57TH CONGRESS, 1st Session. } HOUSE OF REPRESENTATIVES. { DOCUMENT No. 2.

ANNUAL REPORTS

OF THE

WAR DEPARTMENT

FOR THE

FISCAL YEAR ENDED JUNE 30, 1901.

REPORT OF THE
CHIEF OF ENGINEERS.
PART 3.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1901.

APPENDIX U.

IMPROVEMENT OF CERTAIN RIVERS AND HARBORS IN TEXAS.

REPORT OF CAPT. C. S. RICHÉ, CORPS OF ENGINEERS, OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1901, WITH OTHER DOCUMENTS RELATING TO THE WORKS.

IMPROVEMENTS.

1. Galveston Harbor, Texas.
2. Channel from Galveston Harbor to Texas City, Texas.
3. Galveston ship channel and Buffalo Bayou, Texas.
4. Operating and care of Morgans Canal, Texas.
5. Trinity River, Texas.
6. Channel in West Galveston Bay, Texas.
7. Mouth of Brazos River, Texas.
8. Brazos River between Velasco and Richmond, West Galveston Bay Channel, Double Bayou, and mouths of adjacant streams, Texas.
9. Brazos River, Texas.
10. Aransas Pass, Texas.
11. Harbor at Brazos Santiago, Texas.
12. Removing sunken vessels or craft obstructing or endangering navigation.

EXAMINATIONS AND SURVEYS.

13. Galveston Bay, Texas.
14. Trinity River, Texas.
15. Brazos River, Texas.
16. Effect of storm of September 8, 1900, at Galveston Harbor, Texas.
17. Effect of storm of September 8, 1900, at Brazos River, Texas.

UNITED STATES ENGINEER OFFICE,
Galveston, Tex., July 17, 1901.

GENERAL: I have the honor to forward herewith annual reports for the works of river and harbor improvements in my charge for the fiscal year ending June 30, 1901.

Very respectfully, your obedient servant,

C. S. RICHÉ,
Captain, Corps of Engineers.

Brig. Gen. G. L. GILLESPIE,
Chief of Engineers, U. S. A.

U 1.

IMPROVEMENT OF GALVESTON HARBOR, TEXAS.

This work is being carried on under a project formulated by a Board of Engineers, January 21, 1886, the report on which may be found in the Annual Report of the Chief of Engineers for 1886, page 1294 et seq.

Third. Bottom of lower chords 28 to 30 feet above mean low water of river.

I can only give data concerning bridges, etc., within this county, as I have no maps of Dallas County.

Respectfully,

JOHN B. HAWLEY,
City Engineer.

Hon. T. J. POWELL,
Mayor Fort Worth, Tex.

[Inclosure 3.]

LETTER OF CHIEF ENGINEER OF GULF, COLORADO AND SANTA FE RAILWAY COMPANY.

GALVESTON, TEX., *August 25, 1900.*

CAPTAIN: Answering your letter of recent date, must advise that our line of levels from Galveston through to Fort Worth has never been thoroughly checked over, but from the best information I have the following are the elevations you request, mean low tide being the datum:

Low water	463.3
Bottom of chords	496.1
Base of rail	500.9

Yours, truly,

C. F. W. FELT.

Capt. C. S. RICHÉ,
United States Engineer Department.

U 15.

EXAMINATION AND SURVEY OF BRAZOS RIVER, TEXAS.

REPORT ON PRELIMINARY EXAMINATION AND PRELIMINARY REPORT ON SURVEY.

[Printed in House Doc. No. 283, Fifty-sixth Congress, second session.]

OFFICE OF THE CHIEF OF ENGINEERS,
UNITED STATES ARMY,
Washington, January 2, 1901.

SIR: I have the honor to submit the accompanying copies of reports, dated August 29 and December 22, 1900, by Capt. C. S. Riché, Corps of Engineers, the former upon preliminary examination and the latter a progress report upon survey, required by the provisions of the emergency river and harbor act of June 6, 1900, of the following locality, viz:

Brazos River [Texas] from its mouth to the city of Waco: With a view to procuring a navigable depth of four, five, and six feet, first, from its mouth to the town

of old Washington, in Washington County; second, from said town of old Washington to the city of Waco. In case a survey is made, the report thereon shall show the most advantageous depth to each point, and whether a system of locks and dams will be necessary, and if so, the cost and location of same.

In submitting to this office the report upon the preliminary examination, the local officer, Captain Riché, and the division engineer, Col. Henry M. Robert, Corps of Engineers, expressed the opinion that the river from its mouth to Waco is worthy of improvement for light-draft navigation, and by authority of the Secretary of War Captain Riché was directed to make a survey of the river with a view to the preparation of plan and estimate of cost of improvement.

The accompanying survey report relates to the section of river from the mouth to old Washington, and contains alternative plans and estimates of cost for improvement between these two points by means of locks and dams and by open-channel work. The cost of improving the river by the construction of locks and dams is estimated at $2,435,000 for a channel 4 feet deep and $2,450,000 for a channel 6 feet deep. In addition, $100,000 will be required annually for operation, maintenance, repairs, etc. The second method of improvement for this section consists in removing snags and overhanging timber and in narrowing the river at its shoals by training walls and spur dikes in order to concentrate the current and obtain greater depths, the first cost being estimated at $225,000. It is believed that the work proposed by this method could be maintained at a cost not to exceed $20,000 annually. While it is not certain that this method would give the low-water depths referred to, Captain Riché states it would afford these depths under average rainfall conditions for about eight months in the year, and would generally permit navigation at the time when the crop movement is in progress.

Attention is respectfully invited to the opinion of Captain Riché that the improvement of Brazos River for a light-draft navigation should be considered in connection with the inland canal connecting the mouth of the Brazos with Galveston and Matagorda bays, as proposed in his report of January 24, 1900, upon survey of San Bernard River, Texas (printed in Annual Report of the Chief of Engineers for 1900, p. 2438 et seq.).

Colonel Robert, the division engineer, is of opinion, for reasons given, "that the improvement by training walls and spur dikes should be resorted to first."

Very respectfully, your obedient servant,

JOHN M. WILSON,
Brig. Gen., Chief of Engineers,
U. S. Army.

Hon. ELIHU ROOT,
Secretary of War.

PRELIMINARY EXAMINATION OF BRAZOS RIVER, TEXAS, FROM ITS MOUTH TO THE CITY OF WACO, WITH A VIEW TO PROCURING NAVIGABLE DEPTHS OF 4, 5, AND 6 FEET.

GALVESTON, TEX., *August 29, 1900.*

GENERAL: In response to your letter dated June 13, 1900, I now have the honor to submit the following report upon the preliminary

examination of Brazos River, Texas, as required by the following item in the emergency river and harbor act of June 6, 1900:

Brazos River from its mouth to the city of Waco: With a view to procuring a navigable depth of 4, 5, and 6 feet, first, from its mouth to the town of old Washington, in Washington County; second, from said town of old Washington to the city of Waco. In case a survey is made, the report thereon shall show the most advantageous depth to each point, and whether a system of locks and dams will be necessary, and if so, the cost and location of same.

Brazos River between Waco and its mouth (estimated as about 412 miles) has been examined by the Government with a view to its improvement several times in the past.

The first such examination was made in 1874 by Asst. Engineer R. B. Talfor, under the direction of the late Maj. C. W. Howell, Corps of Engineers, United States Army, in compliance with act of Congress dated June 23, 1874.[1]

Major Howell refers to three bridges below Washington, Tex., which are unprovided with draws, and concludes as follows:

It appears proper that the companies owning the bridges should be obliged, under the laws governing the bridging of navigable streams, to provide them with suitable draws. After this is done, making navigation possible from Richmond to Washington, the removal of snags from the river channel would no doubt be desirable, and it is thought that an appropriation of $15,000 should cover the expense of removal, but for such work no exact estimate can be made.

Low-water navigation is now found as far up as Columbia. Above that point, if desirable, it is evident it would cost more than it would be worth.

From Washington to Waco, except at extreme high water, navigation may only be obtained by locks and dams.

The next examination of the river from its mouth to Waco was made in compliance with the river and harbor act of September 19, 1890, and the report on said examination is printed on page 1555 et seq. of the Annual Report of the Chief of Engineers for 1892.

In this report the officer in charge of the work, Maj. Charles J. Allen, Corps of Engineers, United States Army, states as follows:

To overcome the obstructions to low-water navigation presented by the rock and bowlder shoals a system of locks and dams would be required, the cost of which would be out of all proportion to the present commerce of the river. As for the prospective commerce of the stream, or that which might be developed by an expensive improvement, the present indications are too vague and uncertain for them to bear in any degree upon the question of improvement.

Taking into consideration all the foregoing, I am unable to discover any good reason why the United States Government should undertake an improvement of the Brazos River.

I am therefore of opinion that this river should not now be classed amongst those worthy of improvement by the General Government.

The next examination of the river was from its mouth to the town of Richmond, and was made in compliance with the river and harbor act of July 13, 1892.

This examination was also made under the direction of Major Allen, and his report thereon is printed on page 1893 et seq. of the Annual Report of the Chief of Engineers for 1893. In this report Major Allen states as follows:

Taking all the facts into consideration, it appears that the producers of the valley of the Brazos River within the limits examined (from its mouth to Richmond) should have some relief in the shape of increased facility for water shipments, and I am therefore of opinion that the river, from Richmond downstream to the point to which the Brazos River Channel and Dock Company (the corporation mentioned as having

[1]See Annual Report of the Chief of Engineers for 1875, Part I, page 929 et seq.

been authorized to improve the mouth of the Brazos River) intends to extend its works inland, should be classed as worthy of improvement by the General Government, provided the cost of improvement, to be determined by full survey, be not out of proportion to the extent of commerce to be benefited thereby. A full survey will cost $2,500.

The above recommendation appears to have led to the authorization of a survey of the river between Velasco and Richmond, and a report on this survey was made by Maj. A. M. Miller, Corps of Engineers, United States Army, and is printed with maps, profiles, cross sections, etc., on page 1838 et seq. of the Annual Report of the Chief of Engineers for 1895.

In this report Major Miller states as follows:

The navigation of the Brazos between Richmond and Velasco could be improved for navigation at good boating stages by the removal of snags and overhanging trees. It is estimated that $10,000 would put this portion of the river in a good navigable condition at ordinary stages, and an annual expenditure of $2,500 would keep it in this condition.

Pursuant to this recommendation an appropriation of $5,000 for this reach of the river was made by the river and harbor act of June 3, 1896, and the improvement of this portion of the river has thus become an approved project.

Meanwhile, in compliance with the river and harbor act of August 18, 1894, another examination of the river was made from the city of Waco to the town of Richmond.

The report on this examination was made by Major Miller, and is printed on page 1833 et seq. of the Annual Report of the Chief of Engineers for 1895.

In this report Major Miller states as follows:

The Brazos River, Texas, from Waco to Richmond, a distance of 328 miles, flows in a southeasterly direction, between high banks and over a much obstructed bed. At the time of the examination the river was at a very low stage, so much so that in many places it would not float a skiff.

The obstructions consist of rock ledges and sand and gravel shoals, and railroad and other bridges without draws. * * *

Between the above obstructions numerous small shoals and gravel bars, as well as snags were found. * * *

The only method of improving this stream to admit of low-water navigation would be by means of locks and dams. The fall from Waco to Richmond is over 300 feet, and this method of improvement would require an expenditure of, probably, $3,000,000 to $4,000,000. Even if such expensive works were contemplated it is very doubtful if a sufficient water supply could be obtained to render the locks available at low water.

In view of the great cost, in my opinion, this stream is not worthy of improvement.

In addition to the above official reports concerning the river, two unofficial reports regarding its improvement have been made.

The first of these reports was made to the Waco Board of Trade by Prof. J. H. Hurwood in 1890 and covers the reach from Waco to Richmond. Professor Hurwood's report was based on an examination of the river made by himself between July 15, 1890, and August 6, 1890. He estimates that $580,000 would be the cost of removing existing obstructions and jettying the shoal portions of the stream. Professor Hurwood does not state what low-water depth would be obtained.

The second of these reports was made to Hon. Lewis R. Bryan, of Velasco, Tex., by Mr. George Y. Wisner, member American Society of Civil Engineers, in 1894. This report is not based on a personal examination, but discusses the examinations made by Assistant Engineer R. B. Talfor in 1874 and by Prof. J. H. Hurwood in 1890. Judg-

ing from these examinations, Mr. Wisner states that a permanent low-water navigable channel, with a minimum depth of not less than 4 feet, may be made from Waco to tide water, and that after a further examination a contract could probably be made for the successful completion of such a channel for an amount much less than that previously given by him from the data obtainable from Assistant Engineer Talfor's and Professor Hurwood's examinations.

Mr. Wisner's estimate of cost, based on Professor Hurwood's examination, was $1,500,000, and on Assistant Engineer Talfor's examination, $2,500,000.

The reports of Professor Hurwood and Mr. Wisner are appended[1] hereto as parts of Exhibit B of inclosure 8.

From these different reports it appears that the cost of a light-draft low-water channel from Waco to the mouth of the river has been variously estimated at from $580,000 to $4,000,000, none of the estimates, however, being based upon very definite information.

My own judgment, based upon these examinations, is that a permanent low-water channel of 4 feet in depth would cost more than the highest sum named; but I believe $6,000,000 would be an outside figure, and would not be likely to be exceeded, even if a system of locks and dams should prove necessary for the entire distance. Should a further examination of the river show that a system of contraction works, combined with dredging, could be used in the lower reaches of the river, instead of a system of locks and dams, then perhaps the cost of the work could be considerably reduced.

The range in the estimates for the improvement of the river shows the necessity for more detailed information. A survey of the river should be made before a close estimate of the cost of improving the river can be submitted.

Before this survey can be authorized, however, it is necessary, under the law, that the river should be reported as worthy of improvement.

For purposes of argument, therefore, it is assumed that the cost of the improvement of the river would be $6,000,000, and that interest, operating expenses, renewals, etc., would average 10 per cent of this amount annually, or $600,000. Now, if the improvement of the river will effect an annual saving to the people greater in amount than this sum, the river would become worthy of improvement.

In inclosure 8, herewith, Col. L. L. Foster presents an able argument in favor of the improvement of the river, and estimates that the annual saving to the people by reason of the reduced freight rates that would result from the improvement of the river would amount to $3,000,000.

In this connection attention is invited to my report on the survey of Trinity River, Texas, printed as House Doc., No. 409, Fifty-sixth Congress, first session,[2] and to the reasons therein given as to the necessity for improving Trinity River. These reasons apply with equal force to Brazos River. It is urgently necessary that at least one of these rivers should be improved.

The only new feature of the case that now requires consideration is whether or not it is necessary to improve both these rivers.

At first glance it might seem that by improving Trinity River from its mouth to Dallas, and thus obtaining a water rate of freight at that

[1] Not printed.

[2] Reprinted in Annual Report of the Chief of Engineers for 1900, page 2348 et seq.

point, there would result the same or a less rate of freight at Waco and other Brazos River points, because Waco and these other points are intermediate rail points between Dallas and the Gulf of Mexico.

Unfortunately, investigation shows that this result could not thus be obtained. Decisions of various courts show that the "long-and-short haul" clauses of the railway laws of Texas and of the United States can not be effective where the railways can establish that conformity to these clauses would result in rates that were "confiscatory." In this connection, attention is invited to the argument of Col. L. L. Foster on this subject in inclosure 8 herewith, and especially to the opinion of Judge George Clark, of Waco (inclosure 9), an opinion which is fully concurred in by Hon. Marc C. McLemore, United States attorney for the eastern district of Texas (inclosure 10).

It seems clear, therefore, under existing decisions of the courts, that legislative enactments by themselves are of no avail in reducing rates when the railways can show that these enactments are "confiscatory" in character.

The rates charged by the railways are the maximum that the various commodities will "stand." Genuine competition is the only check. The railways will charge the highest rates that will secure the business.

Competition among railways has practically ceased, so far as its effect in lowering rates is concerned. The only genuine competition that now seems practicable is that of waterways.

The question naturally arises as to what effect, if any, the water competition that would be created by the improvement of Trinity River would produce in the way of lowering rates at Waco and other Brazos River points, without the Brazos itself being so improved as to render it susceptible of efficient water transportation.

There might seem reason to believe that the railway nearest the improved river would have to meet the water rate to avoid losing the business between itself and the river, and that the second railway from the river would also have to meet this same rate to avoid losing the business between itself and the other railway, and so on.

It is very difficult to arrive at a satisfactory conclusion in regard to this matter. I have discussed the situation, however, with men practically familiar with the establishment of railway rates, and believe that while the improvement of either the Brazos or the Trinity would somewhat reduce rates in the vicinity of the other or unimproved river, such reduction would not be material.

An almost exactly parallel case exists in the territory south of Vicksburg and Jackson, Miss., and between them and New Orleans. If the improvement of the Trinity would materially reduce rates at Waco, then, the Mississippi being a navigable river, rates at interior Mississippi towns like Jackson, Crystal Springs, Brookhaven, Magnolia, and Fayette ought, under this theory, to be very nearly the same as the rates at a river point like Vicksburg. That rates will not thus be affected is shown by the current charges on cotton to New Orleans from the various towns named. On a bale of uncompressed cotton it appears that while the rate from Vicksburg to New Orleans is 75 cents, the rate from Jackson to New Orleans is $2.15; from Crystal Springs to New Orleans, $2; from Brookhaven to New Orleans, $2; from Magnolia to New Orleans, $1.75, and from Fayette to New Orleans, $1.75, showing clearly that the effect of the river is not material at these latter towns.

It therefore seems that while the improvement of Trinity River would somewhat help Waco and other Brazos River points it would not give the relief desired, and it is evident to me that the advisability of improving either of these rivers is a practically separate and distinct proposition from that of improving the other, and that both rivers should be improved in order to get the best results.

