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The Canal Record

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NOTES OF PROGRESS.

First Lockage at Pacific End.

The first lockage at the Pacific end of the Canal was effected on Tuesday, October 14, when clapet *No. 6*, the tug *Miraflores* with three barges, and the steam launch *Birdena*, were raised together through the west flight of Miraflores Locks, from the Pacific entrance channel to the surface of Miraflores Lake, which was at elevation plus 36.82 feet at 8 a. m., on that date.

The lockage was made without hitch of any kind, the gates, valves, controlling machines, and motors operating with the precision that has been obtained in the operations at Gatun Locks. The passage of the vessels was begun at 11.11 a. m.; they entered the lower level at 11.15 a. m., were raised to the elevation of the upper level at 12.15 p. m., and passed beyond the upper guard gates at 12.41 p. m. The entire operation consumed one hour and 30 minutes.

The gates and machinery of the east flight at Pedro Miguel Locks were in readiness to effect the lift to Culebra Cut on the same day, though it was impracticable to do so, because of insufficient depth of water in the Cut south of Cucaracha slide. The tug, clapet, and launch returned to Balboa, the return lockage occupying 45 minutes in time. When the water in the south end of the Cut is sufficiently deep to allow the passage of the vessels to Cucaracha slide, pipeline suction dredge *No. 85* will be brought from its work at the Balboa terminal through Miraflores Locks and be passed through the single lift at Pedro Miguel Locks to Culebra Cut. The barges now in the lake are loaded with trusses and other materials to be used in the removal of the portable span recently installed in bridge No. 57½ of the Panama railroad, across the Cut at Paraiso, when it is desired to pass vessels through the bridge.

Transfer of Atlantic Division Electrical Work.

Effective October 15, the Gatun power plant, all electrical work heretofore under the supervision of the division engineer of the Atlantic Division, and the installation, maintenance, and operation of sump pumps, in Gatun Locks, spillway, and hydroelectric station, were transferred to the Mechanical Division, together with the necessary number of operatives and workmen. The power plants at Gatun and Miraflores will be consolidated, and the records at both stations will hereafter be kept in the office of Mr. Hartley Rowe, electrical superintendent of the Mechanical Division, at Empire. The account "Operation of Gatun power plant," will be continued as a separate account.

Thirteen Vessels Raised Together Through Gatun Locks.

The west flight of Gatun Locks was used for the second time on October 9, when three groups of dredging vessels and a floating piledriver, in tow of tugs, a total of 13 vessels, were lifted together from the Atlantic entrance channel to the surface of Gatun Lake. This performance, using the entire 1,000-foot length of each chamber, more nearly tested the capacity of the locks in commercial and naval use than the passage of the lone tug *Gatun* on September 26. Because of the care required in handling the groups, which filled the chambers with relatively slight clearance at the gates, the time of passage exceeded that of the *Gatun*, which was one hour and 51 minutes. The first group of dredging vessels entered the lower level at 9.50 a. m., and the rear group passed beyond the upper guard gate at 12.40 p. m.

The first group was composed of the tug *Bohio*, with a 600-ton barge loaded with piles and 500 tons of coal, and two old cement barges loaded with 250 tons of coal each. The second group was the *Gatun*, with pipeline suction dredge *No. 86*, several pontoons, and a fuel oil barge. The third group was the tug *Empire*, with the French ladder dredge *No. 5*, two dump scows, and a floating piledriver. A motor launch and several pangas were towed in the rear. Upon reaching the lake level, the groups were towed beyond the end of the upper approach wall, then across to the edge of the lake, several hundred feet east of the Gatun station of the Panama railroad, to allow disembarking the passengers who had taken the opportunity to go through the locks. Shortly afterward, the tugs *Gatun* and *Empire* returned to the west approach, and were passed down the flight to the ocean in one hour and 35 minutes. The *Bohio* then took the three barges containing 1,000 tons of coal in tow to Gamboa, returning the next day for the dredges, and will remain there as auxiliary in the dredging operations in the vicinity, and in Culebra Cut.

DESTRUCTION OF LAST DIKE.

Water in Gatun Lake and Culebra Cut at Gamboa Equalized on October 10.

