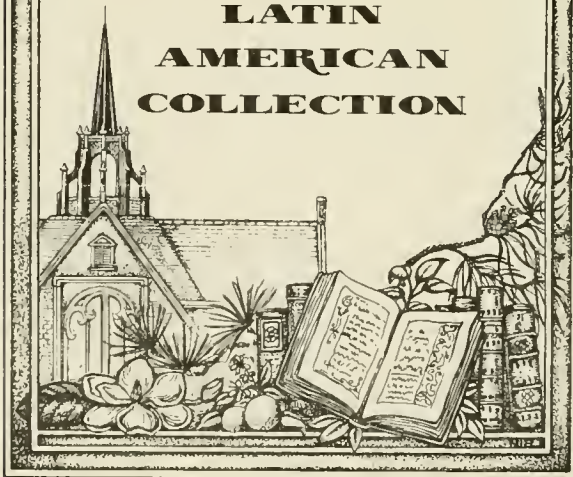




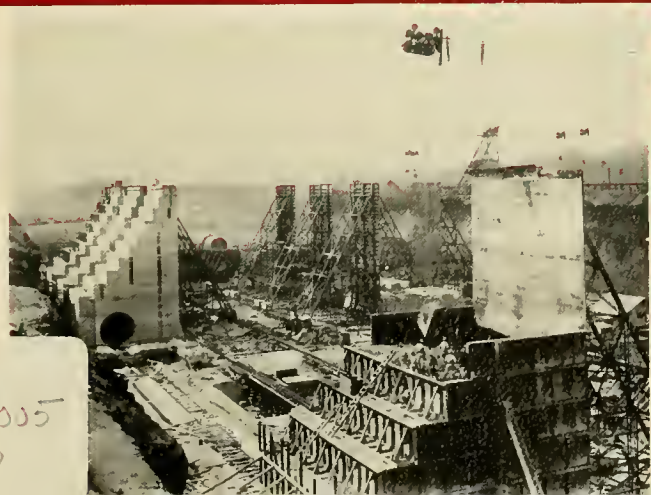
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From The Governor of the Canal Zone



Governor Harold R. Parfitt

At left: The German container ship, "Tokio Express" is assisted by a tug as she approaches Pedro Miguel Locks.

Inside front cover: Ships move through Gaillard Cut where the Panama Canal passes through the Continental Divide between banks exceeding 300 feet in height in some areas. The "Cut", which is about nine miles long, extends from Pedro Miguel Locks north to Gamboa and the edge of Gatun Lake. From this section alone, initial excavations totaled more than 230 million cubic yards, a volume equivalent to a 12-foot-square shaft cut through the center of the earth.

Page 3: Excavation at Culebra Cut in April, 1910, showing the bottom of the Canal. Culebra was later renamed Gaillard Cut to honor Colonel David D. Gaillard, the engineer who was in charge of this phase of the work.

A philosopher of ancient times once said "there is nothing permanent except change." And it is certainly true that the photographs in this issue of the *Review* present a startling contrast in the physical appearance of the Canal Zone as it was yesterday and as it is today.

But more significant to me are the less visible aspects of our daily operation which have persisted throughout the years. The geological composition of the banks of Gaillard Cut remain the same and the problem of slides continues to plague the Canal. The only answer to this threat is constant monitoring and prompt remedial action by highly skilled technicians.

Sanitation efforts, which began with the start of construction, are still a vital part of Canal operations. The threat of tropical disease is ever present. Teams of sanitation workers still go out into the jungle to keep drainage ditches open and pour oil on swamps and stagnant waters to control the mosquito population.

Digging of the Canal has not stopped since the first steam shovel bit into the earth. Dredging, widening, deepening

and removal of island promontories hazardous to modern navigation continue. More material has been excavated since the Canal opened than the amount removed during the entire construction period.

But the most important factor that has remained constant through changing times is the human element—the men and women who operate this waterway. Today, as in construction days, the workforce is composed of highly skilled, dedicated people who take great pride in being part of this efficient world utility.

This *Review* is a tribute to these employees and to the thousands of others who labored in pouring rain and tropical sun to transform the environment and create the Panama Canal.

H. R. Parfitt

HAROLD R. PARFITT
Governor-President

RICHARD L. HUNT
Lieutenant Governor

FRANK A. BALDWIN
Panama Canal Information Officer

THE PANAMA CANAL
REVIEW

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In This Issue

Photography has been a valuable aid to historians, researchers and students since its inception. "Before and after" pictures never cease to amaze—particularly if the viewer has lived through change without really being aware that it was taking place.

Since it was and continues to be one of the engineering marvels of the century and one of the most ambitious projects ever undertaken by man, the Panama Canal, from the beginning, has been a favorite subject for photographers.

In this special pictorial issue of the *Review* we have assembled more than a hundred photographs, spanning nearly a century of history, from the French construction era to the present, to bring our readers a vivid record of an enterprise in which many of us have been intimately involved.

The subjects depicted in their respective eras contrast almost as sharply as the photographs themselves. The old with the new, the glass plate black and white photographs with modern color illustrations.

The bulk of the construction day photographs are the work of that most prolific photographer, Ernest (Red) Hallen, who covered the Canal for 30 years, before and after it opened, and the two men who succeeded him as official photographers of the Panama Canal enterprise, Manuel Smith, and Clyde LeClair.

The complete set of glass negatives depicting the progress of Canal construction, assembled and catalogued by Adrian Bouche, Jr., and the late Ruth Stuhl of the Isthmian Historical Society, numbers about 16,000 8 x 10 plates. If stacked one on top of the

other, they would be 84 feet high, or 25 feet higher than the Goethals Monument.

