

A TRIP TO PANAMA CANAL ZONE, JAMAICA AND CUBA.

By R. D. Caldwell.
(Begun in Robesonian May 22d.)

Three hundred feet is the minimum bottom width of the Canal. This width begins about half a mile above Pedro Miguel locks and extends about 8 miles through Culebra Cut, with the exception that at all angles the channel is widened sufficiently to allow a thousand-foot vessel to make the turn. The Cut has eight angles, or about one to every mile.

Gatun Dam.

The Gatun Dam which forms Gatun Lake by impounding the waters of the Chagres and its tributaries, is nearly 1 1/2 miles long, measured on its crest, nearly 1-2 mile wide at its base, about 400 feet wide at the water surface, about 100 feet wide at the top, and its crest will be finished at an elevation of 105 feet above mean sea level, or 20 ft. above normal level of the lake. It is in reality a low ridge uniting the high hills on either side of the lower end of the Chagres Valley so as to convert the valley into a huge reservoir.

The Spillway is a concrete-lined channel 1,200 ft. long and 285 ft. wide cut through a hill of rock nearly in the center of the dam, the bottom being 10 feet above sea-level at the upstream end and sloping to sea level at the toe. Across the up-stream, or take opening, of this channel, a concrete dam has been built in the form of an arc of a circle, making its length 808 feet, although it closes a channel width of only 285 feet. The crest of the dam will be 69 feet above sea-level or sixteen feet below the normal level of the lake, which is eighty-five feet above the sea level. On the top of this dam there will be thirteen concrete piers with their tops 115.5 feet above the sea-level, and between these there will be mounted regular gates of the Stoney type. Each gate will be of steel sheathing on a framework of girders and will move up and down the roller trains in niches in the piers. They will be equipped with sealing devices to make them water tight. Machines for moving the gates are designed to raise or lower them in approximately ten minutes. The highest level to which it is intended to let the lake rise is 87 feet above sea-level, and it is probable that this level will be maintained continuously during wet seasons. With the lake at that elevation the regulation gates will permit of a discharge of water greater than the maximum known discharge of the Chagres river during a flood.

Hydroelectric Station at Gatun.

Adjacent to the north wall of the spillway will be located a hydro-electric station capable of generating through turbines 6,000 kilowatts for the operation of the lock machinery, machine shops, dry dock, coal-handling plant, batteries, and for the lighting of the locks and Zone towns and, if desirable, the Panama railroad.

The Locks.

There will be six double locks in the Canal; three pairs in flight at Gatun, with a combined lift of 85 feet; one pair at Pedro Miguel, with a lift of 30 1/3 feet, and two pairs at Miraflores, with a combined lift of 54 2/3 feet at mean tide. The usable dimensions of all are the same—a length of 1,000 feet, and width of 110 feet. Each lock will be a chamber with floors and walls of concrete, and mitering gates at each end.

The lock gates will be steel structures seven feet thick, 65 feet long, and from 47 to 82 feet high. They will weigh from 390 to 730 tons each. Ninety-two leaves will be required for the entire Canal, the total weighing 60,000 tons. The leaves are shells of structural steel covered with a sheathing of steel riveted to the girder frame-work.

Electric Control of Lock Machinery.

The gates, valves, and fender chains of the locks will be operated by electricity, and remotely controlled from a central point; that is, there will be a central controlling station for each of the series of locks at Gatun, Pedro Miguel, and Miraflores. In passing a ship through the locks it will be necessary to open and close miter gates weighing from 390 to 730 tons, to fill and empty lock chambers containing from three and one-half to five million cubic feet of water, to raise and lower fender chains weighing 24,098 pounds each, and to tow the vessel through the locks. All these operations, except that of towing, will be controlled by one man at a switchboard.

A ship to be raised to the lake level will come to a full stop in the forebay of the lower locks, prepared to be towed through one of the duplicate locks by electric towing locomotives. The water in the lower lock chamber will be equalized with the sea level channel, after which the miter gates will be opened, the fender chain lowered and the vessel passed into the first chamber, where the water is at sea level. Then the miter

gates will be closed. The rising stem gate valves at the outlet of the main culverts will be closed, while those above will be open, allowing water to flow from an upper level into the chamber, which when filled will raise the vessel 28 1/3 feet, to the second level. This operation will be repeated in the middle and upper locks until the ship has been raised to the full height of 85 feet above the level of the sea.

At Gatun in the passing of a large ship through the locks, it will be necessary to lower four fender chains, operate six pairs of miter gates and force them to miter, open and close 8 pairs of rising stem gate valves for the main supply culverts, and 30 cylindrical valves. In all, no less than 98 motors will be set in motion twice during each lockage of a single ship, and this number may be increased to 143, dependent upon the previous condition of the gates, valves and other devices.

Canal Zone.