Low rates are a necessity if material development is to be had. Present rates on cotton, for example, are about 3 cents per ton per mile. Railway journals claim that railways can carry freight for less than waterways, and that they are hauling freight for one-half cent per ton per mile. With the greater volume of business that low rates would develop they certainly could haul freight in Texas for 1 cent per ton per mile. They do not do it to-day because they do not have to. Water competition would make them do it, and I can see nothing else, short of Government ownership of railways, that would produce the same result.

Paradoxical as it may seem, the railways are not usually injured by a water competition that forces low rates. The most stable railways in the country, financially, parallel efficient waterways. In spite of the "confiscatory" character of low rates, the increased volume of business resulting therefrom usually leads to a prosperous financial condition of the railways affected.

For all the foregoing reasons, therefore, I have the honor to report that in my opinion Brazos River, from its mouth to the city of Waco, is worthy of improvement for a light-draft navigation, even if the cost of the work should be as great as $6,000,000. The exact low-water depths that will be advisable can not be determined until a survey of the river shall have been made.

The survey necessary to permit a close estimate of the cost of the improvement would require $10,000 to be available, as estimated in my letter to you of April 28, 1900. Of this amount, $4,000 will be needed for the survey from Waco to old Washington and $6,000 for the survey from old Washington to the mouth of the river.

The rains this summer have prevented the Brazos from getting to a very low stage. It will, therefore, be difficult to pick up all the obstructions to navigation. The short time that remains before the estimates must be presented to Congress will probably necessitate two or perhaps three survey parties being placed in the field. Something better than a reconnoissance must be made if a close estimate is desired, and it is proposed to make a survey similar to that made of Trinity River last year, and to that made of Brazos River between Velasco and Richmond (p. 1840 et seq., Annual Report of the Chief of Engineers for 1895).

The money now available for Brazos River is all needed for the construction, etc., of the light-draft dredge now being designed at St. Louis, Mo., and none of it can be spared for this survey. Unless the required amount is available from the emergency appropriation made by the river and harbor act of June 6, 1900, I have the honor to recommend that the survey be postponed to await the further action of Congress. The estimate for the survey, $10,000, is the amount submitted to you on April 28, 1900, in response to an inquiry by Hon. T. E. Burton, chairman of the Committee on Rivers and Harbors, and, I presume, was considered when computing the total of the appropriation that was subsequently made.

Inclosed herewith are communications from various persons interested in the proposed improvement of Brazos River. Some of these have been referred to above. Attention is invited to these inclosures[1] for more detailed information as to the prospective value of the improvement to the people, and as to various questions connected with the proposed work.

Very respectfully, your obedient servant,

C. S. RICHÉ,
Captain, Corps of Engineers.

Brig. Gen. JOHN M. WILSON,
Chief of Engineers, U. S. A.
(Through the Division Engineer.)

[First indorsement.]

U. S. ENGINEER OFFICE, SOUTHWEST DIVISION,
New York, September 6, 1900.

Respectfully forwarded to the Chief of Engineers, United States Army.

The Brazos River, with a length of 900 miles and a drainage area of approximately 36,000 square miles of most fertile land, containing, it is claimed, one-third of the population of Texas, is of too much importance not to be surveyed, so as to form an estimate of the cost of its improvement. The estimates made heretofore, based on examinations without survey, vary from $580,000 to $4,000,000. Captain Riché thinks the largest estimate too small for a 4-foot channel. This can only be settled by a proper survey, which Captain Riché estimates at the small sum of $10,000. I think the survey should be made, as from all the data I have seen I am forced to concur with Captain Riché in the opinion that the Brazos River from its mouth to the city of Waco is worthy of improvement for a light-draft navigation, even if the cost of the work should be as great as $6,000,000.

HENRY M. ROBERT,
Colonel, Corps of Engineers,
Division Engineer.

[Second indorsement.]

OFFICE CHIEF OF ENGINEERS,
U. S. ARMY,
September 7, 1900.

Respectfully submitted to the Secretary of War.

This is a report upon a preliminary examination of Brazos River, Texas, from its mouth to Waco (full text of item quoted within), made to comply with provisions of the emergency river and harbor act approved June 6, 1900.

The local officer, Captain Riché, expresses the opinion, which is concurred in by the division engineer, that the river from its mouth to Waco is worthy of improvement for light-draft navigation.

I recommend that a survey of the river within the limits proposed be authorized, the expense, estimated to cost $10,000, to be paid from the appropriation made by the said act.

JOHN M. WILSON,
Brig. Gen., Chief of Engineers,
U. S. Army.

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[1] Inclosure 11 not printed.

[Third indorsement.]

WAR DEPARTMENT,
September 7, 1900.

Approved as recommended by the Chief of Engineers.

G. D. MEIKLEJOHN,
Acting Secretary of War.

[Inclosure 1.]

LETTER OF JUDGE J. H. TEAGUE, COUNTY JUDGE, GRIMES COUNTY, TEX.

ANDERSON, TEX., *June 24, 1900.*

DEAR SIR: Your circular letter of date June 20 to hand. Contents fully noted, and in reply permit me to say that in so far as the matter therein inquired about I am at some loss to know just what I should say in the matter. I have lived on or near the Brazos River for more than thirty-three years, and during the time have noticed the many changes being made by the large volume of water that usually flows through its channel. I find that the channel has, in the last twenty years, filled to a considerable depth. This I believe to be the prime cause of the continued overflows—the want of a sufficient channel to carry off the water. The river, in my opinion, could be straightened in many places, thus giving more speed to the current and by this means wash out the channel. Something should be done to protect the great farming interest lying on and adjacent to this stream, and, if proper remedies could be had, I am satisfied that good results will follow.

I am, yours, very respectfully,

J. H. TEAGUE.

Capt. C. S. RICHÉ.

[Inclosure 2.]

LETTER OF MR. EDWIN WALLER.

QUINTANA, TEX., *June 27, 1900.*

MY DEAR SIR: In reply to your letter of June 20 asking me to give reasons, etc., by July 10 why the Brazos should be made navigable to Waco, would state that to open up said river to navigation would prove a great thing for all central and south Texas, for the Brazos lands from Waco to Quintana, some 600 or 700 miles, can be made a veritable garden, capable of producing millions of dollars' worth of food and spinners' material, and the opening up of said river to navigation would make a low freight rate; besides, it would do away with the overflows that we have been having of recent years. The late floods have caused immense damage to farming interests, the flood of 1899 alone causing almost an entire destruction of all products, and in many cases great numbers of live stock. We have had six overflows since 1885. The damage resulting from these overflows amounts to millions of dollars, and the greatest one, that of last year, covered territory from 10 to 15 miles in width by about 500 or 600 miles in length, or, in round figures, over 25,000,000 acres, capable of producing nearly one-third of the cotton crop of the world, if all planted in cotton, and enough corn, if all planted in corn, to load over 250,000 cars.

By actual figures the loss from these overflows in the last fifteen years amounts to double what would be required to dredge and even straighten the Brazos River from its mouth to the city of Waco, and unless this work is done by the National Government this rich valley of the Brazos must be abandoned and given over to the flood waters. If the Brazos River is straightened and dredged, the immense volume of water rushing toward the Gulf will continue to cut the channel deeper year after year, prevent the overflows, and give water rates competition with the railroads, and will result in the saving to the people of the Brazos Valley of over $1,000,000 per annum in freight rates, besides minimizing the dangers and losses from overflows by relieving the channel of snags and bars which now impede the progress of the waters.

Very truly, yours,

EDWIN WALLER.

Capt. C. S. RICHÉ.

[Inclosure 3.]

LETTER OF JUDGE J. N. GALLAGHER, COUNTY JUDGE, M'LENNAN COUNTY.

WACO, TEX., *June 30, 1900.*

MY DEAR SIR: I have received your circular of June 20, asking for information concerning the present and prospective demands of commerce upon the Brazos River if made navigable. Personally I have been unable to give to this subject the attention its importance demands, and I therefore called upon Judge John N. Lyle, of Waco, who has made a close study of the matter, for the information you desire. I inclose herewith a typewritten copy of his reply.

There is another question of material interest to us in connection with the coming survey of the Brazos and the probable improvement thereof, which is the effect the same may have or can be made to have on overflows. I will not attempt to give statistics for this county, but we suffer great damage therefrom. The Brazos flood convention, which meets at Colle, Station on the 3d proximo, will doubtless supply you with reliable statistics of damage done in past years from McLennan County to the Gulf.

Very truly, yours,

J. N. GALLAGHER,
County Judge.

Capt. C. S. RICHÉ.

[Inclosure 4.]

LETTER OF JUDGE JOHN N. LYLE.

WACO, TEX., *June 25, 1900.*

DEAR SIR: In answer to your request for "facts and reasons" why the Brazos River should be improved for navigation, I submit the following: An inspection of a map shows that this great river bisects an area of rich farming land, the largest in the State, and perhaps in the world. Extending through her center from her northwest to her southeast boundary, the Brazos was aptly named the "Mississippi of Texas" in a resolution by the recent Republican State convention recommending its improvement by the General Government.

The territory whose freight rates will be affected by making the Brazos navigable to Waco embraces counties on the stream and those adjoining them, all of which may be stated as follows: Johnson, Hill, Limestone, Robertson, Leon, Brazos, Madison, Grimes, Walker, Waller, Montgomery, Fort Bend, Harris, Brazoria, Galveston, Wharton, Matagorda, Austin, Colorado, Fayette, Washington, Lee, Burleson, Bastrop, Milam, Williamson, Falls, Bell, McLennan, Coryell, Bosque, Hamilton, Comanche, Erath, and Hood—total, 35 counties. They aggregate an area of 31,340 square miles; nearly as large as Indiana, larger than either South Carolina or West Virginia, and within 1,000 square miles of being the size of Massachusetts, Rhode Island, Connecticut, New Jersey, and Maryland combined. While it is less than an eighth of the area of the State of Texas, it had, according to the census of 1890, nearly one-third her population and produced one-third of her cotton crop.

The last figures published by the Texas bureau of statistics were for 1895. Taking these and allowing a reasonable percentage of increase of production now over 1895, I find that 1,000,000 bales of cotton are produced annually in this territory. Those familiar with matters of transportation tell me that the saving in freight charges to the Gulf ports on this cotton by the improvement of the river may be safely put down at $1 per bale, aggregating a saving of $1,000,000 a year on this one item. This territory under consideration runs far up into the grain and stock producing portion of the State, and the yearly saving in charges on other outgoing products is estimated by conservative minds at another $1,000,000. The saving on the incoming freight is harder to get at, as the railroad companies are stingy about furnishing data. Fortunately I have the tonnage shipped into two or three of these counties, gotten last year.

Excluding Galveston, Brazoria, Matagorda, and Harris counties from the calculation, as being right on the coast, I find that in round numbers 18,000,000 hundredweight of freight are shipped annually into this Brazos territory. The freight rates into Texas from outside points are less to water points than to nonwater points. For instance, the charges to Houston and Galveston are, on average classes of freight, 6 cents per hundredweight less than to Waco and Dallas, although the haul to these last-named cities is much the shorter.

Now, when the Brazos is improved for navigation, stations in the territory under

consideration will become water points and will get the benefit of this 6 cents per hundred pounds reduction, which will aggregate $1,080,000. To recapitulate, we would have by this improvement the following annual saving in freight charges:

On cotton shipped out	$1,000,000
On other stuff shipped out	1,000,000
On incoming tonnage (18,000,000 hundredweight)	1,080,000
Total	3,080,000

Ex-Governor Hogg was not out of bounds when he declared in a speech at Waco that the Brazos should be improved for navigation by the General Government if it cost $20,000,000. Yet $4,000,000 is the highest estimate put on the work, some engineers figuring it as low as $1,500,000. Bear in mind that whenever the railroads touch navigable water they meet its rates. This is exemplified on the Lower Brazos thus: Cotton, from Velasco to Galveston by rail $2.25 per bale (commission rate); by boat, 40 cents, at which the railroads haul it. From Columbia to Galveston (com. rate), $2.15; by boat, $1; and the railroads do the hauling. From Richmond to Galveston (com. rate) by rail, $1.45. No boats ran to Richmond, but the railroads haul it for 75 cents to keep the cotton from seeking the boats at Columbia, some 30 or 40 miles below.

Another reason why the Brazos River should be improved is that three preliminary surveys of the stream from tide water to Waco have already been made by the United States Engineer Department and its improvement declared practicable. One of these examinations was made by Capt. R. B. Talfor in 1874. (See Annual Report of Chief of Engineers for 1875, Part I, pages 929–941.) The second was made in 1891. (See House Ex. Doc. No. 63, Fifty-second Congress, second session.)

The third was made in 1895 by S. W. Campbell, assistant engineer. (See Appendix T of the Report of the Chief of Engineers for 1895, p. 1835.) On the first and second of these reports, Maj. Charles J. Allen, Corps of Engineers, reported it as his opinion that the Brazos was susceptible of improvement, but that the commerce did not justify the cost. (See Ex. Doc. 63, above cited; also, Ex. Doc. 136, Fifty-second Congress, second session.) Maj. A. M. Miller, Corps of Engineers, forwarded S. W. Campbell's report and expressed the opinion that the river was susceptible of improvement for low-water navigation by a system of locks and dams. (See Appendix T, Report of Chief of Engineers for 1895, p. 1834.)

A full survey of the river from its mouth to Richmond has already been completed, and an appropriation made by Congress for its improvement that far. It would seem from what is cited from the official documents above that the only part of the examination required by the act of June 6, 1900, as to the Brazos, is "information concerning the commercial importance, present and prospective, of the river." The three preliminary examinations have satisfied the engineering department as to the practicability of the stream being improved for navigation, but not as to the commerce justifying the expenditure. As to the prospective commerce, it may be stated that hardly one-twentieth of the arable land in the territory that will be affected by the improvement of the Brazos is in cultivation. If with but one-twentieth of its land in cultivation it is producing the present vast volume of commerce, what will it be when the country is fully developed? I have no data as to benefits to be derived by the prevention of overflow in this county.

Yours, truly,

J. N. LYLE.

Hon. J. N. GALLAGHER,
Waco, Tex.

[Inclosure 5.]

LETTER OF JUDGE JOHN N. LYLE.

WACO, TEX., *July 6, 1900.*

DEAR SIR: Yours inclosing circular of July 2, 1900, from the United States engineer office, Galveston, Tex., has been received. In answer to inquiries Nos. 7, 8, 9, 10, 11, 12, 13, I inclose the opinion of the Hon. George Clark, of this city. Judge Clark was the attorney-general of this State during Governor Coke's administration, was on the appeals bench, has a reputation second to none in the State for legal ability and sound judgment as a statesman, is in full practice, and his opinion is worthy of the highest consideration. I fully concur in the conclusions which he reaches.

Answering question 5 (How far up is the Brazos River considered navigable?), will say that by a system of locks and dams the Brazos could be navigated for several hundred miles above Waco.

In answer to No. 6 (How many and what kind of boats have navigated the Trinity to Fort Worth and the Brazos to Waco?), no boats have ever come up as high as Waco. The falls of the Brazos, in Falls County below, have prevented. Steamboats have been built at Waco and run on the river to Towash, some 50 miles above. One of these was taken down the river at a time of very high flood and sold at Galveston.

I am at your command in any way I can serve you in this matter of Brazos navigation.

Yours, truly,

JOHN N. LYLE.

Capt. C. S. RICHÉ,
Corps of Engineers.

[Inclosure 6.]

LETTER OF MR. GEORGE CLARK, ATTORNEY AT LAW.

WACO, TEX., *July 4, 1900.*

DEAR SIR: You have submitted to me a circular letter from Capt. C. S. Riché, Corps of Engineers, under date of July 2, containing a request for information upon certain points connected with the improvement of the Trinity and Brazos rivers, and have requested me to answer such inquiries, numbered 7, 8, 9, 10, 11, 12, and 13, the same relating as they do to legal questions. I therefore answer in the following order:

Question 7.—Did the Republic of Texas define what a navigable river was?

Answer to question 7.—The Republic of Texas, by the act of December 14, 1837, section 42, provided that all streams of the average width of 30 feet should be considered navigable streams, so far as they retained that average width. It is true this related to the location of lands. This statute answers question 9 (Do the land grants extend across navigable streams or do they abut on the stream?) as well as question 7, because it provides further that navigable streams of that width should not be crossed by the lines of a survey. As a consequence no surveys in Texas extend across navigable streams.

Question 8.—Does the State of Texas retain and control the disposition of her public land?

Answer to question 8.—The State of Texas at the time of annexation retained the control and disposition of her public land.

Question 10.—What vested rights have landowners along the streams of Texas?

Answer to question 10.—Landowners along the navigable streams of Texas have a right to a reasonable use of the water, what being reasonable depending upon particular conditions, applicable to each particular case.

Question 11.—If the State of Texas has granted title to both the land and the rivers without reservation when the rivers were considered not navigable, can the United States Government improve any portions of such rivers in Texas so granted without securing the right of way?

Answer to question 11.—The State of Texas has not granted title to both the land and the rivers, because, as stated before in answer to questions 7 and 9, in cases of navigable rivers—that is, rivers 30 feet wide—all surveys stopped on the bank. The United States Government can improve any portion of such rivers in Texas without procuring the right of way.

Question 12.—Will it require legislative enactment to allow the Government to institute condemnation proceedings?

Answer to question 12.—It may require legislative action to authorize the condemnation and taking of abutting property lying along the Brazos River, my belief being that the present law does not cover that character of public improvements. This, however, will be easily obtained, and, as a matter of fact, will hardly be necessary, because adjacent landowners will readily donate necessary sites for locks and dams without charge. The improvement of the navigation of a river is a public purpose, and the sequestration or appropriation of land or other property for such purpose is the proper exercise of the power of eminent domain. (140 U. S., 254.)