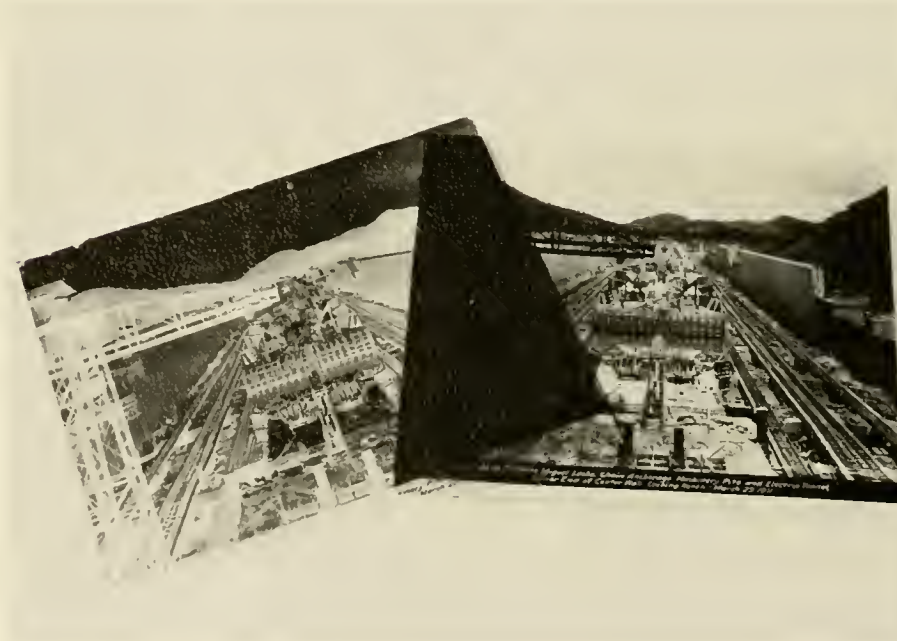
Many of these photographs have been reproduced in magazine and newspaper articles, encyclopedias, and books about the Canal. Some of the more popular ones are included in this issue.

Early photographers, using bulky cameras and magnesium for lighting their subject managed to capture the spirit of the great engineering undertaking, but not the color.

The modern day color photography on the following pages is the work of four Panama Canal photographers, Mel Kennedy, Don Goode, Kevin Jenkins, and Arthur Pollack.

We hope this issue of the *Panama Canal Review* will serve as a lasting pictorial record of man's accomplishments and a nostalgic trip into the past for those of our readers who still remember how things used to be.

Below: Glass plate negative used during construction days and print made from the plate.



Front cover, top left and right: A labor train at Tabernilla during early construction days and Miraflores lower locks, November 10, 1912. Lower left and right: Construction of sidewall monoliths at Gatun, February 15, 1910, and steam shovel loading rock in Culebra Cut, March, 1911. Center: Telephoto of Miraflores Locks. On fold: Gatun Locks, January 31, 1912. Back cover, top left and right: Cristobal before paving, January, 1907 and Fourth of July celebration at Administration Building, July 4, 1915. Lower left and right: Gatun upper locks, January 31, 1912 and railroad yard in shop area at Paraiso. Center: The Administration Building, headquarters of the Panama Canal.

Special credit for this edition goes to Vicki Boatwright for editorial assistance.



Ships from all over the world await transit at Cristobal, the Atlantic entrance to the Panama Canal.

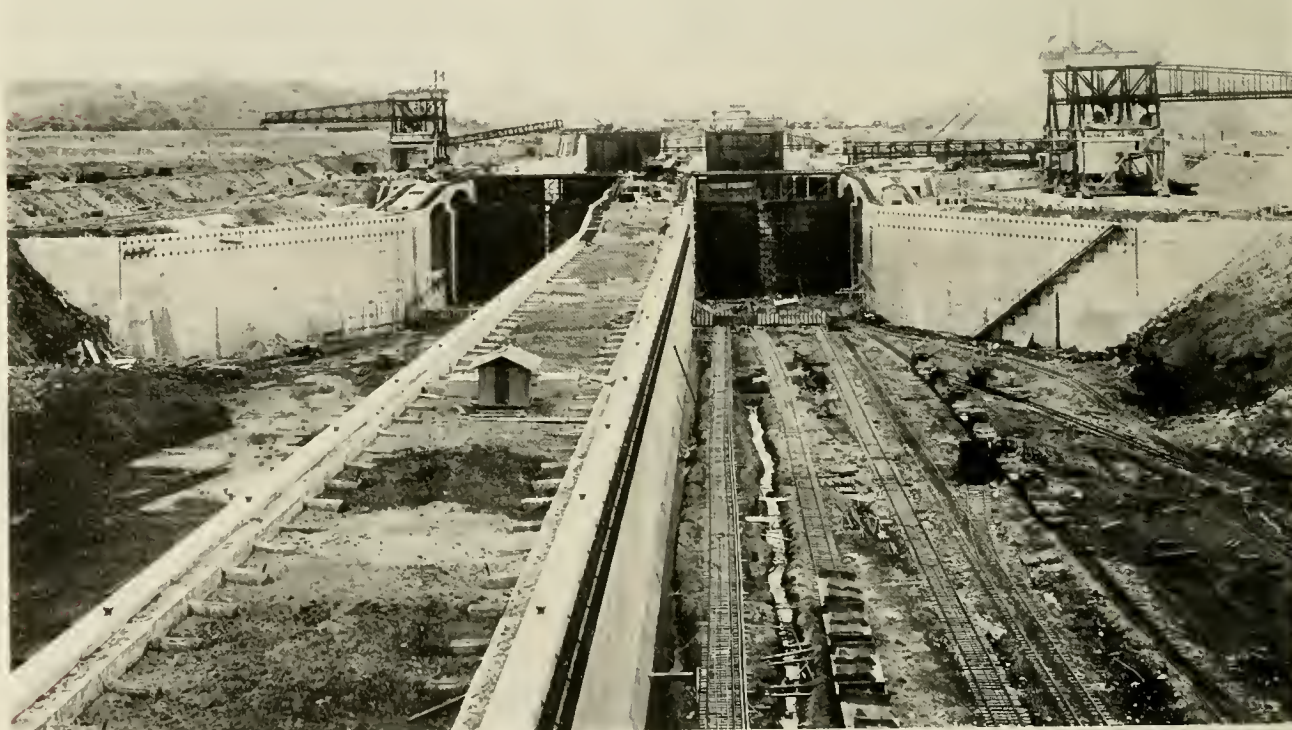
Ships transiting the Canal are raised and lowered 85 feet, from sea level to sea level, by a system of three sets of locks.

