

3. To finish removing the dangerous logs on the Tombigbee below Jackson, &c.

4. To continue removing logs from the Warrior River.

It is proposed to apply the appropriation asked for, for the fiscal year ending June 30, 1881, to—

1. Blasting out McGrew's, Turner's, and Pearson's Shoals on the Lower Tombigbee.

2. To continuing the improvement between Demopolis and Columbus, by removal of snags, overhanging timber, and wing-dams.

3. To continue the improvement of the Warrior River by removal of snags and overhanging trees and construction of wing-dams.

The plan adopted for this work is given in the general report of the Chief of Engineers for 1875.

The original estimated cost of this work is.....	\$172,603 00
The whole amount appropriated since the adoption of the present project.....	88,000 00
The amount expended thereon.....	57,770 52
The amount, exclusive of former appropriations, required for the entire completion of the work:	
For the Warrior River.....	80,000 00
For the Tombigbee River.....	170,000 00
Total.....	250,000 00

The reason for the excess of cost over the original estimate is the new work, now proposed for the first time, on the portion of the Tombigbee River, between Demopolis and Columbus. The plan proposed is to obtain a navigable channel of 3 feet depth at mean low-water, between the points mentioned, by snagging, cutting overhanging timber, wing-dams, shore protection, blasting, and scraping.

It was formerly reported as impracticable, but is now believed to be feasible, and the estimate of cost is based upon information and upon the assumption of a general similarity between the work needed on the Upper Tombigbee and that estimated for on the Warrior from surveys.

The work, when completed, cannot be considered as strictly permanent. The winter's floods will every year bring down drift that will sometimes lodge and form obstructions. These should be removed each summer; and cases will occur where works will be damaged and need repairs.

An annual appropriation of \$10,000 will, I think, be ample to maintain the works in good condition after completion.

There is considerable way-business done on these rivers, of which no records are kept. Aberdeen, Columbus, Tuscaloosa, and Demopolis are points that do more or less local trade upon these rivers, but the value of this trade cannot be ascertained.

The thorough business on these rivers during the past year, according to the Mobile Cotton Exchange, was:

88,000 bales of cotton, at \$50.....	\$4,400,000
Return freights, at 80 per cent of above.....	3,520,000
Total.....	7,920,000

These works are situated in the collection-district of Mobile, and Mobile is the port of entry.

The amount of revenue collected at Mobile during the past fiscal year was \$40,816 10. The respective amounts that could be profitably expended during the next fiscal year are estimated as follows:

For the Black Warrior River, Alabama.....	\$80,000
For the Tombigbee River, Alabama and Mississippi.....	80,000

It is advisable that the above appropriations should be made separately.

Money statement.

July 1, 1878, amount available.....	\$29,144 80
Amount appropriated by act approved March 3, 1879.....	20,000 00
July 1, 1879, amount expended during fiscal year.....	\$49,144 80
July 1, 1879, amount available.....	18,915 32
July 1, 1879, amount available.....	30,229 48
Amount (estimated) required for completion of existing project.....	250,000 00
Amount that can be profitably expended in fiscal year ending June 30, 1881.....	160,000 00

J 10.

IMPROVEMENT OF TOMBIGBEE RIVER, ABOVE COLUMBUS, MISSISSIPPI.

The survey of the Tombigbee River between Fulton and Columbus, Miss., was completed in 1873, under direction of Maj. W. McFarland, Corps of Engineers. In his report (see Report of Chief of Engineers, 1873, page 548,) he recommends the improvement of the river for high-water navigation by the removal of snags, logs, overhanging trees, &c., and estimates the cost at \$35,000. The amount of \$10,000 was appropriated by act of Congress approved March 3, 1873, for the improvement of the Tombigbee River, of which the sum of \$4,667.05 was expended above Columbus; the balance was used for the lower part of the river.

By act of Congress approved June 18, 1878, an appropriation of \$12,000 was made for this portion of the river, and the work assigned to me. In the early part of September necessary preparations were made for the speedy prosecution of the work. A light-draught flatboat for the transportation of tools and provisions, with quarters for superintendent, was built, and work commenced at Aberdeen, Miss., on September 20, 1878, with a force of colored laborers, who were furnished with tents for quarters, which could be moved down the river as the work advanced.

