,000, with an empty treasury and undeveloped resources, into a great nation of 48 States, and four outlying possessions, with a population of 100,000,000, a treasury which sustains easily an annual national expenditure of more than a billion dollars, and with resources so abounding as to be virtually unlimited. From an isolated unit among nations, it has expanded into a world power second to no other on the globe. Impelled by the imperious hand of destiny, it has broken over its borders, and has carried its banner of enlightenment into some of the darkest regions of the earth. Its war with Spain, into which the march of human progress, moving with the unceasing and resistless force of a glacier, thrust it, and which history will record as among the most righteous of all wars, opened the way into this new era. The nation had no choice but to move forward into it, to rise to the new duties forced upon it, and perform them to the uttermost of its ability. How well it has met the test, conditions in Cuba, Hawaii, Puerto Rico, the Philippines, and on the Isthmus of Panama, bear eloquent testimony. In all of these places, the stamp of American energy, intelligence, justice, indomitable perseverance, has been affixed so clearly that all the world may see and understand.

I have said that in this new era of American progress, the workers on the Panama Canal are the advance guard. They hold that position because of the region in which they are carrying it to its successful completion. They are cutting a highway of commerce through what was a plague spot of the world, and, in doing so, they are showing the world how to rid itself of all plague spots. As agents of the American Nation, they are showing the world what can be accomplished by a government which rests upon the popular will, and which is a government of, and by, and for, the people; showing it that popular government, administered honestly and intelligently, is an agency for human welfare and happiness, as well as for national glory. Said a Japanese official, recently visiting the Isthmus: "No nation but the great, rich American nation could build this Canal. No nation can imitate it. We have many things to learn from you."

What the work here has accomplished for the welfare and happiness of the human race can only be dimly perceived now. When the Canal is thrown open to the shipping of the world; when the coast line of the United States thus becomes almost continuous from Maine to Alaska; when, in the American Navy, there is no longer an Atlantic or a Pacific fleet, but simply an American



Against a background of American flags held by girls and boys dressed in white, Colonel Goethals gives the Fourth of July address, which is reprinted on these pages. At far left, on the speaker's stand, are Federico Boyd, at that time Panamanian Secretary of State for Foreign Affairs, and other dignitaries from Panama and the Canal Zone. At right, is the 1911 program which featured the Liberty Bell stamped in gold on the cover.

fleet, patrolling that coast line as national police for the maintenance of order and the preservation of international peace; when American commerce and American capital, seeking new fields through the shortened line of communication, enter into, and develop, the resources of those countries past whose shores that line extends, carrying with them American principles of government and American energy, enterprise, and perseverance—when all these sure developments of the future shall come to pass, then the whole world will recognize the well-nigh limitless value of the contribution to human welfare and happiness which the American nation made when it built the Panama Canal.

THE PIPE RACE WILL CONsist of running 100 yards, picking up a pipe, box of matches, and pack of tobacco that have been placed on the ground about 33 yards apart, the winner being the first man to cross the line with his pipe smoking."

This race was one of the many events on the program when Goethals gave the Fourth of July address in 1911 and was typical of the fun and games that were a part of the enthusiastic celebrations that began on the Isthmus in 1906.

During construction days, entertainment depended on the creativity and initiative of the local residents and the Fourth of July provided an occasion, not only for patriotic celebrations, but for everyone on both sides of the Isthmus to get together for a day of band concerts and contests of all varieties.

A look at the carefully executed red, white and blue programs over the years gives some insight into the changing times on the Isthmus and the world at large.

The Fourth of July was one of the biggest events of the year and plans started far in advance. Committees were formed, responsibilities assigned, and by the time the fourth rolled around, there was an impressive program of entertainment to suit all tastes.

By 1914, the program had grown to 24 pages and featured tennis matches, all types of track events and an "aquatic wrestling match" which was described as a 'free for all to take place on a greased 20-foot floating platform between Piers 8 and 9. Winner to be the last on the platform."

Scheduled for the evening was a grand ball at 9 p.m. at Pier 9 in Cristobal.

By 1917, World War I was reflected in the thick program which featured Uncle Sam in red, white and blue in the centerspread. In one hand he held a battleship which he was placing in the Canal locks. In the other a pick as a tribute to the builders of the Canal.

Movies first appeared in the 1918 celebrations with "War Pictures" and "Charlie Chaplin" listed as the titles of the films to be shown at the Balboa Stadium.

The high point of the evening was an open-air dance at the Administration Building Promenade at 8:30 with music by the 15th Naval District and the 5th Coast Artillery bands.

In 1920, there was an exhibition flight of a dirigible and by 1923, the airplane had become a part of the entertainment with an aerial exhibition including stunt flying by two "SE5s" over Limon Bay. Instructions for the "Triangular Airplane Race" included the information that "the spare wheel and all armament equipment may be removed; large size wheels will be used and any type propeller."

"Miss Liberty" arrived by seaplane, accompanied by maids of honor and train bearers. This was followed by a baby contest.

To add to the festive atmosphere, flags, horns, squawkers, patriotic cockade hats for boys and Miss Liberty hats for girls, blowout ticklers, lollypops and Eskimo pies were distributed to all the children. Mule and "electric truck" joy rides and raspberry punch were also available.

The program advised that "tiny tots are expected to be dressed in red, white and blue (if possible)."

Fourth of July Programs Reflect Changing Times

Spectacular fireworks were a part of every program. The 1908 program featured 46 different scenes and a typical display was that of 1916 which included rockets, and stars shot from submarines in Limon Bay followed by a grand display near Cristobal docks. Listed on the program was a portrait of Theodore Roosevelt, a portrait of George Washington, American beauty roses, a bicycle race, destruction of a battleship by submarine and Niagara Falls.

According to Mrs. Bruce Sanders, who came to the Isthmus in 1910, and is visiting here this year, these elaborate displays were made possible by donations from employees, civic organizations and Panama businesses.

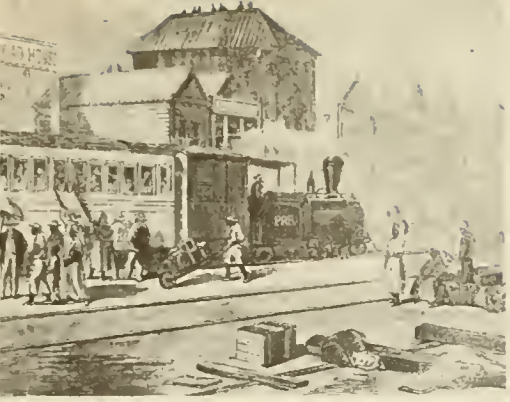
Mrs. Sanders also mentioned that in 1920 one of the highpoints of the day, for adults and children, was a ride on a submarine which included submerging in Limon Bay.

The Fourth of July continues to be a popular celebration in the Canal Zone where the best known street is Fourth of July Avenue.

Royal palms lining the Prado were not yet fully grown when this picture was taken on July 4, 1919. But many present day residents will recognize the concrete family quarters lining the avenue and the Balboa Elementary School at left. The wooden structure at right, originally the Balboa Police Station, subsequently served as the Civil Affairs Building and as the women's dormitory for Canal Zone College before it was finally torn down.

In the old days, folks flocked to the spanking-new Administration Building for patriotic ceremonies on Independence Day. In 1915, despite the weather, men wore coats and ties and women were decked out in long dresses. Though the classic straw skimmers were in vogue, East Indian employees and concessionaires like the group at left, protected their heads from the tropical sun with the traditional turban.

Except for the profusion of flags, the American eagle topping the tile roof and the natty uniforms, the Balboa Fire Station looked much the same 60 years ago as it will on July 4, 1976, when the United States celebrates the 200th anniversary of its independence.



The Panama Railroad

By Pandora Alemán

IT'S EASY, AND CHEAP, AND safe to travel between Colon and Panama these days. Just board any of the red, white and blue Panama Railroad cars, and relax. Want to be cool and dry, insulated from the torrential rain and merciless sun? Choose an air-conditioned car and, if you didn't buy a ticket at the station, pay the conductor $1.50 when he comes around. Prefer an open window so you can see the Canal better, search for alligators, savor the surrounding jungle and the soggy swamps over which you skim? Pick a regular coach, and when the man comes give him a dollar. Either way, you'll clatter across the Isthmus in about an hour and a half.

Unless you're carrying a copy of the Railroad Division's pamphlet **Your Trip on the Panama Railroad** and watching the mileposts, you won't even notice when you cross the continental divide, so effortless will the trip be. It was not always so.

Those who know its story call the Panama Railroad the most audacious piece of engineering the world has known. Begun barely 20 years after the first railroad had been built in the United States, it presented difficulties of a sort no man had struggled with before. As Willis J. Abbot pointed out in 1914:

"Engineers had learned how to cut down hills, tunnel mountains and bridge rivers, but to build a roadbed firm enough to support heavy trains in a bottomless swamp; to run a line through a jungle that seemed to grow up again before the transit could follow the axe man; to grapple with a river that had been known to rise 40 feet in a day; to eat lunch standing thigh deep in water with friendly alligators looking on from adjacent logs, and to do all this amid the unceasing buzzing of venomous insects whose sting, as we learned half a century later, carried the germs of malaria and yellow fever—this was a new draft upon engineering skill and endurance that might well stagger the best."

An average of only 8 miles of track were laid a year, until, after 5 years, the first train ran from sea to sea. Since that time, the railroad has been rebuilt twice. In 1905, it was necessary to rehabilitate the original road so it could withstand the burdens imposed on it by Canal construction. And when it was at last decided to build a lock canal, which required damming the waters of the Chagres River to form the largest man-made lake the world had yet seen, some 40 miles of the roadbed were relocated on higher ground. It is on this line that today's passenger rides.

The story of the first Panama Railroad begins with steamships. In 1847, William Henry Aspinwall, a wealthy New York merchant, contracted to carry the U.S. mails between Panama and Oregon. This raised a few eyebrows in Wall Street, for the contract showed no promise of profit. But Aspinwall was a man of vision; he wanted to build a railroad across the Isthmus and combine sea and land routes into one great system that would open up the whole Pacific.

In late 1848, the Government of New Granada (Colombia) awarded a railroad concession to Aspinwall and his associates, and a few months later the Panama Railroad Company was incorporated under the laws of New York.

Hardly had the first of Aspinwall's steamships left on its round-the-Horn trip to Panama than news of the discovery of gold in California hit the East Coast. By the time the steamer put into port at Panama, there were hundreds of would-be prospectors fighting for space on the ship.

These Forty-Niners had traveled the water route across the Isthmus, debarking at the town of Chagres below Fort San Lorenzo and hiring boatmen to pole them upriver in dugout canoes. Leaving the water at Cruces, they proceeded on muleback through the jungle to Panama. The 4-to-8-day trip was a harrowing experience.

The Gold Rush was on. So, soon, was the business of building a railroad, as engineer George M. Totten and a small workforce set about clearing the island of Manzanillo, chosen as the Atlantic terminus. His workforce, drawn from the four corners of the earth—England, France, Ireland, Germany, Austria, China, India, Jamaica, Colombia—eventually numbered in the thousands.

The passenger boarding at Colon today will see little that suggests the sight that greeted the first railroaders. Separated from the mainland by a narrow strait, the island was little more than a square mile of virgin mangrove swamp abounding with alligators and other reptiles and swarming with mosquitos and sandflies.

Above:
An old woodcut captures the flavor of the Aspinwall station in the mid-1800s.

At left:
Flash floods like this one near Mindi on the old line in 1906 plagued railroad construction and operations from the day work began.

Ribbons of rust resurrected

Its new coat of red, white and blue paint in honor of the Bicentennial of the United States of America does not exempt Engine 901 from work. Here, with a string of passenger cars in tow, it rounds the bend near Pedro Miguel Locks on one of its three daily transcontinental trips.

Today, the train pulls smoothly out of Colon station and about 5 minutes later arrives at Mount Hope. It took a 400-man workforce 4 months to cut a swath through the tangled vegetation to this, the first high ground on their route. They called the place Monkey Hill "owing to the multitude of monkeys gamboling and chattering in the foliage."

Getting the tracks laid to this point was another matter. When Manzanillo Island had been cleared and partly filled, they built a causeway across the narrow channel to the mainland. Over the years, the entire channel was filled in and Manzanillo became a permanent part of the mainland.

Coming into Mount Hope, the traveler sees a cemetery on the hillside to the left, with the date "1908" over the arched gate. The date is misleading, for the cemetery antedates the Canal by over half a century. In March 1851, the official railroad cemetery was established here. As the number of graves grew and the monkeys vanished, the place was christened Mount Hope. Throughout the construction years, there was a daily funeral train to Mount Hope.