The Canal runs from northwest to southeast, with the Atlantic entrance 33.5 miles north and 27 miles west of the Pacific entrance



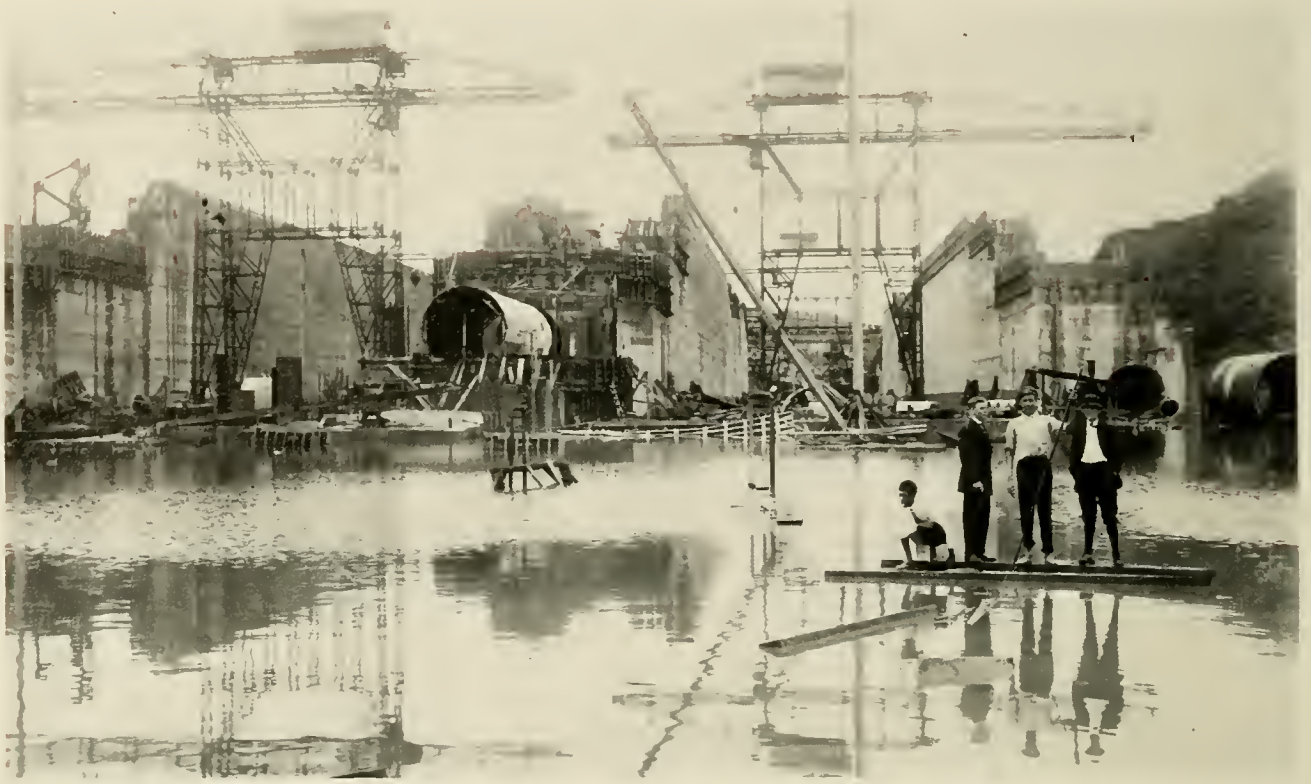


In October 1908 work had scarcely begun on the desolate swampland that would one day be Miraflores Locks.



By June 1913 the work neared completion. The lock gates at Miraflores were made the highest in the system because of the extreme tidal variation in the Pacific Ocean. At right, a present day view of ships in transit at Miraflores.