A section of Gamboa dike was dynamited at 2.02 p. m., on Friday, October 10, making practically a clear opening 125 feet wide, through which water from Gatun Lake flowed in sufficient volume to complete the filling of Culebra Cut from the dike to Cucaracha slide in about two hours' time. Water was first admitted to this section of the Cut on October 1, and by the 10th, it had risen to elevation 61.7 feet, or about six feet below the level of the lake. The shot was not a large one, as compared with some of the previous blasts in connection with the Canal work, but it did perfect execution.

In accordance with an arrangement made two or three days beforehand, the blast was fired by President Woodrow Wilson at Washington. This was effected by using the land telegraph to Galveston, Texas, and connecting it there with the Central and South American Cable Company's submarine cable, and land lines which, by employing the company's transisthmian cable, furnished a connection to a local circuit in the vicinity of the dike. When the President depressed the lever, the current was relayed from point to point along the route, and was eventually transmitted to the local circuit, closing it and tripping a weight attached to the handle of a switch. The weight threw the switch setting off the blast.

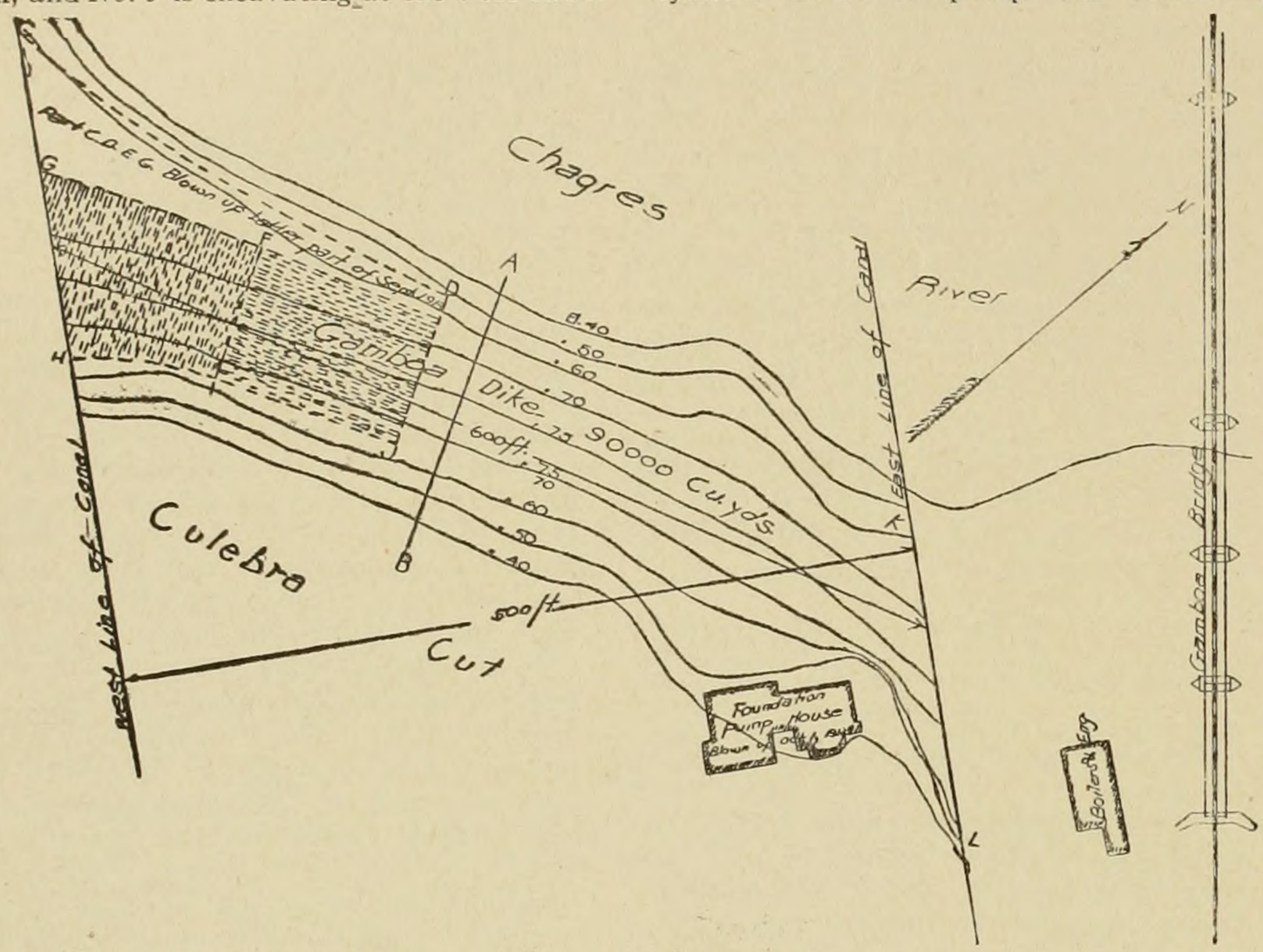
The event was witnessed by a large number of spectators, who lined the banks of the Canal, or occupied advantageous positions on nearby hills. The zone of danger was marked by stakes, and the people were kept back of this line. A special train was run from Panama, and some extra coaches were attached to the regular passenger train out of Colon. Half an hour or more after the dike was broken, a cayuco, or native canoe, made the passage through, followed shortly by three launches.