Legend has it that one man died for every tie laid—a gross exaggeration. But it is fact that by 1855 there were more than 6,000 graves at Mount Hope, and the total number of railroad deaths has been estimated at 12,000.

Though it may be apparent to the traveler today that from Mount Hope to Gatun he has sped along through swampy terrain, there is nothing in the easy 10-minute ride to indicate his proximity to the legendary Black Swamp, which nearly defeated the railroad project when it had barely begun.

Leaving Monkey Hill, the rails were to follow Navy, or Limon, Bay about 3 miles to the "Mindee" River, and from there cross a 3-mile stretch of quicksand and sinkholes, where in places bottom was not found even at 200 feet. Tons upon tons of trees and rock were fed into the maw of the swamp, with no apparent effect. At last, flatcars were chained together and sunk in sections to make a floating base for the roadbed. The rails in place, trainloads of rock were dumped on either side in hopes that the fill would hold the floating foundation steady. The desperate trick worked. But, in years to come, cars left too long on this section would simply disappear, leaving "only a muddy blank on the right of way."

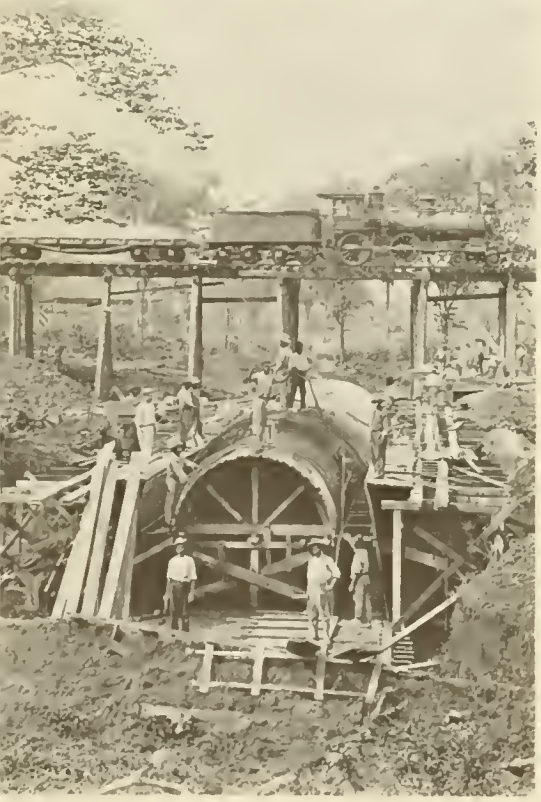
The first train of work cars ran to Gatun on October 1, 1851. The very worst of the construction work was past, but the company's funds were exhausted—and what investor would risk more money on a company that had spent 20 months laying 8 miles of track in the wilderness? Nature, which so far had given nothing but trouble, now offered a helping hand. Beset by a hurricane that prevented transfer of their passengers to the tiny native boats at Chagres, two steamships took shelter in Navy Bay. They dropped anchor near the railroad company's pier on Manzanillo, and when the gold-rabid passengers spied the train, there was no keeping them back.

They piled themselves and their baggage onto the work cars and rode to Gatun, where they hired boats and proceeded to Cruces without waiting for the storm to subside.

When Wall Street heard that the far-from-complete railway had already carried over a thousand passengers, confidence was restored, credit was reestablished, and work went on. Steamers made Manzanillo their stopping place, the railroad went into the passenger business in earnest, and Chagres faded into the jungle.

At Gatun the train today offers travelers an excellent view of the mile-long Canal locks and, if it is not hidden by a transiting ship, the spillway of Gatun Dam, at whose immenseness he

Fifty-one engineers and draftsmen died in the cholera epidemic



can only guess by the vastness of the waters it holds back.

From here to Gamboa, the train skirts the lake, alternately penetrating stretches of dense jungle and offering an unobstructed view of the ships wending their way along the main channel. Much of the time those ships are traveling far nearer to the original railroad bed, now under 40 to 75 feet of water, than the observer on the train.

Navigational charts in the **Panama Canal Company Pilot's Handbook** show Lion Island, Tiger Islands, Bohio Reach, Buena Vista Point, Frijoles, Barbacoa Island, Gorgona Islands, Bas Obispo Reach, Empire Reach, and other names that conjure up memories of way-stations on the original railroad.

After the railroad's first transporting of California-bound passengers to Gatun, the tracks pushed on through the Chagres Valley past Lion and Tiger Hills—so named by the railroad construction crews because, as Joseph L. Schott says in **Rails Across Panama**, "their monkey population filled the nights with a roaring sound that was at first mistaken for the sounds of lions and tigers." By March 1852 the road had been completed to Bohio Soldado, 8 miles beyond Gatun, and passenger trains met every steamer arriving in Navy Bay.

Passing through Buena Vistita, the line reached "Frijoli" 2 months later. The passenger today may take note of Frijoles Station, about 20 miles from Colon on today's route, only if his train pulls to a stop to allow passengers to catch a launch for Barro Colorado Island, where the Smithsonian Institution maintains a wildlife preserve.

By July 1852, the tracks extended to Barbacoas, 23 miles from Aspinwall, as the Atlantic terminus was now called. Travelers could come halfway across the Isthmus by train, but the road had cost far more than anticipated.

To make matters worse, in the spring and summer of that year, a cholera epidemic had struck the Isthmus. Many of the workers, hit suddenly with cramps, managed to drag themselves to the tracks, where they were picked up and carried to the hospital at Aspinwall. The less fortunate were swallowed up by sinkholes or eaten alive by ants and land crabs. All but one of Totten's entire technical staff—51 engineers and draftsmen—died in the epidemic, which paralyzed progress on the road until it ran its course in late August.

Into this death trap marched the Fourth Infantry Regiment of the U.S. Army, which was being sent to California. The group traveled by rail to

Above: Even before its completion, the Panama Railroad was beset by accidents like this one near Gatun on top of all the disasters a hostile nature could send its way.

Above left: Close by Miraflores Locks and Spillway, this stone railroad bridge dating from 1855 stands in mute tribute to the men who gave their all to build the world's first transcontinental railway.

At left: An Isthmian Canal Commission locomotive steams across a trestle in 1907, hauling loaded dirt cars to one of countless dump sites while work on a culvert goes on below.

At left:
Few today would recognize this building as the old Panama station, here festooned and bedecked with flags to celebrate the third anniversary of Panama's independence.

Below:
The famed Las Cruces Trail, which formed part of the old Isthmian "water route," before the railroad was built.

Barbacoas; from there, the main body of men marched over the trail from Gorgona to Panama. The sick, the women and children, the baggage and one company were to go upriver by boat and then take the somewhat shorter trail from Cruces.

With the second group was Capt. U.S. Grant, the regimental quartermaster. Though mules had been arranged for at a reasonable rate, the owner held out for the higher rates he was offered by civilian travelers. After a dozen cholera deaths and a 5-day wait, Grant in desperation paid the higher rate for the promised mules.

Of that terrible transcontinental journey, Schott wrote: "As long as Grant lived he would tell more of the hellish march across Panama than of any of his famous battles. The rain, the mud, the sick, and the dying on the jungle trail made a lifelong impression on him. In his old age he told his intimates that the burdens put on him . . . had served at least one good purpose by revealing to him his own 'unguessed powers at this business of managing a command of military men'." It was this same Ulysses S. Grant who, as commander of the Union army, later accepted Confederate Gen. Robert E. Lee's surrender at Appomattox and went on to become President of the United States.

Once the cholera had subsided, the railroaders faced the challenge of building a bridge across the Chagres at Barbacoas. Totten argued hotly in favor of an iron bridge. But the board of directors, wanting a less costly temporary wooden structure, contracted out the remainder of the railroad work.

So Minor C. Story, who had earned a reputation as a boy wonder of the railroad business, came to the Isthmus and set about building a bridge spanning the 300-foot-wide river that had been known to rise 40 feet in a single night. All through the dry season his men worked; but when the rains began in April the nearly finished bridge was swept away by the first flood. The railroad again placed Totten in charge.

Totten completed a 625-foot, six-span bridge of boiler iron at Barbacoas by the end of November 1853. Meanwhile, crossing the Isthmus by train, boat, and mule, was still a 36-hour journey, most of which was taken up by the ride over the road from Las Cruces. This excerpt from the journal of one who crossed the Isthmus that year shows why: "The road, a narrow bridle-path through the forest, was bad beyond description; in many places the mud was so deep that it covered the legs of both mule and rider, while those who were not thrown off into it, were frequently obliged to unseat themselves to allow the animal to get out of it." Totten sent a workforce to widen and repair the road in an attempt to shorten the transit time.

Today, arching the malodorous Curundu River just outside Fort Clayton's Curundu Gate No. 2 and beside Frangipani Avenue, stands a small bridge, unheeded and overgrown. Its well-hewn stones and careful mortar work mark it as one of those that Totten's men built or rehabilitated on the fabled Las Cruces trail.

From Gorgona on the west bank of the Chagres, the road was to go to Matachin (now under water in the general vicinity of present-day Gamboa), then follow the valley of the Obispo River.

Leaving the river, it would climb to Emperador (Empire) and finally to the Summit, or Culebra, 40 railroad miles from Manzanillo Island. From there, the rails would begin a winding descent to the Pacific, cross the Rio Grande and follow its east bank across the Pedro Miguel, Caimitillo and Cardenas rivers. Then it would traverse the beautiful valley of Paraiso, the broad plain of "Corrisal" and the swamp of "Correndeu" till it neared Mount Ancon and, finally, the sparkling cathedral towers, red tile roofs and ancient fortifications of the city of Panama.

Around the end of March 1854, a thousand Chinese laborers arrived at Panama and were put to work, along with Irishmen and others, excavating a cut in the red clay between Gorgona and Matachin. The small, slight men worked steadily and well. But their opium smoking scandalized their Irish coworkers, whose protest, together with a New York bookkeeper's decision that it was an unnecessary expense, put a stop to the importation of the drug by the railroad commissary. Within weeks, there were mass suicides. According to Schott, Totten's investigation of the Chinese incident showed that their depression over the deaths of a number of their group from fever had been deepened by withdrawal from the drug to the point where they chose suicide

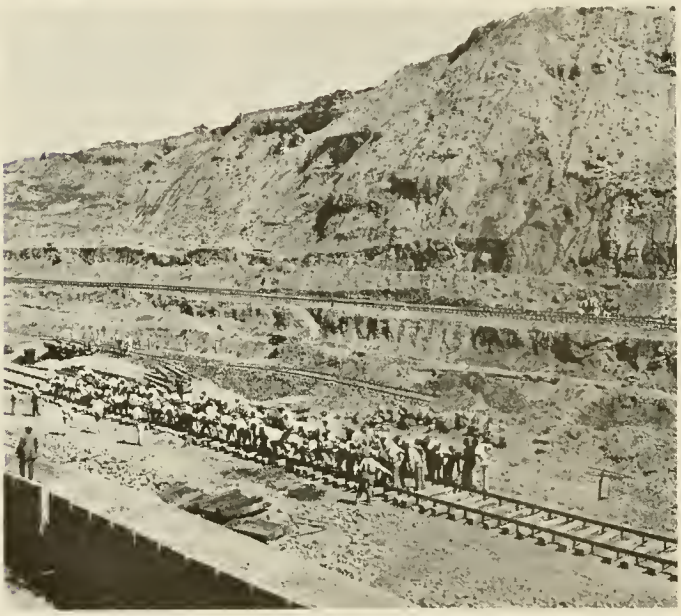
At right:
Motor Car No. 4, the "Yellow Peril" carried Chief Engineer Goethals on inspection trips. Here, he and Mrs. Goethals are seen with a group of visitors.

Below left:
This view of the work in progress at Pedro Miguel Locks in 1911 underscores the vital role played by the railroad.

Below right:
Before the Panama Railroad manager invented a mechanical track-shifter, gangs like this one of 150 men had to move the tracks, ties and all, to new locations in the Cut so steamshovels could attack new ground.

Bottom left:
Gone are the days when a train pulling out of Panama Station would hold up traffic on Central Avenue. The station, visible in the background of this 1930 photograph, has been renovated by the Panamanian Government and is soon to become an anthropological museum.

Bottom right:
At the Balboa Heights station, a plaque (marked with arrow) honors George M. Totten, who as chief engineer of the Panama Railroad pushed the transisthmian railway through to completion in 1855.



as the only escape from the hell of their existence.

Work was at last inching along at the Pacific end, and on the rainy night of January 27, 1855, the last rail joined the two sections—14 years before completion of the first transcontinental railroad in the United States.

The next day, 4 years and 9 months after work had begun, a train ran from ocean to ocean. The road, 47.51 miles long, crossed 170 waterways, 36 of which required bridges more than 10 feet long. Then, as now, it was a single 5-foot-gage track with sidings at points along the way.