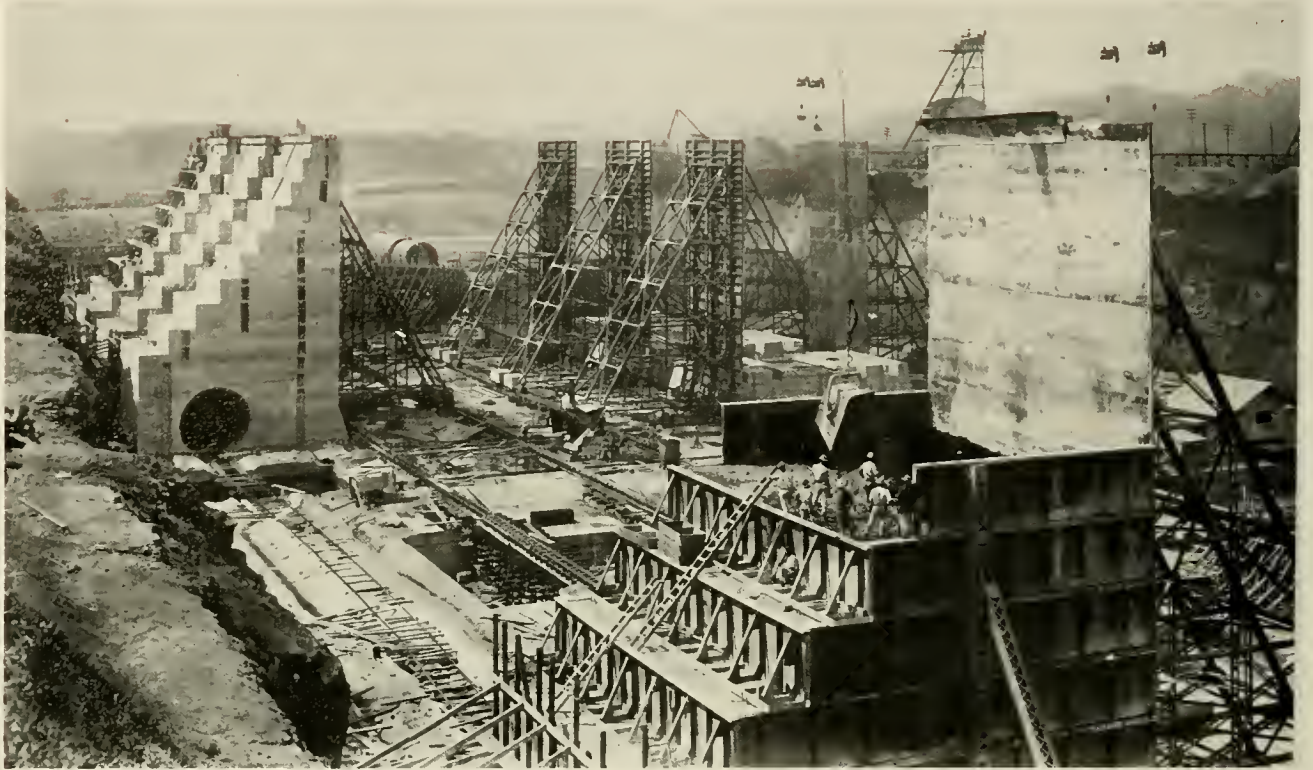


Frequent flooding hampered construction work on the Canal, but attracted sightseers such as these at the Pedro Miguel Locks in December 1910.



The single flight of locks at Pedro Miguel was the first to be completed in 1911. At right, a large container ship and a smaller vessel prepare to pass through the gates at Pedro Miguel Locks and move into Gaillard Cut, seen in the distance.





The sidewall monoliths of the upper lock at Gatun looked like this while under construction in February, 1910. The culverts at left are 18 feet in diameter.



Just 14 months before the Canal opened, this interior view of the north approach wall to Gatun Locks resembled a stark cathedral, stripped of all statuary and religious symbolism. At right: An aerial view of Gatun Locks and Gatun Lake.





The "SS Ancon" passes a slide in Gaillard Cut during the official opening of the Canal, August 15, 1914.



Work on clearing of the slide that occurred October 10, 1974, continues as a cruise ship passes through the Cut.



Dirt trains are loaded in Culebra between Gold Hill and Contractors Hill, December 28, 1912. To the left of the flat cars is the bottom of the Canal.



Steam shovels #230 and #222 meet "nose to nose" on completion of bottom pioneer cut at Culebra May 20, 1913. All that remained was to widen it to 300 feet. The many puffs of steam indicate the great activity all along the line at that time.



Devastating slides, such as this one on December 3, 1913, plagued the Canal during its construction and continued after the Canal was opened. An avalanche, September 15, 1915, closed the Canal for seven months.



This slide, October 10, 1974, dumped 1,000,000 cubic yards of dirt along with trees and shrubs into the Canal channel.



An aerial view of the October 10th slide shows the craneboat "Goliath" and the dipper dredge "Cascadas" starting clearance work.



A large vessel maneuvers carefully past the slide with the assistance of a tug. The Canal was closed for several hours while hydrographic survey crews determined that half of the channel could be used for one-way traffic.



The Panama Canal's fleet of dredges scooped out tons of rock and earth from the newly named Gaillard Cut after a slide in September, 1915 closed the Canal to traffic for seven months.



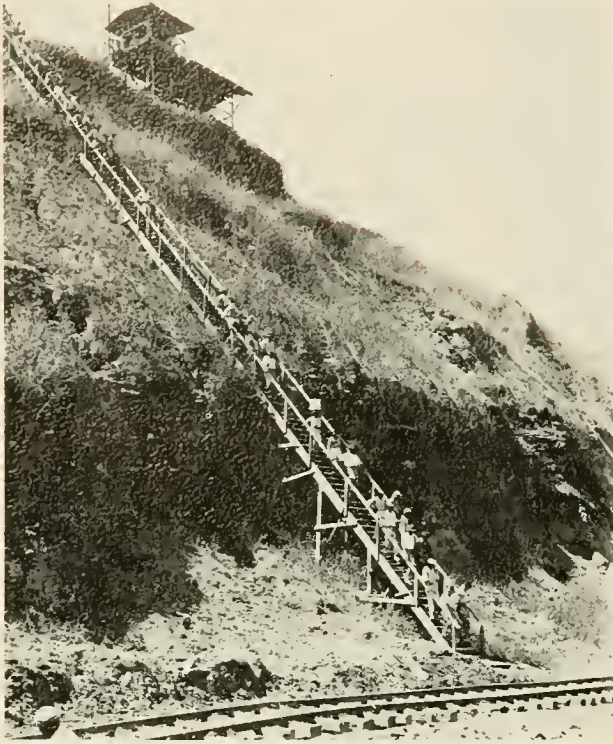
Dredging is still an integral part of Canal maintenance. The Panama Canal Company recently added to its fleet the \$6 million "U.S. Rialto M. Christensen", the largest dipper dredge in the world.



