L 17.

WATER-GAUGES ON THE MISSISSIPPI RIVER AND ITS PRINCIPAL TRIBUTARIES.

Observations were continued at all the gauges during the year. Repairs were made upon those at Carrollton, Helena, Jacksonport, mouth of White River, Natchez, and Red River Landing. New gauges will be required at Helena, Lake Providence, mouth of White River, Red River Landing, and Vicksburg, which will be done so soon as the stage of water will permit.

The gauges are used by the Signal Service for their daily reports upon the stage of water in the rivers where they have stations. Records of the Carrollton gauge were furnished Captain Brown at Port Eads each week. At Little Rock the gauge was transferred from its old location on the levee to the railroad bridge. At Nashville no standard low-water has ever been obtained until October, 1878, when the lowest water reached 0.4 below the zero of the gauge. The standard low-water is now that of 1878, reading—0.4.

Hydrographs were made of all the gauges but retained in this office; others upon a smaller scale are transmitted herewith for the annual reports.

Copies of the gauge records at all the stations for the year are also transmitted.

Money statement.

July 1, 1878, amount available	$5,000 00	
Amount appropriated by act approved March 3, 1879	5,000 00	
		$10,000 00
July 1, 1879, amount expended during fiscal year		4,679 30
July 1, 1879, amount available		5,320 70
Amount that can be profitably expended in fiscal year ending June 30, 1881		5,000 00

L 18.

EXAMINATION OF THE BIG SUNFLOWER, COLDWATER, AND TALLAHATCHIE RIVERS, MISSISSIPPI.

UNITED STATES ENGINEER OFFICE,
Memphis, Tenn., January 2, 1879.

GENERAL: I have the honor to transmit the following report upon the examination of the Big Sunflower, Coldwater, and Tallahatchie Rivers, Mississippi.

Arrangements were made early in the season to have these examinations proceeded with, so as to have the reports in early for the consideration of Congress. The spread of the epidemic, however, throughout the South prevented any work of this character being prosecuted, and therefore it had to be delayed until very late in the season, and at a time also when operations were liable to be interfered with on account of rising water. This gave, to some extent, only a limited time in which to make the examinations and to have the reports presented in time for action.

The examinations were made by Mr. James M. Searles, assistant engineer, with a party under his charge, and sufficiently in detail to give all necessary information concerning the obstructions to navigation and cost of improvement. The character of the rivers and ordinary obstructions to navigation are so well known to us that I did not deem it necessary to have an instrumental survey made. In the improvement of streams of a like character the first important step is to remove from the stream all temporary and accidental obstructions, such as snags, logs, &c., and afterwards, as the means justify, to attempt the radical improvement of the river.

In reports made upon the improvement of the Yazoo River for former years, I recommended that, in case any appropriations were made again, the benefits thereof be extended to the Big Sunflower, Tallahatchie, &c. I did this for the reason that these streams are identical in their commercial interests, and all navigated by the same class of boats, and any improvement extended to them would also be a benefit to the main stream, and also to the adjacent country through which they passed.

Taken in this connection I have therefore concluded to embrace in one report what pertains to them all.

BIG SUNFLOWER RIVER.

This river has its source at Mud Lake, in Coahoma County, Mississippi near what is known as Horseshoe Bend on the Mississippi River. As a tributary of the Yazoo, it joins that stream about 55 miles above its mouth, flowing through the counties of Coahoma, Washington, and Issaquena, and forming part of the boundary between the latter and Yazoo County. During the high-water stages it is navigable for a distance of 280 miles, or as high up as the town of Clarksdale, in Coahoma County, which is known as the head of navigation. During the season of low-water, however, the boats seldom ascend higher than Garvin's Ferry, Coahoma County, a distance of 135 miles. It is not every year that they can reach this point; some years the steamboat travel is entirely suspended for a short time, generally, however, we can depend upon uninterrupted low-water navigation for a period of ten months.

The stream has a uniform low-water width of from 150 to 175 feet. The obstructions to navigation at low-water season consists of snags and sunken logs, and at all stages the leaning timber along the banks are serious obstructions. These obstructions could be readily removed and a channel-way maintained of sufficient width and depth for the passage of such steamboats as are employed in carrying the commerce of the river. In many places the low-water channel being filled with logs, is of no greater depth than 18 inches, while the confining snags on either side greatly reduce the width, leaving barely sufficient room for the safe passage of the small steamers that navigate the river. These obstructions are so general throughout the entire length of the stream, and are so constantly being brought in by the sliding banks, &c., that it would be useless to attempt any description of the points at which they are to be found. If any improvement looking to their removal should be attempted, the work should commence at the upper limit and work gradually down, taking out all obstructions that are met with.