Question 13.—After improvement by the United States Government, will the United States Government be liable for any damage resulting from overflow due to the erection of locks, dams, etc., or any work that might inflict a hardship upon or damage to land through which the river flows?

Answer to question 13.—My opinion is that the United States Government, if it should undertake the improvement of the Brazos and Trinity rivers, would not be

liable for damages resulting from overflow due to the erection of locks and dams, etc., or for any other consequence that might follow upon such construction. In the case of Willimette Iron Bridge Company *v.* Hatch (105 U. S., 344), the Supreme Court held that it was not to be deemed that Congress had assumed police power over navigable rivers in consequence of expenditures improving their navigation. See, also, Newport Bridge Company *v.* United States (Fed. Cases, 10, 186); United States *v.* Round River Boom Company (1 McCrary, 397); Water Power Company *v.* Connecticut River Company (20 Fed. Rep., 71).

Public works authorized by law constitute an exception as to liability for damages in favor of persons acting in performance of a legal duty or in the exercise of power specially conferred by law. See Pollock on Torts, p. 608; Dunn *v.* Birmingham Canal Company (89 Q. B., 42).

Pollock in his admirable work lays down this principle and says it was hardly ever disputed.

A State may authorize obstructions, or even authorize obstruction in its navigable waters (16 Wis., 661; 42 Penn. St., 231). I do not consider that the United States Government will become liable in any manner for the work done if undertaken.

Respectfully,

GEO. CLARK.

Hon. J. N. LYLE,
Waco, Tex.

[Inclosure 7.]

LETTER OF RAILROAD COMMISSION OF TEXAS.

RAILROAD COMMISSION OF TEXAS,
Austin, Tex., July 12, 1900.

DEAR CAPTAIN: Your letter of yesterday is received, in which you make some suggestions and submit some inquiries in relation to the powers of the railroad commission and in relation to freight rates as between shipments by land and those by water.

If we should make rates which would in fact have the effect of confiscating the property of the railroads, this would furnish grounds for the courts to enjoin the enforcement of such rates, provided the business on the roads in question should be sufficient to justify better rates.

Your suggestion that "the courts hold that the railways can never be prevented from earning enough money to pay reasonable interest on all their bonded indebtedness, a reasonable dividend on their stock, and also their operating expenses," is incorrect. There was at one time very much such a decision made, but that has, by subsequent decisions of the Supreme Court of the United States, been overruled, and the principle seems now to be well established that what the railroads have a right to demand in this respect is a reasonable interest on the value of their property, ignoring their claim of interest and dividends on watered and fraudulent stock and bonds.

In the case of the competition between transportation by land and by water carriage this commission can lawfully make the land rates low enough to meet the water rates without giving grounds for an injunction. And this commission is empowered by law to make different rates for different railroads and for different lines under the same management, or for different parts of the same lines, if found necessary. And in cases where it is found necessary to the ends of justice it may, after full consideration, authorize the charging of more for a haul of a shorter than for a longer distance.

Very respectfully,

JOHN H. REAGAN,
Chairman.

Water transportation means where vessels are plying, carrying passengers and freight. R.

Capt. C. S. RICHÉ,
Corps of Engineers.

[Inclosure 8.]

LETTER OF MR. L. L. FOSTER ON BEHALF OF THE BRAZOS RIVER IMPROVEMENT EXECUTIVE COMMITTEE.

WACO, TEX., *July 26, 1900.*

SIR: On behalf of the Brazos River improvement executive committee, delegated by two different conventions of the citizens of the Brazos Valley to take steps to

secure the navigation of the Brazos River, I beg to submit the following statements and accompanying data on this subject:

GENERAL STATEMENT.

The Brazos River is the largest river that flows into the Gulf of Mexico west of the Mississippi River; is about 900 miles long and drains an area of about 36,000 square miles. It has its source in the northwestern part of the State and flows generally in a southeasterly direction to the Gulf of Mexico. It runs through the heart of the agricultural section of Texas, and its alluvial valleys rival the Nile in fertility of soil and productive capacity. It is at present navigable from its mouth to Bolivar Point, a distance of about 50 miles, and contains navigable water from its mouth to the town of Washington, a distance of 225 miles; but the accumulation of snags above Richmond and the presence of rock shoals prevent its use except during high water.

The purpose in view, therefore, in asking an appropriation from the General Government to remove obstructions to navigation where navigable water already exists, and to provide locks and dams to extend navigable water to Waco, a distance of about 400 miles from present navigable water, is to secure, through this outlet to the sea from the interior of Texas, the benefit of water transportation in competition with the railroad lines to the Gulf of Mexico, to the end that freight rates may be cheapened. Any other benefits that would occur would be incidental, and the result of keeping the river open to navigation.

There are two points involved. The first is whether, as an engineering proposition, the river can be made navigable. Second, does the commerce, present and prospective, of the territory that would be benefited justify the expenditure necessary to do the work?

The first proposition is one for solution by engineers, and I shall advert to it only to call attention to physical facts and corroborative testimony showing that the river not only can be, but has been, successfully navigated from its mouth to the town of Washington, about 225 miles from its mouth, and that navigable water can be extended, by a system of locks and dams, as far inland as Waco, a distance of about 400 miles from the head of present navigable water. (See Exhibit A and Exhibit B, filed herewith.)

You are also referred to the following official documents, which I presume you have or can easily obtain:

Ex. Doc. No. 136, Fifty-second Congress, second session; Ex. Doc. No. 63, Fifty-second Congress, first session; and the report of a survey of the Brazos River from Waco to Richmond, by direction of Congress, made by Assistant Engineer Talfor in 1874. This report I have been unable to obtain and refer to more specifically.

The State of Texas undertook the improvement of the Brazos River by removing the snags and other obstructions to navigation from its navigable water, and appropriated $60,000 for that purpose in 1858, but the outbreak of the civil war in 1860 prevented further consideration of the matter.

The completion of the Galveston, Houston and Henderson Railroad from Galveston to Houston in 1858 diverted a considerable portion of the traffic of the State theretofore carried on the Brazos to Galveston by way of Houston and down said road. This, together with the building of the Galveston, Harrisburg and San Antonio Railroad from Houston to San Antonio, and the Houston and Texas Central Railroad from Houston to the interior along the Brazos, reaching the river above the head of navigable water, accounts for the gradual diminution of river traffic.

Regarding the artificial obstructions, such as railroad bridges, of which there are eight between Waco and the mouth of the river, I would state that the railroads would have to provide drawbridges and remove such obstructions at their own expense should the General Government make the river navigable, nor would the Government become liable to private owners of land along the river banks for timber cut and removed as an obstruction to navigation or for damages for flooding lands caused by the necessary locks and dams. (See legal opinion of Judge A. T. Watts to the Dallas Commercial Club touching both of these points regarding the navigation of the Trinity River, Ex. Doc. No. 409, Fifty-sixth Congress, p. 26; also statement of Capt. C. S. Riché, Corps of Engineers, same document, p. 6.)

But to avoid any issue on this point, the Brazos River improvement executive committee will undertake to secure from abutting landowners along the river a release to the Government of any and all claims for damages of this character. It may be asked, in view of the fact that the river can be made navigable with a comparatively small outlay of money from Washington to its mouth, where navigable water already exists, why the Government has not improved that part of the river. I answer, first, that the Government's energies were directed at removing the bar at the mouth of the

river; subsequently a private corporation acquired control of the harbor at Velasco, and were authorized to charge toll on the commerce passing through to the sea. The reports of the Government engineers, who surveyed the river since then, while favorable to improving it, gave this as the controlling reason why the Government should not do it. (See report Lieutenant Langfitt, Ex. Doc. No. 136, Fifty-second Congress, second session.) That reason no longer exists. The question of securing deep water at the mouth of the river has been settled, and the Government is in control of the harbor and is building jetties there.

In passing from this part of the subject I will say that the progress of modern engineering skill since any survey of the Brazos River has been made has been most marvelous, and what may have then been considered problematical, if not impossible, is now regarded as entirely feasible and easy of accomplishment. With modern machinery and modern dredges there are few obstacles to navigation that will not succumb to the engineer's skill.

The second proposition is, does the commerce, present and prospective, of the Brazos Valley and tributary territory justify the Government in undertaking its improvement? By the terms of the act authorizing a survey of the river, the river is to be divided into two sections and a report made on the cost of improving each separately. The first section begins at the mouth of the river and ends at the town of Washington. The second division begins at the town of Washington and ends at Waco. I shall first present data relating to the commercial interests of the section embraced within the first division, and then discuss the commercial interests of the Brazos Valley and tributary territory as a whole and present statistics relating to the commerce of the area of territory affected by the proposed improvement.

It is difficult to arbitrarily divide the commerce of a given territory along physical lines and treat the interests on different sides of such lines as separate and distinct. However, I invite attention to the following data, arranged to show, as far as possible, the commercial interests of the first division:

Quantity and value of agricultural products grown in 1899 in 13 counties lying between the town of Washington, in Washington County, and the mouth of the Brazos River.

[The following are the names of the counties: Brazoria, Fort Bend, Austin, Waller, and Washington, fronting on the river, and Wharton, Matagorda, Colorado, Fayette, and Montgomery, forming the second tier from the river. Harris and Galveston counties, though in the second tier of counties, have navigable water and are seaport towns, and are therefore not included in the list.]

	Quantity.	Value.
Cotton.....bales..	399,270	$11,828,124
Corn.....bushels..	7,745,620	3,611,729
Oats.....do....	6,694,524	502,965
Wheat.....do....	337,666	242,086
Sweet potatoes.....do....	527,590	456,522
Irish potatoes.....do....	76,745	65,729
Sugar.....barrels..	53,622	702,261
Hay.....tons..	37,500	216,249
Wool.....pounds..	753,173	75,317
Cotton seed.....tons..	221,773	1,522,411
Hides.....pounds..	500,000	40,000
Horses, cattle, hogs, sheep, and goats.....	.....	6,250,000
Cotton-seed oil, meal, and cake.....	.....	550,000
Total.....	.....	26,082,881

See also Exhibit C.

Rates, as a general rule, are lower as the seaboard is approached and proximity to navigable water is reached, however crude and unskillful the means of navigation. Rates are therefore much lower along the Brazos from Washington down to the mouth of the river than in its upper reaches, and, while still lower rates would follow the freeing of the river of obstructions to navigation and improved facilities of transportation in the navigable part, no such a reduction can be looked for in that section as would follow in the second division. Rates are, however, high from the seaboard inland, and the improvement of the river would materially reduce inland rates from that section.

The fact that the principal work necessary to make the first division of the river navigable is to remove the snags in the river bed and cut away overhanging trees along the banks makes it comparatively so inexpensive that there can be no serious objection from any source to the appropriation necessary to do that work. I will therefore pass to the discussion of the subject as a whole.

Quantity and value of agricultural products and the live stock owned in the 26 counties lying between the mouth of the Brazos River and the city of Waco. (Twelve of these counties front on the Brazos River and 14 adjoin those fronting the river and form the second tier from the river.)

[The following is a list of the counties: Brazoria, Fort Bend, Waller, Washington, Austin, Burleson, Grimes, Brazos, Robertson, Milam, Falls, and McLennan fronting on the river, and Bastrop, Bosque, Coryell, Colorado, Fayette, Hill, Lee, Leon, Limestone, Madison, Matagorda, Montgomery, Wharton, and Williamson adjoining them. Harris and Galveston counties are also in the second tier, but have navigable water and are seaport points, and are therefore not included.]

	Quantity.	Value.
Cotton.....bales..	985,677	$29,570,310
Corn.....bushels..	17,212,963	5,163,879
Wheat.....do....	446,666	2,500,000
Oats.....do....	1,687,659	421,914
Sweet potatoes.....do....	1,172,200	586,100
Irish potatoes.....do....	876,400	876,400
Sugar.....pounds..	15,000,000	900,000
Hay.....tons..	83,335	510,553
Wool.....pounds..	1,506,346	150,634
Cotton seed.....tons..	985,677	3,449,866
Hides.....pounds..	1,250,000	100,000
Horses and mules.....number..	312,119	6,242,310
Cattle.....do....	1,198,828	23,976,560
Cotton-seed meal, cake, and hulls	.....	1,262,000
Total	.....	75,710,516

In the above table no account is taken of the vegetable crop produced in truck gardens, melons, and miscellaneous crops grown, that form a considerable part of the commerce of south Texas.

Of the above-mentioned products, cotton, cotton-seed oil, meal, and cake, wool, hides, and the live stock sold are almost entirely exported from the State, and constitute the bulk of the export freight handled by the railroads. The value of these products in the counties named in 1899 was $35,532,800. It is safe to assume that the import commerce brought into these counties annually, consisting of lumber, building material, machinery, and general merchandise, will equal three-fourths of the value of their export commerce, which would be $26,649,600. Add the export and import commerce actually transported into and out of these counties annually together, and we have a total of $62,182,400 in value.

It would, however, be a very circumscribed view of the influence of water competition to hold that the navigation of the Brazos River to Waco would only benefit the commerce of the counties I have named. It would be wider and vastly more far-reaching.

But, to test the matter from another standpoint, take the cotton crop of Texas for ten years past, which has been as follows:

Number of bales of cotton produced annually for ten years.

1889–90 (Galveston News)	1,743,320
1890–91 (Galveston News)	2,111,090
1891–92 (Galveston News)	2,406,408
1892–93 (Galveston News)	2,108,523
1893–94 (New Orleans Cotton Exchange)	2,059,060
1894–95 (New Orleans Cotton Exchange)	3,275,958
1895–96 (New Orleans Cotton Exchange)	1,990,000
1896–97 (New Orleans Cotton Exchange)	2,247,554
1897–98 (New Orleans Cotton Exchange)	3,074,811
1898–99 (New Orleans Cotton Exchange)	3,555,091
Total	24,571,815

See also exhibit.

The average production per annum in Texas for the past ten years has been 2,457,181 bales. The Brazos Valley and tributary territory has generally and by common consent been credited with producing and shipping one-third of the entire cotton crop of the State. Add to this the cotton that moves along lines of railway that run down the valley from different points north to the seacoast, and it is cer-

tain that at least one-half of the cotton crop of Texas is moved to the seaboard from points that would be affected to a greater or less extent by water rates on the Brazos River.

The last fact regarding the commerce of this section, and which I offer in support of my position is the railroads themselves. Whatever discredit may fall on cities and towns, boards of trade and individuals representing them, no one will gainsay the business acumen and foresight of railroad presidents and managers. It is a well-known fact that railroads are always built, first, where there is an existing commerce because they must have a support and live, and second, where there is the possibility of greatest development. It must be shown to the satisfaction of capitalists that there is a present existing commerce to be transported which will justify them in investing their money in railroads before they will put a dollar in them. They go where the business now is, not where it is to be, because they must earn expenses, if not dividends, in order to exist.

Where was the first great line of railroad built in Texas? Through what part of the State have they sought an outlet to the seaboard since, and where are they still being built? I answer, right along the Brazos River and on the foothills bordering the valley and parallel with that great drainage system.

The Houston and Texas Central Railroad, one of the best in Texas, and the most prosperous, originally started by Houston capitalists to promote the business interests of that city, made a bee line for the Brazos River, 51 miles distant, and, skirting its bottom on the east side, followed it to Bremond, and afterwards to the city of Waco. Subsequently the managers of that road built the Texas Central from Ross Station in McLennan County (the terminus of the Houston and Texas Central), to its present terminus near the head waters of the Brazos, following in the main the river the entire distance.

On the west side of the river the Gulf, Colorado and Santa Fe follows the Brazos Valley country from the town of Richmond, in Fort Bend County, to the town of Cameron, in Milam County, and back into McLennan and Bosque counties, crossing the river in the latter county at Morgan. The road is at all points between these crossings, which are about 350 miles apart by the meanderings of the river, with the exception of Bell County, within easy reach of the Brazos Valley trade. The Texas Western, a narrow-gauge road, also projected by Houston capitalists, built directly west to the Brazos River. The road has been made a standard gauge, and the company is now surveying a line right up the Brazos River bottom from the town of Sealy, its present terminus, to the city of Fort Worth. The line has not yet been finally located far beyond Sealy, but it is understood that the management intend paralleling the river and keeping in the bottom. The road is being constructed from the Houston end. The Hearne and Brazos Valley, a road 20 miles long from Hearne to Stone City, lies right in the river bottom. This road, originally built by the Brazos bottom planters, was purchased by the Houston and Texas Central Railroad and is now owned by that company. The Sugarland Railroad runs from Sugarland, on the Galveston, Harrisburg and San Antonio Railroad, right down the Brazos River bottom on the east side, almost in sight of the river, about 20 miles to Duke, on the Gulf, Colorado and Santa Fe Railroad.

The Velasco Terminal Railroad runs from Velasco, 5 miles above the mouth of the river, parallel with the river, on the east side, to Chenango Junction, on the International and Great Northern Railroad, a distance of 20 miles. The Columbia Branch of the International and Great Northern Railroad, known as the "Columbia Tap," extends from Houston to Columbia, on the Brazos River, near the head of present navigation, and parallels the river for more than half the distance.

The Cane Belt, understood to be an extension of the Missouri, Kansas and Texas Railroad, is now being constructed through the town of Wharton; thence across the Caney and Bernard rivers to the Brazos, and down said river to its mouth, at Quintana, on the west side.

The International and Great Northern Railroad Company, owning a road from Longview to Laredo, running across the State from northeast to southwest, and crossing the Brazos River near Hearne, after kicking against the pricks for many years has at last discovered the source of greatest freight tonnage and passenger traffic in Texas, and is now building a road parallel with the Brazos River, right in the river bottom and between the Gulf, Colorado and Santa Fe on one side and the Houston and Texas Central on the other, from Marlin, in Falls County, to Bryan, in Brazos County, a distance of about 75 miles, and is under contract to complete it by August 1.