Operations were carried on steadily until the latter part of November, when, on reaching Tatum's Landing, 34 miles below Aberdeen, work had to be suspended on account of heavy rains and corresponding rise in the river; and after safely storing all the public property the force was discharged. It was confidently expected that the improvement would be carried as far as Columbus before the close of operations, but the unusually early rise in the river prevented the completion of the work contemplated.

About the middle of May, 1879, the river commenced falling rapidly, and preparations were at once made for the resumption of operations. On the 26th of May work was recommenced at Tatum's Landing, and continued with only slight interruption, by rain, to the close of the year, when Waverly, about 11 miles north of Columbus, was reached. Between this point and Aberdeen the river was cleared of all overhanging trees, drift-logs, and snags down to low-water mark, giving a clear channel for high-water navigation.

By act of Congress approved March 3, 1879, the sum of \$10,000 was appropriated for this improvement, and it is proposed to apply this amount—

1. To the completion of a high-water channel from Columbus to Fulton, Miss.

2. To improve the shoals for low-water navigation by wing-dams and jetties from Columbus, Miss., north as far as the appropriation will permit.

It is expected that during the present working season the high-water channel between Fulton and Columbus will be completed, which will enable the river steamers to make regular trips for at least five months of the year.

This work is situated in the collection district of Mobile, and Mobile is the port of entry.

No reliable information could be obtained as to amount of trade on this section of Tombigbee River for the past year.

From Aberdeen alone 16,830 bales of cotton were shipped, and it is estimated by well-informed merchants that 40,000 bales of cotton, which would have to be hauled from 20 to 30 miles to the nearest railroad station, will be brought to market by the river as soon as the improvement is far enough advanced to insure high-water navigation.

The plan adopted is detailed in annual report for 1873.

The original estimated cost of the work as now being carried on.....	\$35,000 00
The whole amount appropriated since the adoption of the present project..	22,000 00
The amount expended thereon.....	2,851 05

The work will not be permanently completed, but will require a yearly appropriation of about \$2,000 to maintain the work in the condition contemplated in the plan of improvement adopted.

Money statement.

July 1, 1878, amount available.....	\$12,000 00
Amount appropriated by act approved March 3, 1879.....	10,000 00
	<u>\$22,000 00</u>
July 1, 1879, amount expended during fiscal year.....	2,851 05
July 1, 1878, amount available.....	19,148 95
	<u>19,148 95</u>
Amount (estimated) required for completion of existing project.....	8,332 95
Amount that can be profitably expended in fiscal year ending June 30, 1881.	8,332 95

J II.

IMPROVEMENT OF PASCAGOULA RIVER, MISSISSIPPI.

Under the appropriation of June 18, 1878, an examination was made of the East Pascagoula River, from its mouth to its head. The report is contained in House Ex. Doc. No. 95, Forty-fifth Congress, third session. Nothing further has been done under this appropriation, nor under that of March 3, 1879, owing to the failure to obtain a proper guarantee against any interference with the work of improvement under the charter granted by the State of Mississippi to A. A. Green, which gave him an exclusive right to construct a canal or channel through the shoal at the mouth of the East Pascagoula River. As soon as this matter is settled it is proposed to expend the appropriations already made in dredging a channel 200 feet wide and 7 feet deep through the shoal referred to, following the natural channel, and to carry out the plan of improvement of the remainder of the river as recommended in the report already made of the examination.

The estimated cost of the work is:

For dredging, 69,600 cubic yards, at 50 cents.....	\$34,800
For removing snags and overhanging trees, including outfit.....	14,000
Engineering and contingencies.....	5,000
	<u>53,800</u>

The work will not be permanent, but will probably require a further expenditure in five or six years, but the amount cannot be stated with any precision.

The work is situated in the collection district of Shieldsborough, Miss. Pascagoula is the nearest port of entry, and is situated at the mouth of the river. The amount of commerce to be benefited is indicated by the custom-house record for the year 1876-'77, as follows:

Exportation.			Value.	
Number of vessels.	Tonnage.	Lumber.	Lumber.	Total.
171	43,850	22,126,893	\$221,268 93	\$221,268 93

Money statement.

