

THE WORK AND REPORT OF THE CANAL COMMISSION.

The work done by the Isthmian canal commission was authorized by the river and harbor act passed March 3, 1899. In this law, congress empowered the president to make a full investigation of all practicable locations for a canal across the American isthmus, and to "determine the most feasible and practical route across said isthmus for a canal, together with the cost of constructing and placing the same under the control, management and ownership of the United States."

The task intrusted to the president was one of great magnitude, requiring the conduct of extensive surveys in Nicaragua and Costa Rica, on the isthmus between the cities of Colon and Panama, and at several points along the Isthmus of Darien between the city of Panama and the mainland of South America. In general, the president was requested to examine all the facts bearing upon the location and choice of a route and "to report to congress the results of such investigations, together with his recommendations in the premises."

To secure the information desired by congress, the president, after holding the matter under consideration for three months, selected, without reference to political affiliations, a commission of nine experts. The navy was represented by Rear Admiral John G. Walker, whom the commission made its president; from the army were detailed Col. Peter C. Hains and Lieut. Col. Oswald H. Ernst, and from among the civil engineers of the country were chosen George S. Morison and William H. Burr of New York, Alfred Noble of Chicago, and Lewis M. Haupt of Philadelphia. A lawyer, ex-Senator Samuel Pasco, of Florida, was selected with reference to the study of "rights, privileges and franchises," and the writer of this article was placed on the commission to assist in investigating and reporting on the industrial, commercial and financial aspects of the canal.

The commission met for organization on June 15, 1899, and established permanent offices in Washington. To facilitate the prosecution of its several lines of inquiry, five committees were appointed, each committee consisting of three men besides the president of the commission, who was ex-officio a fourth member of all committees. There were three engineering committees—one on the Nicaragua route, one on the Panama route, and one on additional or Darien routes. In addition to these engineering committees, there was one on "rights, privileges and franchises," and another on "the industrial, commercial and military value of the canal." These several committees prosecuted their several lines of investigation, and laid before the full commission both the results of their work and the data upon which all their conclusions were based. The work of each committee was carefully gone over in detail by the full commission. The committees were merely auxiliaries to the commission, and not substitutes.

Much of the work of the commission had necessarily to be done directly by the full body. Soon after organization, it decided that a trip to Paris was necessary, because the records and data collected by the Panama Canal company during the past twenty years were in the archives of the company in its Paris offices. This trip took between six and seven weeks of the commission's time in the summer and early autumn of 1899.

On January 6, 1900, the commission sailed from New York for Greytown, Nicaragua, which point was reached on the 19th of the month. Five weeks were spent in Nicaragua, during which time the harbor problems were studied, all the camps of engineers were visited, additional instructions were given the division engineers in charge, and a careful study was made of the work being done by the engineers in charge of the hydrographic work and the borings. Ten days were spent by the commission at the capital of Nicaragua, where interviews were had with the president and higher officials concerning the question of concessions.

From Nicaragua the commission went by steamer to Panama. It made its headquarters at Colon, and during the fifteen days of its stay on the isthmus every important detail of the project was given a careful personal examination. When the commission left Colon, the chairman of the committee on the Darien routes proceeded along the Caribbean shore on the United States auxiliary cruiser Scorpion, which had some months previous been placed at the disposal of the commission. This trip was taken for the purpose of visiting the engineering parties engaged in the surveys being conducted on that part of the Isthmus of Darien. The other members of the commission went to Port Limon, Costa Rica, and thence to the capital of the country, San Jose, where six days were spent in conference with the president and higher officials. * * * No previous engineering work with reference to the location of a canal route has been done with thoroughness comparable with that insisted upon by the present commission. Among the distinctive features of this phase of the commission's work should be mentioned its examination of the Isthmus of Darien between the mainland of South America and the Panama canal location. The narrowest portion of the isthmus lies in the Darien region, and several men of high authority have long claimed that the most practicable route for the canal was to be found on the Darien portion of the isthmus, either in the neighborhood of the Atrato river or along what are known as the Caledonia bay route or the San Blas location. The information obtained by means of the Darien surveys showed that the Atrato route was entirely out of the question, and established the fact that the Caledonia and San Blas routes are the only possible ones for a canal across the isthmus of Darien, and that in the case of both of these locations the construction of a long tunnel would be necessary. The enormous cost of a tunnel, and the practical impossibility of so ventilating it as to make it a feasible passageway for ships of large dimensions, eliminated the Darien routes from consideration.

The choice lay between the Panama and the Nicaragua locations, and the detailed study of these two routes has shown that the engineering problems on the Nicaragua route are less difficult and less expensive than they had previously been supposed to be. The most difficult engineering feature of either of the two lines is the construction of the Bohio dam on the Panama location, the commission having been unable to find a rock foundation for that structure that does not involve masonry work at a depth of 128 feet below the level of the sea. No foundation has yet been sunk to that depth. The commission believes, however, that the Bohio dam could be constructed without serious difficulty.