It had cost around $7 million—about $150,000 a mile. But even before it was finished it had earned roughly a third of its cost by transporting passengers and freight. By the end of 1858, it had grossed over $8 million.

The company fixed what it thought would be prohibitive tariffs in the hope of controlling the number of users clamoring for its services. It set the first-class rate at $25 gold, and "steerage" passage at $10 gold. For $5, one could walk the track from sea to sea. The outrageous fares stood for 20 years.

The railroad had given Panama a tremendous advantage over other possible sites for an interoceanic canal. Its construction had given engineers an intimate knowledge of the problems posed by the terrain and climate, and it was itself the most indispensable of all tools for digging a canal.

Under the terms of its concession, the Panama Railroad had the right to prevent construction of a canal near its own transit line. So in 1881 the French canal company purchased nearly all of the company's stock for $20 million.

The French canal enterprise folded, and the railroad collapsed along with it. Its condition, when in 1904 the U.S. Government bought it from the French canal company and the remaining stockholders for a mere $9 million, has been succinctly described as "two streaks of rust and a right of way."

It was the chief engineer of the Canal, John F. Stevens, who rescued the railroad from chaos and created the organization that would carry the Canal construction through to completion.

Stevens, a respected railroad engineer, came to the Isthmus in 1905. He postponed large-scale excavation and gave priority to the construction of housing, shops and docks and to the sanitation work. Above all, he concentrated on the problem of transportation.

To construct the Canal, an enormous amount of earth and rock would have to be excavated and moved over distances ranging from 3 to 30 miles. Stevens set about preparing the railroad for the enormous job it had to do. Heavier rails were laid, new rolling stock was purchased, and the organization became a model of efficiency. By the end of 1906, 37 miles of the Panama Railroad had been double-tracked to accommodate not only the endless stream of dirt cars but also the vastly increased commercial traffic of Canal construction days.

He carefully selected dumping sites, laid out a complex trackage system in Culebra Cut, and coordinated dirt train schedules with the excavation work.

Today, as the train pulls out from Gamboa and crosses the 1,320-foot steel-girder bridge that spans the Chagres, passengers may be able to see a ship emerge from the narrow confines of the Cut. But in Canal construction days a passenger on the world's busiest railroad was afforded a different view.

John F. Stevens rescued the railroad from chaos and created the organization that built the Canal

In 1912, Forbes Lindsay wrote: "In the Cut, the scene is of the busiest. Dirt trains are moving in every direction, or standing to be filled. Steam shovels take 5 cubic yards of material and make a dump every 15 or 20 seconds. Not a moment is lost unnecessarily. . . . The strings of cars move back and forth like shuttles in a loom and nothing is allowed to interfere with their regularity. All other traffic gives way to the dirt car."

There were in reality two systems operating together. The Isthmian Canal Commission operated the work lines, and the Panama Railroad, still a separate entity though government owned, handled passenger and commercial freight traffic in addition to supporting the Canal operation with its steamships, commissaries, bakery, laundry and cold-storage plant. In all there were about 300 miles of trackage.

A peculiarity of the excavation railroad system was aptly described by Abbot: "One of the witticisms of the Zone is that the Panama is the only railroad that runs crosswise as well as lengthwise. This jest is . . . based on the practice of picking up every night or two some thousand feet of track in the Canal bed and moving it bodily, ties and all, some feet to a new line. This is made necessary when the steam-shovels have dug out all the rock and dirt that can be reached from the old line, and it is accomplished by machines called track-shifters, each of which accomplishes the work of hundreds of men."

Another oddity seen along the tracks was the gasoline-propelled pumpkin-colored contraption—something between an automobile and a locomotive—which every morning took Stevens' successor, Chief Engineer Col. George W. Goethals, to inspect the work. Known variously as the Yellow Peril and the Brain Wagon, it would on a typical day carry the Old Man to Pedro Miguel, where he would alight and, umbrella in hand, walk along the construction line north to Gamboa or south to Corozal.

Surveys for the new, relocated railroad line had been completed in November 1906, and in June 1907 work began. It progressed rapidly, as in contrast to the pioneer railroaders the Canal men had a well-trained, well-housed, well-fed, and healthy workforce of some 40,000 men—not to mention their superior equipment.

At first it was planned to carry the railroad through Culebra Cut on a berm along the east side, 10 feet above the water level, but the slides made this impossible. So after passing Gamboa today's traveler leaves water's edge at Bas Obispo. The train follows a line cut around Gold Hill through a ridge of solid rock, and runs down the Pedro Miguel Valley to Paraiso. From there, it practically parallels the Canal to Panama, passing the locks at Pedro Miguel and Miraflores. The new line has at least one feature the old one lacked: a 736-foot tunnel cuts through Miraflores hill, providing a bit of novelty and, with its sudden blackness on a bright day, startling children making their first transcontinental journey.

The new 47.2-mile-long railroad was ready by May 1912. After half a century of service to world progress, the original Panama Railroad line was

Paymasters and guards relax in the Isthmian Canal Commission's Pay Car after paying workers along the route.

abandoned to make way for the Canal it had helped create. Fittingly, when the Canal was inaugurated on August 15, 1914, the ship chosen to make the initial transit was the Panama Railroad steamship *Ancon*. It traveled from Cristobal to Panama Bay in 9 hours and 40 minutes under the watchful gaze of Goethals, who stationed himself at vantage points along the way.

Since that day, as before it, the Panama Railroad has carried on its proud tradition of service to the Canal, to Panama, and to the world. The only year-round passenger and freight operation of its kind run by the United States Government, it runs seven transcontinental round-trips for passengers daily (six on weekends) and a round-trip freight train with one car for passengers nightly.

Its 1,600-horsepower 75-ton Diesel-electric Alco-GE road and switching locomotives are a far cry from the tiny wood-fueled steam engines that performed a heroic task in the early days of railroad building. And its long, roomy air-conditioned steel coaches with comfortable reclining seats are hardly reminiscent of the original little wooden cars, with their venetian blinds and canework seats.

The Isthmus' most effective means of mass transit, the railroad carries a good share of the freight moving between Colon and Panama—about evenly divided among the Canal, U.S. military installations in the Zone, and Panama—and handles most of the container cargo between the two ports. In fiscal year 1975, it transported 779,700 passengers and 213,000 tons of freight.

From the early 1920s until 1951, railroad headquarters were at Balboa Heights. But with the incorporation of the Panama Canal Company and the consequent merging of the Panama Railroad and the Panama Canal, the railroad became one of five divisions of the Transportation and Terminals Bureau and moved its headquarters back to the Atlantic side, where it started 126 years ago.

The visitor to Colon today can view, between the oceanfront Washington Hotel and the first Episcopal church in Latin America (built with the help of the Panama Railroad), a memorial to the founders of the railroad. And an unobtrusive brass plaque at Balboa Heights station acknowledges Totten's work.

But perhaps the best monument to those who accomplished the most daring engineering feat of the mid-1800s stands, overlooked, in the midst of the Canal works.

Close beside the bridge on the road leading from Gaillard Highway to Miraflores Locks, not far from the southern end of the railroad tunnel, stands one last remnant of the original Panama Railroad: a stone bridge built around 1855. It once spanned the Dominica River, the channel of which lay where the Miraflores Power Plant now stands.

The Panama American reported in 1930 that A. E. Meigs of Pedro Miguel had had the stonework repaired and the brush cleared away. In the 46 years since then the jungle has again encroached, and the water pouring over Miraflores Spillway has eroded the bridge at its base. Without Meigs' work, perhaps there would be nothing to see at all.

Here, beside the great locks and the dam that holds back the waters of Miraflores Lake, one can contemplate in solitude the last vestige of the world's first transcontinental railway and pay silent tribute to the men whose blood, sweat, toil and tears marked every inch of the road that made it possible to realize the dream of centuries—the Panama Canal.

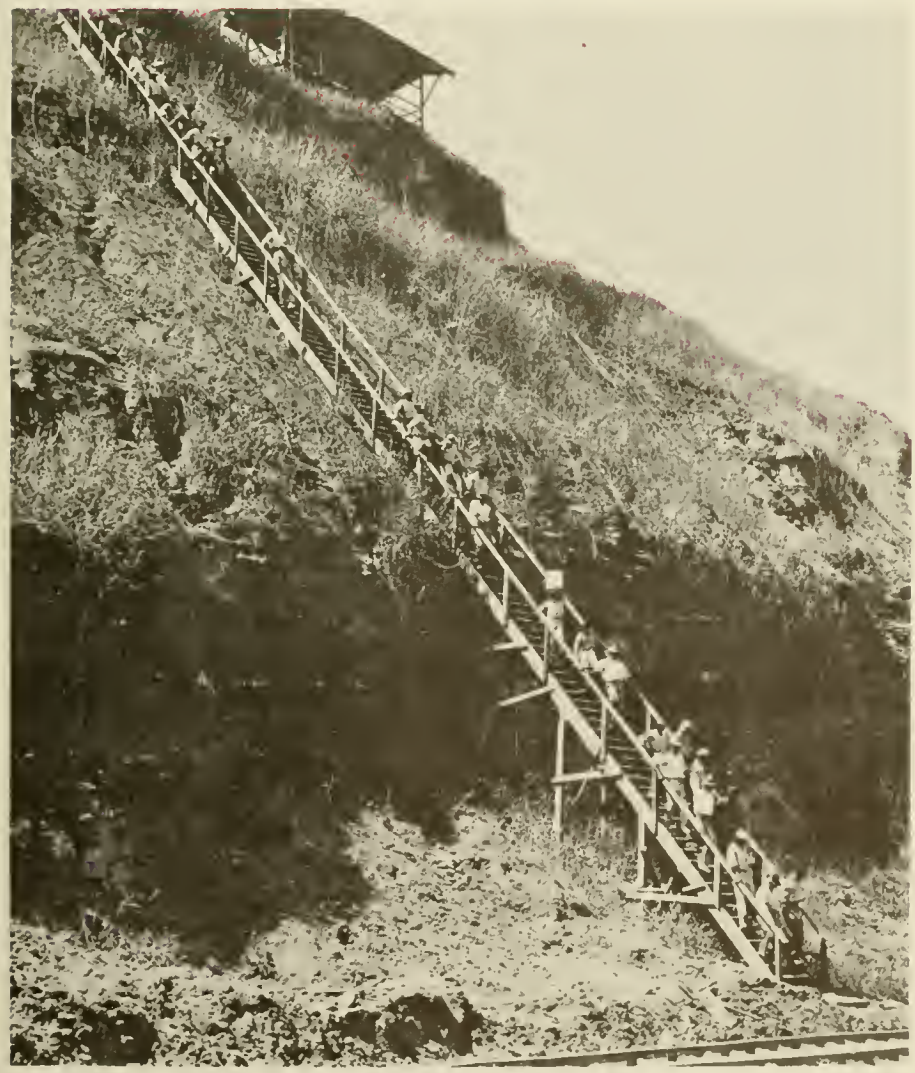
Old 299, an American locomotive engine dating from 1906, has been enshrined at Balboa Heights Railroad Station in tribute to the men and engines that performed heroically during railroad and Canal construction days.

Glimpses of the Canal are of little interest to this young passenger, who takes advantage of her reclining seat to nap.

Brawn and brains built the Canal

. . . but it takes many skills to run it

By Willie K. Friar



Workers, headed for their jobs in the Cut, walk down the "big stairway" in 1911. Coming down was easy but climbing the 154 steps after a 10-hour day was a formidable challenge.

A LIVEABLE ENVIRONMENT created by modern technology and premium pay have made the current Alaska pipeline project popular as well as practical. But in the early days of the American effort to build a canal across the Isthmus of Panama, the only incentive that could be offered was good wages.

The environment was a formidable obstacle to recruiting workers. Discussing this problem, some years later, Chief Engineer John F. Stevens, who was responsible for changing living conditions on the Isthmus said, "Colon at the northern, and Panama at the southern terminus of the Canal, were, up to 1907, two of the most forbidding, dirty, unhealthy places on earth."

With the discouraging news of disease and death being printed in most of the newspapers in the United States, recruiting labor was a difficult task and there was no surplus labor in the Republic of Panama. The population was sparse and during the entire construction period, Panama supplied only 357 workers.

Laborers came from many lands to work on the "big job" in steaming jungle, tropical sun and pouring rain

Since the United States was not only constructing a canal but providing all auxiliary services ordinarily available from other sources, an enormous amount of labor was required. The United States had to conduct the Government of the Canal Zone, create fire and police departments, a department of schools, construct and operate hospitals, commissaries and hotels, run the Panama Railroad, and provide all other services that would be required in a community in the United States.

Firemen, policemen, cooks, stewards, nurses, doctors and all types of skilled and unskilled laborers had to be imported to perform these functions.