While these, as stated, abound throughout the entire river, there are two points especially mentioned, between which they are found in great number, and are a serious obstruction, viz, between the mouth of Silver Creek and Choctaw Bend (foot of Muscle Shoals). These two points are respectively 25 and 43 miles from the mouth of the Big Sunflower, thus covering a distance of 18 miles.

While these obstructions are what might be termed accidental or temporary obstructions, there are two which are of a permanent character, viz, Oliphant's Bar and Muscle Shoals.

Oliphant's Bar begins at the mouth of the river, and extends a distance of 15 miles though on the upper 3 miles is where the shoalest water is found, the depth throughout this section being about 18 inches, while the average on the portion below it is about 24 inches.

Muscle Shoals are about 5 miles in length, the least depth of water over them being 17 inches, while the general average depth is 24 inches.

The method of improvement suggested for these shoals is to build ordinary wing-dams, and thus scour out a channel sufficiently deep for the passage of the small boats that navigate the river, from 3 feet to 40 inches being ample for the purpose.

For the removal of the snags and other obstructions, it is necessary to have a boat especially designed for that purpose. For the lower part of the river, the snagboat which has operated on the Yazoo could be used, while for the upper part and for cutting the leaning timber, a flatboat properly fitted out could be successfully operated. This work, in connection with the other streams, would have to be extended over parts of several seasons, in order to accommodate all those for whose use the boats are built.

For the improvement of the Big Sunflower River, I estimate as follows:

Wing-dam at Oliphant's Bar		$5,000 00
Wing-dam at Muscle Shoals		2,000 00
For cutting trees and pulling snags in upper part of the river:		
Flatboat and outfit	$2,000	
Repairs, rigging, &c	500	
10 months' work, at $2,500 per month	20,500	
		23,000 00
For cutting trees and pulling snags in lower part of the river:		
Use of snagboat 12 months, at $2,500 per month		30,000 00
		60,000 00
Contingencies		6,000 00
Total		66,000 00

COMMERCIAL STATISTICS.

During the season of 1875 and 1876 the steamer Sunflower Belle made regular weekly trips the whole year round, and four other boats were also required in the trade for that season. The above boats carried to Vicksburg 14,161 bales of cotton and 12,522 sacks of cotton-seed. This is estimated at about two-thirds of the staple shipped from the Big Sunflower. The uncertainty of navigation in this stream compels a number of the planters on the upper river to haul their cotton to the Mississippi, which otherwise would go down this stream. It is estimated that the shipments would be twice the amount of the present movements in up and down freights if the navigation of the river were to be improved. We may safely estimate the value of the freight for cotton, plantation supplies, &c., at upwards of $2,000,000.

COLDWATER RIVER.

This stream and its continuation, the Tallahatchie, might be considered as one stream. The latter, when joined by the Yallabusha, near Greenwood, forms the Yazoo.

The Upper Coldwater, that is, above the junction of the Yazoo Pass, is not navigated, as the commerce of the country is more economically accommodated by wagon transportation to the Mississippi River on the west and by the Mississippi and Tennessee Railroad on the east. From its junction with the Yazoo Pass it flows through Tunica County, when it joins the Tallahatchie. This distance is about 80 miles. There are no special natural obstructions to be noted, those that abound in the stream being the numerous snags, logs, and overhanging trees, which extend throughout its entire length, and the improvement necessary would constitute their removal. For this purpose it would be necessary to have a flatboat fitted out, such as was recommended for the Upper Big Sunflower, and to commence work at the upper limit, say, Yazoo Pass, and work down stream, cutting the leaning timber and removing the snags and logs that constitute the obstructions.

The cost of this improvement I estimate at $25,000.

TALLAHATCHIE RIVER.

The headwaters of this river are in Tippah County, from whence it flows through the counties of Union, La Fayette, Panola, joins the Coldwater river in Tunica, then, as the main stream, it flows through Tallahatchie and Leflore, and, joining the Yallabusha River, forms the Yazoo.

The upper section, before joining the Coldwater, is not considered as in any navigable condition. It is crossed by two lines of railroad—the Mississippi Central and Mississippi and Tennessee—which supply and transport all freight for the section of the country through which the stream passes. It is necessary, therefore, to consider only the main river, which, with the Coldwater, may be regarded as one stream.