The extensive borings in Nicaragua resulted in finding a new location a few miles from Boca San Carlos, at Conebuda, for the large dam across the San Juan river. The dam on this site can be constructed in about four years after work is begun, or in less than two-thirds of the time it would have

taken to have constructed the dam at Boca San Carlos. The locks on both routes have been located on good rock foundations, and every important engineering problem has been satisfactorily solved. There will be no engineering works of such difficulty or magnitude in Nicaragua as the construction of the Bohio dam and the excavation of the Culebra cut on the Panama line. The excavation of this cut would require about eight years, while it is believed that there is no single piece of work on the Nicaragua route which could not, under favoring conditions, be completed within four years after work is actually under way.

An examination of the two routes from the engineering standpoint shows that neither one possesses very decided advantages over the other.

The differences of the two routes are most pronounced in the matter of concessions. In the case of the Nicaragua line, there are no private corporations holding any concessions at present valid, and the United States is free to treat directly with Nicaragua and Costa Rica. * * * The Panama Canal company controls absolutely the situation at Panama. It has a concession certainly valid until 1904, and which the company considers to be valid until 1910. Furthermore, the Panama railroad is owned by the Panama Canal company, and the concession under which this road was constructed has over fifty years to run. By its terms, no canal can be built in the neighborhood of the railroad without arrangements being made with the owners of the concession. It thus becomes necessary for the United States to buy out the Panama Canal company before negotiations with the Colombian government can be consummated.

Whether the United States should adopt the Panama route or the one across Nicaragua and Costa Rica is a question to be decided by considerations of cost of construction and acquisition, expenses of maintenance and operation, and of the usefulness of the routes to the commerce of the United States and foreign countries. * * * The expenses of operation and maintenance are in favor of the Panama location. A study of this question by the commission indicates that these expenses would be about \$2,000,000 a year for the Panama line and about \$3,350,000 for the Nicaragua canal. Against this difference in expenses of operating and maintaining are to be placed the greater advantages of the Nicaragua route as a highway for the commerce of the United States.

The Panama canal being 40.09 miles in length, and the Nicaragua canal 183.66 miles long, a ship would be able to pass through the former canal in less time than it would take to steam from Greytown to Brito. As stated in the final report of the commission, "The estimated time for a deep-draught vessel to pass through is 12 hours for Panama and thirty-three hours for Nicaragua. . . . Except for the items of risks and delays" (that are liable to happen to a vessel passing through a restricted channel), "the time required to make the transit through the canals needs to be taken into account only as an element in the time taken by the vessels to make their passage between terminal ports. Compared on this basis, the Nicaragua route is the more advantageous for all trans-isthmian commerce except that originating or ending on the west coast of South America. For the commerce in which the United States is most interested, that between our Pacific ports and Atlantic ports, European and American, the Nicaragua route is shorter by about one day. The same advantage exists between our Atlantic ports and the orient. For our gulf ports, the advantage of the

Nicaragua route is nearly two days. For the commerce between North Atlantic ports and the west coast of South America, the Panama route is shorter by about two days. Between gulf ports and the west coast of South America the saving is about one day.

Special efforts were made to ascertain the effect which the canal would have upon the traffic of American railways. Numerous conferences were had with railway officials, and information was obtained by correspondence both with railway officials and with shippers. As to the business of the railway systems in the territory between Chicago and New York, and of those in the southern states, the evidence is practically unanimous that the canal will be beneficial. As regards the effect of the new water route upon the railroads west of the Mississippi river, the testimony is divided. That the canal will be a rate-controlling factor of wide-reaching importance is generally admitted, and, naturally enough, is feared by those railway officials who do not think the waterway will bring much new and compensating business to the railroads. Here is the crux of this question—will the canal make business for the transcontinental railroads? Some of the transcontinental officials say yes, and some say no; but the experience of history has always been that the improvements in facilities for water transportation have resulted in the diversification and distribution of industry and added to the volume of business done. Some of the railway officials with whom I have conferred believe that this experience will be repeated by the opening of the isthmian waterway.

A toll considerably higher than one dollar per ton net register would probably yield a larger maximum revenue than would a toll of one dollar; but in fixing the charges for the use of an isthmian canal, owned and operated by the United States government, the principle of maximum revenue could not wisely be followed. The function of the canal as a toll-gate will be a minor one as compared with its service in promoting the industrial and commercial progress and general welfare of the United States. The language of the final report of the commission on this point is that "An annual traffic of 7,000,000 tons at one dollar per ton will produce a revenue of \$7,000,000. The expenses of operating and maintaining the Panama canal are estimated at about \$2,000,000 per annum, and those of the Nicaragua canal at about \$3,350,000. Upon this basis, the net revenue by either route would not be sufficient, at the opening of the canal, to pay interest upon the capital invested and compensate a private corporation for the risks involved. It is the opinion of the commission, however, that there are other considerations more important than revenue. It may even be expedient for the United States to reduce the tolls to an amount which will barely cover the expenses of operation and maintenance. A large increase of traffic in the future is probable, and the revenue producing value of the canal would then be proportionately greater."

The commission's unanimous conclusion, as the result of its entire investigation, was that "After considering all the facts developed by the investigations made by the commission, and the actual situation as it now stands, and having in view the terms offered by the new Panama Canal company, this commission is of the opinion that the most practicable and feasible route for an isthmian canal, to be 'under the control, management and ownership of the United States,' is that known as the Nicaragua route." —Emory R. Johnson, member of the Isthmian Canal Commission, in Review of Reviews, and reprinted by courtesy of the Review of Reviews.