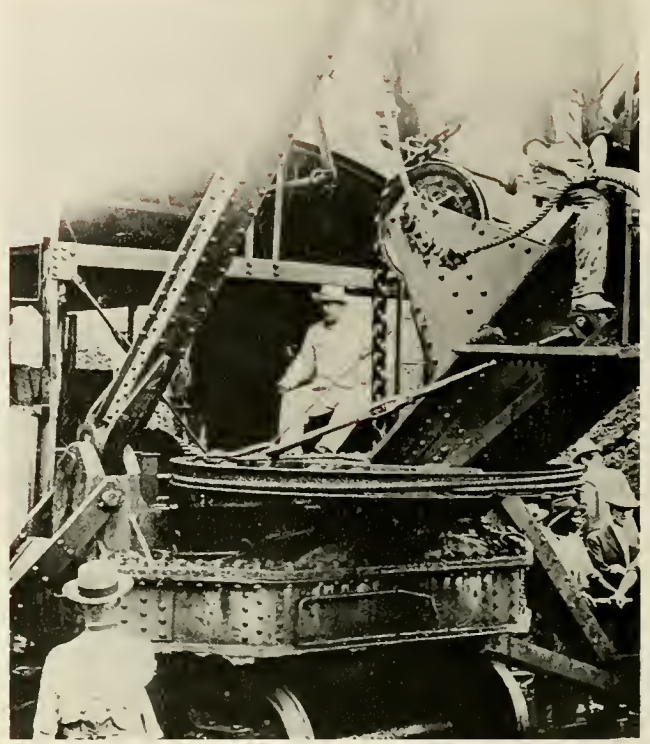
On September 26, 1913, the first trial lockage was made at Gatun Locks by the tugboat "Gatun", which carried Colonel George W. Goethals and his wife and other dignitaries.



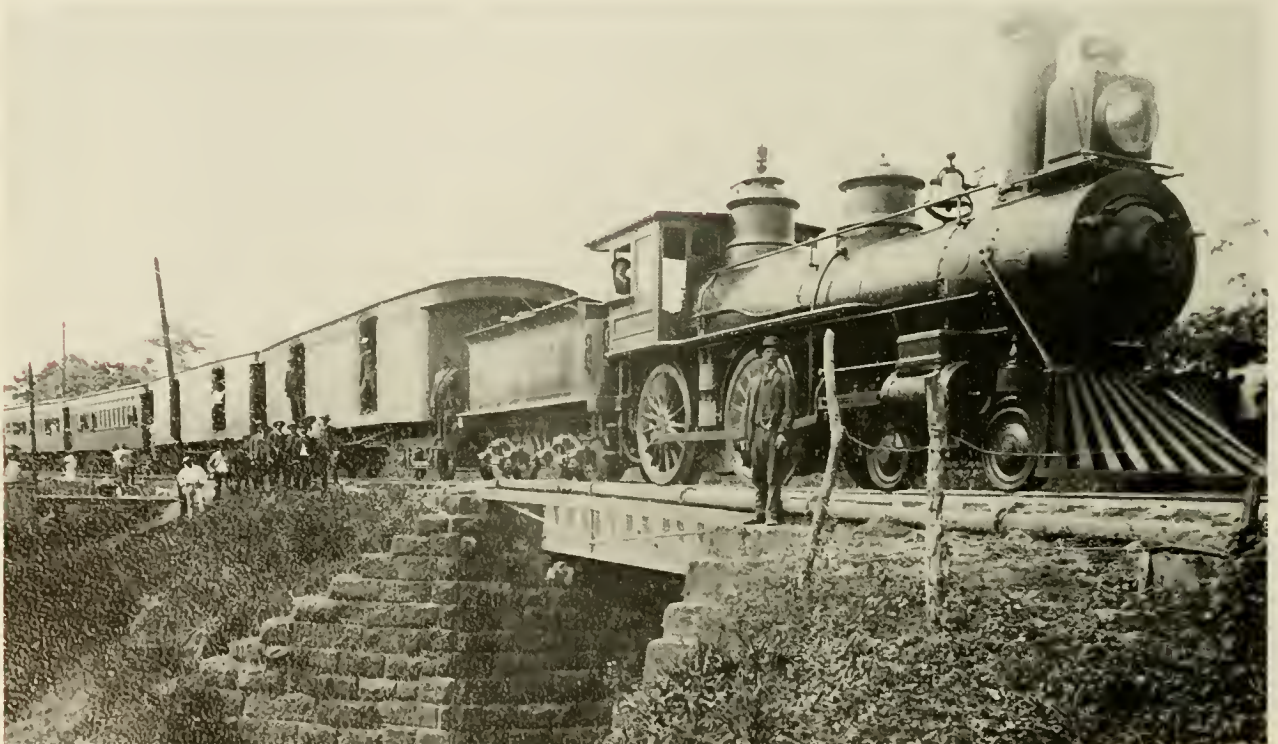
The purchase of the new sister tugs "M. L. Walker" and "H. Burgess" at a cost of \$5 million is part of the Canal organization's continuing program of upgrading its watercraft to assist transiting vessels. The tugs were named after the fourth and fifth governors of the Canal Zone.



Coming down the big stairway on the west bank of Culebra Cut in 1911 was no problem but the 154 steps up to the village after 10 hours of work made a hard climb.



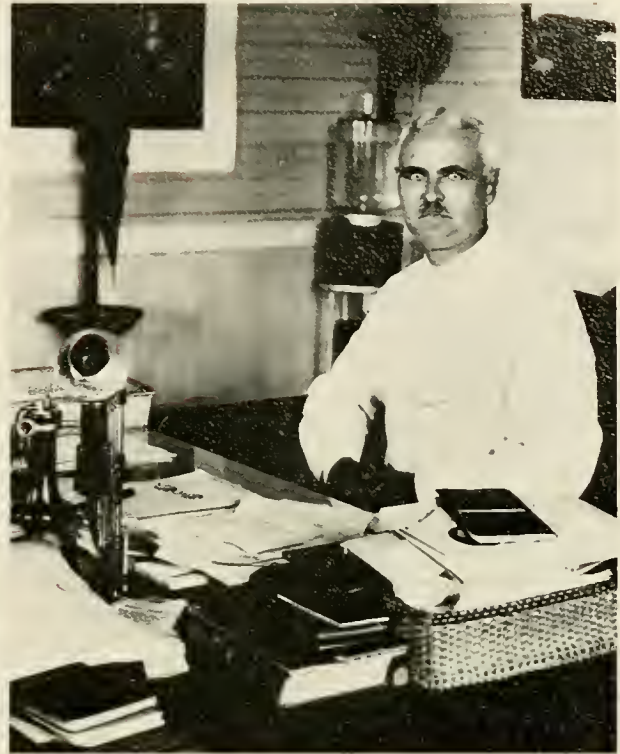
Theodore Roosevelt, the first President of the United States to leave the country during his term of office, climbs aboard a Bucyrus steam shovel at Pedro Miguel while inspecting the Canal work in November, 1906.