July 1, 1878, amount available.....	\$10,000 00
Amount appropriated by act approved March 3, 1879.....	14,000 00
	<u>\$24,000 00</u>
July 1, 1879, amount expended during fiscal year.....	1,506 30
July 1, 1879, amount available.....	22,493 70
	<u>22,493 70</u>
Amount (estimated) required for completion of existing project.....	31,306 30
Amount that can be profitably expended in fiscal year ending June 30, 1881.	31,000 00

EXAMINATION OF PASCAGOULA RIVER, MISSISSIPPI.

UNITED STATES ENGINEER OFFICE,
Mobile, Ala., February 3, 1879.

GENERAL: I have the honor to submit the following report on the examination of the Pascagoula River, Mississippi, provided for by act of Congress approved June 18, 1878, and assigned to me by letter dated July 8, 1878.

The river was examined carefully from its head, the junction of the Leaf and Chickasaha, to its mouth, or rather to the outlet of the East Pascagoula, the principal one of the streams into which it divides, into Mississippi Sound, a distance of 80½ miles, computed.

The river was found to be a fine navigable stream its entire length, with abundant depth and width for light-draught steamers.

The channel was very uniform, being almost entirely free from bars and islands, and the banks but very little subject to caving.

The obstructions to such navigation as would seem to be required are snags and overhanging trees and the bar at the mouth of the river, a survey and report on which was made in 1873, and is contained in the Annual Report of the Chief of Engineers of 1874.

The removal of the former is an easy matter, and one the cost of which can be estimated by examination, and therefore no survey was made.

The latter has already been surveyed and mapped, and no material changes have since taken place.

A change has been suggested in the plan originally proposed for the improvement at the mouth, which I think it would be well to adopt.

It consists in changing the direction and location of the proposed channel slightly, and using one jetty instead of two. The change in direction I consider advisable, for the reasons given in the accompanying report of Mr. Powhatan Robinson, and the use of one jetty is approved, for the reason that, should it be found not to accomplish what was claimed for it, the other jetty could be constructed, which would be a return to the plan originally proposed, with only the changes in location and direction. If it should be successful, of course the cost would be very much reduced.

A considerable increase in the estimate of the cost of the jetty was computed by the results obtained, by actual experience, in the construction of the proposed gabionade at Galveston, by the same officer, Lieutenant Quinn, who proposed it at this point.

The estimated cost of the whole work is as follows:

Removing snags and overhanging trees in the river	\$5,500 00
Improving bar at the mouth of the river jetty, 4,700 feet, at \$4.30 per linear foot	20,210 00
Twenty-four wing-dams, 32 feet long, if found necessary	3,302 40
Mat protection, 4,700 feet, at 40 cents per foot	1,880 00
Dredging of channel, 100 feet wide by 7½ feet deep, 34,800 cubic yards, at 50 cents	17,400 00
Outfit	9,000 00
	57,292 40

This is all I consider needed for immediate relief; a still further improvement is, perhaps, desirable between the mouth of the river and a point 7 miles above, but no estimate can be prepared for it until after a further examination is made. This can be readily done, should the work above suggested be undertaken, at small cost, to be borne by the appropriation while the work is going on, and would cause no loss of time in the accomplishment of the full improvement.

The report of Mr. Powhatan Robinson accompanies this, together with a paper containing his suggestions concerning the improvement at the mouth. If the improvement is considered of sufficient importance to be undertaken, I would recommend the appropriation of \$48,800 at once.

It is understood that the State of Mississippi has secured a release from the owners of the Noyes Canal of all claims referred to in Major Howell's report of October 23, 1873.

No commercial statistics of a reliable character could be obtained along the river; but lumber, rosin, and turpentine shipments are the interests to be benefited by the improvement, the resources of the adjacent country in which are very great.

The statistics of Pascagoula, the nearest and natural port, are as follows:

From July 1, 1876, to June 30, 1877.

Exportation.				Value.	
Number of vessels.	Tonnage.	Shingles.	Lumber.	Lumber.	Total.
171	43,850	22,126,893	\$221,268 93	\$221,268 93

"The above is taken from the custom-house records, and shows only such vessels as cleared there, which does not include the New Orleans lumber trade, which would increase the above nearly, if not fully, 25 per cent."