The accompanying plan and cross section of the dike shows its general characteristics, and its position relative to the east and west lines of the Canal. The dike was originally about 600 feet long, 78.2 feet above sealevel at its highest part, 150 feet wide at the base, and contained about 90,000 cubic yards of material. In the section that was destroyed, 400 holes had been drilled from 20 to 35 feet in depth. The total number of holes in the dike was 1,277; 200 of these were made with tripod drills, and the remainder by churn drills. The length of all the holes if placed end to end would equal 41,166 lineal feet, or 7.79 miles. In charging the well drill holes, 25,700 feet of 4-inch galvanized iron pipe were used.

The remainder of the dike, east of the opening, will probably be dynamited about October 17. It includes a hard rock sec-

tion where the end of the dike abuts on the east side of the Canal. What is left of the west end of the dike is composed of relatively soft material, and will be removed by dredge without any more blasting.

Dredges *No. 86* and *No. 5*, which were passed through Gatun Locks on October 9, have begun operations near the dike. *No. 86* is assisting *No. 82* in the work of cleaning the channel north of the dike of material silted in, and *No. 5* is excavating at the west end of the dike. The material excavated by ladder dredge *No. 5* is being towed by the tug *Bohio* and dumped into an arm of the lake, north of the old site of Mamei.



General Plan of Gamboa Dike.
(*Hatched section blown up October 10.*)

CUTTING THROUGH CUCARACHA SLIDE.

After the blowing up of Gamboa dike, the southern end of the Canal, beyond Gold Hill, was separated from the waters of the lake by the foot of Cucaracha slide. Beginning October 6, forces of the Central Division had been engaged in digging a trench through the top of this barrier to allow the passage of the water from the north side. Successive downward movements of the slide, however, kept closing the trench, and it was decided to blow a gap in the barrier in the hope that the water would rush through it. A ton and a half of dynamite was placed in the toe, just opposite Contractor's Hill and exploded at 4.15 p. m., October 10. The explosion threw a great mass of earth and rock high into the air, and stones were hurled as far as 1,500 feet on either side, but the clay of the slide slumped back into place and closed the break before any considerable amount of water had passed through. Later blasts produced similar results, and the effort to clear the barrier in this manner was abandoned on Saturday, October 11. Trenching with pick and shovel was resumed that morning, and water began to pass through to the south side of the slide at 3.43 in the afternoon. During Saturday night, a movement of the slide closed the trench. It was opened again by 11 a. m., Sunday, October 12, and has remained open since. A force of 200 men with shovels has been engaged in keeping the trench clear, and, with the assistance of the flowing water, making it deeper and wider. By 4 p. m., Sunday, pipe connections had been made with a water tank on the south side of Contractor's Hill and the work of the men with shovels was augmented by sluicing with a 3-inch hose along the lower side of the barrier. During the forenoon of Monday, October 13, a 2-cylinder air-driven pump and connecting pipe and 4-inch hose were brought from Empire and installed on the north side of the slide. At 2.50 p. m., this outfit began supplying water at 150 pounds pressure for sluicing the northern, or upper, part of the trench. This so facilitated the work that by 4 p. m., the water was flowing over the slide at the rate of about 40 cubic feet a second, in a stream from six to eight feet wide and approximately a foot deep, moving about six feet a second. It is believed that this method will so increase the flow as to fill the south end of the Cut within a convenient period, though all calculations may be upset by further movements of the slide. The material of the slide is a dense, adhesive clay, intermixed with stones up to two feet in diameter, and does not yield easily to the flow of water.