With no surplus of skilled labor available in Central and South America, it was recognized that most of the foremen, and the higher grades of skilled labor would have to come from the United States.

A diverse labor force but great esprit de corps

Attractive pay was offered and large numbers of Americans were brought down in 1905. But the living conditions were so bad that many went back home. By 1908, due to the success of sanitation efforts and building of adequate quarters, more Americans came and stayed. During the construction period, the number of Americans employed at any one time averaged more than 5,000.

Additional sources of labor had to be found, however, and recruiters fanned out over the world. The American work force was soon supplemented by laborers from many other countries including Spain, France, Italy, India, Germany, Greece, Armenia, China, Russia, Cuba, Costa Rica and Colombia.

The work force increased from 1,000 in 1904 to over 30,000 in 1907. Considering the problems of those days, it is easy to appreciate the difficult task of recruiting and organizing a work force of over 30,000 men in less than 3 years.

By 1914, the work force had reached 45,107. Taking into consideration the size and type of work performed as well as the diversity of the work force, one of the greatest triumphs was the creating of an enthusiastic esprit de corps.

Writing about the Canal workers in 1916, Maj. R. E. Wood, who was with the Canal Quartermaster's Department from 1905-15, said: "The Canal will always remain a material monument from a construction and engineering standpoint; it will also stand as a monument in the minds and hearts of the employees who worked on it during the construction period—a monument no less enduring than its physical presence. Every wage earner, whether a high salaried superintendent or division head, or the lowest paid laborer, was given a chance in every sense of the term, and was able to earn more than his living expenses. The handling of the working force during the construction of the Canal will always stand as a model of an intelligent, just, and liberal treatment of labor."

D. T. Lawson, one of the construction day employees who came to the Isthmus in 1906, wrote proudly in later years, "Nationals of every tribe, race and color, from all parts of the world, contributed to the building of the great waterway."

But after conditions had improved, Government red tape and strict personnel regulations, including thorough medical examinations, still presented a problem in recruiting skilled laborers.

A story, told about the 1905 Civil Service Commission at a meeting of engineers in Chicago, was typical of the problems.

According to the story, in the early days, boilermakers were badly needed, and a request for 20 was made in the regular way. Some time passed and the following cables passed between the Isthmus and Washington:

"Why have you not sent boilermakers, as per my cable?" The reply came back. "Forty applicants examined. All failed account of defective hearing."

From the Isthmus to Washington, "Never knew of good boilermakers that could hear. Send twenty of the deaf applicants as soon as possible."

But as health and organizational difficulties were overcome, the work force became stable and there was a certain sadness felt by many laborers the day the Canal opened. As the first ship transited, one man, recalling the esprit de corps of the construction days said rather wistfully, "I would almost like to see it filled up so we could start all over again."

The SS "Ancon" arrives at Cristobal with 1,500 laborers from Barbados in 1909.

East Indian laborers, wearing their native turbans, line up for paychecks in Balboa in 1913.

Spanish workers remove tracks from Culebra (now Gaillard) Cut in 1913 before water is let into the Canal prism.

Fumigation gangs, which required large numbers of laborers, armed with mops, brooms, buckets, and ladders prepare for work in Panama in the early days of the United States effort to rid the Isthmus of yellow fever and malaria.

Made possible by the sweat of thousands of laborers and the far-sighted vision of great engineers, the Panama Canal owes its efficient operation to carefully trained competent personnel

As traffic and size of ships increased over the years, the Canal became a complex operation with 1,754 occupational designations. The only other U.S. Government agency having a greater range of jobs is the Department of Defense. On the following pages, illustrating the diverse occupations, are some of the more than 14,000 employees who operate the Canal today. As in the construction-day work force, many nationalities are represented. Occupations of employees shown are:

First row—Bureau director, secretary-stenographer, special assistant to bureau director, Canal pilot, secretary, police officer, audiovisual specialist, operating room nurse, linehandler.

Second row—Administrative officer, firetruck driver, veterinary aid, pool guard, electrician, painter, civil engineer, attorney, Canal Zone guide.

Third row—Pharmacist, systems accountant, statistical draftsman, programer, clerk typist, boatman, custodian, gynecologist, locks helper.

Fourth row—Rigger, medical technician, security guard, messman, schoolteacher, motor launch operator, machinist diver, police private, supervisory mechanic.

Fifth row—Linehandler, budget analyst, civil engineer, mechanic leader, office supervisor, tugmaster, mechanical engineering technician, control house operator, community relations assistant.

Sixth row—Towing locomotive operator, boatman, welder, launch captain, receptionist, chauffeur, translator, custodian foreman, radiologist.


POLICE

A view from the bridge

Senior pilot Capt. L. S. Hart, at far right of the bridgewing of the "Zannis Michalos," concentrates on the job as the supership enters Pedro Miguel Locks, while Capt. S. Kalogeras, master of the ship, and another officer observe the transit.

1914-1976

sixty-two years of Panama Canal piloting

By Capt. Norman A. Werner

SINCE THE PANAMA CANAL opened to world commerce 62 years ago the ships that have transited and the men who took them through have played a significant role in the maritime history and progress of the United States.

This is a look at the evolution of the Canal pilot force and a review of some of the over half-million ships that have been piloted from ocean to ocean since 1914.

The controversy leading up to the first official Canal transit was significant. Col. George Goethals, Chief Engineer and Governor of the Canal Zone, had planned as early as 1911 that pilots would board vessels for transit as soon as they entered Canal waters and steam them up to the locks approach walls where they would then be moored. When safely alongside the locks and made fast by cables from towing locomotives, two locks employees would board the ships, one to direct the lockage from the navigation bridge, the other to stand by in the engine room. The locks employees, who were basically skilled mechanics, were to lock the ship through without the use of the ship's engines. This practice was based on barge-canal ideas used on the Mississippi River.

Capt. Hugh S. Rodman, the first Marine Superintendent of the Panama Canal and a naval officer, voiced strong opposition to the proposed plan. He objected to pilots surrendering control of the ships to unlicensed "landsmen" who had no experience in shiphandling. Rodman stated that the planned concept would lead to "delay, confusion, and danger." He wanted to speed up the operation by eliminating the mooring procedure and allow ships to use their engines while moving through the locks with the locomotives serving as "traveling capstans" alongside the ships.

Although Rodman persisted in his opposition to the proposed lockage plan the first Canal regulations provided for locks personnel to lock the ships through.

Shortly before the scheduled official opening of the Canal, the Secretary of War ordered that a trial transit be made. The ship that made the transit was the Panama Railroad vessel SS *Cristobal* measuring 489.5′ x 58′ beam. The *Cristobal* was a twin-screw steam ship of 9,606 gross tons. Her draft during this trial run was 25 feet.

On board was Dr. Richard H. Whitehead, a doctor of engineering, inventor, economist, author, and scholar, in charge of the transit on August 3, 1914.

On this test transit the lock force, as shiphandlers, did not prove satisfactory. At Gatun Locks, the current caused by the mixing of the heavier salt water and the less dense fresh water coming out of the chamber, caused the *Cristobal* to take an uncontrollable sheer and an electric towing locomotive burned out a motor. This current reaches a maximum velocity of 4 knots at the sea entrances of Miraflores Locks as well as Gatun.

At Pedro Miguel Locks, one of the cables from the locomotives parted and it appeared that the ship would collide with the lock gates before it could be stopped. Goethals witnessed the incident at Pedro Miguel and was convinced that competent mariners should take over control of the towing and handling of ships inside the locks. Rodman got his pilot force of experienced mariners.

Competent personnel and finely attuned procedures keep the Canal operating efficiently

The original pilot force was divided into two groups, locks pilots and lake (channel) pilots. The more experienced locks pilot reported to the locks and went out to meet the approaching ship by skiff. He then relieved the channel pilot and maneuvered the ship in and through the locks. Whereupon he was in turn relieved by the channel pilot who navigated to the next locks. This process was discontinued in 1920 to reduce the number of pilots needed.

1914—August 15. The SS *Ancon* has been gaily rigged for the occasion. Flags of all nations were hauled to the wind to mark the international aspect of the event.

Capt. John A. Constantine, decked out in a high collar cream-colored Palm Beach cloth uniform with brass buttons and a stiff cap with the word "pilot" embossed on it, ordered the mooring lines to be singled up in preparation for sailing from Pier 9 at Cristobal. Constantine has the distinction of being not only the first Panama Canal pilot but also the most famous—a legend in his own time.

Stroking his handle-bar moustache, at 7:10 a.m., Constantine ordered the remaining lines cast off, thus commencing the historic first official transit that opened the Panama Canal to world commerce. Instead of heading directly for Gatun Locks, the *Ancon* turned north and went out to the Atlantic entrance so as to include the entire length of the Canal in the first transit.

The SS *Ancon* took 9 hours and 40 minutes to reach the end of the Pacific channel. Thousands of construction era workers and their families cheered as the ship steamed by the townsites along the banks of the Canal.

Constantine, who had emigrated to the United States from his native Greece, had sailed extensively for a number of years before coming to work for the French Interoceanic Canal Company as a harbor pilot. When the U.S. Government formed the Isthmian Canal Commission in 1905, Constantine was appointed master of the steam craneboat *LaValley*.

1919—July 24. The U.S.S. *New Mexico* (600′x 97′) is secure in the lower chamber of Gatun Locks with cables attached from eight electric towing locomotives. She is part of the Pacific naval fleet returning to San Diego, California after World War I.

The fleet is under the command of Hugh S. Rodman—by then an admiral—who had been transferred from Canal Zone duty in 1915. He specifically requested that Constantine be the pilot of his flag ship, the dreadnaught *New Mexico*, during Canal transit. There were 30 ships in the Pacific fleet and lined up stem to stern they would stretch more than 2½ miles. The destroyers were locked up in two ranks of three in each chamber. One pilot was in charge of each group of three destroyers.

In 1919 there were 27 pilots working on the Panama Canal. During the 5 years of operation the fame of the Canal and the reputation of the pilots had been well established throughout the world wherever ship masters got together to spin sea stories. Constantine, or "Capt. John" as he was affectionately called, was known for his skill as a ship handler as well as for his congenial "pilot house manner."

He once told a pilot-in-training who was obviously over speed with the ship he was maneuvering, "Son, if you're in a big hurry to get this vessel alongside,

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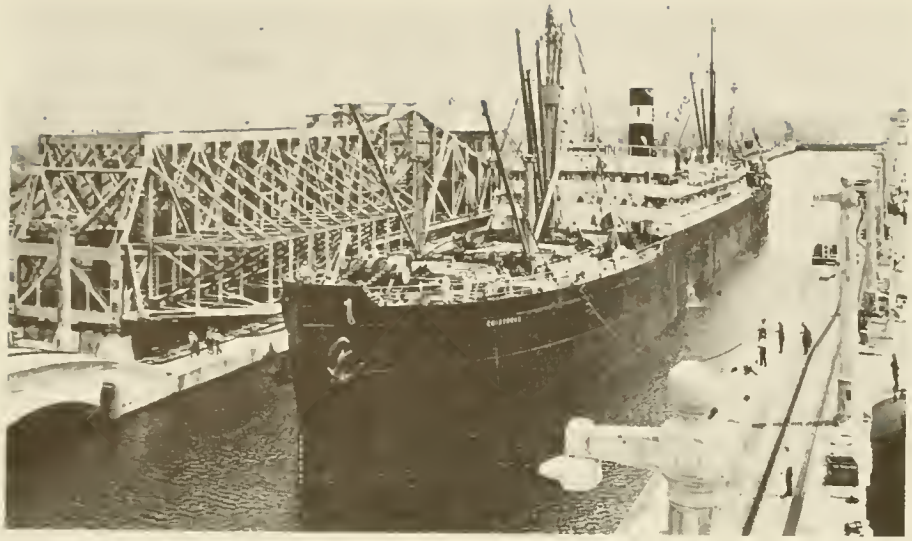
Guest writer Norman A. Werner has been a pilot on the Panama Canal for 8 years.



Above:
The SS "Cristobal" passes through Gatun Locks on a trial transit, August 3, 1914, to test procedures prior to the official opening of the waterway.

Below:
The SS "Ancon," with Capt. John A. Constantine as pilot, moves through Gaillard Cut, August 15, 1914, officially opening the waterway. (The small tugboat is escorting the "Ancon" and is not made fast to the ship.)

Below right:
The U.S.S. "New Jersey" is shown at Pedro Miguel Locks during her last transit of the Canal on June 4, 1968. With a length of 800 feet and a 108-foot beam, the "New Jersey" and her sister ships are the widest vessels to transit the waterway.

then, I would advise you to go very slow." This has become a classic phrase in the vernacular of professional ship handlers.