The Panama Railroad, which was completed in 1855, stops to disembark passengers. Built by a group of American businessmen, it was the first transcontinental railroad. Acquired later by the French, it was a part of the French Canal Company when it was purchased by the U.S.



Mary Goethals, great-granddaughter of Colonel George W. Goethals, and her husband, Charles M. Poster, visit the Miraflores Locks Control House during a recent visit to the Canal Zone to get their first look at the Canal.



A characteristic pose of "The Colonel" as Colonel Goethals was known to the thousands of Canal workers. He was appointed Chairman and Chief Engineer on April 1, 1907 and served until completion of the Canal.



With a new coat of red, white, and blue paint in celebration of the Bicentennial of the United States, Engine 901 of the Panama Railroad, operated by the Panama Canal Company, rounds the bend near Pedro Miguel Locks.



Horse-drawn wagon trains crossed the Canal's Pacific entrance during maneuvers in 1933. It was called the Thatcher Ferry in honor of Maurice H. Thatcher, who served as Civil Administrator of the Canal from 1910 until 1913.



The ferry continued to operate, carrying passengers and vehicles across the Canal until October, 1962, when the Thatcher Ferry Bridge, one of the largest steel arch bridges in the world, was dedicated.



Built at a cost of \$20 million, the bridge was inaugurated on Columbus Day, October 12, 1962, in a ceremony attended by Panama and U.S. Government officials and diplomatic representatives.



The brightly illuminated structure is a familiar sight to Panama Canal pilots who guide ships through the waterway 24 hours a day. From abutment to abutment, the bridge measures 5,428 feet.



Clearing and leveling land for construction of the townsite of Balboa and the Canal Administration Building was underway when this picture was taken from atop Sosa Hill in June, 1912.



Two years later, in May, 1914, one wing of the Administration Building had been completed and work was progressing on the employee quarters along the street that was to be named the Prado.



The townsite of Culebra was the official headquarters of the Isthmian Canal Commission during construction days. Located on the banks of "the Cut," the town was moved before the Canal opened.



By 1915, when the headquarters of the Canal had been moved to Balboa Heights, the Administration Building and the employee quarters along the Prado had been completed, though not completely landscaped. Centerspread: The view from the top of the Administration Building stairs at Balboa Heights is a magnificent panorama of Canal Zone landmarks: Goethals Memorial, the grassy expanse called the Prado, the Thatcher Ferry Bridge, and Sosa Hill.





Early landscaping work can be seen in this 1915 picture of the Prado, the street leading from the center of Balboa to the Administration Building in Balboa Heights. The palm-lined center area was built to the exact dimensions of the lock chambers—110 feet by 1,000 feet.



The original concrete employee quarters along the Prado still stand today, the royal palms are fully grown and a monument to George W. Goethals stands at the foot of the steps which lead to the Administration Building.



The first of a long list of distinguished guests to be accommodated at the old Tivoli Hotel in Ancon was President Theodore Roosevelt, during his visit to the Isthmus in November, 1906.



The Tivoli, no longer a commercial hotel but a guest house for visiting officials and government employees on temporary assignment, was for many years a social center and a landmark in the Canal Zone. It was closed and dismantled in 1971.



The Governor's House, originally built in the community of Culebra as the residence of the Chief Engineer during Canal construction days, was dismantled and moved to its present location before the waterway opened.



Though renovated and air conditioned, the classic architectural style of the early 1900's, the wide verandas and high ceilings, are still charming features of the Governor's House as it appears today.



In 1904, the three R's were taught in rustic little school houses like this one in Gorgona. As the sign proclaims, schooling was free for employee dependents.



The school system in the Canal Zone today includes such modern facilities as Balboa High School, on the Pacific side of the Isthmus, which boasts a 600 seat auditorium where plays and concerts are staged.



The post office at Empire was one of the first to be opened in the Canal Zone in 1904. As Canal construction work changed location, post offices were moved or new ones opened to follow the workers.



The Balboa Post Office, one of the two main post offices in the Canal Zone, is located on Stevens Circle. The Circle is named after the Canal's second Chief Engineer, John F. Stevens, who created a living and working environment that made construction of the Canal possible.



A new reinforced concrete fire station at Cristobal was completed in August, 1912, and motor equipment was on order to replace the remainder of the horse-drawn engines.