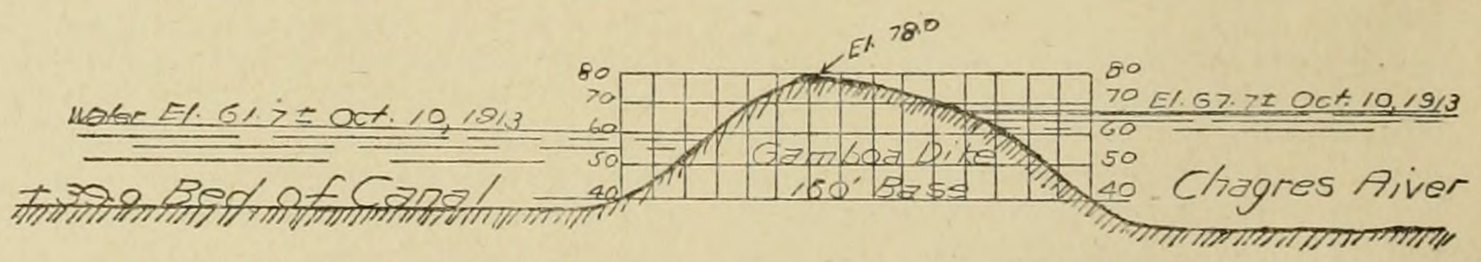
The trench through the slide is parallel to the axis of the Canal and about 20 feet from the west bank. Its intake is at elevation 66.5 feet above sealevel, and its discharge at the level of water in the southern part of the Cut, which was at elevation plus 43.4 early in the evening of October 15. The trench is in two sections, with a total length of 600 feet, separated by a small lagoon, about 300 feet across, enclosed between elevations of the toe of the slide. The material now in the Cut from the slide amounts to about 600,000 cubic yards.

The trench through Cucaracha slide has been deepened about a foot and a half, and widened slightly, since beginning of sluicing at the upper end, on Monday afternoon, but the flow of water has increased only slightly. The surface of the water in the south end of the Cut was at 43.1 feet above sealevel at 8 o'clock in the morning of October 15, giving about a 4-foot depth in that part of the Canal. On October 14, it stood at +42.85. On the north side of the slide the surface of the water was at 68.96 feet above sealevel on October 15, at 10.30 a. m.

By evening of October 15 the flow had increased to 60 cubic feet per second, and it is believed that by Tuesday, October 21, the water south of slide will be of sufficient depth to float a dredge.

The last Culebra slide, immediately north of Gold Hill, made a movement across the channel on Saturday and Sunday, but sufficient clearance remains to allow passage of dredging vessels. The material at the foot of this slide is mostly rock, and it is possible that ladder and dipper dredges will be brought from the Atlantic entrance to work on it.

Surveyors from the Sixth Division are engaged in placing water-gage rods and range markers, showing center line of Canal channel and liners 150 feet each side of center, in preparation for beginning of dredging. Final adjustments are being made at the twin pump relay station south of Contractor's Hill, and at the electric transformer station, for supplying it with power, diagonally across from it, on the 95-foot berm along the east bank. Discharge pipe and pontoons for supporting it on the water, have been distributed along the west side for a distance of about 1,000 feet, between the relay station and the foot of Cucaracha slide.



Cross Section of Gamboa Dike.

Donation of Books for Zone Penitentiary.

Messrs. Hurst and Company, publishers, of New York City, have donated to the Commission for use at the Canal Zone penitentiary 533 bound volumes of miscellaneous literature. The books have been received at the penitentiary and are now being classified and listed in the catalogue of the library. The volumes donated consist of a large assortment of fiction, some historical and scientific works, poems and poetical works, and dictionaries—French and English, German and English, and Spanish and English. The chief of police in reporting the receipt of the books states, as follows:

> "The books are new, and except for flaws in binding, or damages resulting from handling, etc., (which do not affect their value to the penitentiary at all) they are in splendid condition, and form a very important and much appreciated addition to the prison library."