It will be extended to Houston on the south and Fort Worth on the north end, and almost the entire distance will be either actually in the river bottom or within reach of its rich alluvial lands and bountiful harvests. Take the map of Texas and examine its railroad systems, and see how the great arteries of trade run from the

seaboard inland along the Brazos Valley, forming not only the principal channel of commerce from the northern and western parts of Texas to the Gulf, but from the States north of Texas and west of the Mississippi River. Do not these facts show where a large part of the commerce of Texas is to be found and constitute an unanswerable argument in favor of improving and opening to navigation the only river in Texas that can or will have any material influence in cheapening their rates of transportation? Nowhere else in Texas have railroads been built along and parallel with a waterway for commercial reasons. Nor can it be claimed that these lines accidentally concentrate in the Brazos Valley on their way to Galveston Harbor or the Gulf. All of them, except one now under construction, were built from the coast inland before Galveston had a harbor worthy of the name and in order to reach the Brazos River trade. Until recent years they had no northern outlet. Besides the roads paralleling the river six east and west lines cross the river at right angles between Waco and the Gulf. (See Exhibit I.)

In estimating the benefits resulting from water competition in freight rates from the Gulf of Mexico to Waco we must therefore consider the vast commerce now actually being moved over these railways, and which comes from points beyond the territory lying immediately on the river, and whose products are given above. The cost of moving commerce will, to a greater or less extent, be cheapened, according to the proximity to the river of the railroad over which it is transported.

PROSPECTIVE GROWTH IN POPULATION AND COMMERCIAL DEVELOPMENT.

Thus far I have dealt in facts relating to existing commerce. I now come to discuss the possible results on the growth in population and wealth the improvement of this great river would insure. The 12 counties fronting on the river and the 14 counties adjoining them, making 26 counties from its mouth to Waco coming under its immediate influence, contain 23,670 square miles of land, a large part of which is unequaled in fertility and productiveness except, possibly, in the valley of the Nile. In 1890 they contained a population of 476,138. They now have a population of 595,172, according to their voting strength. This is only 25.14 persons to every square mile of territory, and only a fraction over 2,500,000 acres, or about one-sixth of the entire territory, was in cultivation in 1890.

Therefore, when I remember that in Europe Holland supports an average of 485 people to the square mile and England 389, and that in America Massachusetts supports 278.48 and Rhode Island 319.44 population to the square mile, under conditions of soil and climate in no particular equal to the Brazos Valley, I approach the consideration of this phase of the subject with the firm conviction that comparisons of this section with other countries equal in area and now heavily populated will fail to fully convey to the mind an adequate conception of the untold possibilities of development in the Brazos River Valley country under the benign influence and healthful stimulus of water competition and cheap transportation. That any sum within the limits of reason expended by the Government on this great enterprise would not weigh a feather's weight set over against the vast commerce it would induce, and the inestimable blessings it would confer on millions yet unborn, is a self-evident conclusion from what has already been demonstrated by the settlement and development of the small area now occupied and the quantity and value of its products annually.

Taking the population now supported in Holland to the square mile as a basis, these twenty-six counties would support a population of 11,479,950. On the basis of the density of the population of England they would support 8,177,630 people, and on the Massachusetts ratio 6,591,095. Estimating production at one-third of a bale of cotton per acre, they are capable of producing 5,049,600 bales of cotton annually.

Crossing the banks of the river at right angles at several different points lie vast beds of lignite coal, some of it being mined, but the great body of it awaiting the influence of cheap transportation to get it to market. But why theorize on this question? Manufacturing enterprises of various kinds are just being inaugurated at different points along the river; the mineral deposits of untold value in its upper reaches have scarcely been touched, and the prospective growth and development along all lines of the future commerce of this section challenges the wildest flights of the imagination.

But it is in the line of sugar production that the greatest development will occur in the Lower Brazos bottom. Under modern methods of handling sugar cane and manufacturing sugar the expansion of the industry is largely dependent on cheap transportation. Only a few of the more wealthy planters can build mills, on account of the amount of money required to build a modern plant. These mills purchase cane from the small planters and convert it into sugar, and the area of territory reached

by a mill depends upon its means of transportation. Mills along the Brazos River at any point could be reached by barges. At least three-fourths of the Brazos River bottom land, comprising all that part lying south of Bryan, amounting to over a million acres right along the river banks, is capable of producing the very best quality of ribbon cane, out of which sugar is produced. This is a far more profitable crop than cotton, and with facilities for transporting the cane the river bottom would soon rival Louisiana as a sugar-producing territory.

There is another powerful factor that can be legitimately considered in ascertaining the prospective commerce of the Brazos Valley, and that is the influence of permanent cheap transportation in drawing commerce and forming great commercial highways. Even a temporary drop in rates often diverts traffic from its accustomed channels. Fortunately, I am not without an example to demonstrate the truth of the proposition. Take the history of the Mississippi River traffic. In 1876 the tonnage by boat on the river amounted to over 3,000,000 tons. In 1892 it was not quite 2,000,000, and has grown less since. The value of this commerce declined from $173,826,434 in 1876 to $72,760,956 in 1892, a decrease of 41½ per cent in value. (See remarks of E. L. Corthell before River and Harbor Committee, January 28, 1897.) This change represented the amount diverted from river transportation to the railroads. New lines of roads have been built down the Mississippi Valley, and year by year the commerce that passes along the valley to home and foreign markets has increased. Why? Because commerce always seeks an outlet along lines of least resistance. It is claimed that the action of the Government in keeping open the Mississippi River to navigation and thus maintaining low freight charges has made "living cheaper" to the great majority of the American people. It has also benefited the railroads as well as their patrons. Their traffic has increased to such an extent as to many times compensate them for the reduction effected in the rate of charges. Their tonnage has increased beyond all expectation, and the Mississippi Valley has become the greatest artery of domestic and foreign commerce in the Southern States.

PROBABLE REDUCTION IN FREIGHT CHARGES THAT WOULD FOLLOW OPENING THE BRAZOS RIVER TO NAVIGATION.

I do not deem it necessary to go into elaborate details on this point. A few illustrations, showing the practical effect on rates of navigating the river, will suffice. (See Exhibit E.)

All rates are based on the nearest seaboard point, whether on export or import traffic. All other seaboard points meet the rates made via the shortest route to the sea at the nearest harbor. Therefore, any reduction of rates to or from the seaboard at any point will be met by lines from the same territory to all seaboard points. It is 236 miles from Waco to Galveston, the present outlet for Texas cotton, and it costs $3 to ship a 500-pound bale of cotton from Waco to that point. That cotton could be shipped from Waco to Velasco, at the mouth of the Brazos River, by barges drawing 3 feet of water and landed alongside seagoing ships for $1 per bale, including all charges except compressing, I have not the least doubt. Should this be done, all roads at Waco and near enough thereto to be influenced by wagons hauling cotton to Waco for the cheaper rates (which would extend as far as 50 miles) would immediately meet this rate. This would mean a reduction of $1.50 net on each bale of cotton shipped from Waco by any route to the seaboard.

The distance from Waco to the mouth of the river via the river is approximately 500 miles. The charge for hauling a bale of cotton from Memphis to New Orleans, 600 miles, is 75 cents by water, and the railroads carry it at the same price. Rates then would be made to Waco from points north, and from all points east and west of the river, from Waco down to its mouth, by adding the cost of the rail or wagon rate to the river at the nearest point to the river rate, thence to its mouth at the sea, the combination of charges, plus 50 cents for compressing, forming the through rate from the point of origin to the seaboard. The railroad commission reports are full of instances where rail rates have been reduced to compete with wagon rates, and it is difficult to determine the exact rate that would be charged on cotton from any point within wagon haul of the river. It would, however, be little, if anything, above the water rate.

From the International and Great Northern Railroad crossing near Hearne to the sea, the rate would be from 60 to 75 cents per bale by the river, and from the Central Railroad crossing, between Brenham and Hempstead, it would be about 50 cents per bale. Hempstead, Navasota, and Brenham would get the benefit of these rates, because the railroad running through these places would meet them rather than see the cotton go by wagon to the river, which cost would be so trifling as to amount to but little. So it would be at Marlin, Bryan, Hearne, Cameron, Brenham, Bellville,

Richmond, and all points along the river. The producers throughout the Brazos Valley would control the freight situation, and there is not a town within a day's drive of the river by wagon that would not practically get the river rate on all classes of merchandise.

North of Waco rates would be reduced in proportion to the distance from Waco until Waxahachie was reached, where the rate via rail to Waco, thence to Galveston by the river, including the cost of compressing, equals the all-rail rate, which includes the cost of compressing.

From McGregor, at the crossing of the Santa Fe and Cotton Belt railroads, 19 miles distant, the rate to Galveston is $3 per bale. By hauling cotton to Waco by rail at the commercial rates, thence by water to Galveston, it would be done for $2.25 per bale, including cost of compressing; but cotton could and would be hauled from McGregor to Waco by wagon. If the rate was $1 per bale from Waco to Galveston, then the McGregor rate would only be the cost of the wagon haul to Waco, plus compress charges, higher than the Waco rate.

The reduction of freight charges on cotton alone that would result from making the river navigable to Waco would, in my opinion, amount to $2,000,000 a year. A corresponding reduction in rates on all other articles would follow, and the total saving to producers and consumers would be difficult to predict. I would regard $3,000,000 a year on the present incoming and outgoing freight along the Brazos Valley as a conservative estimate of the reduction in freight charges that would be effected by improving the Brazos river; but let us put it at $3,000,000 a year. If this estimate is even approximately correct, and it costs $5,000,000 to make the river navigable to Waco, it would be repaid to the people, with $1,000,000 to spare, in two years. If it cost $10,000,000 it would be repaid in a fraction over three years. The appropriation, whatever it might be, would be paid in installments, and would not be a large outlay, annually, for the Government to spend for such a purpose.

LIMITATIONS OF THE INFLUENCE OF NAVIGABLE WATER IN THE TRINITY AND BRAZOS RIVERS ON FREIGHT CHARGES.

The general rule is that river transportation will reduce rates until a distance from the river is reached where the rail rate from any point to the river and thence to the sea combined equals the all-rail rate from the same point to the sea.

The limit of the influence of navigating either the Brazos or Trinity rivers on freight charges is easily fixed, and can be laid down with as much certainty under the present railroad commission rates as the boundary lines of a county. Add the railroad rate on a bale of cotton from a given point to the river to Galveston and 50 cents per bale for compressing, and you have the rate by rail and water to Galveston, which rate should be compared with the railroad rate (which includes compressing) to the same point. The difference between the two will show which is the cheaper. At points on the river add 50 cents per bale to the river rate for compressing, which will give the rate to compare with the railroad rate.

The discussion of this question is made necessary by the suggestion that the improvement of one of these rivers will reduce freight rates all over Texas, and consequently there will be no need for the extra expense required to improve the other. That such a result would not follow naturally, and that the improvement and navigation of the one can have no appreciable effect in lowering the freight charges in the section penetrated by the other, I propose to demonstrate by figures taken from the present railroad commission tariffs. The two rivers lie in different sections of the State, between which there is no such communication, natural or artificial, as is necessary to a community of interest commercially; besides, the distance between the two rivers is such that the freight rate from one to the other is too great to enable shippers to transport freight by rail from one to the other, thence to the seaboard at rates below present railroad rates. Take, for example, Dallas, the proposed head of navigation on the Trinity, and Waco, the proposed head of navigation on the Brazos. The distance between these two places is 100 miles, and the railroad rate on a 500-pound bale of cotton from one place to the other at present commission rates is $2.

Suppose the river rate from both places to Galveston to be $1 per bale (which is the rate claimed by the friends of each proposition); add this to the $2 rail rate, and we have $3. But the railroads compress cotton out of the freight charge, which costs 50 cents per bale; so we must add that sum to the rail and river rate combined, which would make the cost of shipping a bale of cotton from Waco to Dallas by rail, thence down the Trinity to Galveston by water, $3.50, against $3 by all-rail route from Waco. Thus it will be seen that the improvement of the Trinity River would not exert an influence on rates as far away from Dallas as Waco. The same rule would apply if any attempt should be made to ship cotton from Dallas to Waco, thence down the

Brazos River, in competition with the all-rail rate from Dallas, because the rate is the same in each case, and the improvement of the Brazos would therefore not influence rates as far away as Dallas. The navigation of the Brazos to Waco would lower rates on cotton as far in the direction of Dallas as Waxahachie, 69 miles, where the rate would be reduced 5 cents per bale—practically the limit of river influence.

At Gatesville, 46 miles, the reduction would be 30 cents per bale; at Temple, 35 miles, 55 cents per bale; at Hillsboro, 34 miles, 60 cents per bale, by shipping via Waco or at all-rail rates fixed by that route. From each of these points toward the river the reduction would be greater until the $1 water rate was reached at Waco. Every other class of freight would be similarly affected. These illustrations, that could be indefinitely multiplied, serve to show the principle and establish the limit of the influence of water rates in either the Trinity or Brazos River sections on railroad freight charges. For further particulars on this point see Exhibit E, herewith submitted. The halfway line between the Brazos and Trinity rivers would constitute the practical limit of the influence of navigable water in either stream on freight rates. Draw a line halfway between these rivers, beginning at the Gulf of Mexico and going north to the State line, and you find west of this line more than three-fourths of the State of Texas, a territory large enough to swallow up the whole of New England and New York and Pennsylvania thrown in. West of that line would be found three-fifths of the railroad mileage of Texas, and nearly if not quite as large a proportion of the State's taxable wealth.

I do not cite these facts to show that one of these rivers should be improved and the other neglected, but to show that each drains an empire in itself, located in entirely different sections of the State and at such a distance from the other as to render the improvement of both rivers necessary. See map of Texas showing railroad lines that in whole or in part parallel the Brazos River, marked "Exhibit I," and submitted herewith.

NAVIGATION MUST BE ACTUAL AND NOT CONSTRUCTIVE TO ESTABLISH WATER COMPETITION.

The Interstate Commerce Commission has repeatedly decided this point. The courts have also upheld this construction of the law. In order to receive the benefits of water rates by rail between given points it must be shown that actual transportation of freight by water between these points is possible and being carried on. (See Interstate Commerce Commission, Thirteenth Annual Report.)

INTERMEDIATE POINTS.

The popular idea that railroads can not charge a higher rate at intermediate points than where water competition has forced down the rate is erroneous. The report of the Interstate Commerce Commission is full of instances where water competition between two points has compelled the railroads to haul freight at a very low rate, and between which points the intermediate stations pay a higher rate. (See Thirteenth Annual Report of the Interstate Commerce Commission; also Exhibit H.) But we have examples right in Texas, and I call attention to Exhibit F, herewith filed, showing comparative rates from St. Louis, Mo., a water point, to Dallas and Waco, intermediate points, and Galveston and Houston, water points. This statement shows that Waco and Dallas are charged from 10 to 20 per cent more on the same class of goods than Galveston and Houston, though all freight coming to the latter points must pass through the former. The Texas State railroad commission permits the same practice. (See Eighth Annual Report Railroad Commissioners.) The rate on a 500-pound bale of cotton from Velasco to Galveston, 110 miles, is 40 cents, on account of water competition, but from Angleton, an intermediate point, 15 miles nearer, it is $1.10 per bale to Galveston. The rate on cotton from Port Lavaca to Galveston is 40 cents per 100 pounds, while from Placedo, an intermediate point, it is 55 cents.

The rate on cotton from East Columbia to Galveston and Houston is $1 per bale, but the rates from Oyster Creek, which is an intermediate point, are, to Galveston, 28 cents, and to Houston 22 cents, per 100 pounds.

The rate on cotton from Lufkin to Houston is 44 cents per 100 pounds, based upon the mileage of the Houston, East and West Texas Railway, but the Cotton Belt Railroad has the privilege of taking cotton from Lufkin for Houston at the rate of 44 cents and hauling it through Jacksonville and Palestine, although the rates from the two last named points to Houston are higher than that from Lufkin.

Instances could be multiplied where this practice prevails, but these will suffice to show the practice. Under the railroad-commission law the commission has the power to make a different rate for different roads or different parts of the same road, as they have done in the instances cited above. (See Exhibit G.)

Waco, nor any point along the Brazos River down to its mouth not actually in reach of navigable water by rail or wagon, so as to avail itself of such water route at a lower rate of charges than the railroad charges from such point, would not secure a cent's reduction in rates by making the Trinity River navigable. To illustrate this point further: If the Trinity was navigable from Dallas to Galveston, and the rate on cotton by the river from Dallas to Galveston was $1 a bale, plus the cost of compressing, which is 50 cents, making a $1.50 per bale rate, the Missouri, Kansas and Texas Railroad, which runs through Waco to Galveston, would apply to the railroad commission for and get authority to reduce its rate from Dallas to Galveston, on account of water competition, to $1.50 per bale, without affecting intermediate points, and lower rates would be put on at all stations out of Dallas, where the present rate could be reduced by shipping into Dallas and thence by water to Galveston, until a point was reached out of Dallas where the rate could not be reduced by this method, which would be about 70 miles as a general rule.

The commission would be subject to an injunction should they undertake to compel railroads to put on unremunerative rates at intermediate points when water competition did not actually exist—in fact to enforce such rates at any point. The right to meet water competition is inherent, and has been so decided recently by the Federal court. The commission authorizes railroads to meet competition by water but does not compel them to do so.