Amount appropriated by act of Congress approved June 18, 1878, for this improvement	\$10,000 00
Amount expended for surveys	1,504 80
Amount now available	8,495 20
Estimated cost of the project as recommended	57,292 40
Amount asked for fiscal year ending June 30, 1880	48,800 00

Capt. C. W. Howell, United States Engineers, in his report to the Chief of Engineers on the survey of Pascagoula River, dated New Orleans, La., October 23, 1873, deducts from his estimate an appropriation of \$25,000 made by the State of Mississippi, which, however, as I am informed, has been annulled by subsequent legislation, and can no longer be taken into consideration.

Respectfully submitted.

A. N. DAMRELL,
Captain Engineers.

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

REPORTS OF MR. POWHATAN ROBINSON, ASSISTANT ENGINEER.

1.

CAMP No. 13, AT "DURELL'S,"
NEAR MOUTH OF PASCAGOULA RIVER, October 29, 1878.

MAJOR: I will now proceed to make a report of my examination of the Pascagoula River.

The Pascagoula is formed by the junction of the Chickasaha and Leaf Rivers. Leaf River appears to be about two-thirds the size of the Chickasaha.

From the head of the Pascagoula to Dead Lake, about 47 miles, I estimate the cost of improvement at \$70 per mile; or total cost, say, \$3,300. Dead Lake begins at the mouth of Black Creek; and the river here develops into quite majestic proportions, from 250 to 300 feet in width. From this point down to the fork of East and West Pascagoula there is but little visible obstructions to navigation; only a few snags. But I am told that there are hidden snags, which are dangerous and should be removed.

In suggesting different depths to which I have advised that obstructions should be removed, I do not wish to be understood as intending to determine the measure or standard of improvement to be adopted between the points mentioned, but only as referring to a rule which I think should be adopted in the plan of improvement, to wit: That obstructions should not be removed to a greater depth below low-water surface than the least depth of channel, at low-water, below (as the stream runs) the work in progress. As the work progresses *up-stream* there will be ample time and opportunity to get full information on these points. The Pascagoula is naturally a fine navigable river throughout its entire length.

I do not think a less depth than 6 feet can be found anywhere in mid-channel at lowest water, unless, indeed, the normal condition has been disturbed by *cut-offs*, of the ill effects of which Bilbo's, Ferrell's, and Picket's cut-offs, on the Upper Pascagoula (above Dead Lake), are striking examples.

The regimen of these rivers (the Chickasaha and Pascagoula) is, I think, remarkably uniform when undisturbed by cut-offs.

There are no bars extending across the bed and making *shallow rapids* alternately with deep and comparatively stagnant pools; on the contrary, I found a well-defined channel, appearing to extend throughout the entire distance of my reconnaissance.

Also, there are no islands save one small one. This absence of islands and comparative freedom from sand-bars is very noteworthy.

The banks are but little subject to caving. The cut-offs are generally due either to the washing away of the surface by strong cross-currents at high water, or to "ditches"

dug by amateur hydraulic engineers for the improvement of navigation. In the first case they are locally called "washes," in the second, "ditches."

About 65 miles below its head the Pascagoula divides into two branches, of which the east is narrower and deeper than the west. They are about 110 and 130 feet in width respectively at their heads, and flow in almost opposite directions.

The chief obstacle to the navigation of the Pascagoula is to be found at its mouth, and its navigable capacity will be limited by the measure of improvement here bestowed.

The plans and sections of former surveys, with which you have supplied me, appear to be amply sufficient, so far as they go, but accurate information in regard to the fluvial and littoral currents must be obtained before the work can be judiciously located. When the location is effected the channel should be immediately opened to navigation by dredge-boats.

In my whole engineering experience I have never had to encounter so much severe sickness in my parties.

This and our yellow-fever environment and other causes of delay have extended the time occupied in the examination far beyond what would otherwise have been required to do the work.

It will be economical as to time, labor, and money, and conducive to health, to furnish accommodations for the entire laboring force on the snag-boat, or if necessary on an accompanying barge.

ESTIMATE OF COST OF REMOVING TREES, SNAGS, ETC.

From head of River to "Dead Lake," 47 miles	\$3,300
From Dead Lake to mouth of river, 33½ miles	1,700
Plant, including snag-boat, blocks and tackle, and all necessary implements and material	9,000
	<hr/>
	14,000

What I have said in regard to commerce and products in my reports on the Chickasaha will apply as well to the Pascagoula.