Constantine was injured while boarding the *Ionic* on January 21, 1929 when a pilot launch crushed both his feet against the side of the ship. He was 80 years old at the time and had received special dispensation from the Government to continue working beyond the mandatory retirement age. He died in 1930.

In 1943 a WW II Liberty class ship was named for him. This is an honor bestowed posthumously upon distinguished Americans and he was the only ship pilot to receive such a distinction.

1932—April 1. The roaring 20's had been reduced to a whisper by the economic reality of the depression. But not everyone was feeling the pinch. The well-to-do could book passage on the quadruple screw Canadian Pacific flag

Locks personnel were used as shiphandlers on trial transit in 1914

ship *Empress of Britain* (733′x 98′) and see the Panama Canal from their living room windows.

Capt. W. J. H. Peterson was on the bridge as she increased speed to expeditiously cover the 21 miles of Gatun Lake. Peterson was well known to the ship's master, Capt. Latta, who specifically requested his services whenever the *Empress* transited. Frequently, the entire transit was made without tug boat assistance.

Peterson brought a broad maritime background with him when he became a Canal pilot in 1918. He had been a master on Dollar Line passenger ships.

As master of a merchant ship at sea a man develops great confidence in his judgment. His decision can mean the difference between a ship and her crew surviving or sinking. Such autonomous responsibility makes a mariner irreverently independent and suspicious of change. These characteristics transfer well to piloting on the Panama Canal.

A Canal pilot must have quick and true judgment plus decision making abilities. The confined nature of the Canal demands not only the judgment of channel and harbor pilots but also an extraordinary degree of timing skill to maintain a consistent flow of ships

into and out of the massive concrete and steel locks without incident. Experience is the basic requirement of a successful pilot.

1934—January 21. Not all transits of the Canal are routine. At 1:15 p.m. this day in history Capt. W. J. Kennedy was piloting the 769-ton Dutch vessel *Brion* north in Gatun Anchorage. As the ship came into the anchorage a five degree list to port developed which the ships crew was unable to correct. It was later learned that a crew member had accidentally opened the sea valves allowing water to enter the hull. As the vessel continued to sink, Kennedy maneuvered the *Brion* to the eastward out of the anchorage. When it was apparent she could not be saved, captain, crew, and pilot climbed into the life boat and rowed ashore. The *Brion* sank in 13 fathoms of water 150 feet from the bank. The railroad tracks ran adjacent to the lake at this point so once ashore Kennedy flagged down the 4:40 p.m. train out of Colon and went home.

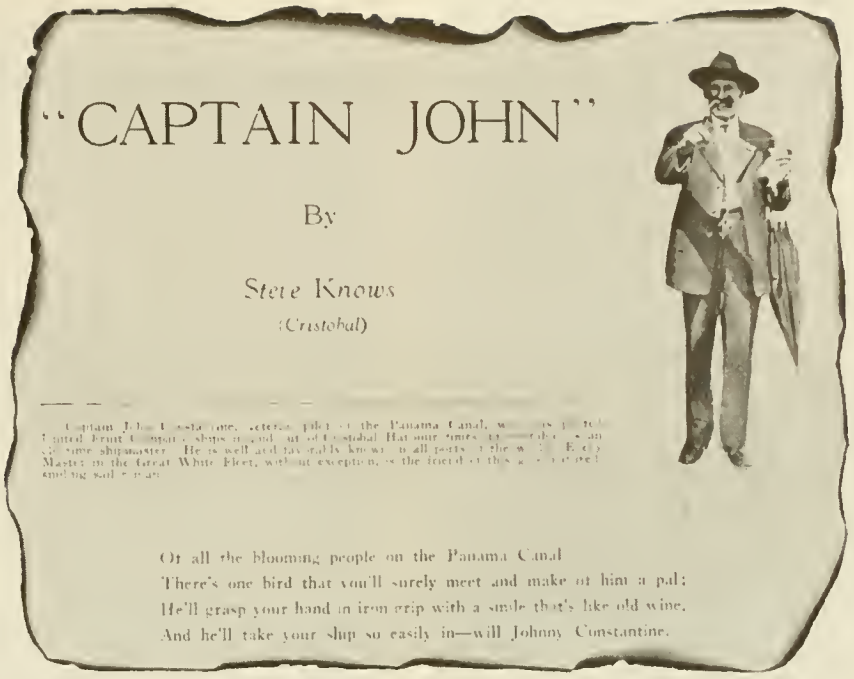
At the inquiry the following day the pilot was asked why he had not maneuvered the sinking ship to the westward behind Guarapo (Navy) Island where a spoil area had already been established. His sense of humor, getting the better of him, the pilot answered, "Had I gone westward with the ship, I would have missed my train."

The *Brion* remains today where Kennedy left it. It is now used as a diving school. The first divers to visit it were the boys in the Gatun townsite diving for it's cargo of ivory nuts. The boys involved were easily recognizable to their school mates as the fuel oil from the ruptured vessel had permeated their hair which had to be shaved off.

1938—October 10. The 100,000th transit of the Panama Canal is logged, the SS *Steel Export* (424′x 56′) operated by Isthmian Steam Ship Lines. Capt. R. H. Wyle navigates into Bohio Turn, the sharpest in Gatun Lake, with the propeller churning the water to foam as the bow wave curls away.

No maritime port, anywhere in the world, guarantees the safety of a vessel maneuvering in its waters to the same degree as the Panama Canal organization. Management relies on the ability, judgment, and good seamanship of its pilot force as part of a transit team to help protect it from the financial liability that goes with this guarantee.

Originally, the Panama Canal Company had accepted liability for it's employees and equipment only while a ship was in the locks. The pilot functioned in an advisory capacity to the ship's master during the rest of the transit. However, with the grounding of the French Line ship *Wisconsin* in 1935 and ensuing litigation it was realized that in order to protect the Canal and the ships that used it, the pilot must have complete control of the vessel at all times. A problem with one ship not only affects those in the immediate vicinity but hundreds of people behind the scenes throughout the Canal.


"CAPTAIN JOHN"

By

Steve Knows

(Cristobal)

Captain John Constantine, veteran pilot of the Panama Canal, was [illegible] United Fruit Company ships in and out of Cristobal Harbor [illegible] as a sailing shipmaster. He is well and favorably known to all ports of the world. Every Master in the Great White Fleet, without exception, is the friend of this [illegible] smiling soul of ours.

Of all the blooming people on the Panama Canal
There's one bird that you'll surely meet and make of him a pal;
He'll grasp your hand in iron grip with a smile that's like old wine.
And he'll take your ship so easily in—will Johnny Constantine.

Capt. John A. Constantine, the first Panama Canal pilot and a legend in his own time, inspired this poem, which was published in 1926 along with his photograph.

The outcome of the *Wisconsin* incident led to the extending of Canal Company liability to the entire Canal and broadening the pilot's responsibility from advisory to "control of navigation and movement of a vessel within Canal Zone waters." This became law when President Franklin D. Roosevelt signed Executive Order 9227 on August 19, 1942.

1943. World War II saw a frantic build-up of allied shipping capacity. In U.S. shipyards, "Rosie the Riveter" turned out Liberty and Victory ships faster than the German U-boats could sink them.

In a German prisoner-of-war camp, 66 master mariners, who literally had their ships torpedoed out from under them, debated on what man-made structures ranked as the greatest feats of engineering. They decided on the Panama Canal as one of the world's great engineering achievements. During their enforced leisure they designed an elaborate scroll stating their opinion. They singled out the smoothness with which a vessel passes through the Canal as a tribute to the pilots and the Marine Division of the Panama Canal Company.

The war years also saw a marked increase in naval vessels passing through. Some of the aircraft carriers required five pilots to navigate them through the locks. The flight deck of the larger flattops actually overhung the 110-foot wide locks chambers. The hull had to be centered perfectly in the chamber to prevent damage as the locks were emptied during descent.

In 1945, 8,866 vessels transited the Canal piloted by 87 pilots.

1950. Gen. Douglas McArthur's forces landed at Inchon, Korea. Once again the Panama Canal provided an interoceanic aqueduct 85 feet above mean sea level. American war supplies were transported through the Canal on board ships such as the *Tillie Lykes, President Tyler*, and *Pioneer Tide*.

Capt. E. B. Rainier headed the SS *Pioneer Tide* (459′x 63′) into Gamboa Reach. "South three proceed" he said aloud as he studied the block signal at the entrance to Gaillard Cut. Rainier sailed as master on the original *Cristobal* when it was operated by the Panama Railroad Company. After a number of years piloting he became the first civilian Port Captain for the Canal Company.

Control pilot Capt. L. S. Hart guides the "Zannis Michalos," which is 738 feet long and 105.8 feet wide, into Miraflores Locks. The large radio in his right hand is used for communication with assisting tugs and towing locomotives on the lock walls. The small radio is for contact with the three other pilots aboard, two of whom are visible on the platforms rigged on the forward portion of the ship.

At left:
Bow pilot Capt. G. R. Cooper is seen on the platform and on the deck as the ship is guided into the locks. His function is to relay information to the control pilot.

Left below:
Control pilot Capt. L. S. Hart (seated) directs the transit from the navigation bridge.

At right:
The "Verrazano Bridge," which is 867 feet by 105.6, leaves Pedro Miguel Locks. Arrow marks position of the bow pilot who is seen close-up below.

1956—December 12. "Its Cotton, Says Billion-Ton Captain" read the banner headlines in the Panama-American newspaper. The SS *Edward Luckenbach* (498'x 69') transported the billionth ton of cargo to pass through the Canal since it was opened in 1914. Capt. Kenneth Roscoe was the Canal pilot on board the 7,870 gross ton freighter as she reduced speed passing the dredging headquarters in Gamboa and the mouth of the Chagres River. Roscoe, a native of Boston, Mass., graduated from Massachusetts Maritime Academy in 1930. He sailed as master with American-Hawaiian Line out of San Francisco, Calif., before coming to the Isthmus to take on the challenge of the Panama Canal.

Pilots navigate the Canal, north or southbound, depending on the number of ships that arrive at either terminal for transit. During the course of each transit a ship will be affected by wind, current, hydraulic suction, and other forces. The pilot learns through many transits how to compensate for these factors.

1957—December 17. The dry bulk carrier *Cosmic* (744'x 101') making it's first transit enters Gaillard Cut. The unique feature of the *Cosmic* was the navigation bridge which was well aft, leaving the remainder of the ship measuring the length of two football fields put end to end ahead of the bridge.

Capt. C. S. Townshend was the first control pilot of this first large "stem winder" (as bridge-aft vessels have come to be known). He instructed that a temporary cat-walk be constructed athwartships in the forward part of the vessel prior to transit. During the lockage at Gatun, he conned from this forward position assisted by three additional pilots, two stationed on the extremities of the navigation bridge. Capt. C. G. Didrickson, who was the second control pilot, tried it from the navigation bridge aft during the descending lockage at Pedro Miguel and Miraflores Locks. Eventually all control pilots on "stem winders" worked from the navigation bridge but forward temporary platforms are still required for assisting pilots on stem winders over 100 feet in beam.

As a large vessel approaches, moves through and leaves the locks, the pilot's role is particularly important

A ship transits with the help of the extensive lighting which was installed along the banks of Gaillard Cut. It is a different Canal at night as any pilot or ship's master will tell you.

Capt. Robert Rennie sits on top of the amphibious jeep "Tortuga" as it approaches Pedro Miguel Locks in 1955. Pilots are accustomed to coping with the unusual as well as the conventional transit.

Ships such as the *Cosmic*, especially when deeply loaded require a pilot's full concentration when navigating Gaillard Cut. This part of the Canal (originally called Culebra Cut which is Spanish for snake), was chiseled out of the rock on the Continental Divide. Until 1971 the cut was 300 feet wide. When a large and unwieldy vessel of over 100-foot beam moves in such a confined waterway, asymetrical hydrodynamic forces are created. The moving ship will actually cause the surface water level on one side to be higher than the other. This creates a force that will cause the ship to sheer off course. To counter this, the pilot must order the use of the ships rudder and engines with unerring precision.

A system of securing a tug boat astern with a two-line bridle was developed at the David Taylor Model Basin in Carderock, Md., expressly for ships navigating Gaillard Cut. This provides a "second rudder" and has proven quite successful.

Even smaller ships that are allowed to meet in the restricted confines of the Cut create an interaction. Again the experienced pilot will counter the sheer with precisely the proper degree of rudder angle and engine power.

When the Cut was 300 feet wide the standard method of meeting another ship was to steam head on to the approaching vessel until both ships were about one ship length apart. At this point both pilots would order the rudder put to the right on their respective ships. As the bows of the two ships swung to starboard a cushion of water built up between the ships allowing them to pass without colliding. Needless to say this maneuver required absolute precision and strong nerves.