The general principle applying in rate making is that railroads are entitled to earn current expenses and fixed charges, which includes interest on the capital invested. Any rate that yields a less amount is confiscatory and could be enjoined. The present value of a railroad must be considered in fixing rates, according to the opinion of the Supreme Court in the case of Ames *v.* Smythe. (Vol. 166, Supreme Court Reports.) The present value of a railroad is a question of fact, to be determined as any other fact in a trial; but, unless the contrary is shown, the bonds and stocks of a road would be accepted as the correct measure of its value. In Texas railroad properties have been valued by the commission, but such valuations are only prima facie evidence of their value, and would undoubtedly be called in question in any suit involving the reasonableness of the commission tariffs. In the litigation in the Federal court about a year ago, involving the reasonableness of the commission tariffs, the Federal court ignored the commission valuations. The cases were compromised, however, and the suits dismissed. The Texas commission was enjoined from enforcing a rate but a small per cent lower than the railroad tariff had theretofore been.

Because the rate on cotton from Dallas to Galveston was $1 per bale the Texas railroad commission could not arbitrarily reduce the rate at all intermediate points to $1 per bale. And if such an order should be issued the courts would enjoin its enforcement if the railroads could show that it reduced their earnings below a living basis. The reduction of the rates at intermediate points would depend on their proximity to navigable waters, the rates varying in accordance therewith; and they would be reduced because of such competition, as the case of the rate from Dallas, and on their own volition, in order to meet competition, and not on account of an order from the commission. I state, without fear of contradiction, that the commission would not reduce rates on cotton from Dallas to Galveston to $1 per bale, nor at any intermediate points where water competition existed with their present earnings, except on application of the railroad companies desiring to meet such competition.

There is also another factor to be considered. In the case above cited the Supreme Court held that in determining the reasonableness of rates by the State railroad commission only local tonnage—that is, tonnage moved wholly in the State—could be considered, and if rates in such cases are not compensatory the courts will enjoin their enforcement. Regarding the power of the commission to fix a higher rate for a short than a long haul when such short haul is included within the long haul, and also its discretionary authority in making rates, see railroad commission law, section 15c, a copy of which is herewith submitted, marked "Exhibit G."

I beg also to cite, in support of this proposition, the following extract from a report of Capt. C. S. Riché to Brig. Gen. John M. Wilson. See Document No. 409, Fifty-sixth Congress, first session. On page 8 the following statement relating to the reduction of railway rates occurs:

"It is claimed in some quarters, however, that railway rates can be reduced in other ways than by water competition, and that national or State railway commissions can force rates down whether water competition exists or not. That this state of affairs does not obtain at present can be seen by reference to the statement of the Dallas Commercial Club (inclosure 3 herewith) to the effect that twice in recent years has the Texas railway commission been successfully enjoined in the United States courts from attempting a reduction of a small per cent of the railway tariffs, the railways

establishing in the litigation that any reduction was confiscatory, the original and accrued costs of the railways, as represented by their stock indebtedness, and not their present value, apparently being the basis from which is computed the reasonable profit, of which they can not legally be deprived by national or State railway commissions."

In addition to this statement I wish to say that if the railroad commission of Texas could exercise such arbitrary authority and the courts were powerless to enjoin the enforcement of its orders, then there would be no further need for the Government to spend another dollar improving rivers and inland waterways. The ultimate object of all such improvements is to reduce rates and to cheapen the cost of transportation, and that could be done by a stroke of the commission's pen. The presence of navigable water in any river in Texas will not change the commission's power or authorize it to make a single rate that would not now be compensatory. If the commission could legally make rates at any point after navigable water had been obtained there that would not compensate the carrier for the service performed, it could make such rate without navigable water. As stated elsewhere, railroads are not compelled to meet water rates, and the commission has no power to compel them to meet such rates unless it can be clearly shown that such rates will compensate the carrier for the service performed.

The improvement of our rivers is, therefore, the only hope of receiving that full measure of relief necessary to commercial prosperity. In this statement I am supported by the experience of the people of every State in the Union. The free waterways of this country are about the only things left for us free from monopolies, and subject to no combinations of carriers to maintain rates, or injunctions of the court against further reducing them. Any man capable of building a flatboat and wielding a paddle can navigate them and fix his own freight rates.

TOO MANY RIVERS AND HARBORS IN TEXAS.

If objection is made to improving all of our harbors and inland waterways on the ground that there are too many of them, and that the amount of money necessary to accomplish this result is too great for a single State to expect from the Federal Government for such a purpose, I answer, first: This country is one and indivisible in a commercial as well as a political sense, and, while for certain purposes arbitrary political divisions are regarded in dealing with matters affecting the commercial interests of the country, such divisions should not and can not in justice to the people be considered.

The only divisions worthy of consideration in this connection are those made by nature and which determine, to a very large extent, the channels of commerce and consequently the amount the Government would be justified in expending within such natural divisions for river and harbor improvements. The practice of appropriating money for river and harbor improvements between States with reference to political divisions is, in my judgment, pernicious in its moral effect, and results in many cases in a waste of public money.

Second. Nowhere else in this country are conditions to be found similar to those existing in Texas. It is dissimilar to other States in area and extent of territory, in natural divisions, its location with reference to the seaboard, and the magnitude and mportance of the local and through commerce, present and prospective, to be accommodated by the improvement of its harbors and inland waterways. Instead of comparing State with State in appropriating the fund to be devoted to river and harbor improvements, area with area, natural division with natural division, the amount of commerce, present and prospective, constitutes the only just and fair basis of comparison, and by this standard will the people of Texas stand or fall in the judgment of their fellow-citizens of other Commonwealths, and on this rule or right will they base their claim to an appropriation from time to time large enough to inaugurate and prosecute to a successful conclusion the improvement of every harbor and inland waterway in the State that may be found worthy of improvement.

Texas in area of territory is larger than the combined area of New England, New York, Pennsylvania, New Jersey, Delaware, Maryland, Ohio, and Indiana. Suppose all of the above-named States were one State with one government, like Texas, and some Congressman or Senator should rise in his place and propose that only so much money could be given to each State in considering the river and harbor appropriations, and that as there were many rivers and harbors in the State, the Ohio River be chosen as the Government beneficiary. What would the New York, the Indiana, and the Maryland sections of this State say? Would they not say "We want the Ohio River improved; it is necessary, proper, and right; but it will benefit us only as citizens of the Commonwealth, and to subserve the interests of our part of the State the rivers and harbors located in our midst must be improved?"

And yet this proposition, preposterous as it may appear, is just as reasonable and just as applicable to that situation as is the proposition that the improvement of the Trinity River will meet the commercial needs of the entire State, or, on the other hand, that the improvement of the Brazos River would accomplish the same purpose.

I have shown that Texas is large enough in area and great enough commercially to receive more than ordinary consideration by the General Government in the matter of river improvements. I have shown, also, that the Brazos and Trinity rivers run through widely separated communities, and that the improvement of the one would not materially benefit the section traversed by the other; therefore both rivers should be improved. And I have shown that in no other way can the benefits of cheap transportation be secured to the people of Texas except by the improvement and navigation of her waterways. Your judgment on the facts presented will have much weight with the engineering department of the General Government and with Congress, and it is to you, sir, that we look for assistance in this great enterprise, the accomplishment of which shall be a benediction to the present generation and bring untold blessings to generations yet unborn.

L. L. FOSTER.

C. S. RICHÉ,
Captain, Corps of Engineers, U. S. A.

EXHIBITS SUBMITTED HEREWITH.

EXHIBIT A.[1]—Minutes of the Brazos River Navigation Convention.

EXHIBIT B.[1]—Address by Velasco Board of Trade, letter from George T. Wisner, civil engineer, and report of survey of the Brazos River by Prof. J. H. Hurwood, civil engineer; also report of a survey of the Brazos River in 1875, by R. B. Talfor, assistant engineer, United States Government.

EXHIBIT C.—Commerce and products of Washington County.

EXHIBIT D.—Business and resources of the city of Waco in 1898[1]; tonnage in and out of McLennan County by rail in 1899, and manufacturing enterprises in Waco in 1899.

EXHIBIT E.—Showing comparative cost, at present railroad commission rates, of carrying a bale of cotton from any point on or near the Brazos River, by river and by rail to Galveston.

EXHIBIT F.—Showing rates of charges fixed by the railroad commission of Texas to meet water competition, and instances where rates are higher at intermediate points.

EXHIBIT G.[1]—Railroad commission law of Texas. Section 15c.

EXHIBIT H.—Comparative interstate freight rates, showing higher rates for a shorter than a longer haul between water points.

EXHIBIT I.[2]—Map of Texas showing position of Brazos River and railroad lines parallel therewith.

[Exhibit C of inclosure 8.]

Commerce and products of Washington County.

Area	square miles	603
Area in acres		385,000
Brazos River frontage	miles	30
Cultivated area	acres	231,000
Cultivated area in cotton	do	133,000
Cultivated area in corn	do	93,000
Cultivated area in other crops	do	5,000
Native hay	do	14,000
Pasture and timber	do	140,000
Cotton crop, 1898	bales	60,000
Cotton received by wagon, Brenham	do	44,000
Cotton compressed in Brenham	do	162,000
Corn raised in 1898	bushels	2,556,000

Number and value of live stock in 1898.

Horses, 10,548	$421,170
Cattle, 12,086	181,290
Hogs, 8,627	25,881
Other stock, 100	3,000

[1]Not printed. [2]Not forwarded to office of the Chief of Engineers.

[Extract from Exhibit D of inclosure 8.]

STATEMENT OF THE WACO (TEX.) BUSINESS MEN'S CLUB.

* * * * * * *

FREIGHT TONNAGE IN 1899.

Tonnage received by all railroads in McLennan County.

In pounds	635,268,205
Number of cars	26,436

Tonnage forwarded by all railroads in McLennan County.

In pounds	459,745,855
Number of cars	19,156

MANUFACTURING INDUSTRIES IN WACO.

Architectural iron foundry: O. Canuteson.

Wood manufacturers: Burlake Wood Manufacturing Company, manufacturers of hard woods, spokes, axles, and tongues.

Awning and tent manufacturing company: L. N. Griffin.

Baking powder manufactory: E. A. Johnson.

Mattress and bed-spring manufacturers: Dennis Manufacturing Company.

Blank-book manufacturers: J. S. Barnett.

Boiler and machine manufacturers: Waco City Iron Works.

Soda and mineral water manufactories: Artesian Manufacturing and Bottling Works; J. E. Harrigan; Waco Ice and Refrigerating Company.

Ice manufactories: Waco Ice and Refrigerating Company; Geyser Ice Company.

Brick manufacturers: James B. Baker; J. N. Harris; J. W. Mann.

Broom manufactory: J. S. Thompson.

Cider and vinegar factory: Waco Cider Extract Company.

Cigar manufacturers: M. Friedman, A. J. Herz & Brother, B. J. French.

Woolen mills: Slayden-Kirksey Woolen Mills.

Fire kindler manufacturer: J. E. Harrigan.

Corn and feed mills: Waco Electric Milling Company.

Cornice manufacturers: Woodall Brothers, W. S. Lewis, L. G. Nye, Ed. Strauss.

Cotton compresses: American Cotton Company, Brazos Compress Company, Geyser City Press, National Compress Company, Weld & Neville (Lowry round bale).

Cotton machine manufactory: Waco Cotton Machine Manufacturing Company.

Cotton gin saw filer manufacturer: C. A. Richardson & Co.

Cotton-seed oil manufacturers: Consumers' Cotton Oil Company, National Cotton Oil Company.

Flavoring extract manufacturers: Artesian Manufacturing and Bottling Works, E. A. Johnson & Co., G. H. Knebel & Co., P. E. Maaz & Co., Waco Cider Extract Company.

Flouring mills: Hubby & Gorman.

Horse collar manufacturer: Broad & Rester.

Saddle and harness manufacturers: Tom Padgitt Company.

Mattress machine manufacturers: White's Cotton Down Mattress Machine Company.

Mattress manufacturers: Dennis Manufacturing Company, C. W. White.

Medicine manufacturers: W. B. Morrison & Co., G. H. Knebel & Co., Waco Electric Medicine Company, W. L. Tucker & Co., Zimmerman Liniment Company.

Office and store fixture manufacturers: T. H. Kessell & Co., Mailander & Sons Manufacturing Company.

Packers of beef, etc.: Waco Packing Company.

Paint manufacturers: Enamel Carbon Paint Company, E. E. Thompson.

Planing mills: T. H. Kessler & Co., Waco Planing Company.

Refrigerator manufacturers: Mailander & Sons Manufacturing Company.

Show case manufacturers: Waco Show Case Company, Mailander & Sons Manufacturing Company.

Respectfully submitted.

WACO BUSINESS MEN'S CLUB.
A. P. DUNCAN, *President.*
H. B. MISTROT, *Secretary.*

[Exhibit E of inclosure 8.]

COMPARATIVE COST OF TRANSPORTING A BALE OF COTTON BY RAIL AND BY RIVER.

Comparative cost on basis of present railroad commission rates of carrying a bale of cotton (500 pounds) from the points named to the Brazos River, thence to Galveston, and from same points to Galveston by rail.

[The present commission rates include cost of compressing cotton, paid by railroad companies out of the rate for all distances over 40 miles, and a proportion of the compress charge for distances over 30 miles. Hence in comparing the rail and river charges with the all-rail charges 50 cents per bale has been added to the river charge for compressing.]

To Galveston (via Waco) from—	Distance to Waco.	Rail rate to Waco per bale.	Cost of compress per bale.	River rate from Waco to Galveston per bale.	Combined rail and river rate per bale.	Present rates to Galveston, including compressing.
	Miles.					
Hillsboro	34	$0.90	$0.50	$1.00	$2.40	$3.00
Waxahachie	69	1.45	.50	1.00	2.95	3.00
Dallas	100	2.00	.50	1.00	3.00	3.00
Morgan	53	1.25	.50	1.00	2.75	3.00
Gatesville	46	1.20	.50	1.00	2.70	3.00
McGregor	19	.75	.50	1.00	2.25	3.00
Temple	35	.90	.50	1.00	2.40	2.95

To Galveston (via Lewis Switch) from—	Distance to river at Lewis Switch.	Rail rate to Lewis Switch per bale.	Cost of compress per bale.	River rate from Lewis Switch to Galveston per bale.	Combined rail and river rate per bale.	Present rate to Galveston, including compressing.
	Miles.					
Rockdale	25	$0.75	$0.50	$0.75	$2.00	$2.60
Taylor	51	1.25	0.50	0.75	2.50	2.85
Franklin	17	0.75	0.50	0.75	2.00	2.65
Jewett	50	1.20	0.50	0.75	2.45	3.00

To Galveston (via point on river near Chappell Hill) from—	Distance to river near Chappell Hill.	Rail rate to river near Chappell Hill per bale.	Cost of compress per bale.	River rate from river point to Galveston per bale.	Combined rail and river rate per bale.	Present rate to Galveston, including compressing.
	Miles.					
Giddings	49	$1.20	$0.50	$0.50	$2.20	$2.40
Elgin	81	1.75	0.50	0.50	2.75	2.70

NOTE.—Hearne, Bryan, Brenham, Caldwell, Bellville, Navasota, Richmond, and other points would take the river rate, being immediately on the river or within easy reach by wagon haul. To ascertain the reduction in rates from either of these places to Galveston, deduct the following from the all-rail rates from these places to Galveston: Points between Waco and Hearne, $1 water freight, 50 cents compress charge. The water rate per bale, including compress charges, $1.50. Points between Hearne and Brenham, 75 cents per bale water rate and 50 cents compress charges. Total water rate per bale, including compress charges, $1.25. Points from Brenham to mouth of the river would range from 50 cents per bale to 40 cents per bale. Charge from Velasco to Galveston, which does not include compressing, either by rail or water, and should not be included in any comparison of rates from Brenham and points below. The rail rates to the river would soon be modified by wagon competition, and the rates from more distant points reduced. Insurance and all costs of handling are also counted in both rail and river rates. Insurance will in both cases be carried by the transportation lines and paid for out of the rate.

[Exhibit F of inclusure 8.]

STATEMENT SHOWING THAT RAILROAD COMMISSION RATES ARE LOWER FOR LONGER THAN FOR SHORTER HAULS WHERE WATER COMPETITION EXISTS AT TERMINAL POINTS.

The class rates from Galveston to Velasco are as follows:

1	2	3	4	5	A	B	C	D	E
25	25	25	25	20	20	20	16	15	12

while those applying from Galveston to Angleton are:

1	2	3	4	5	A	B	C	D	E
47	41	35	29	27	28	26	22	20	15

The class rates from Galveston to Port Lavaca are:

1	2	3	4	5	A	B	C	D	E
30	30	30	30	20	20	20	20	20	16

while those applying from Galveston to Placedo, an intermediate station, are:

1	2	3	4	5	A	B	C	D	E
75	70	62	57	45	49	42	33	24	17

The rates from Houston to Port Lavaca are:

1	2	3	4	5	A	B	C	D	E
30	30	30	30	20	20	20	20	20	16

and those from Houston to Placedo, which is an intermediate station, are:

1	2	3	4	5	A	B	C	D	E
68	64	57	54	42	46	39	31	22	15

The rate on cotton from East Columbia to Galveston and Houston is $1 per bale, but the rates from Oyster Creek, which is an intermediate point, are to Galveston 28 cents and to Houston 22 cents per 100 pounds.

The rate on cotton from Velasco to Galveston is 14 cents, while that from Angleton to Galveston is 26 cents, per 100 pounds.

The rate on cotton from Lufkin to Houston is 44 cents per 100 pounds, based upon the mileage of the Houston, East and West Texas Railway; but the Cotton Belt has the privilege of taking cotton from Lufkin for Houston at the rate of 44 cents and hauling it through Jacksonville and Palestine, although the rates from the two last-named points to Houston are higher than that from Lufkin.

[Exhibit H of inclosure 8.]

Statement of comparative rates (interstate) from St. Louis, Mo., to Dallas and Waco, and Houston and Galveston, Tex.