The Tallahatchie is somewhat wider than the Yazoo, and has quite as good a depth of water for the usual class of boats that navigate the stream. From its junction with the Coldwater to the town of Sharkey, a distance of 60 miles, the obstructions to low-water navigation consist of snags and sunken logs, with the addition of leaning timber. From Sharkey to the junction with the Yazoo, a distance of 130 miles, the same character of obstructions exists as in the upper stretch, we may say one continual stretch of the same, though probably to not so great an extent. At a point 8 miles above the junction with the Yazoo lies the wreck of the steamer Star of the West. Part of this wreck was removed, by my direction, two seasons ago, as it blocked all navigation above that point, but it is necessary to remove the greater portion of what is still left.

Like all streams of this character, the main obstructions will be seen to be snags, logs, &c., and the improvement will consist principally in their removal. This can be done by the snagboat, when operating in the Yazoo, having her field of operations extended to the Tallahatchie.

For the removal of the wreck and other obstructions, I estimate that it will take two good seasons' work with the boat, the ordinary running expenses of which per month is $2,500, and for eight months $20,000. Two seasons' work would be $40,000.

These rivers—the Big Sunflower, Coldwater, Tallahatchie, and Yazoo—which constitute the main commercial avenues of that portion of the Yazoo basin back of the Mississippi, pass through a country of unsurpassed fertility; and if their improvements be carried out the products of the country will be greatly increased.

To show to what extent the cultivation of cotton was carried on (not

counting other products), the following table of the several near counties, taken from the census of 1860 and 1870, is given:

Names of counties.	Per census report of 1860.	Per census report of 1870.
	Bales.	*Bales.*
Bolivar	33,452	15,571
Coahoma	13,325	11,456
De Soto	40,113	24,118
Holmes	41,830	19,027
Issaquena	41,170	15,821
Panola	24,311	15,764
Sunflower	No returns.	7,028
Tallahatchie	15,894	6,760
Tunica	13,025	6,424
Washington	No returns.	35,902
Yazoo	64,075	26,047

Very respectfully, your obedient servant,

W. H. H. BENYAURD,
Captain of Engineers.

Brig. Gen. A. A. HUMPHREYS,
Chief of Engineers, U. S. A.

L 19.

EXAMINATION OF UPPER RED RIVER, LOUISIANA AND TEXAS.

UNITED STATES ENGINEER'S OFFICE,
Memphis, Tenn., January 2, 1879.

GENERAL: I have the honor to transmit the following report of the examination of Red River from the crossing of the Missouri, Kansas and Texas Railroad to the head of the raft, Louisiana, made in accordance with the river and harbor act of June, 1878.

I have divided the river into two portions—the upper part from the bridge to Fulton, and the other from Fulton to the head of the raft. The former was examined under my direction by George H. Wilson, assistant engineer, and the latter I have been over myself with the steamer Florence; and the report is made from that, and also from notes by Capt. J. S. Tennyson, who has also made several examinations of this section. The total length of the river examined, extending from the Missouri, Kansas and Texas Railroad bridge to the head of the raft, is 425 miles.

The main obstructions to the navigation of the stream consist of snags, logs, drift-piles, overhanging trees, and shoals.

1.—FROM MISSOURI, KANSAS AND TEXAS RAILROAD BRIDGE TO FULTON

The banks in the upper part of the river are much higher than those in the lower part, gradually increasing in height as we ascend. They are, however, very unstable, as the number of cut-offs along the entire length of the stream above Fulton attest. These caving banks precipitate immense quantities of timber into the stream, causing the great number of snags and like obstructions found throughout its entire length. The river brings down that great quantity of timber that annually, or at least with each high water, completely blocks up the river

above Shreveport in what is known as the raft region. The greater quantity of this material seems to come from the country above Kiametia, from both the main and the tributary streams. At a number of points along the river rocks outcrop, and in a few instances they extend entirely across the river. They are, however, no serious obstruction to the navigation of the stream.

The upper portion of the river is comparatively unsettled, except near the principal crossings; few names of localities, &c., can therefore be given, but all points are clearly indicated on the map.