The Canal Zone contains about 436 square miles, about 95 of which will be under the waters of the Canal and Gatun and Miraflores Lakes. It begins at a point 3 marine miles from mean low water mark in each ocean, and extends for five miles on each side of the center line of the route of the Canal. It includes the group of islands in the Bay of Panama named Perico, Naos, Culebra, and Flamenco. The cities of Panama and Colon are excluded from the Zone, but the United States has the right to enforce sanitary ordinances in those cities, and to maintain public order in them in case the Republic of Panama should not be able, in the judgment of the United States, to do so.

Canal Force, Quarters and Supplies. The Canal force is recruited and housed by the quartermaster's department, which has two general branches, labor and quarters, and material and supplies. Through the labor and quarters branch there have been brought to the Isthmus 44,394 laborers, of whom 11,797 came from Europe, 19,448 from Barbados, the balance from other islands in the West Indies and from Columbia. No recruiting is required at present, the supply of labor on the Isthmus being ample.

On December 1, 1912, the total force of the Isthmian Canal Commission and Panama Railroad Company, actually at work, was divided as follows:

	Gold.	Silver	Total
Isthmian Canal			
Commission ..	4,475	26,199	30,594
Panama R. R. Co.	630	4,256	4,886
Panama R. R. Commissary	257	923	1,180
Total	5,362	31,298	36,660

In addition to the above there were in the employ of contractors on the Isthmus, 454 gold and 3,045 silver employes, a total of 3,499.

The gold force is made up of the officials, clerical force, construction men, and skilled artisans of the Isthmian Canal Commission and Panama Railroad Company. Practically all of them are Americans. The silver force represents the unskilled laborers of the Commission and the Panama Railroad Company. Of these about 4,500 are Europeans, mainly Spaniards with a few Italians and other races. The remainder about 25,000 are West Indians, about 5,000 of whom are employed as artisans receiving 16, 20, 25, 32 and 44 cents an hour and 7,000 on a monthly basis. The standard rate for the West Indian laborer is 10c an hour, but a few of these doing work of an exceptional character are paid 16 and 20 cents. The larger part of the Spaniards are paid 20 cents an hour, and the rest 16 cents an hour.

The material and supply branch carries in eight general storerooms a stock of supplies for the Commission and Panama Railroad valued approximately at \$4,500,000. About \$12,000,000 worth of supplies are purchased annually, requiring the discharge of one steamer each day.

Food, Clothing and Other Necessaries.

The Canal and Panama Railroad forces are supplied with food, clothing and other necessities through the subsistence department, which is divided into two branches, commissary and hotel. It does business of about \$7,500,000 per annum. The business done by the commissary department amount to about \$6,000,000 per annum and that done by the hotel branch to about \$1,500,000 per annum. The commissary system consists of 22 general stores in as many Canal Zone villages and camps along the relocated line of the Panama Railroad. It is estimated that with employees and their dependents, there are 65,000 people supplied daily with food, clothing and other necessities. In addition to the retail store, the following plants are operated at—Cristobal: Cold storage, ice making, bakery, coffee roasting, ice cream, laundry and packing department.

A supply train of 21 cars leaves Cristobal every morning at 4 a. m. It is composed of refrigerator cars con-

taining ice, meats and other perishable articles, and ten containing other supplies. These are delivered at the stations along the line and distributed to the houses of employes by the Quartermaster's Department.

The hotel branch maintains the Hotel Tivoli at Ancon, and also 18 hotels along the line for white gold employes at which meals are served for thirty cents each. At these eighteen hotels there are served monthly about 200,000 meals. There are 17 messes for European laborers, who pay 40 cents per ration of three meals. There are served at these messes about 200,000 meals per month. There are also operated for the West Indian laborers 16 kitchens, at which they are served a ration of three meals for 27 cents per ration. There are about 100,000 meals served monthly at these kitchens.

The supplies for one month for the line hotels, messes and kitchens costs about \$85,000; labor and other expenses about \$16,500. The monthly receipts, exclusive of the revenue from the Hotel Tivoli, amount to about \$105,000.

(Next Thursday's Robesonian will have an account of visits to the Islands of Jamaica and Cuba.)

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Time Table No. 3.

In effect 6:00 o'clock a. m. Sunday, May 11th, 1913.

Between Alma and Rowland, N. C. Mixed train daily except Sunday

Southbound		Northbound	
First Class	Daily Except Sunday	First Class	Daily Except Sunday
No. 35.	Stations	No. 36.	
Lv. 9.00 p m	Alma	Ar. 7.45 a m	
" 9.10 "	McLeods	Lv. 7.35 "	
" 9.20 "	Raemon	" 7.25 "	
" 9.30 "	Chaloner	" 7.15 "	
" 9.35 "	Bracy	" 7.10 "	
Ar. 9.45 "	Rowland	" 7.00 "	

Second Class Daily Except Sunday

No. 7		Stations		No. 8	
Lv. 9.15 a m	Alma	Ar. 5.40 p m			
" 9.27 a m	McLeods	Lv. 5.28 p m			
" 9.40 a m	Raemon	" 5.15 p m			
" 9.55 a m	Chaloner	" 5.00 p m			
" 10.00 a m	Bracy	" 4.55 p m			
Ar. 10.10 a m	Rowland	" 4.45 p m			

Nos. 7, 8, 35 and 36 will stop on signal at McLeods and Chaloner.
No. 7 will wait at Alma for Seaboard Air Line train No. 11
No. 35 will wait at Alma for Seaboard Air Line train No. 20.
No. 8 connects with Seaboard Air Line train No. 13 at Alma.
No. 36 connects with Seaboard Air Line train No. 19 at Alma.
C. J. Cottingham, A. J. Steed, General Manager. Gen. Pass. Agt.