	Dallas and Waco.	Houston and Galveston.
Agricultural implements	$0.64	$0.60
Bagging and ties	.32	.32
Canned goods	.48	.46
Cotton piece goods	[1]1.13	[2].79
Iron and steel articles	.50	.33
Pipe	.55	.39
Molasses	.53	.40
Packing-house products	.60	.55
Wooden ware	.70	.61
All goods in class "A," W. C.	.74	.70
"B"	.65	.60
"C"	.54	.52
"D"	.43	.43
"E"	.36	.36

[1] Carload. [2] Less than carload.

[Inclosure 9.]

LETTER OF MR. GEORGE CLARK, ATTORNEY AT LAW.

WACO, TEX., *July 28, 1900.*

DEAR SIR: In accordance with your request of yesterday, made at the instance of Captain Riché, to furnish you an opinion in writing as to the views expressed by me in the conference held at the board of trade rooms in this city on Thursday, the 26th instant, I beg to submit the following brief summary and statement of my investigations and conclusions upon the point presented. This point, as I understand it from Captain Riché, is whether or not the improvement of the Trinity River from its mouth to the city of Dallas would or could, under the law, affect the rates of railway transportation from Waco equally as favorably as such rates from the city of Dallas.

As I stated in said conference, such could not be its effect, and that the improvement of the Trinity River by the Government so as to render it a navigable stream from its mouth to the city of Dallas could only affect points upon the river, and could not affect in any manner points distant 100 miles from the river so improved. Our laws, both interstate and State, upon the subject of railway regulation are substantially similar in the several provisions as to unreasonable and unjust discrimination and as to the long and short haul clause; and the construction of these several provisions by the various railway commissions and courts, State and Federal, proceed substantially upon the same lines and reach the same conclusions.

The provision in the Texas revised statutes of 1895 which was cited by Captain Riché in the conference is in all substantial effects but the counterpart of a similar provision in our interstate-commerce law, with this difference perhaps, that in the State statute express authority is given the State commission to prescribe or permit different rates on the same line at different localities, while in the interstate law this power of the commission is only implied. Notwithstanding this the power has been frequently exercised by the Interstate Commission and according to my information has been similarly exercised by the State commission of Texas.

The result of all the cases, Federal and State, may be stated concisely as follows: In fixing rates for railway transportation between any two given points the peculiar circumstances and conditions prevailing at those points must be considered and taken into account whether they are fixed by the railroads themselves or whether they are fixed by governmental authority in the shape of commissions.

The fact that there are peculiar conditions at the two termini of shipment which must be considered, and which frequently may and do authorize lower rates between those two points than from any intermediate point to either of the termini, does not force the carrier in fixing rates, or the governmental authority in prescribing them, to give the same rate to an intermediate point that is given from one terminus to the other. To illustrate: With water transportation to Dallas furnishing competition, a railroad would be authorized to give a rate from Dallas to Houston, another water point, sufficiently low to secure to a reasonable extent a portion of the traffic; but the fact that the railway fixed the rate from Dallas to Houston at a lower figure for this purpose would not necessarily require the railway to fix the same rate at all intermediate points between Dallas and Houston. The decisions are directly to the contrary, and the books are full of cases in which, although the contention was raised under exactly similar conditions as those stated between Dallas and Houston, yet the courts and commissions have uniformly held that the circumstances and conditions at the intermediate points were not the same, and therefore that the railroad was authorized in such cases to charge a larger sum for a short haul than for a long haul.

One of the earliest decisions I have been able to find is the case of the New Orleans Cotton Exchange *v.* sundry railroads, a synopsis of which decision may be found in the Fourth Annual Report of the Interstate Commerce Commission, page 89. In that case it was held that a railroad forced to compete at a water point with water transportation may charge a higher rate for a shorter than a longer haul and may charge higher rates from intermediate points on its own line.

So also in Lehman, Higginson & Co. *v.* sundry railroads, Fourth Annual Report of the Interstate Commerce Commission, page 94 et seq., the Commission held that a railroad may charge higher rates from a town situated on one of its lateral branches than it charges from a water terminal.

So also in the case of George Rice *v.* sundry railroads, Fourth Annual Report of the Interstate Commerce Commission, page 104 et seq., the Commission held that a railroad is justified in making a lower rate to or from a water point, and is not compelled to make the rates at intermediate points as low as the rates forced upon it by competition at the water terminal.

So, also, in the case of San Bernardino Board of Trade *v.* sundry railroads, Fourth Annual Interstate Commerce Commission Report, pages 98 and 99, it was distinctly laid down that the water competition must be actual to justify a greater charge for a shorter distance. Mere possible or constructive competition will not suffice. In other words, the mere fact that Dallas, distant 100 miles from Waco, has actual water facilities in competition with railways could not be extended that distance to Waco so as to give Waco the benefit of the same water rate.

In W. S. King & Co. *v.* The New York, New Haven and Hartford Railroad Company et al., Fourth Annual Interstate Commerce Commission Report, pages 106–107, it was held that because water competition existed between New York and Boston, necessitating a reduction of railway rates between those points, yet such reduction could not be held applicable to Readville, an interior town only 8 miles from Boston, because no such competition existed at Readville, although it was on the line of the all-rail route.

I cite you also to the following cases by the Supreme Court of the United States:

Texas and Pacific Railway Company *v.* Interstate Commerce Commission (162 U. S., 197).

Cincinnati, New Orleans and Texas Pacific Railway Company *v.* Interstate Commerce Commission (162 U. S., 184).

Interstate Commerce Commission *v.* Alabama Midland Railroad Company (168 U. S., 144).

By an examination of these cases Captain Riché will readily perceive the extent to which the courts have gone in their application of the rules prescribed in the various commission laws of the United States and especially the Interstate Commerce Commission act. In the case first cited (Texas and Pacific Railway Company *v.* Interstate Commerce Commission) the Supreme Court of the United States, in a very elaborate opinion by Mr. Justice Shiras, went into the whole matter, examining all the statutes, English and American, as well as the decisions holding in effect that a mere disparity between the through and the local rate, even though considerable, did not of itself warrant the court in finding that such disparity constituted an undue discrimination. In other words, that such disparity in the particular case was reasonable and proper.

A further examination would reveal many other cases; but, in my opinion, additional authorities are not necessary upon the proposition. With all due respect to those who entertain an opposite view and who are urging that view upon Captain Riché, I have to say that in my opinion no good lawyer will be found who can afford to give such contention the approval of his legal judgment. I suggest that Captain Riché be invited by our committee to submit the question to some disinterested attorney or attorneys in whom he has confidence, knowing that but one conclusion can be reached by a lawyer upon the question presented.

I repeat that the improvement of the Trinity River from its mouth to the city of Dallas could not affect the rates for railways on the line of the Brazos in any manner whatsoever. Neither could the improvement of the Brazos affect the rates for railway transportation upon the line of the Trinity. In order for any beneficial effect by reason of water competition to come to either the city of Dallas or the city of Waco, or both, said cities must be directly on the line of actual water competition. In other words, whenever a locality demands of a railway company or companies reduced rates believed to accrue to such locality by virtue of water competition they must be able to point out actual water competition at their very door; otherwise they are not entitled to the benefit of reduced rates by reason of alleged water competition in some other locality.

Very truly, yours,

GEO. CLARK.

Hon. JNO. N. LYLE,
Waco, Tex.

[Inclosure 10.]

LETTER OF MR. MARCUS C. M'LEMORE, UNITED STATES ATTORNEY.

GALVESTON, TEX., *August 4, 1900.*

SIR: I have the honor to acknowledge receipt of your communication of July 31, 1900, with respect to the improvement of the Brazos River for light-draft navigation from its mouth to the city of Waco, in which you propound to me that, under certain circumstances, the following will not occur:

First. That the railways are not likely to voluntarily lower the rates.

Second. That the Government regulation of rates is restricted by decisions of the courts, and as matters now stand no further relief can be thus obtained.

Third. That the Government ownership of railways would do it, would also involve objections which would make this method undesirable; and in connection with these propositions you ask the question whether or not the improvement of the river is the only way by which lower rates can be obtained.

These matters and such questions have for some time been the subject of discussion by the courts of our country, and the only solution of them has been to say that it depends entirely on what the circumstances are surrounding the claims of contesting points as to whether or not the railroads are justified in making a lower rate for the long haul than for the short haul. The object that Congress had in making an appropriation or entertaining a proposition for an appropriation for the development of the Brazos River waterway was, and is, to secure to those who have access to the river, the benefit that would naturally accrue from water rates of freight in competition with the present railway rates in force. There can be no question but that where the railways come in competition with water transportation as a matter of course, a necessity, the railways are compelled in order to secure business to adopt and maintain the same rates as is exacted by the transportation companies on the water. The development of the Trinity River to Dallas insures to the people of that community and vicinity lower rates than are now in vogue, and the question to be discussed is, whether or not it becomes necessary to develop the Brazos River up as high as Waco in order to accomplish the reduction of freight rates to that point.

The suggestion made by yourself is that Waco being an intermediate station between Galveston and Dallas and water transportation and rates being in vogue to and from Dallas to the seaboard that Waco and other intermediate stations would be benefited in practically the same degree that Dallas is. Because, as I construe your letter and suggestion that the railroads, under the law, would not be permitted to charge a higher relative rate to Waco than to Dallas. I can not agree with you in this contention, for experience has taught us and the decisions show that there are innumerable instances where a lower rate is charged for the long haul than for the short and where places are on the same basis, where circumstances and conditions are practically the same, the law is that the railroads can not discriminate between the two, but where the circumstances are not the same and conditions dissimilar, it is a matter to a certain extent of discretion in the railroad as to what extent they can go in the naming of the rates to the respective places. As an illustration, I am advised by an agent of one of the railroad companies in Galveston with respect to rates from Pittsburg in Pennsylvania to points in Texas, the rate from Pittsburg to Galveston by water is, say, 50 cents per 100 pounds, and the all-rail rate is the same; but the rate from Pittsburg to Palestine, Tex., a point closer to Pittsburg by rail than is Galveston, is the combination of the water rate from Pittsburg to Galveston plus the local rate from Galveston to Palestine, and while a shorter haul by rail, the freight exacted is higher.

My impression is that should water transportation on the Trinity be effected, the freight and rates between Dallas and the seaboard would be most materially reduced, and the only effect that such reduction would have on the rate from Waco to the seaboard, based on Trinity River transportation, would be that the rate from Waco to Galveston would be the rate from Waco to Dallas by rail or to some point on the Trinity River, plus the freight rate by water from that point to Galveston. In other words, that the railroads would maintain a rate of that character because, should the rail rates between Waco and Galveston be higher than the sum of the local between Waco and Dallas and from Dallas by water, all freight naturally would seek the water transportation.

I do not think the matter or question of intermediate points can be considered in this connection. I have read with considerable interest the opinion of Judge Clark, of Waco, on this subject, and, in my opinion, the expressions of Judge Clark with respect to these matters ought to settle it beyond contravention.

And in answer to your question as to the necessity for the development of the Brazos in order to secure a lower rate that would be dictated by water transportation, I would say that the development of the Trinity would not necessarily reduce materially the rates now extant.

Very respectfully,

M. C. McLEMORE,
United States Attorney.

CHARLES S. RICHÉ, Esq.,
Captain, Corps of Engineers.

[Inclosure 12.]

LETTER OF THE GENERAL FREIGHT AGENT OF THE ILLINOIS CENTRAL RAILROAD.

ILLINOIS CENTRAL RAILROAD COMPANY,
OFFICE OF GENERAL FREIGHT AGENT,
New Orleans, August 29, 1900.

DEAR SIR: Replying to your letter of the 24th instant, beg to name following rates on cotton, per bale not exceeding 500 pounds, to New Orleans, La.:

From Vicksburg, Miss	$0.75
Jackson, Miss	2.15
Crystal Springs, Miss	2.00
Brookhaven, Miss	2.00
Magnolia, Miss	1.75
Fayette, Miss	1.75
Natchez, Miss	.95
Amite, La	1.50

These rates also apply on cotton uncompressed, and to our depot only.

Yours, truly,

W. M. RHETT,
General Freight Agent.

C. S. RICHÉ,
Captain, Corps of Engineers.

PRELIMINARY REPORT ON SURVEY OF BRAZOS RIVER, TEXAS, FROM ITS MOUTH TO OLD WASHINGTON, WITH A VIEW TO PROCURING NAVIGABLE DEPTHS OF 4, 5, AND 6 FEET.

UNITED STATES ENGINEER OFFICE,
Galveston, Tex., December 22, 1900.

GENERAL: In accordance with your instructions, I now have the honor to submit a progress report (covering the reach from the mouth to old Washington) upon a survey of Brazos River, Texas, with a view to its improvement, as required by the following item in the emergency river and harbor act of June 6, 1900:

Brazos River from its mouth to the city of Waco: With a view to procuring a navigable depth of four, five, and six feet, first, from its mouth to the town of old Washington, in Washington County; second, from said town of old Washington to the city of Waco. In case a survey is made, the report thereon shall show the most advantageous depth to each point, and whether a system of locks and dams will be necessary, and if so, the cost and location of same.

The commercial importance of the river was described in a previous report upon its preliminary examination, submitted to you under date of August 29, 1900.

As this report deals with but a portion of the river under survey, it will necessarily be incomplete in several particulars. The index map has been held until the completion of the survey from old Washington to Waco, so as to include the entire river from its mouth to Waco. The other drawings[1] accompanying this report are necessary to an understanding of the engineering questions involved, but it is recommended that their publication be postponed until the final report on the survey is received.

The field work of the survey from old Washington to Waco has just been completed, much delay having been caused by rises in the river, bad weather, and similar causes. It is anticipated, however, that the final report can be forwarded in about three weeks.

[1] Not printed.

Under the wording of the item above quoted the depths to be obtained are 4, 5, and 6 feet, respectively, at mean low water. To be certain of obtaining these depths at mean low water, I believe that a system of locks and dams will be necessary for the entire distance. This will require 12 locks, with movable dams, which are estimated to cost $200,000 apiece. In addition, some snagging and cutting of overhanging timber will be necessary, at an estimated cost for this reach of $35,000.

The above will give a low-water depth of 4 feet, but as it is proposed to construct the locks for a draft of 6 feet, to avoid obstructing navigation by deepening them later, the through low-water depth of 5 and 6 feet can then be had by a small amount of dredging, which, for the reach in question, is estimated to cost $15,000 for 6 feet, and half of that amount, or $7,500, for 5 feet.

By this plan the estimate for a 6-foot depth from the mouth to the town of old Washington is as follows:

Snagging and cutting timber	$35,000
12 locks and dams	2,400,000
Dredging	15,000
Total	2,450,000

It is estimated that operation, maintenance, repairs, etc., will cost $100,000 annually.

The cost of locks and dams on Brazos River will be higher than on Trinity River, in consequence of the absence of good foundations, the greater width of the river, and its unstable banks and shifting character.

For purposes of estimate, locks were assumed as 42 feet by 200 feet in the chamber, with 12-foot lift. These dimensions are subject to change. Lock sites were chosen provisionally and should not be definitely selected until just prior to construction.

As the reach of the river now under consideration was regularly navigated before railways had penetrated into its vicinity, it is possible that a less expensive form of improvement would answer for the present.

This second method of improvement would consist in removing snags and overhanging timber as before and in narrowing the river at its shoals in order to concentrate the current and obtain greater depths, and the estimate for this method would be as follows:

Snagging and cutting timber	$35,000
Training walls and spur dikes	158,000
Contingencies, engineering, superintendence, etc	32,000
Total	225,000

With an estimated annual cost for maintenance of $40,000.

While this latter method would not be certain to give the low-water depths named above, it would give these depths under average rainfall conditions for about eight months in the year, and would generally permit navigation at the time when the crop movement was in progress. Later, as the demand for a longer season of navigation developed, locks and dams could be constructed where most urgently necessary.

The improvement of Brazos River for a light-draft navigation should not be made unless its mouth is connected by inland canal with Galveston and Matagorda bays, as proposed in my report of January

24, 1900, on San Bernard River, Texas. (See Annual Report of the Chief of Engineers for 1900, page 2438 et seq.)

For details, attention is invited to the inclosed report of Assistant Engineer F. Oppikofer, with its exhibits and drawings. Other matters connected with the subject will be referred to in the final report.

Very respectfully, your obedient servant,

C. S. RICHÉ,
Captain, Corps of Engineers.

Brig. Gen. JOHN M. WILSON,
Chief of Engineers, U. S. A.

(Through the Division Engineer.)

[First indorsement.]

U. S. ENGINEER OFFICE, SOUTHWEST DIVISION,
New York, December 27, 1900.

Respectfully forwarded to the Chief of Engineers, United States Army.

If from Captain Riché's estimate of the cost of improving this portion of the Brazos River by training walls and spur dikes we deduct the cost of snagging and cutting timber, which is common to both plans, we have $190,000 for the cost of the improvement by this method, or less than the cost of one of the twelve locks and dams required to give slack-water navigation. Captain Riché is of the opinion that the plan of improvement by training walls and spur dikes will give the required depth under ordinary conditions of rainfall for about eight months in the year, including the season when navigation is most desired.

Under these circumstances I think that the improvement by training walls and spur dikes should be resorted to first.

HENRY M. ROBERT,
Colonel, Corps of Engineers,
Division Engineer.

REPORT OF MR. F. OPPIKOFER, ASSISTANT ENGINEER.

VELASCO, TEX., *December 4, 1900.*

CAPTAIN: I have the honor to submit to you the following report of a preliminary survey of the Brazos River from old Washington to its mouth, made from October 15 to November 28, 1900, under instructions received from you October 8, 1900, with an estimate of cost of improvement.

The river flows in a southerly direction from old Washington, emptying into the Gulf of Mexico, a distance of 253½ miles to initial point of northeast jetty, with a fall of 158.5 feet to mean low tide of Gulf, which necessitates a correction of 107.5 feet from assumed elevation of survey.