The examination of the upper part was conducted by Mr. Wilson and party in an open skiff, starting in at the crossing of the Missouri, Kansas and Texas Railroad bridge, descending the river, mapping it as they progressed, taking the courses at every turn, and checking the distances or section-lines obtained from maps recently made by the State for the counties bordering on Red River. All the snags, logs, drift-piles, &c., are noted on the map presented herewith.

The rise and fall of the river at the old county bridge, about 1 mile below the Missouri, Kansas and Texas Railroad crossing, is about 36 feet. At the time the examination was made the river at this point was about 2 inches above extreme low-water.

Starting from the bridge, for the first 60 miles along the front of Grayson and Fannin Counties the navigation of the stream is exceedingly difficult, there being barely sufficient water in many places to float a skiff, and, in addition to numerous sand-bars, the channel is very tortuous and full of snags and drift. At the fifty-second mile the river made a cut-off, there being a fall at that place of about 4½ feet in 100, the river rolling over an immense log or drift pile that appears to have been there many years. This drift-pile completely obstructs all navigation of the river above that point, except at the very highest stages. From the bridge at Garret's Store, some few miles below mouth of Bois d'Arc Creek, Mr. Wilson does not deem that anything could be done toward improving the navigation of the stream. There is scarcely any water in the river, except upon the rises. These latter only occur about twice during the season and are very sudden, rising very rapidly and falling the same, giving barely sufficient time for a boat to make the trip up and down again upon the same rise. Several years ago a boat attempted to go up upon a rising river, and had to remain up one whole season before she could return. The banks, however, could be cleared of timber, and the immense drift-piles could be burned, which would tend to relieve the lower river of a portion of the annual contribution of drift. In this section of the river the settlements are very few, and scattered at that.

From Garret's Store to the mouth of Pine Creek, the extremity of Lamar County, and from thence to Kiametia, on the south side of the river, nearly opposite old Fort Towson, the river appears to be more stationary with respect to the changes taking place in the bed and banks. In this stretch, in addition to the immense drift-piles and snags, there are several bars which have upon them at low-water about 1½ feet, the river between these bars being of sufficient depth for ordinary light-draft boats. While not advisable to attempt any dredging or cutting of these bars, still, with ordinary water, boats of the above class could very easily pull over them. If the snags were pulled out and the navigation improved, Garrett's Store would be the main shipping point for Lamar County and adjacent country, as there are good roads leading to the prairies, and also into the Indian Territory. In the river along the front of Lamar County there are 311 snags required to be taken out and immense drift-piles to be removed.

Kiametia (122 miles below the Missouri, Kansas and Texas Railroad bridge) seems to be the principal crossing from Texas to the Indian Territory. Kiametia River enters from the Territory at this place, and is stated to give very good navigation for about 20 miles, but above that it becomes very difficult of navigation on account of rapids. In the river along Red River County the number of snags requiring removal is 367, besides immense drift-piles.

Bowie County begins at the one hundred and seventy-sixth mile point, and the settlements increase very rapidly, both in number and size. The portion of the river from this point to Fulton, 46 miles, is by far the worst section of the river in respect to obstructions. It is filled with snags and drift-piles, and in many places it is impossible to pass even with a skiff without cutting a way through. The river is also in places wide and more shallow. About 8 miles below Lanesport (just within the Arkansas line), there are two shoals very near each other. They are composed of gravel and hard earth. Close to the bank the depth over them is 3½ feet, but over the remainder there is scarcely 0.8 foot. These, however, can scarcely be considered a great obstruction, since it takes 3 feet on the gauge at Fulton to get by that point, which would give a very good depth over the bars and shoals in the upper part of the river.

Just above the mouth of Little River, at the wreck of the steamer Roland, the river is completely blocked or jammed with snags. It will be impossible to pass this point next season at any stage of water.

In the length of the river from Garret's Store to Fulton, a distance of 222 miles, which is the portion of the upper section considered necessary to improve, there are some 2,100 snags and 54 drift-piles.

The steamboat men have hitherto complained of the Great "White Oak" Shoals. They have now entirely disappeared, owing to the river changing its banks, and there is sufficient depth of water in the vicinity for navigation purposes.

2.—FROM FULTON TO HEAD OF RAFT.

[Distance, 125 miles.]

At Fulton the Saint Louis and Iron Mountain Railroad crosses Red River. The channel has changed here, and, instead of being through the draw-span, is now on the opposite side of the river and under the south fixed span. At or near low-water both passages of the draw-span are entirely blocked up by sand-bars. The company, however, state that it is their intention to alter their structure and put in a new bridge with all facilities for passage of steamers.