Ship masters who bring their vessels to the Canal for the first time are understandably apprehensive as they witness the margin of clearance reduced from miles such as it is in the open ocean to feet as it is in the Canal.

One pilot couldn't resist the temptation of having fun with a particularly nervous and obviously new skipper. The situation was a meeting of two vessels in the Cut as described before. As the two 10,000 ton ships approached each other dead on, the new skipper's pacing increased. When the two ships were about to reach the point when the maneuver to starboard was called for, the pilot, turning to the skipper took off his glasses, rubbed his eyes, and asked "Captain, my eyes aren't so good anymore. Can you tell me if you see a ship ahead?"

Another problem that is particularly acute in the Cut is the accumulation of fog (pea soup variety) at night during the rainy season. On the average, ships are tied up for fog 65 nights a year.

1962—September 16. With then President of Panama Roberto F. Chiari and Canal Zone Gov. Robert J. Fleming as special guests, the nuclear powered ship NS *Savannah* (595'x 78') enters the "jaws" at Pedro Miguel Locks. The entrance to the locks chamber is termed the jaws because the slightest error here, either human or mechanical, can result in the ship's hull being ripped open if it strikes the concrete.

Capt. C. V. Torstenson is the pilot during this maiden transit. He was sent to the United States to go on board the *Savannah* during her sea trials to determine what special precautions would be necessary when the first atomic powered merchant ship transited.

1970—June 2. The ore carrier *Oswego Venture* (760'x 102') carries the 2-billionth ton of cargo through. Unlike the *Edward Luchenback*, which made history when it carried the billionth ton 13 years earlier, no ceremony accompanied this transit. It was business as usual for control pilots Capts. E. G. Evans and W. Cronin who were unaware of the significance of their transit.

1972—April 19. The *Tokyo Bay* (950'x 106') departs Pedro Miguel and glides effortlessly across Miraflores Lake. The first of the super container ships that have come to be called "Panamax" was guided by Capts. A. L. Wilder and T. W. Gove, control pilots. The Panamax designation is applied

ONCE THE LOCKS DWARFED THE SHIPS, NOW THE SHIPS DWARF THE LOCKS—Four destroyers move through Pedro Miguel with space to spare in 1925 while today, the "Kowloon Bay," a regular customer, which is 950 feet long and 106 feet in the beam, squeezes through.

to ships designed to take maximum advantage of the limiting dimensions of the locks.

Originally, the Canal was designed with extra capacity and the locks dwarfed the ships of that era. Fifty-eight years later it would be the ships that dwarfed the locks.

By now the Canal has gone to a 24-hour operation starting January 1, 1963. Vessels had transited at night as early as 1940 on a selective basis. This was made possible by the installation of bank lighting in the Cut. In 1964 pilots gave up using hand signals to the locomotives as new radios permitted pilots to communicate with locks, tugs, and marine traffic coordinators. And the original electric towing locomotives have been replaced by more versatile machines.

1974—May 8. The *Pennsylvania Getty* (799′x 105′) awaits the gates to swing open in Miraflores Locks. She is en route from Hampton Roads, Va. to Japan with 51,686 tons of coal. The *Getty* is the 400,000th ocean going vessel to transit. Capts. F. D. Saunders and T. W. Gove are the pilots. Seventeen years earlier, Saunders took the 200,000th commercial vessel through the waterway. That ship was the *Santa Mercedes* (459′x 63′) operated by Grace Line. It took 43 years of Canal operation before the 200,000th ship to transit and about half as long for the second 200,000th transit.

1976—July 4. More and bigger ships create greater demands on the skill of the pilots. In 1975 reported mechanical failures aboard transiting vessels averaged 28 a month. It is during these unforeseen emergencies that a pilot must frequently utilize all the knowledge and experience at his command to avoid disaster.

A dip into the pool of statistics indicates other significant Canal transit marks:

Fastest transit ocean to ocean:
Ondine (456′x 55′) 4 hours and 27 minutes on September 30, 1961, piloted by Capt. John F. Campbell.

Fastest transit locks to locks:
Brunskappel (446′x 55′) 3 hours 53 minutes from entering Miraflores Locks to clearing Gatun Locks on December 30, 1968, piloted by Capt. Robert Rowe.

Most transits in a calendar year:
15,523 in 1970

Most transits started in a day:
65 on February 29, 1968.

Largest ship:
San Juan Prospector (975′x 106′) on April 6, 1973, piloted by Capts. C. J. Gundersen and W. Hopkins.

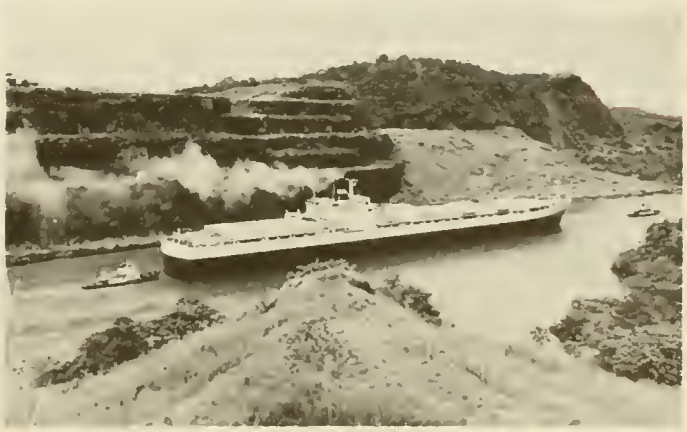
Greatest volume of cargo in a ship:
61,078 long tons on the *Melodic* on May 29, 1973, control pilots A. T. Wilder and J. W. Chamberlain.

Largest passenger ship:
Queen Elizabeth II, March 25, 1975, control pilots Robert F. Boyd and Furman D. Saunders.

The largest commercial ship to transit, the "San Juan Prospector" (now the "Marcona Prospector"), with a length of 975 feet and a beam of 106 feet, is a tight fit in the 1,000 by 110 feet lock chamber at Miraflores. Since the bridge is amidships, she required only 2 pilots. She transited in ballast in April 1973 and paid $40,951.44 in tolls.

Wearing a pith helmet as protection against the tropical sun, a Canal pilot boards a launch and heads for home after a transit.

SLIDES AND SUPERSHIPS MAKE TRANSITING THE CUT A COMPLEX OPERATION—This unusual scene in Gaillard Cut was photographed in 1923 when southbound ships were moored on the left bank, while northbound ships passed in close formation following a slide. At right below: The "Tokyo Bay," one of the largest ships to transit, moves through Gaillard Cut with the help of one tug which is attached to the stern by a bridle to act as a second rudder. The tug ahead of the "Tokyo Bay" is escorting the vessel and could be made fast to the ship in an emergency.



Above left:
Seventh grade art teacher Bill Koons gives instructions to Kimberly Montgomery how best to combine the mola art form with her Bicentennial design.

Above right:
Although painted on paper, these colorful molas, with patriotic motifs, look very much like the cloth ones.

Lower left:
Barry Novack works on an eagle design.

Lower right:
Two Cuna women are wearing molas, sitting on molas, and surrounded by molas as they stitch up some new molas at Miraflores Locks.

Bicentennial Molas

THEY MAY NOT KNOW IT, but the Cuna Indians of the San Blas Islands have made a colorful contribution to a Curundu Junior High School bicentennial project.

The unique art form of the Cuna culture—the mola—inspired art teacher Bill Koons and his enthusiastic seventh grade students to paint a series of patriotic posters depicting such standard symbols of grass roots Americana as eagles, stars and stripes, liberty bells and, even a hamburger.

Imitating the intricate designs and bright colors favored by the Cuna women in their cotton cloth "cutwork stitchery" the Curundu students are creating their own molas on manila paper.

Using real molas as visual aids, Koons and his students first discussed the special qualities of the Cuna art and the characteristics that make it unique. The abundant use of black, orange and red; the special feeling for beautiful shapes and outlines and artful use of space and attention to detail.

Once having established the theme and the guidelines, Koons gave the students a free hand to create, with some very imaginative results.

As an art form exclusive to Panama, molas are popular souvenir items among tourists. They are also widely used as wall hangings, sewn on shirts, skirts and jackets or used to make items of clothing and accessories ranging from tote bags to bikinis. Clubs and fraternal organizations often have their seals or emblems copied and made into molas by the skillful Cuna women.

Made basically to be worn on fronts and backs of their own blouses, the brightly colored molas are now produced by the San Blas women in large quantities and sold at almost every curio shop and department store on the Isthmus—even outside the entrance to Miraflores Locks.

Cuna girls are taught the art of mola making at an early age. They cut out intricate designs on several layers of contrasting colored cloth that have been sewn together. After cutting the design into each layer so that the contrasting color underneath it creates the desired contour, the edges are carefully folded under and sewn with tiny stitches.

The paper molas created by the Curundu students show that the distinctive design techniques can be adapted to depict a great variety of artistic expressions, reflecting the ingenuity, creative ability and often the mood of the mola maker.

Canal Zone schooner joins "Operation Sail '76"

AS A PARTICIPANT IN THE BICENTENNIAL SALUTE TO THE maritime heritage of the United States, the Canal Zone Sea Explorer schooner *Chief Aptakisic* will sail up the Hudson River, July 4 along with more than 100 other sailing vessels.

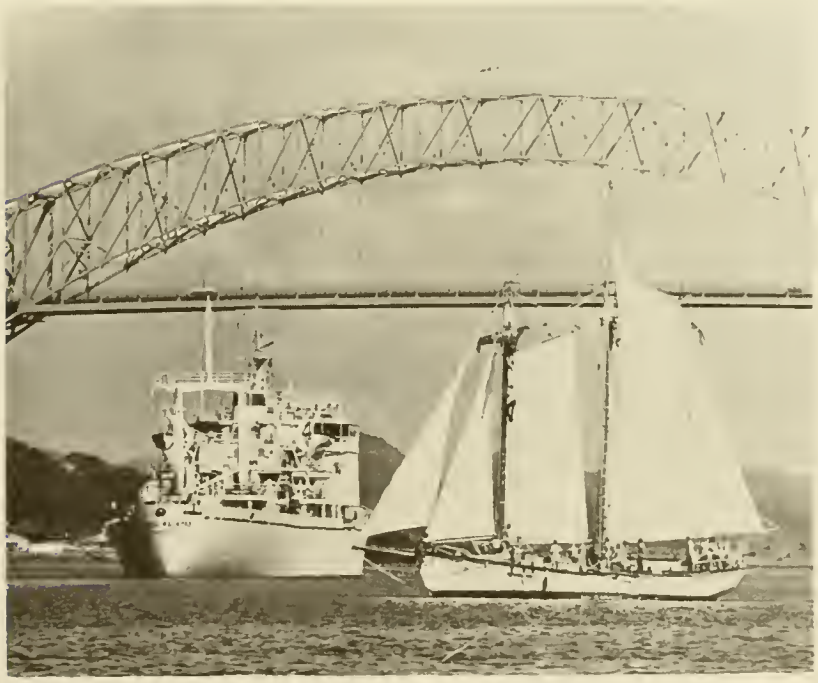
Plans are for the President of the United States to review the vessels from the deck of an aircraft carrier as they enter New York Harbor.

The two-masted vessel, which has a crew of Canal Zone Sea Explorers and adult volunteers, will join "Operation Sail '76," one of the major events of the Bicentennial. More than 25 to 30 of the few remaining tall-masted sailing ships and approximately 100 smaller sail training ships and sailing yachts will come to the United States for the event.

Chief Aptakisic will compete with these vessels in a race from Bermuda to Newport, R.I. and from there will sail to New York for the spectacular parade up the Hudson River to George Washington Bridge on July 4.

After the celebrations in New York, *Chief Aptakisic* will begin her return voyage to the Canal Zone, visiting enroute several Bicentennial "Operation Sail '76" host cities.

Following completion of her 12,000 mile voyage, the 53-foot schooner, which was refurbished and outfitted through the financial efforts of Canal Zone Project Windjammer Inc. '76, will be used locally by Sea Explorers for instruction in sailing.



The "Chief Aptakisic" attracts the interest of the crew of a transiting ship as she sails under the Thatcher Ferry Bridge which spans the Pacific entrance to the Panama Canal at Balboa.

Men Dug the Canal

...but women played a vital role

By Fannie P. Hernández

THERE WERE THOSE WHO contended that building the Panama Canal was a man's job. The Isthmus was no place for a woman. The men could come and live in tents and rough it and when the job was done, in 5 or 10 years, they could pack their grips and go back to their wives and children.

Although the First Canal Commission discouraged American women from coming to the Isthmus, it was soon realized that it was impossible to keep the men here without them. In the first 2 years of the construction, turnover was so great among the foremen, subordinate engineers, and skilled craftsmen that it was impossible to organize an efficient work force.