Sixty-six cross sections were taken, 12 of which extend from 1 to 15 miles across river bottom; 22 bench marks established (Exhibit A[1]), and all the field notes plotted daily.

In former years the river was regularly navigated to old Washington, and I am reliably informed that a few trips were made as far as Waco.

With the completion of the Houston and Texas Central Railroad in 1860 to Navasota and Bryan, the navigation of the river without some systematized improvement would not permit competition with railroad transportation.

[1] Not printed.

The survey was made under very unfavorable conditions. Rainy weather kept the river often half and once bank full and made it difficult to determine shoals.

There is no doubt that the tremendous flow of water last year and the continued high stage since then has scoured and deepened the bed of the river considerably, but probably this will not be permanent.

Obstructions to navigation at present are 41 shoals (Exhibit B) and 7 bridges (Exhibit C).

The height of banks from old Washington to near Columbia varies from 30 to 40 feet, with occasional higher bluffs. From Columbia they decrease to 5 to 8 feet near the mouth.

The banks of the part of the river surveyed are generally unstable; continuous landslides during almost every flood and after heavy rain are a feature of the river. The composition of the banks is clay, sand, and alluvial deposits.

The bottom lands of the Brazos from old Washington to the Gulf vary from 1 to 20 miles in width and are very fertile, producing from 1 to 2 bales of cotton per acre; corn, alfalfa, sugar cane, etc., in proportion. They were overflowed last year to a depth of from 3 to 10 feet.

The inhabitants along the river clamor for some remedy to prevent the recurrence of the large overflows of 1899. Cleaning the river will in some measure alleviate the overflows. A system of levees (built 200 to 300 feet from bank, with a base of 50 feet and a height of 12 feet) involves earthwork of 38,000,000 cubic yards, with probably 7,000,000 cubic yards more for the numerous creeks and gulleys emptying into the river, or a total of 45,000,000 cubic yards, at 10 cents per cubic yard, equals $4,500,000.

To straighten the bends of the river would no doubt give some relief in the upper stretches, but on the other hand would increase the danger in the lower river.

The improvement of the river for navigation may be accomplished by two methods:

1. By cleaning the river of snags, cutting overhanging trees, placing spur dikes, etc., for removal of shoals, and thus affording a 4 to 6 foot navigable depth for at least eight months in the year. The cost of this would be as follows:

1 snag boat	$10,000
Operating expenses, eighteen months	15,000
Total for snagging	25,000
Cutting overhanging trees	10,000
Training walls and spur dikes (see Exhibit B)	158,000
Contingencies and engineering	32,000
Total	225,000
Maintenance, annually	40,000

2. By locks and dams:

Snagging and cutting timber	$35,000
12 locks and dams (see Exhibits D[1] and E[1])	2,400,000
Dredging to obtain 6 feet	15,000
Total	2,450,000
Maintenance and repairs, annually	100,000

This estimate for locks and dams is not excessive, taking into consideration the unstable condition of the banks and foundation, and that in consequence only first-class work will stand the test of floods and time, as has amply been proved by the condition of the seven bridges crossing the river, four of which have had to be rebuilt during the last ten years.

About 200,000 bales of cotton raised in the six counties (Washington, Grimes, Waller, Austin, Fort Bend, and Brazoria) bordering on this section of the river and about 200,000 tons of miscellaneous freight would be tributary to the river if it was navigable, which would save the people on freight all of $600,000 per year.

I have requested prominent people along the river to send you the necessary statistics, more in detail, as I was unable to procure complete data in the time allotted me for this survey.

Very respectfully, your obedient servant,

F. OPPIKOFER,
Assistant Engineer.

Capt. C. S. RICHÉ,
Corps of Engineers, U. S. A.

[1] Not printed.

[Exhibit B.]

Shoals on Brazos River from the Gulf to old Washington.

No.	Distance from mouth.	Name of shoals.	Composition of shoals.	Estimated cost.		
				Dikes.	Cost per foot.	Cost.
	Feet.			*Feet.*		
1	208,496	Sand shoals	Sand	500	$6.00	$3,000
2	270,995	.....do	.....do	600	6.00	3,600
3	353,850	.....do	.....do	400	6.00	2,400
4	391,875	.....do	.....do	600	6.00	3,600
5	458,996	.....do	.....do	400	7.00	2,800
6	501,496	.....do	.....do	500	6.00	3,000
7	508,996	.....do	.....do	500	6.00	3,000
8	512,796	.....do	.....do	500	6.00	3,000
				800	6.00	4,800
9	547,496	Ferris Shoals	Rock and gravel	400	10.00	4,000
10	602,496	Clay shoals	Clay and sand	600	6.00	3,600
11	637,496	Rock shoals	Rock and gravel	500	6.00	3,000
12	643,496	.....do	.....do	500	9.00	4,500
13	649,996	.....do	.....do	600	9.00	5,400
14	712,246	.....do	.....do	400	10.00	4,000
15	756,496	Gravel shoals	Gravel	600	6.00	3,600
16	763,496	.....do	.....do	600	8.00	4,800
17	779,496	Sand shoals	Sand	400	5.00	2,000
18	787,346	Gravel shoals	Gravel	400	7.00	2,800
19	790,496	.....do	.....do	600	7.00	4,200
20	829,996	.....do	.....do	600	8.00	4,800
21	852,196	San Felipe Shoals	Rock and gravel	2,000	8.00	16,000
22	921,996	Sand shoals	Sand	400	7.00	2,800
23	966,996	Gravel shoals	Gravel	600	6.00	3,600
24	972,996	.....do	.....do	1,000	6.00	6,000
25	982,996	Rock shoals	Rock and gravel	800	10.00	8,000
26	985,496	Gravel and sand	Gravel and sand	600	7.00	4,200
27	991,996	Sand shoals	Sand	300	7.00	2,100
				400	8.00	3,200
28	998,996	Gravel shoals	Gravel	400	8.00	3,200
29	1,015,171	Cockran Shoals	Rock and gravel	1,000	6.00	6,000
30	Between 1,015,171 feet from Gulf and old Washington there are 12 slight sand and gravel shoals, the total of which will be			4,500	6.00	27,000
	Total					158,000

[Exhibit C.]

Bridges.

Name of bridge.	Distance from mouth of Brazos.	Distance from lower chord to W. S.	Clearance between piers.	Synopsis of description.
	Feet.	*Feet.*	*Feet.*	
Gulf, Colorado and Santa Fe R. R. Bridge.	397,605	41.0	254.0	Three-span iron bridge, supported by two rock piers, 8 by 20 feet at top, 12 by 30 feet at bottom. Rock foundation under both ends of bridge. Length of bridge proper, 558.8 feet.
Southern Pacific R. R. Bridge.	525,311	37.0	254.5	Three-span iron bridge, supported by two piers; rock pier under west end of long center span, 8 by 20 feet at top, 12 by 30 feet at bottom; concrete pier at east end of long center span 9 by 20 feet at top, 18 by 30 feet at bottom. Rock foundation under both ends of bridge; trestle beyond. Length of bridge proper, 568 feet.
Richmond wagon bridge	526,111	41.5	209.0	Three-span iron bridge, supported by four twin-cylinder iron piers filled with concrete; two center piers 5 feet in diameter at top and 7 feet at bottom; two end piers 3 feet at top and bottom; wooden approach connects both ends. Length of bridge proper, 419.3 feet.
San Antonio and Aransas Pass R. R. Bridge.	703,955	36.2	95.0	Two-span iron bridge, supported by two twin-cylinder iron piers filled with concrete; 10 by 20 feet top and bottom; connects with trestle on both ends. Length of bridge proper, 402 feet.

Bridges—Continued.

Name of bridge.	Distance from mouth of Brazos.	Distance from lower chord to W. S.	Clearance between piers.	Synopsis of description.
	Feet.	*Feet.*	*Feet.*	
Missouri, Kansas, and Texas R. R. Bridge.	799,985	33.0	154.0	Three-span iron bridge, supported by one twin-cylinder pier, iron filled with concrete, 7 feet in diameter under west end of center pier. Solid concrete pier 8 by 20 feet at top, 10 by 30 feet at water surface. Both ends connect with trestle. Length of bridge proper, 477.2 feet.
Hempstead and Bellville wagon bridge.	1,008,131	49.0	245.0	Four-span iron bridge, supported by four twin-cylinder piers, iron filled with concrete. Two center piers 4 feet in diameter at top and 7 feet at water surface. Two end piers 3 feet in diameter at top and bottom. Length of bridge proper, 565.5 feet.
Austin branch of Houston and Texas Central R. R. Bridge.	1,098,129	47.0	189.0	Three-span wooden bridge, supported by two rock piers 5 by 20 feet at top and 12 by 30 feet at water surface. End of bridge supported by rock foundation on right bank and granite on left bank. Length of bridge proper, 407.4 feet.

[Exhibit F.]

Approximate discharge and mean velocity of the Brazos River near old Washington, October 1 to October 15, 1900.

Stage.	Depth.	Discharge per second.	Mean velocity per second.
	Feet.	*Cubic feet.*	*Feet.*
Low river	4	3,000	2.2
¼ bank	10	18,000	3.8
½ bank	20	35,000	4.4
¾ bank	30	62,000	5.2
Full bank	40	105,000	6.2

FINAL REPORT ON SURVEY OF BRAZOS RIVER, TEXAS, FROM ITS MOUTH TO THE CITY OF WACO, WITH A VIEW TO PROCURING NAVIGABLE DEPTHS OF 4, 5, AND 6 FEET.

[Printed in House Doc. No. 450, Fifty-sixth Congress, second session.]

OFFICE OF THE CHIEF OF ENGINEERS,
UNITED STATES ARMY,
Washington, February 8, 1901.

SIR: The emergency river and harbor act of June 6, 1900, makes provision for an examination and survey to be made at the following locality, viz:

Brazos River [Texas] from its mouth to the city of Waco: With a view to procuring a navigable depth of four, five, and six feet, first, from its mouth to the town of old Washington, in Washington County; second, from said town of old Washington to the city of Waco. In case a survey is made, the report thereon shall show the most advantageous depth to each point, and whether a system of locks and dams will be necessary and, if so, the cost and location of same.

A report upon preliminary examination of the river from its mouth to Waco and a progress report upon survey of the section between the mouth and old Washington were rendered by the district officer, Capt. C. S. Riché, Corps of Engineers, August 29 and December 22, respectively, 1900, and were submitted to the Secretary of War with letter from this office of January 2, 1901. These reports are printed in House Doc. No. 283, Fifty-sixth Congress, second session.

The progress report mentioned contains alternative plans and estimates of cost for improvement up to old Washington by means of locks and dams and by open-channel work, and these estimates are repeated in the accompanying copy of Captain Riché's final report, dated January 30, 1901, which I have now the honor to submit, with maps, for transmission to Congress.

The cost of procuring a 6-foot depth at low water from the mouth to Waco by means of locks and dams is estimated in the reports as follows:

From the mouth to old Washington	$2,450,000
From old Washington to Waco	3,500,000
Total	5,950,000
Additional annual expense for operation, maintenance, repairs, renewals, etc	225,000

The river between old Washington and Waco is so obstructed by shoals and rapids that a system of locks and dams will be necessary for the entire distance in order to permit of light-draft navigation, and the above estimate for this section includes also the cost of necessary snagging and dredging and the cutting of overhanging timber.

If the reach from the mouth to old Washington be improved by a system of temporary spur dikes, as proposed in the progress report, the estimated cost of improvement from the mouth to Waco is as follows:

From the mouth to old Washington (open-channel work)	$225,000
From old Washington to Waco (locks and dams, etc.)	3,500,000
Total	3,725,000
Additional annual expense for operation, maintenance, repairs, renewals, etc	145,000

Captain Riché reiterates in his final report his remarks contained in the progress report, that the improvement of the Brazos River for a light-draft navigation should be considered in connection with the inland canal connecting the mouth of the Brazos with Galveston and Matagorda bays, as proposed in his report of January 24, 1900, upon survey of San Bernard River, Texas (printed in Annual Report of the Chief of Engineers for 1900, page 2438 et seq.).

The division engineer, Col. Henry M. Robert, Corps of Engineers, is of opinion that the river up to Waco is worthy of improvement for a light-draft navigation, and remarks as follows relative to claims for damages to land that might be injured from overflow, as a result of the proposed dams, viz:

> The Brazos River is subject to great floods, and I presume the presence of fixed dams in it would give occasion for many claims for damages. The lands that might occasionally be injured by the dams would, on the whole, be greatly enhanced in value by the improvement of the river, and it would seem but equitable that the owners should waive all claims for damages, arising from the construction of these dams, before any of them are begun.

In forwarding to this office Captain Riché's progress report of December 22, 1900, Colonel Robert expressed the opinion that in the reach below old Washington "the improvement by training walls and spur dikes should be resorted to first."

Very respectfully, your obedient servant,

JOHN M. WILSON,
Brig. Gen., Chief of Engineers,
U. S. Army.

Hon. ELIHU ROOT,
Secretary of War.

REPORT OF CAPT. C. S. RICHÉ, CORPS OF ENGINEERS.

UNITED STATES ENGINEER OFFICE,
Galveston, Tex., January 30, 1901.

GENERAL: In accordance with your instructions, I now have the honor to submit the final report upon a survey of Brazos River, Texas, with a view to its improvement, as required by the following item in the emergency river and harbor act of June 6, 1900:

Brazos River from its mouth to the city of Waco: With a view to procuring a navigable depth of four, five, and six feet, first, from its mouth to the town of old Washington, in Washington County; second, from said town of old Washington to the city of Waco. In case a survey is made, the report thereon shall show the most advantageous depth to each point, and whether a system of locks and dams will be necessary, and if so, the cost and location of same.

A progress report, covering the reach of the river from its mouth to old Washington, was submitted to you on December 22, 1900. While the estimates contained in that report are repeated herein for convenience, the present report deals principally with the reach from old Washington to Waco.

The progress report, above referred to, and the report on the preliminary examination of the river, which latter describes its commercial importance, have been printed as House Doc. No. 283, Fifty-sixth Congress, second session, to which attention is invited.

The drawings accompanying the present report are numbered continuously with the drawings which accompanied the preceding progress report, and which have not yet been published. As these drawings are necessary to an understanding of the engineering questions involved, it is recommended that they be all published with the present report.[1]

Brazos River between Waco and old Washington is so obstructed by shoals and rapids that a system of locks and dams will be necessary for the entire distance to permit a light-draft navigation. As a result of better foundations, these locks and dams can probably be built for somewhat less money than those on the lower river, and it is thought that $190,000 apiece will suffice. Eighteen locks will be necessary for the reach in question. In addition, snagging, cutting overhanging timber, and some dredging will have to be done. By this plan the estimate for a 6-foot depth from old Washington to Waco is as follows:

Snagging and cutting timber	$65,000
Eighteen locks and dams	3,420,000
Dredging	15,000
Total	3,500,000

[1] From drawings printed in House Doc. No. 450, Fifty-sixth Congress, second session; not reprinted.

For reasons stated in the progress report, the locks should be built for a draft of 6 feet at the start. If but 4 feet or 5 feet of water is required, less dredging will be necessary. The above estimate can be reduced by $15,000 for 4 feet of water, and by $7,500 for 5 feet of water.

It is estimated that operation, maintenance, repairs, renewals, etc., will cost $125,000 annually. For details, attention is invited to the inclosed report of Superintendent S. W. Campbell, with its exhibits and drawings.

Repeating the estimate for the reach from the mouth to old Washington, and summarizing, we have:

For a low-water depth of 6 feet.

Mouth to old Washington	$2,450,000
Old Washington to Waco	3,500,000
Total	5,950,000

With an estimated annual cost of $225,000 for operation, maintenance, repairs, renewals, etc.

If the reach from the mouth to old Washington be improved by a system of temporary spur dikes, as proposed in the progress report, the estimated cost of improving the river becomes as follows:

Mouth to old Washington	$225,000
Old Washington to Waco	3,500,000
Total	3,725,000

With an estimated annual cost of $165,000 for operation, maintenance, repairs, renewals, etc.

The chief purpose of improving the river being the lowering of charges for transporting freight, it seems proper to invite attention to the following:

For waterways to control railway charges, navigation must be actual and not theoretical. The mere existence of a waterway will effect nothing in this respect unless boats can easily and quickly be placed upon it should railway charges at any time be raised.

The character of boat that is necessary for economical river navigation can not safely navigate the Gulf of Mexico. If Brazos River were improved, and its mouth not connected by an inland canal with Galveston and Matagorda bays, it would form an isolated waterway. Boats that could be used for its navigation could not then be used elsewhere. They would be confined to Brazos River alone.

If a number of boats were then built and used upon the river it is conceivable that the railways whose rates were affected by these boats could lower their rates to such a point as to drive the boats out of business. By subsequently returning to their former or to higher rates, the railways could reimburse themselves for the cost of destroying this competition. The ability of the railways thus to "freeze out" the boats would deter people from attempting to go into the boat business on the river.

There are two ways by which to overcome this difficulty.

One way is to carry the river improvement up to a city like Waco, whose commercial interests have a great deal to gain by a lowering of rates. The Waco Business Men's Club could then, itself, own and operate a line of boats upon the river, and could afford to run these boats at a loss, in order to secure the far greater benefits to be derived from lower freight rates.

The other and more satisfactory way to overcome the difficulty lies in the improvement of the canals and other waterways mentioned in my report of January 24, 1900, upon the survey of San Bernard River, Texas (published, with map, in Annual Report of the Chief of Engineers for 1900, p. 2438 et seq.).