To the Head of the Raft the obstructions to navigation consist of snags, logs, and overhanging trees. To Spring Bank, a distance of 13 miles, there are a number of snags requiring removal, these being the principal obstructions. A number of leaning trees also require to be cut down.

From Spring Bank to Duke's Bend about the same number of snags exist as in the previous stretch.

At Lee's Place, Long Prairie, Dickinson's, Dooley's Bend, Upper California, Bokes, Buzzard's Towhead, Amours, and Chicanini Cut-off, a further distance of 37 miles, the river is quite full of snags, and the trees along the bank require to be felled.

At a point 28 miles below Chicanini Cut-off I placed, several yearg ago, a party to cut the timber along the banks, so as to prevent the same from sliding into the river and blocking up the raft region below. At the same time I had a number of trees girdled along both banks to within a short distance of Fulton. No work, however, was done in the river itself.

From the cut-off to Dooley's Ferry, 35 miles, and from there to the Head of the Raft, a further distance of 27 miles, there are upward of 800 snags requiring removal.

The following will give an approximate amount of work required to be done in this section of the river:

Miles.	Snags to be removed.	Trees to be cut.
13	100	1,875
50	450	2,380
35	488	1,392
27	314	1,167
125	1,352	6,814

In the upper section of the river 5,500 bales of cotton were shipped, part of this going to Fulton and part to Shreveport. This amount would be greatly increased if the people along the river had any assurance that they would be afforded increased facilities for shipment by the improvement of navigation, as the expense of hauling to the railroads, which are from 15 to 24 miles distant, and over very bad roads, hardly warrants an increase of planting. From the section below Fulton it is estimated that 9,000 bales of cotton are shipped annually. To these items should be added a corresponding amount of return freight, consisting of merchandise, supplies, farming implements, &c.

ESTIMATES.

From Missouri, Kansas and Texas Railroad Bridge to Fulton.

For this section it would be advisable to have a flatboat arranged with shears to pull snags, and to have a party to cut the timber along the banks. They could start up when the river was at a good stage and work down during the low-water season.

Flatboat and outfit for removing snags and drift	$2,500 00	
Five months in field	12,000 00	
Contingencies	2,000 00	
		$16,500 00
Clearing banks.		
One flatboat for quarters	$1,000 00	
Clearing 208 miles below Garret's Store, 60 feet wide, trees cut down and into lengths of 20 feet, $108.75 per mile	22,620 00	
Clearing 75 miles above Garret's Store	8,156 25	
		31,776 25
Below Fulton, 125 miles.		
Expense of craneboat now in my charge, five months, at $1,100 per month	$5,500 00	
Outfit, &c	800 00	
Contingencies	500 00	
		6,800 00
Expenses of snagboat, five months, at $2,100 per month	$10,500 00	
Rigging, rope, &c	1,100 00	
Contingencies	1,160 00	
		12,760 00
Total		67,836 25

Very respectfully, your obedient servant,

W. H. H. BENYAURD,
Captain of Engineers.

Brig. Gen. A. A. HUMPHREYS,
Chief of Engineers, U. S. A.

L 20.

EXAMINATION OF LITTLE RIVER, ARKANSAS.

UNITED STATES ENGINEER OFFICE,
Memphis, Tenn., January 2, 1879.

GENERAL: I have the honor to transmit the following report of the examination of Little River, Arkansas, made in accordance with the provision of the river and harbor bill of June 18, 1878.

Little River is formed by the junction of two small streams, the Mountain Fork and Grove's Fork, and flows in a general southeastern direction and enters Red River near Fulton. It is a clear stream the entire distance to its mouth, and remains about the same width, 191 feet throughout, except where the small islands divide it. The distance from the State line to the mouth is 117 miles. The banks are low at various points, with valuable lands subject to overflow. During extreme high-water boats ascend to Hawkin's Landing, about 20 miles above the State line. A rise 20 feet at the mouth of the river backs up to Anderson. The river is one succession of pools and shoals. The latter are composed almost entirely of gravel, the depth over them varying from 0.25 foot to 1.4 feet.

From the State line to Anderson's Ferry, a distance of 36 miles, there are 11 shoals, the depth varying from 0.25 foot to 0.6 foot in the channel over them, the depth between them being sufficiently good for ordinary boats. From Anderson's Ferry to Hood's Ferry, 21 miles, there are 12 more shoals, having from 3 to 8 inches of water over them in the channel, and very rapid. This landing (Hood's) is the main shipping point on the river. It is, however, only retained for that purpose, it having been abandoned by settlers on account of sickness.