After a few months on the Isthmus, many of the American men became disenchanted and lost interest in their work. There was none of the excitement of the city and they found the energy-sapping heat, the lack of women and social life, and the dense steaming jungle demoralizing.

Complaints and murmurs of discontent were heard among laborers. Boldly asserting their disgruntlement, a group of West Indian workers held a sitdown strike announcing, "No women, no work." About that time American men made it known that they too were ready to do some "sitdowning" for the same reason. Commission officials soon were convinced that workers needed a normal social life, and changing the policy, hired more married men and encouraged bachelors to marry.

In those early days of chaos and confusion, women workers were not recruited from the United States mainly due to the lack of suitable housing and the general rigors of the unhealthy climate. But a few wives and daughters of employees were hired.

The Isthmian Canal Commission had obtained more than 2,000 houses from the French Canal, most of them in poor condition. These were renovated, boxcars were placed on sidings and fitted out as quarters, and tents put into service. Anything with four walls, a roof and a floor was considered living quarters. Food familiar to Americans was scarce and very expensive. There was no cold storage, no fresh milk and little meat. There was no potable water; distilled water was delivered to each house daily. When it was not available, water was boiled.

As time went on and conditions improved, Canal officials began urging women to come and to stay. They came and with their arrival life in the construction towns began to change. They were soon influencing the choice of furnishings, food and clothing sent to the Isthmus and they not only beautified their own quarters with plants, but also the public grounds.

Housekeeping was almost as much of an adventure as digging the Canal. There was the constant battle with ants, roaches and spiders. Fleas came with the dry season and, at certain times of the year, big black ants swarmed through the houses. The sugar bowl was kept in the ice box. Table legs were immersed in oil. Cooking was done on a coal or wood-burning stove, and at times the smoke got very thick.

The first woman to be employed by the Isthmian Canal Commission was Mary Eugene Hibbard who was appointed Superintendent of Nurses in June 1904, 1 month after the transfer of the French property to the United States Government. Two weeks later, she arrived in the Canal Zone with her commanding officer, Dr. W. C. Gorgas, Chief, Sanitary Officer, and two trained nurses who were to work with her.

Miss Hibbard wrote of her first day at the Ancon Hospital: "We found about 75 buildings, very scattered. Our work was to study the situation and find the best possible for the patients who were to be accommodated." After selecting the five buildings she wanted to use for wards, sanitary conveniences, diet kitchen, and linen rooms, she wrote: "The amount of cleaning after 15 years of neglect can be imagined." She spent 4 years here and a bronze

Above:
Women brave the mud to observe the work in the Cut.

plaque at Gorgas Hospital honors her as "Nurse, patriot, gentlewoman, humanitarian, friend, who rendered outstanding service to the development of better health in the tropics."

The nurses who came to the Isthmus were highly qualified, having served as Army or Red Cross nurses in the Spanish-American War, the Russo-Japanese War, or at hospitals in Cuba, Italy, Switzerland and the Philippines.

Among those who soon followed Miss Hibbard was Jessie M. Murdock, who later succeeded Miss Hibbard as chief nurse. They were well aware of the problems and challenges that faced them. An obstacle they did not anticipate was the hostility of the French nursing nuns who had been caring for the sick and understood that the coming of the American nurses meant their departure.

An even more serious problem for the new nurses developed from the religious vows of the nursing nuns, whose intentions were far better than their training. Surgeon's orders that post-operative patients be fed nothing were ignored by the nuns who vowed to "feed the sick and pray for the dying.' Despite these drawbacks, Miss Murdock wrote in "Ancon Hospital in 1904 and 1905" in the Society of Chagres Yearbook, 1913, that the nuns were "women of much refinement and charm" and she praised their heroic work in the face of great difficulties.

She noted that the buildings were not screened, but each bed had a mosquito bar making it difficult to attend the patients. The French nuns thought the netting unattractive and tied it back with bows of ribbon to the dismay of the American nurses. When yellow fever patients were admitted, a wire cage was built around the bed. For the nurses who had night duty, their only protection from the mosquitoes was swathing themselves in bandages soaked in oil of citronella.

Early in December of that first year, as yellow fever and other forms of sickness became more prevalent, almost causing panic, she wrote: "Had we allowed ourselves to do so, we would have lost heart completely, for death seemed to dominate the situation. But the unselfishness and splendid administrative skill by which our work was arranged made everyone feel that we too must do our work courageously, and in the trying days when one of our number was stricken, no one showed the white feather but all stood faithfully to their tasks." Ada Jane Nice, one of those valiant women on the Ancon Hospital staff, was the first nurse to die on the Isthmus. She was from Riegelsville, Pa.

In closing her account of those early days at Ancon, Miss Murdock wrote, "Before two years were over we were surrounded by all the modern comforts and conveniences. Telephones buzzed, electric lights were flashed on, and we recognized ourselves as only a part of an ideal community. It would be hard for anyone today to believe that Ancon had ever gone through a pioneer stage. We are glad to have had a hand in the work of those early days, and although as women we achieved no distinct celebrity, yet we flatter ourselves that we played an important part in the building of the Canal."

In addition to the nurses, a few women were employed as teachers. Most were wives or daughters of employees. Feminists today would wince

"It's not an easy work. Sometimes it's rough on the men and a little rougher on the women."

at the reference to the employment of women teachers in the 1907 Canal Record: "On account of their natural qualifications for the work and because at the salaries paid it was easier to secure women with requisite experience than men." Their salaries ranged from $30 to $110 a month.

The first Canal Zone free public school was opened in June 1906 at Corozal with Emily Kyte as the teacher.

"Line teachers" received the highest pay. They were the "permanent substitutes" who taught wherever there was a temporary vacancy. They also did tutoring wherever they were assigned. Line teachers put in a 12-hour day, leaving for school on the 7 a.m. train and returning at 7 p.m.

Among those substitute teachers was Winifred Ewing, who celebrated her 90th birthday on the Isthmus last January. Recalling those days, she commented on the tropical rains and the mud in the wet season. But for her, hardships and inconveniences have been smoothed out or forgotten with the passing of the years.

Her husband Ora Ewing had come to work in the Sanitation Department in November 1906. A year later he returned to his home in Glensville, W. Va., married and brought his bride to the Canal Zone. They were assigned a little house on the Ancon Hospital grounds. It had one room with a tiny kitchen and woodburning stove. Though she had graduated from Normal School and would have qualified for a full-time teaching job, Mrs. Ewing preferred to devote most of her time to homemaking. Her two daughters were born in Ancon Hospital. Later, after her husband's death, Mrs. Ewing was for many years the housemother at Canal Zone College. Reflecting on those early days, Mrs. Ewing said, "We got along alright with what we had. It was no problem. It did rain a lot but it didn't bother us. We became used to it. I've lived here since 1907 and I've loved it."

The early Canal Zone high school was a migratory one, located at various times in Culebra, Cristobal, Gatun and Ancon.

When it was on the Atlantic side, slides on the railroad frequently prevented students from the Pacific area from getting home and they would have to overnight with friends on the Gold Coast. Although high school pupils were enrolled in the Canal Zone as early as 1907 (before there was a high school) the first high school commencement was not until 1911. It was at Gatun and there were two girls in the class. At that time the Canal Zone high school diplomas were signed by the President of the United States.

Mamie Elizabeth Miracle, the first American schoolteacher at Empire, was the principal of the high school at Culebra. She came to the Isthmus in March 1906 to marry Frank W. Miracle, a storekeeper in the Quartermaster Department at Empire. They had the distinction of being the first couple to be wed in the Canal Zone after it came under U.S. control.

Reminiscing on what it was like teaching at Gatun School, a construction-day teacher recalled that during the rainy season it involved the changing of shoes several times a day. Teachers would board the train and before reaching Gatun would change to boots to walk through the mud to the schoolhouse, then change to shoes and then back to boots when it was

"We are glad to have had a hand in the work of those early days and although as women we achieved no distinct celebrity, yet we flatter ourselves that we played an important part in the building of the Canal."

time to go home. It was a bothersome chore considering the high buttoned shoes of the day.

In 1907, so many were the inconveniences faced by families in the Canal Zone, President Roosevelt sent Gertrude Beeks, of the Department of Welfare of Government Employees of the National Civic Federation, to look into labor conditions to try to find out why the men would not stay on the job. A capable investigator, Miss Beeks got closer to the American workers than the officials and they talked frankly with her without the fear of being called complainers.

Though living conditions were much improved and quite good compared to those found by the first workers who came here, Miss Beeks made a report to the Isthmian Canal Commission and the Panama Railroad including such criticisms as no hot water in the showers; inadequate quarters for about 1,000 men living in boxcars; the existence of bedbugs and vermin; the nurse's dormitory at Colon Hospital where during rain storms nurses sleeping on the ocean side got drenched and were known to sleep with umbrellas over them; no adequate supply of fresh vegetables; lack of rain sheds along the Canal for the workers; and a number of other complaints.

Miss Beeks also found that women were lonely without the social and cultural activities they had enjoyed at home. To remedy the situation, she recommended that women's clubs be formed. At her suggestion, Helen Boswell, of the Federation of Women's Clubs in the United States, was sent to the Isthmus. During a month-long visit, she encouraged women to form clubs affiliated with the Federation. Nine clubs were formed. Soon, they were holding meetings and finding outlets for their mental and social talents in club work.

They developed home gardens, promoted the organization of the Humane Society in the Canal Zone, sponsored home nursing programs and many other educational and cultural projects. Their recommendations on community improvements generally brought results.

A few women held important positions during construction days.

Above left:
Christiana Benson, who managed the hotels at Las Caseadas and Bas Obispo.

Above right:
Mamie Elizabeth Miracle, who was principal of the first high school in the Canal Zone.

Above:
The families of Canal laborers wait at the free clinic sponsored by the Cristobal Woman's Club in the early days.

Above:
Eight pupils and their teacher pose on the porch of the first free public school operated by the municipality of Gorgona in 1904.

Construction-day employees used lively imaginations to create a homey atmosphere within the bare wooden walls of early Canal Zone quarters as shown by this sitting room in a four-family house in Culebra in 1914. The bead curtain and hanging lamp lend a touch of French decor.

"And they made it home. Ah, that's the point."

Above right:
A typical street in Cristobal in 1907 before paving. Despite the mud and makeshift housing, the women of the Canal Zone created a pleasant home environment.

Above left:
Mrs. Gaillard pours tea for herself and her husband, Col. David Du Bois Gaillard, who directed the work in Culebra Cut, which was renamed in his honor.

Above right:
J. Bucklin Bishop, secretary of the second Isthmian Canal Commission, relaxes with his wife and daughter on the front porch of their quarters.

Family photographs and a doll adorn the walls of this bedroom in family quarters which show exposed studs on the wood siding. (Housing of this type is still in use today.) The door with wooden louver inserts and the shuttered window were built-in "breeze conditioning" of that era. The French influence is evident in the furniture.

A woman was one of the first swimmers of the Canal. Elaine May Golding, billed in the local press as the "champion lady swimmer of America," bypassed the locks and the Cut but swam most of the Canal in stages between December 12 and 16 in 1913.

Viewing the beautiful royal palm lined Prado in Balboa today one would find it difficult to visualize the Canal Zone as the grim muddy place it was when the first women arrived to establish homes. In the foreground is the monument to Gen. George W. Goethals, chief engineer during the construction of the Canal. In the background is the U.S. built Thatcher Ferry Bridge which spans the Canal.

In 1908 the personnel rolls of the Isthmian Canal Commission showed 6,100 American males and 205 American females employed. There were 117 female nurses in the service, 25 women schoolteachers, and 45 were employed as copyists, coupon counters, clerks, postal clerks, dietitians, timekeepers, telegraphers and storekeepers. A total of 18 women were working for the Panama Railroad.

Among the few American women employed in the early days was Florence Williams who came to the Isthmus in 1906 from Buffalo, N.Y., to live with her doctor father and her brother who had come earlier. After living at Empire for about a year, she moved to Gatun and was one of the American women who lived there in tents until the houses were built. She recalls witnessing, in September of 1906, the first cut of Gatun Locks as the steam shovel began excavating at the lock site.

A Roosevelt Medal holder, Miss Williams worked for the Isthmian Canal Commission from 1907 to 1909 as a telephone operator at Empire. After attending school in the United States, she returned to the Canal Zone and in 1922 went to work in the Canal's Accounting Division, retiring in 1954.

During her many years on the Isthmus, she saw important landmarks being built in the Canal Zone. A few years ago, looking on as the Balboa Club House was being demolished, she reflected, "I saw it built at Empire, I remember when it was moved here, and now it is being torn down.'