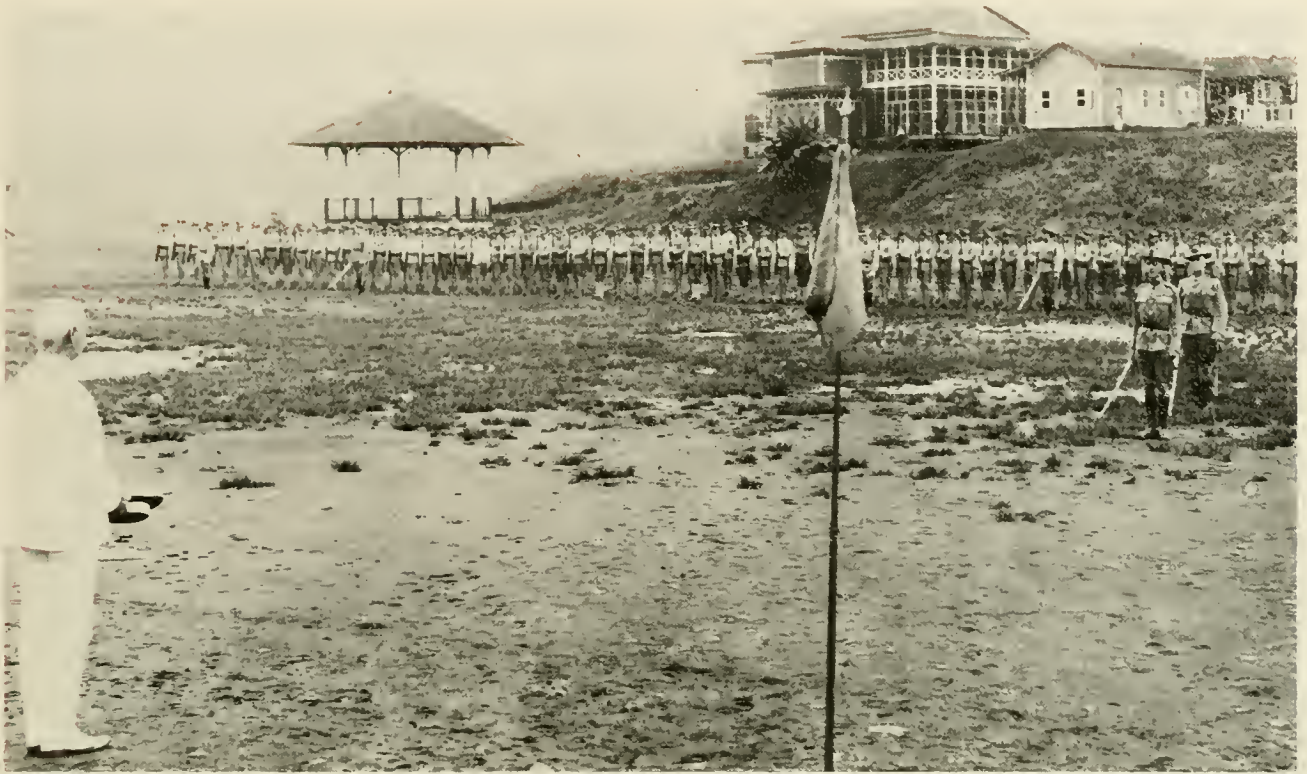
Today the Canal Zone Fire Division has among its ranks highly trained professionals, skilled at combating fires aboard ship.



In 1905, the Canal Zone Police Station at Mount Hope was located in a dilapidated house left over from French construction days.



Today's Canal Zone Police force is composed of women and men, and they no longer cover their beat on horseback.



Despite the mud, Colonel George W. Goethals is dressed in his traditional white attire to review the Marines at Camp Elliott, Canal Zone in July, 1911.



Members of the U.S. Armed Forces participate in a recent review in the Canal Zone. The military forces continue to play an important role in the defense of the Panama Canal.



A reserve of water for the operation of the Panama Canal was created in the 1930's with the construction of Madden Dam and the creation of Madden Lake. The two U.S. built lakes, Gatun and Madden, provide water not only for the Canal Zone but for Panama City and Colon as well.



Without this dam, which also serves to operate a hydroelectric plant, the Canal could not meet today's traffic requirements. Panama City draws raw water from Madden Lake for purification at the Republic's Chilibre plant.



This was Panama City's North Avenue in June, 1907.



Here is the same street after paving, two months later.



Clubhouses offered band concerts, bowling.



Announcements of events were posted in the lobby.



Slides, like this one in 1911, were a menace.



Houses were dismantled and moved to new locations.

Simultaneously with the digging of the Canal, the United States constructed housing and recreational facilities for the workers, built roads and paved streets in Panama and the Canal Zone. Isthmian Canal Commission Club Houses, which offered pool tables, reading rooms and a variety of other amenities, were run by the YMCA.



Sanitation played a vital part in the construction of the Canal. Ridding the area of the dread yellow fever and malaria was the responsibility of Dr. William Crawford Gorgas.



Spraying and fogging to control the mosquito population and the diseases they carry goes on today in much the same manner as it did when the Canal was being dug.



The original Ancon Hospital was built by the French shortly after the French Canal Company began operations in 1880. Americans built additional hospitals and clinics to care for the health needs of an army of workers.



This seven story structure, completed in the 1960's, is part of the complex of buildings of Gorgas Hospital which today serves Canal employees in the Pacific sector.





One of the greatest changes in shipping since World War II is the shift from general cargo vessels to the huge container ships that squeeze through the Canal, their decks piled high with containerized cargo.



(At left)

The majestic "Queen Elizabeth 2" set a record in 1975 as the largest passenger ship ever to transit the Canal and another record in 1977 for paying the largest Canal toll, a whopping \$68,499.46. The "QE2" is 963 feet long and has a beam of 105 feet, a tight fit through Canal locks which are 1,000 feet long and 110 feet wide.



The lights of a suction dredge glow brightly as work continues around the clock. Continuous dredging is a vital part of Canal operations.



Moving through Miraflores Locks, the "Althea" produces a dramatic night scene. An elaborate lighting system makes it possible for the Canal to operate 24 hours a day.