Five miles below Hood's Landing we reach White Cliff, a shipping point for the back country some 6 or 8 miles distant. This cliff is a white limestone formation about 150 feet high. At one time lime of a fair quality was made here, but the place was abandoned on account of sickness.

In the next stretch of 5 miles (or to the 43-mile point above the mouth) there is but one bad shoal, with only 0.8 foot in the channel. From the 43-mile point to the 36-mile point the river is but one succession of shoal places, with depth of water from 0.8 to 1.2 feet. At the 33-mile point another bad shoal occurs. This is about 800 feet long, with a depth of 1 foot through the channel.

From this point to the mouth there is but one more shoal place, known as Granite Bar, 24 miles above the junction with Red River. This shoal is about 1,000 feet long, with a depth of 1.4 feet upon it. It gives good water for 9 miles, averaging 6 to 10 feet depth. The bar is composed of large gravel and earth and extends entirely across the river, and appears up the banks on both sides as if it were regular strata.

From Granite Bar to the mouth the navigation is very good, the water averaging from 12 to 15 feet in depth.

There is but little water in the river at its lowest stage. At the time the examination was made the water at Anderson's Ferry was about 3 inches above extreme low-water. Considerable difficulty was experienced by the party in getting their skiff (which drew 4 inches, light) over the shoal places, and in many places had to be dragged. The total distance in ascending and descending the river, in which that had to be done, was fully 50 miles.

The obstructions in the stream are the shoals and leaning timber.

Nothing can be done to the shoals but attempting slack-water navigation, which, considering the amount of water in the river and the resources of the country, would not be justified in attempting. Since the shoals themselves act as dams for the stretches of river above them, the navigation would only be injured by attempting to cut through them. The only thing would be to cut the timber along the banks and to clear out the ordinary obstructions in the river, such as snags, logs, &c. This I estimate will take the sum of $12,000.

Last season there were shipped from the river 3,200 bales of cotton, none of which was raised in the bottom-land, but all came from the hills back. There is but one settlement on the river, that a small place at Crooks, 40 miles above the mouth of the river. Every place that has been started on the river has been abandoned on account of sickness. People who did not die moved back to the hills on each side, and haul their crops 40 to 50 miles to the different railroads.

Taken altogether, I cannot state to what amount the improvement of the stream would extend the commerce of the adjacent country. The prospect for settling along the banks of the stream is not a very inviting one. Back from the river on the south side the lands are said to be very good; on the north side they are hilly and very poor.

Twelve miles east of the State line in Sevier County, Arkansas, there are a number of lead mines. These are now being worked, and the products hauled during low-water to Fulton, and are shipped thence by rail. Any improvement of the river would greatly facilitate the shipment of these products, and tend to the greater development of these mines.

Very respectfully, your obedient servant,

W. H. H. BENYAURD,
Captain of Engineers.

Brig. Gen. A. A. HUMPHREYS,
Chief of Engineers, U. S. A.

L 21.

EXAMINATION OF TONE'S BAYOU, BAYOUS PIERRE AND WINSEY, AND LAKES BAYOU PIERRE AND CANNASANIER, LOUISIANA.

UNITED STATES ENGINEER OFFICE,
Memphis, Tenn., January 22, 1879.

GENERAL: I have the honor to transmit herewith a report upon the examination of Tone's Bayou, Bayou Pierre, Lakes Cannasanier and Bayou Pierre, and Bayou Winsey, made under my direction by Mr. George R. Wilson, assistant engineer.

The improvement of the above bayou and lake route, it is presumed, is intended to supersede that of Red River between the limits indicated, viz, the head of Tone's Bayou and the outlet of Bayou Pierre through the Winsey, just above Grand Ecore.

The upper part of Bayou Pierre, that is, the section above the junction with Tone's Bayou, is not considered, as the great expense and the unreliability of making that a navigable channel leave it entirely out of the question.

The contemplated route enters from Red River through Tone's Bayou. This bayou is about 28 miles below Shreveport, and is in length about 2½ miles, when it joins Bayou Pierre proper. It has of late years been a source of great injury to the navigation of Red River below its head. From a small and apparently insignificant stream, it has enlarged to such an extent that it finally carried off upwards of four-fifths of the water of