Virginia & Carolina Southern Railroad Co

Time Table No. 17.

In Effect 12 o'clock Midnight Tuesday, January 9th, 1912.

Between Lumberton and Hope Mills. SOUTHBOUND

Daily		No. 65		No. 79	
Lv	Hope Mills, 5.15 p m				7.45 a m
"	Roslin, 5.26 "				7.56 "
"	McMillan, 5.33 "				8.03 "
"	Oakland, 5.40 "				8.10 "
Ar	St. Pauls, 5.48 "				8.18 "
Lv	St. Pauls, 5.50 "				8.20 "
"	Roziers, 6.01 "				8.31 "
"	Woodmore, 6.06 "				8.36 "
"	Powers, 6.13 "				8.43 "
"	Bee Gee, 6.18 "				8.48 "
Ar	Lumberton, 6.25 "				8.55 "

NORTHBOUND

Daily		No. 64		No. 78	
Ar	Hope Mills, 11.00 a m				9.30 p m
Lv	Roslin, 10.50 "				9.17 "
"	McMillan, 10.42 "				9.10 "
"	Oakland, 10.35 "				9.02 "
Ar	St. Pauls, 10.27 "				8.57 "
Lv	St. Pauls, 10.25 "				8.55 "
"	Roziers, 10.14 "				8.44 "
"	Woodmore, 10.09 "				8.39 "
"	Powers, 10.02 "				8.32 "
"	Bee Gee, 9.57 "				8.27 "
"	Lumberton, 9.50 "				8.20 "

Elizabethtown Branch

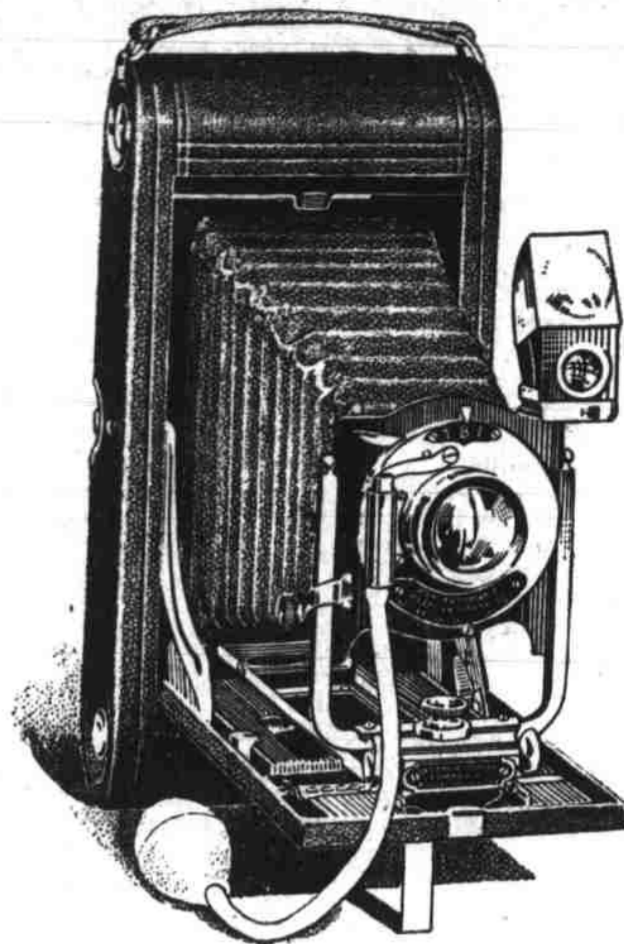
Between St. Paul and Elizabethtown Mixed train daily except Sunday.

No. 8.		No. 7.	
Ar	St. Paul 8.00 a m	Lv	9.05 p m
Lv	Tar Heel 7.15 "	"	9.55 "
"	Dublin 6.30 "	"	10.25 "
"	Eliz'th'n 6.00 "	Ar	10.45 "

Nos. 5 and 6 will not carry passengers
Nos. 7 and 8 will stop on signal at Dundee, Tobermory, Duart, Perth and Berwick for passengers.
No. 79 will wait 15 minutes at St. Paul for passengers from No. 8.
No. 7 will wait at St. Paul for passengers from No. 78.
J. P. Russell, General Supt.

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