The system of sheltered light-draft waterways along the Texas coast therein referred to would, if developed, lead to the creation of a fleet of boats suited to the transportation requirements of the coast country. These boats would reach points to which it would be impracticable to build railways, and, as a result, could never be driven out of business. With Brazos River as a component part of such a light-draft system of waterways, suitable boats would always be available for the Brazos River trade should railway rates at any time become excessive.

The ultimate connection of this system of waterways with the Mississippi River and its tributaries (see Annual Report of the Chief of Engineers for 1875, Part 1, p. 876 et seq.) would render the situation still more secure, and would permit the maximum development of the country tributary to Brazos River.

Very respectfully, your obedient servant,

C. S. RICHÉ,
Captain, Corps of Engineers.

Brig. Gen. JOHN M. WILSON,
Chief of Engineers, U. S. A.
(Through the Division Engineer.)

[First indorsement.]

U. S. ENGINEER OFFICE, SOUTHWEST DIVISION,
New York, February 6, 1901.

Respectfully forwarded to the Chief of Engineers, United States Army.

I have already, in my indorsement on Captain Riché's report on the Lower Brazos, published in House Doc. 283, Fifty-sixth Congress, second session, page 33, stated my opinion that the Lower River, below Washington, should be improved, first, by training walls, spur dikes, and snagging, at an estimated cost of $225,000. I have also, in the same document, page 8, stated that I thought the Brazos River, from its mouth to Waco, was worthy of improvement, for a light-draft navigation, even if the cost should be as great as $6,000,000.

I have seen nothing to change my opinion on either of these points. This report shows that the work can be accomplished at an estimated cost not exceeding that amount, even were slack-water navigation carried all the way from the mouth to Waco, while by adopting the recommended plan the estimate is reduced to $3,725,000.

The Brazos River is subject to great floods, and I presume the presence of fixed dams in it would give occasion for many claims for damages. The lands that might occasionally be injured by the dams would, on the whole, be greatly enhanced in value by the improvement of the river, and it would seem but equitable that the owners should waive all claims for damages arising from the construction of these dams before any of them are begun.

HENRY M. ROBERT,
Colonel, Corps of Engineers,
Division Engineer.

[Inclosure 1.]

REPORT OF MR. S. W. CAMPBELL, SUPERINTENDENT.

UNITED STATES ENGINEER OFFICE,
Galveston, Tex., January 21, 1901.

CAPTAIN: I have the honor to submit, under instructions received October 8, 1900, the following report of a preliminary survey of the Brazos River from Waco to old Washington, from October 15 to December 22, 1900.

The river flows in a southerly direction 170.70 miles to old Washington, with a fall of 223 feet in this distance. The conditions for surveying were very unfavorable, through bad weather, rises in the river, and sickness in party.

Sixty-seven cross sections were taken, four of which extended from three-fourths to 3 miles on each side of river, but owing to dense undergrowth the exact limit of flood water was not obtained, as it would have delayed the party too long to run out to high ground on both sides.

Twenty-two bench marks were established. (See continuance of Exhibit A of Assistant Engineer F. Oppikofer.)

Obstructions to navigation are fifty-seven shoals and rapids and nine bridges. Twelve bridges are shown, three of which are above the initial point at Waco.

The height of banks varies from 20 to 55 feet, but where low banks (20 to 25 feet) occur there is a second bank from one-fourth to one and one-half miles back from the river. The composition of banks is clay, sand, shale, and gravel, with rock in a few places.

Between miles 349 and 354 from the mouth there is considerable sandstone suitable for lock and dam construction, but the stone found at other points is very poor.

There are very few places naturally adapted for lock sites, as one bank or the other is of a caving nature, except at lock sites Nos. 18 and 20, where both banks are shale for 15 feet up from low water.

The improvement of this section of the river for navigation will have to be done with locks and dams, the removal of snags and overhanging trees, and a small amount of dredging.

Estimate for locks and movable dams.

18 locks and dams, at $190,000	$3,420,000
Snagging, dredging, etc.	80,000
	3,500,000
Maintenance and repairs annually	125,000

Very respectfully, your obedient servant,

S. W. CAMPBELL,
Superintendent.

Capt. C. S. RICHÉ,
Corps of Engineers, U. S. A.

[Exhibit A.]

Bench marks on Brazos River survey. (Waco to old Washington.)

B. M. No.	Date.	Distance from mouth.	Location.	Description	Elevation.	
					Assumed.	Corrected.
		Feet.			*Feet.*	*Feet.*
1	Oct. 14	2,241,175	McLellan County.	Top of fire hydrant, corner 1st and Washington streets, Waco.	406.03	413.03
2	Oct. 18	2,190,364	.....do.....	Railroad spike in 24-inch cottonwood tree on left bank, 50 feet from shore line, cut in side facing river.	374.03	381.03
3	Oct. 28	2,101,573	.....do.....	Top of upstream tubular pier on left bank, wagon bridge from Gurley to Marlin.	368.17	375.17
4	Oct. 30	2,072,411	.....do.....	Chip in 14-inch hackberry tree on right bank, 50 feet from shore line. 40-foot bank.	337.49	344.49

Bench marks on Brazos River survey. (*Waco to old Washington.*)—Continued.

B. M. No.	Date.	Distance from mouth.	Location.	Description.	Elevation.	
					Assumed.	Corrected.
		Feet.			*Feet.*	*Feet.*
5	Oct. 30	2,057,868	Falls County	Chip in 24-inch hackberry tree on left bank, 100 feet from water's edge. 25-foot bank.	354.59	361.59
6	Nov. 4	2,052,063	.....do	Bolt head on south end of guard rail upstream side of Marlin Bridge, right bank.	355.94	362.94
7	Nov. 5	2,025,380	.....do	Cross cut in top of red bowlder on right bank, 300 feet from water line and 500 feet above "Falls of the Brazos."	318.25	325.25
8	Nov. 9	1,952,295	.....do	Chip in 14-inch white elm on left bank, 150 feet from water line, at foot of rapids. (Blue Shoals.)	313.69	320.69
9	Nov. 11	1,909,180	.....do	Chip in 8-inch box elder, 50 feet from top of left bank, 150 feet from water line.	295.97	302.97
10	Nov. 14	1,861,713	Milam County....	Cross cut in top of seat stone downstream end of first pier on right bank of Black's Bridge, "Calvert Bridge."	300.40	307.40
11	Nov. 18	1,846,700	.....do	Chip in 18-inch white oak at top of right bank. On right bank of small draw, 700 feet from water line.	288.87	295.87
12	Nov. 23	1,802,080	.....do	Chip in 24-inch white oak top of right bank, 200 feet east of the front of B. A. Averett's frame house.	284.87	291.87
13	Nov. 26	1,774,740	.....do	Cross in northeast corner of top of center pier of I. and G. N. Rwy. Bridge, upstream end.	280.80	287.80
14	Dec. 1	1,727,840	.....do	Chip in 24-inch cottonwood on top of left bank, 150 feet from water line.	246.42	253.42
15	Dec. 2	1,690,880	.....do	Chip in 20-inch cottonwood top of right bank, 100 feet from water line.	231.52	238.52
16	Dec. 5	1,653,312	.....do	Cross and chip in 14-inch mulberry tree on right bank at Moseleys Ferry, 250 feet from water line.	247.61	254.61
17	....do...	1,632,871	.....do	Chip in 24-inch cottonwood, top of right bank, 500 feet from water line.	235.08	242.08
18	Dec. 6	1,624,711	.....do	Top of upstream caisson on left-bank shore bent of Pitts's Bridge, on road to Bryan.	242.02	249.02
19	Dec. 7	1,561,756	.....do	Top of upstream caisson, left-bank shore pier of Jones's Bridge, road Caldwell to Bryan.	234.72	241.72
20	Dec. 13	1,439,917	.....do	Cross on top of stone pier, upstream side, west end Santa Fe Rwy. Bridge.	204.75	211.75
21	Dec. 17	1,370,690	.....do	Cross and chip on 24-inch cottonwood, top of left bank, at foot of Hidalgo Falls, 200 feet from water line.	186.96	193.96
22	Dec. 18	1,342,250	Washington County.	Cross on top of stone pier, upstream end of old Washington Bridge, left bank.	194.26	201.26

[Exhibit B.]

Shoals on Brazos River from old Washington to Waco.

[Continuation of Exhibit B, contained in House Doc. No. 283, Fifty-sixth Congress, second session.]

No.	Distance from mouth.	Name of shoals.	Composition of shoals.
	Feet.		
43	1,350,250	Sand	Sand and snags.
44	1,358,580	.....do	Do.
45	1,371,697	Hidalgo Falls (6.2 feet fall in 1,400 feet)	Rock, clay, and gravel.
46	1,447,537	Sand	Sand.
47	1,453,167	.....do	Do.
48	1,464,482	Rock shoal	Bowlders and gravel.
49	1,470,450	Sand	Sand and snags.
50	1,485,755	.....do	Do.
51	1,501,633	.....do	Do.
52	1,504,093	No name	Shale.
53	1,517,342	Sand	Sand and snags.
54	1,533,585	.....do	Do.
55	1,566,173	.....do	Sand.
56	1,599,583	.....do	Sand, gravel, and snags.
57	1,608,000	Thompson Shoals	Rock and shale.
58	1,613,851	Munsons Shoals, 7 feet (7 feet fall in 7,600 feet)	Conglomerate and shale.
59	1,632,871	Little Brazos Shoal	Shale, gravel, and clay.
60	1,683,950	Sand	Sand and clay.
61	1,691,385	Shale	Sand pack (or poor sandstone) and shale.
62	1,704,995	Mud Island	Clay and gravel.
63	1,717,267	No name	Soapstone and conglomerate bowlders.
64	1,724,994	Gravel (narrow channel left bank)	Sand and gravel.
65	1,740,157	Gravel	Do.
66	1,754,157	Sand	Sand.
67	1,783,948	Sand and gravel	Sand, gravel, and snags.
68	1,796,371	Port Sullivan Bridge	Sand.
69	1,800,141	Lower Port Sullivan Shoal	Shale and bowlders.
70	1,801,298	Upper Port Sullivan Shoal (8.4 feet fall in 5,700 feet)	Rock.
71	1,814,345	Sand	Sand.
72	1,820,041	.....do	Do.
73	1,843,131	.....do	Do.
74	1,846,539	Shoals and rapids	Shale and rock.
75	1,851,138	Herndon Shoals (5.5 feet fall in 7,800 feet)	Rock and lignite.
76	1,858,008	Blacks Shoals	Rock and shale.
77	1,865,404	Cannon Ball Shoal	Rock.
78	1,873,923	Curley Shoals (2.4 feet fall in 1,700 feet)	Rock and conglomerate.
79	1,909,991	Sand and gravel	Sand, clay, and gravel.
80	1,923,187	Sand	Sand.
81	1,927,817	.....do	Do.
82	1,938,499	.....do	Do.
83	1,957,507	Blue shoals	Shale and conglomerate.
84	1,968,709	Sand	Sand.
85	1,989,187	Shale shoal	Shale and gravel.
86	1,996,801	Sand	Sand.
87	2,001,701	.....do	Do.
88	2,024,701	Falls of the Brazos (9.5 feet fall in 7,500 feet)	Soapstone and limestone.
89	2,028,655	Soapstone Shoal	Soapstone and gravel.
90	2,043,499	Sand	Sand.
91	2,068,241	.....do	Sand and gravel.
92	2,076,362	.....do	Do.
93	2,137,969	.....do	Sand.
94	2,162,166	Shale	Shale and sand.
95	2,183,306	Sand	Sand.
96	2,202,031	.....do	Do.
97	2,218,871	.....do	Do.
98	2,231,128	.....do	Do
99	2,234,864	.....do	Do.

[Exhibit C.]

Bridges.

[Continuation of Exhibit C, contained in House Doc. No. 283, Fifty-sixth Congress, second session.]

Name of bridge.	Distance from mouth.	Distance from lower cord to W. S.	Clearance between piers.	Synopsis of description.
	Feet.	*Feet.*	*Feet.*	
Old Washington wagon bridge.	1,342,259	46	190	Two-span iron bridge, supported by one rock pier and two rock abutments. Piers 6 by 20 feet at top and 14 by 24 feet at bottom. Total length, 302.5 feet.
Gulf, Colorado and Santa Fe R. R. Bridge.	1,439,917	39	201	Two-span iron bridge, supported by two rock piers and one rock abutment on left bank. Piers 8 by 20 feet at top and 15 by 30 feet at bottom. Trestle on both ends. Length of bridge proper, 433 feet.
Caldwell and Bryan wagon bridge (Jones's Bridge).	1,581,756	47	156	Three-span iron bridge supported by four twin-cylinder tubular 5-foot iron piers filled with concrete. Length of bridge proper, 345 feet.
Caldwell and Bryan wagon bridge (Pitts's Bridge).	1,624,711	47	222	Three-span iron bridge, supported by tubular iron piers filled with concrete. Piers 4 feet at top and 6 feet at bottom. Wood approach on left bank. Length of bridge proper, 435 feet.
International and Great Northern Rwy. Bridge.	1,774,829	53	238	Two-span iron bridge, supported by one stone pier and two stone abutments. Pier 5 by 21 feet at top and 21 by 24 feet at bottom. Length of bridge proper, 399 feet.
Port Sullivan wagon bridge, Cameron to Hearne.	1,796,371	50	203	Three-span wooden bridge. "Howe" truss and one timber approach, supported by six tubular piers 4 feet in diameter filled with concrete. Length of bridge proper, 472 feet.
Cameron to Calvert wagon bridge (Black's Bridge).	1,861,718	.....	.....	Bridge collapsed October 31, 1900. Shore span on right bank standing. Distance from face of abutment to pier across river, 284 feet.
Belton to Marlin wagon bridge.	2,052,296	32	150	Four-span iron bridge, supported by one concrete and six tubular piers. Concrete pier, 5 by 19 feet at top and 12 by 25 feet at bottom; tubular piers, 5 feet in diameter, filled with concrete. Length of bridge proper, 583.6 feet.
Wagon bridge, Gurley to Marlin.	2,101,611	40	274	Three-span iron bridge, supported by eight tubular piers, filled with concrete; 5 feet in diameter at top and 7 feet at bottom. Length of bridge proper, 516 feet.
Missouri, Kansas and Texas Rwy. Bridge at Waco.	2,240,000	31	147	Three-span iron railway bridge, supported by eight tubular piers, 5 feet in diameter and filled with concrete. Two bent trestle on right and left bank. Length of bridge proper, 456 feet.
St. Louis and Southwestern Rwy. Bridge at Waco.	2,240,425	33	145	Three-span iron railway bridge, supported by eight tubular piers, 5 feet in diameter and filled with concrete. Three bent trestle on right and left bank. Length of bridge proper, 450 feet.
Suspension wagon bridge at Waco.	2,241,275	35	462	Single-span suspension bridge. Length of span from center to center of towers 475 feet. Width of roadway 18 feet. Length of bridge proper 752 feet.

[Exhibit D.]

Lock sites (old Washington to Waco).

Lock No.	C. S. No.	Lift.	Width of W. S. at low water.	Maximum depth.	Top to top of high bank.	Composition of bottom.	Height of banks.		Composition of banks.		Distance from mouth.
							Right bank.	Left bank.	Right bank.	Left bank.	
		Feet.	*Feet.*	*Feet.*	*Feet.*		*Feet.*	*Feet.*			*Feet.*
13	69	12	220	8.25	325	Sand	30	30	Sand	Sand	1,348,250
14	75	12	200	9	372	.....do	35	40	Sand and soil.	.....do	1,430,892
15	81	12	205	9	355	Shale	30	30	Sand and gravel.	Soil.....	1,504,093
16	85	14	160	8	420	Sand	35	30	Clay	Sand	1,566,173
17	None.	14	400	None.	520	Shale and rock.	35	35	Shale and sand.	Soil.....	1,608,000
18	95	12	260	5	330	Shale	35	30	Shale and sand pack.	Shale and sand.	1,691,385
19	100	12	140	19	390	Rock and sand.	20	35	Rock and sand.	Sand	1,747,527
20	107	14	260	10.5	365	Shale and rock.	35	35	Shale	Clay	1,800,141
21	114	15	160	9.5	720	Rock	40	35	Rock and sand.	Shale and sand.	1,851,138
22	None.	12	200	None.	500	Sand	20	25	Sand	Clay	1,899,900
23	124	12	260	6	328	.....do	25	20	Sand and soil.	Sand	1,938,499
24	126	11	240	8.5	490	.....do	25	20	Clay	.....do	1,968,709
25	128	12	180	7	425	.....do	25	25	.....do	Gravel....	2,001,701
26	None.	14	450	7	900	Gravel and shale.	25	25	.....do	Sand	2,023,645
27	133	14	230	7.5	425	Sand	20	20	Sand	.....do	2,068,241
28	137	14	350	8.5	465	.....do	25	25	Sand and clay.	Sand and clay.	2,119,449
29	139	9	270	4	525	Shale	20	55	Sand	Shale and gravel.	2,162,166
30	142	8	311	4	611	Sand	30	30	.....do	Sand	2,218,871

U 16.

REPORT UPON EXAMINATION OF THE EFFECT OF THE STORM OF SEPTEMBER 8, 1900, ON THE JETTIES AND MAIN SHIP CHANNEL AT GALVESTON, TEX.

[Printed in House Doc. No. 134, Fifty-sixth Congress, second session.]

OFFICE OF THE CHIEF OF ENGINEERS,
UNITED STATES ARMY,
Washington, November 26, 1900.

SIR: I have the honor to submit herewith, in duplicate, the report of the Board of Engineers, dated the 23d instant, convened at Galveston, Tex., by my direction, to make an examination of the effect of the storm of September 8, 1900, on the jetties and main ship channel at Galveston, and to report upon their present condition and the cost of necessary repairs.

The Board estimates the cost of repairs to the jetties rendered necessary by the storm at $1,500,000.