The demise of the Tivoli Hotel was even more disturbing since she had lived there for more than 17 years following her retirement. At 84, she still has happy memories of gala social events, white formal frocks and long white gloves and young men in starched white suits and high collars. Then, the average ratio of men and young women ran about 25 young engineers or other Canal bachelors to each American girl in her late teens or early twenties.

Stories told and recorded by women Roosevelt Medal Holders who attended the Theodore Roosevelt Centennial in the Canal Zone in 1958 give a vivid insight into life in the construction-day towns.

Among these historical accounts is one by Mrs. Bruce Sanders, whose husband came to the Isthmus in 1908 to work as a nurse. She came in 1910, as a bride, and lived for a few months in Panama City and then moved to a little house just reclaimed from the jungle. It was in a settlement called Caimito Mulato, a part of San Pablo on the banks of the Chagres River, so close to the water that it was possible to fish off the back porch. There were 30 or 40 houses and no one knew the town existed until some engineers running a line for the Canal discovered it.

The house had no ceilings, only a tin roof. Cooking was done on a wood-burning stove and old railroad ties were used for fuel. She remembered that blasting on the Canal played havoc with cake-baking because the blasts shook the whole house. A cake would either fall flat or spill out into the bottom of the oven. However, she continued to bake what she called "up side down biscuits" explaining that the uneven temperature burned the biscuits on the bottom and all she had to do was pop them out of the tin, turn them over, and put them back into the oven. She said that the dirt trains ran along the door and always seemed to pass by at meal time so that cinders

Mrs. Bruce Sanders came in 1910

"upside down biscuits"

Mrs. Ora Ewing came in 1908

"tropical rains and mud"

PANAMA CANAL TRAFFIC

Three Quarters Fiscal Year 1976

TRANSITS (Oceangoing Vessels)

	1976	1975
Commercial	9,096	10,168
U.S. Government	75	144
Free	26	6
Total	9,197	10,318

TOLLS °

Commercial	$98,723,926	$105,916,438
U.S. Government	639,723	1,166,946
Total	$99,363,649	$107,083,384

CARGO°° (Oceangoing)

Commercial	87,541,026	107,167,621
U.S. Government	149,386	431,250
Total	87,690,412	107,598,871

° Includes tolls on all vessels, oceangoing and small.

°° Cargo figures are in long tons.

were a daily item on the family menu.

The Sanders moved 13 times that first year. While living at Gorgona, they were notified on a Monday morning that they must be out of the house by 1 o'clock and the next time she saw the house it was half way down the banks of the excavation.

Their next house was on the top of a hill in Paraiso. What was supposed to be a "choice house" had two rooms and a small porch where you could place a rocking chair if you were careful how you turned it. She noted that Paraiso was the only town along the line that had fresh drinking water. The first soft drink plant was installed there because of the good water.

Recalling their first Christmas on the Isthmus in 1907, Mrs. Steve Calvit remembered that the men went into the jungle and cut down an orange tree laden with ripe and green fruit. They set it up in the schoolroom and decorated it with whatever they had available to make it colorful. Among the few presents distributed was some guava jelly made by Mrs. Mattie Morrison, who came in 1905. They had no jelly jars and used heavy drinking glasses. To seal them, they fashioned tops out of correspondence paper and dipped them in egg white to make them stick.

Mrs. Calvit, her four daughters and a nephew, Joe Ebdon, arrived in May 1907, to join her husband and two sons. They were assigned a cottage in Gorgona much too small for their large family.

In 1908, when they were assigned a larger house; it burned down 2 hours before they were to move in. "Three

CANAL COMMERCIAL TRAFFIC BY NATIONALITY OF VESSELS

Three Quarters Fiscal Year

Nationality	1976 No. of transits	1976 Tons of cargo	1975 No. of transits	1975 Tons of cargo	1965-69 Avg. No. transits	1965-69 Avg. tons of cargo
Belgian	112	1,114,925	116	954,290	60	160,062
British	977	8,795,841	1,013	10,712,339	1,025	7,554,799
Chilean	131	1,258,778	103	1,224,265	86	572,605
Chinese, Nat'l.	88	1,068,683	115	1,476,153	82	615,551
Colombian	150	262,124	107	215,958	166	341,884
Cypriot	81	479,737	186	1,328,858	11	83,457
Danish	208	1,427,620	232	1,745,108	285	1,658,981
Ecuadorian	108	773,402	85	587,527	51	62,551
French	140	802,345	176	1,060,991	162	669,842
German, West	475	2,712,034	558	3,387,423	913	3,182,940
Greek	662	9,827,026	878	13,013,069	369	3,807,322
Italian	192	1,413,061	183	1,261,500	169	1,147,676
Japanese	777	6,821,886	949	8,116,625	679	5,080,587
Liberian	1,299	20,737,442	1,417	26,470,028	1,013	13,657,609
Norwegian	505	6,598,333	641	10,174,947	1,098	10,760,813
Netherlands	239	1,307,573	316	1,401,772	390	1,687,381
Panamanian	690	5,041,871	789	5,611,117	394	1,823,641
Peruvian	182	1,905,547	145	1,484,837	114	548,033
U.S.S.R.	154	618,993	130	815,365	46	344,944
Singaporean	65	516,301	56	703,406	N.A.	N.A.
South Korean	69	375,435	90	607,457	23	123,777
Spanish	76	306,499	45	386,893	13	58,014
Swedish	253	2,735,602	260	2,668,527	329	2,151,847
United States	772	5,825,998	819	6,649,544	1,188	6,632,992
All other	691	4,813,970	759	5,109,622	589	2,429,933
Total	9,096	87,541,026	10,168	107,167,621	9,255	65,157,241

TRAFFIC MOVEMENT OVER PRINCIPAL TRADE ROUTES

Three Quarters Fiscal Year

Trade routes—(Large commercial vessels, 300 net tons or over)	1976	1975	Avg. No. transits 1965-69
East coast United States—Asia	2,038	2,279	1,994
Europe—West coast South America	843	889	1,006
East coast United States—West coast South America	894	1,006	1,299
Europe—West coast United States/Canada	652	585	755
Europe—Asia	389	648	157
Europe—Oceania	339	365	308
East coast Canada—Asia	198	229	124
United States Intercoastal(including Hawaii)	292	288	371
East coast South America—Asia	130	196	148
West coast South America—West Indies	235	221	196
All others	3,086	3,462	1,259
Total	9,096	10,168	7,617

MONTHLY COMMERCIAL TRAFFIC AND TOLLS

Vessels of 300 net tons or over—(Fiscal years)

Month	Transits 1976	Transits 1975	Transits Avg. No. transits 1965-69	Tolls (In thousands of dollars)[1] 1976	Tolls (In thousands of dollars)[1] 1975	Tolls (In thousands of dollars)[1] Average tolls 1965-69
July	1,089	1,219	1,067	$11,753	$11,834	$6,322
August	1,039	1,121	1,044	11,367	12,254	6,298
September	954	1,095	1,015	10,639	11,928	6,139
October	1,045	1,125	1,049	11,150	11,855	6,387
November	994	1,086	1,021	10,846	11,150	6,258
December	992	1,111	1,035	10,722	11,487	6,409
January	1,018	1,142	1,003	11,043	12,081	6,167
February	912	1,052	922	9,900	10,682	5,654
March	1,053	1,217	1,098	11,269	12,607	6,748
April		1,142	1,087		11,773	6,681
May		1,209	1,110		12,966	6,854
June		1,090	1,052		11,281	6,609
Total		13,609	12,503		$141,898	$76,526

[1] Before deduction of any operating expenses.

weeks later," she said, "21 men stood at the door and the boss said that they were to move us and they did, carrying everything down one hill, around the ravine and up onto another hill where six four-family houses had been completed."

In a Star & Herald editorial reproduced in the Society of the Chagres Yearbook, 1916-17, S. P. Verner wrote of the Women Who Made the Canal, "And then they made it home. Ah, there's the point. The government might have build barracks of silver and floored them in gold, it might have put on its hotel tables the vintages of fair champagne and patés of old Strasbourg—but no woman, no home, for God made it so from the beginning of creation, and ordained it to the end of time."

In an address to the employees of the Isthmian Canal Commission in November 1906, President Roosevelt said, "It is not an easy work. Mighty few things that are worth doing are easy. Sometimes it is rough on the men and just a little rougher on the women. It has pleased me particularly to see as I have met the wives who have come down here with their husbands, the way in which they have turned in to make the best of everything and to help the men to do their work well."

According to personal interviews and written accounts, the great majority of construction day wives and women employees of the Canal in those early days were happy to have lived on the Isthmus at such a momentous time and to have been a part of the beginning of the Panama Canal. In the words of Mrs. Sanders, who recently returned to the Canal Zone to visit one of her six children born here, "Those were the happiest days. They were hard times and we griped and fussed but one did not give up. If you didn't have the pioneer spirit, you just left."

Today, women constitute approximately 20 percent of the Canal's work force. In addition to teachers and nurses and other professions traditionally known as women's jobs, the Canal's personnel rolls show they are employed as physicians, lawyers, engineers, geologists, police officers, and in other fields formerly considered exclusively the realm of men.

At right:
Two large vessels move through Pedro Miguel Locks. In the background is Gaillard Cut where the Canal passes through the Continental Divide.

PRINCIPAL COMMODITIES SHIPPED THROUGH THE CANAL

(All cargo figures in long tons)

Pacific to Atlantic

Commodity	Three Quarters Fiscal Year 1976	1975	Avg. No. Tons 1965-69
Petroleum and products	6,853,973	6,481,248	965,491
Manufactures of iron and steel	5,712,344	7,105,478	2,596,337
Ores, various	3,103,628	4,825,365	4,310,699
Lumber and products	2,692,746	2,324,180	3,420,981
Sugar	2,122,835	2,321,764	1,931,141
Food in refrigeration (excluding bananas)	1,327,234	1,123,227	853,992
Bananas	1,162,030	1,255,725	953,056
Metals, various	959,530	1,292,352	962,231
Pulpwood	888,476	1,469,171	589,669
Autos, trucks, and accessories	834,712	758,522	64,739
Coal and coke	704,011	1,260,940	125,745
Sulfur	663,785	895,325	142,887
Molasses	513,419	350,925	276,102
Wheat	506,702	126,991	728,618
Fishmeal	493,142	669,651	N.A.
All other	9,221,687	10,029,031	7,664,695
Total	37,760,254	42,289,895	25,586,383

Atlantic to Pacific

Commodity	Three Quarters Fiscal Year 1976	1975	Avg. No. Tons 1965-69
Coal and coke	12,285,079	19,182,424	7,427,147
Petroleum and products	9,555,594	11,317,715	11,288,969
Corn	5,700,928	5,078,538	1,941,988
Soybeans	3,279,574	2,848,263	1,627,549
Phosphate	2,521,079	4,207,327	2,835,271
Wheat	1,987,873	3,394,874	755,964
Sorghum	1,942,080	1,844,267	N.A.
Metal, scrap	1,285,561	1,510,854	1,830,775
Ores, various	1,125,090	1,677,753	1,204,226
Chemicals, unclassified	746,340	681,025	623,947
Manufactures of iron and steel	564,615	1,424,493	1,348,952
Sugar	498,116	1,155,121	585,849
Fertilizers, unclassified	442,840	956,408	330,670
Salt	348,990	63,057	N.A.
Caustic soda	341,479	440,640	N.A.
All other	7,155,534	9,094,967	7,769,551
Total	49,780,772	64,877,726	39,570,858

CANAL TRANSITS—COMMERCIAL AND U.S. GOVERNMENT

	Three Quarters Fiscal Year 1976 Atlantic to Pacific	1976 Pacific to Atlantic	1976 Total	1975 Total	Avg. No. transits 1965-69 Total
Commercial vessels:					
Oceangoing	4,576	4,520	9,096	10,168	9,255
Small [1]	300	235	535	572	413
Total	4,876	4,755	9,631	10,740	9,668
U.S. Government vessels: [2]					
Oceangoing	34	41	75	144	679
Small [1]	86	27	113	85	85
Total	120	68	188	229	764
Total Commercial and U.S. Government	4,996	4,823	9,819	10,969	10,432

1 Vessels under 300 net tons or 500 displacement tons.
2 Vessels on which tolls are credited. Prior to July 1, 1951, Government-operated ships transited free.

"It is not the critic who counts, not the man who points out how the strong man stumbled, or where the doer of deeds could have done them better. The credit belongs to the man who is actually in the arena; whose face is marred by dust and sweat and blood; who strives valiantly; who errs and comes short again and again; who knows the great enthusiasms, the great devotions, and spends himself in a worthy cause; who, at the best, knows in the end the triumph of high achievement; and who, at the worst, if he fails, at least fails while daring greatly, so that his place shall never be with those cold and timid souls who know neither victory nor defeat."

THEODORE ROOSEVELT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