Indeed, they are one river under two names. But the Pascagoula is utilized for navigation to some extent. Small boats run up to "Dead Lake," and occasionally some distance above.

I am encamped at "Durell's," three quarters of a mile below Scranton, and a little above the mouth of the river, which is 160½ miles from Camp No. 1.

I am, major, with great respect, your obedient servant,

POWHATAN ROBINSON.

Maj. A. N. DAMRELL,
Capt. Corps of Engineers, U. S. A.

2.

MOBILE, ALA., November 19, 1878.

MAJOR: I beg leave to submit to you the following suggestions and outlines of a project for the improvement of the mouth of the Pascagoula River, which I think will prove to be the most efficient and cheapest (so far as these elements can be combined) that can be adopted.

From the head of the "Bayou La Butte" the river flows in a direction south by east for nearly three-quarters of a mile, when it takes a slight bend to south by west, which causes the current to press upon the left or east bank. The left bank turns in a pretty regular curve then from south by west to a southeasterly course.

About "Yazoo Gut" the current leaves the left bank and flows across toward the right bank, which it strikes some little distance above Light-House Point, and clings to it until it passes the point, round which it bends quite abruptly and flows with a rapid current toward the southwest, as indicated by the blue arrows on the tracing with which you furnished me, and is wearing away Light-House Point.

The current persists in this southwest course for some distance down the canal, in a direction north and west of Round Island. Then it bends gradually toward the south until at the end of the canal we find it directed toward the eastern extremity of the island.

This would seem to indicate, first, that Mr. Grant was correct in his statement to you that a littoral current prevailed in a westerly direction along that portion of the coast; and secondly, that its force is very much reduced at a distance of less than a mile from the shore.

When a channel is opened we must rely upon the river current to keep it scoured out, and to do this effectively I think nothing more will be needed but to extend the

western shore to deep water, by building a jetty in the proper direction and about 4,700 feet in length.

The westerly littoral current will press and hold the river current to its channel next to the jetty, and no other work whatever will be required, in my opinion, to accomplish our object. Indeed, several plans of auxiliary jetties have attracted my attention, but on due consideration they appeared to me to present more objectionable than favorable features, and, in short, that the work would be better without them than with them.

I think that the canal is favorably located for our purpose. I would therefore advise that its western boundary be adopted as the face of our jetty, rounding off the abrupt angles with proper curves. I would certainly *not* advise that the work should be directed eastward of the position occupied by the canal. It is desirable that the river current after passing the end of the jetty should sweep toward the west and deposit its sediment at the rear of the work and northward of Round Island; therefore we should divert the current as little as possible from its westward course. Moreover, if we turn it toward the southeast, the heavy storms from that quarter would tend to cause a deposit of the suspended matter about the end of the work, and perhaps form a bar there, while this change in direction would only save some 200 or 300 yards of distance to vessels approaching from the southeast. Another consideration that favors the location advised is, that we cannot leave the line of the canal without very seriously increasing the amount of excavation required to open a channel.

The canal was originally excavated to a width not exceeding 40 feet. It may now be re-excavated to a depth of 7 feet by the removal of about 12,000 yards of material. This width is insufficient, but may be increased to a width limited by the amount of funds on hand applicable to the purpose.

This work should be next in order to the location of the jetty, in order to give at once some additional facilities to commerce.

The river at present deposits all or *very nearly* all of its sediment to the west of Light-House Point. The matter deposited to the east of its mouth comes from a different source. When storms prevail the waves drive the sand along the shore past Jupiter Point, and some distance up into Yazou Bayou, where it is deposited in large banks. When the waters subside these sand banks are gradually worn off and carried away by the current of the bayou and deposited to the southwest and southeast of Jupiter Point.

I am indebted to Mr. J. L. Grant, a gentleman of intelligence and remarkable accuracy, for this information. He says he has long observed the process, and though it is *very slow*, it is persistent.

A more elaborate examination should be made of the river from Scranton to a point a little above Moss Point, at the mouth of Dog River.