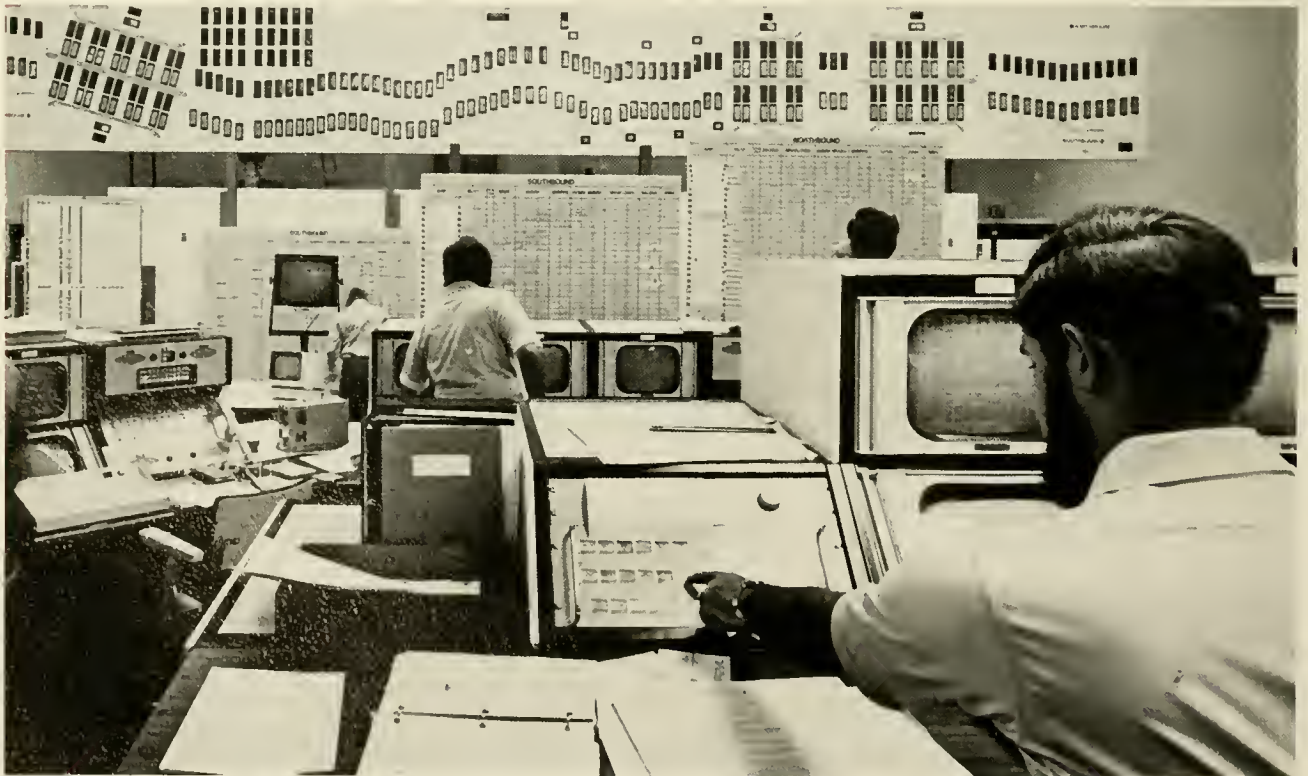
Shrouded in fog, a supertanker is carefully maneuvered into the 110 by 1000-foot lock chamber. Fog is a continuing problem for Canal transit personnel.



A tropical downpour obscures the control house and cuts visibility to a minimum for these transiting ships. The rainy season poses special problems for Canal pilots.



Despite the lack of air conditioning, the formality of the times is reflected in the attire of these office workers in the General Office of the Quartermaster Storehouse at Empire.

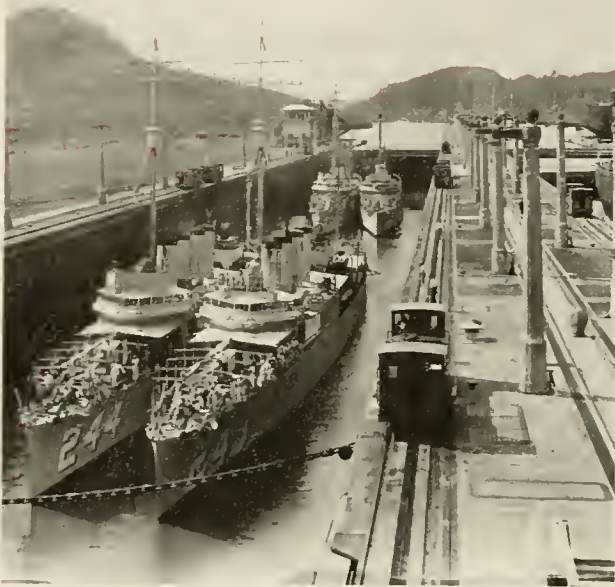


In the age of computers, the traffic situation in the Canal can be viewed at a glance on a 48-foot by 6-foot display board in the Marine Traffic Control Center at La Boca.



Colonel and Mrs. David D. Gaillard enjoy tea at their home in Culebra. Gaillard directed the work in Culebra Cut, which was renamed in his honor. On pages 46 and 47: A supertanker squeezes through the west chamber of Miraflores Locks while the east chamber is dewatered for locks overhaul.





Four destroyers are locked through simultaneously at Pedro Miguel Locks in this 1925 photo. Ships of war have used the Canal since its opening in 1914, just days after the outbreak of World War I.



A modern-day destroyer wends its way through the waterway. U.S. Government ocean traffic reached a peak of 1,504 transits during the height of the Vietnam war in 1968.



Guided with hand-held lines instead of towing locomotives, these vintage submarines resemble toys in a huge bathtub as they make their way into the locks which were sometimes used as dry docks before the Canal was officially opened.



Making a northbound transit through the Canal with crew topside, a U.S. Navy nuclear submarine is locked through a chamber at Miraflores.



Filling the east chamber at Pedro Miguel Locks with her 108-foot beam is the battleship "New Jersey", which along with her sister ship, the "Missouri", is among the widest vessels to transit the Canal.



The largest Navy vessel, in service today, to transit the Canal is the huge new amphibious assault ship, "Tarawa". Only 13 vessels in the U.S. Navy are too large to use the Canal. On pages 50 and 51: The Norwegian ship "TSU", one of 10 new general cargo and container ships that will be regular users of the Canal, makes its way through Gaillard Cut as the U.S. Drill Boat "Thor" works at deepening the waterway.







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