About three-quarters of a mile below Moss Point we come to "Crooked Bayou," and one and three-quarters miles below this to "Bayou Chemise," both of them connecting the east with the west branch of the Pascagoula. Through these the current flows *into* the East Pascagoula at flood tide, and *out* of it again on the ebb. This characterizes them as collateral branches of this river. The same may be said of Bayou La Butte, immediately below the railway bridge.

If these bayous were closed, it would increase the effect of the ebb tide in scouring out the dredged channel. And this suggests an additional reason for not constructing any work at the mouth except the jetty that I have recommended.

If works of an obstructive character should be placed there, it will force a greater quantity of water through the collaterals at a higher velocity.

Bayou Chemise is much used as a channel of communication, and is too convenient and valuable as such to admit of its being closed.

It appears to me that the policy of spending money on the improvement of rivers for the benefit of commerce is purely a financial question, and the propriety of granting or withholding the appropriation desired should depend on its merits as an investment; that is to say, whether or not it will pay.

I will here give an extract from a letter of Mr. H. F. Krebs, of the firm of H. Krebs & Son, in Scranton, and also some commercial statistics furnished me through the courtesy of that gentleman:

[Extract.]

"Bercier & Desmet claim to have paid upward of \$5,000 in one year for demurrage caused by detention of their lighters at the bar. Denny & Co., who, besides being large shippers, are part owners of several coasting-vessels which, during the winter months, lose from 3 to 5 days almost every trip by low-water at the bar, and coasting-vessels owned by other parties here, to the amount of 15 or 20, are in the same category, and their losses, all told, for about 6 months, are fully \$5,000. It is hard to get a proper estimate from the parties themselves, for no record is kept of these things. It is now that the evil effects of low-water can be seen, and I can safely say from what information I can get, and what I know from my own observations, that the

deepening of the channel would be a saving to the commerce of this place of at least \$15,000 a year, besides increasing the facilities of a large class of vessels loading at the mills, thereby increasing the commerce of the place 50 per cent. in a very short time.

Commercial statistics.

	Number of vessels.	Tonnage.	Exportation.		Value.		
			Shingles.	Lumber.	Shingles.	Lumber.	Total.
From July 1, 1874, to June 30, 1875	182	45,742	2,062,500	31,819,517	\$6,187 50	\$318,195 17	\$324,382 67
From July 1, 1875, to June 30, 1876	156	46,623	1,712,380	30,342,481	5,137 14	303,424 81	308,561 95
From July 1, 1876, to June 30, 1877	171	43,850	22,126,893	221,268 93	221,268 93
	509	136,215	3,774,880	84,288,891	11,324 64	842,888 91	854,213 55

"The above is taken from the custom-house records, and shows only such vessels as cleared there, which does not include the New Orleans lumber trade, which would increase the above nearly, if not fully, 25 per cent."

Add 25 per cent. for New Orleans trade not included above. The value is given by myself and rated low.

It appears that the annual saving which would result from the opening of the river would be \$15,000 to Scranton alone; to this we may safely add \$10,000 for Moss Point, for I am informed that one firm alone, at the latter place, paid as much as \$6,000 for demurrage in one year. Thus we have a loss on the present business of these two places of \$25,000 per annum. If these merchants could give \$250,000 for the removal of obstacles to navigation, the investment would pay them 10 per cent. per annum, provided that their firms were perpetual, and that they had the exclusive privilege of the commerce of the river. But this cannot and should not be.

It rests with the general government, having the control and protection of commerce in their hands, to furnish the necessary means for the removal of this very heavy burden.

I can devise no plan which seems so well adapted to the condition of the case as the gabion method proposed by Lieutenant Quinn, and I therefore recommend its adoption. I would also advise that gabions of the oblong form be used, with a horizontal section of 8 feet by 4 feet, which will be amply sufficient to resist the action of wind and waves at this point.

Lieutenant Quinn's *a priori* estimate of the cost of the work seems to be too low when tested by his experience in construction at Galveston.

I have made proper allowance for this, and herewith submit what I conceive to be a very liberal estimate of the cost of the work proposed.

ESTIMATE.

Jetty, 4,700 feet, at \$4.30 per linear foot	\$20,210 00
Wing-dams, 24-32 feet long (if they be necessary), at \$4.30 per linear foot ..	3,302 40
Mat protection, 4,700 feet, at 40 cents per foot	1,880 00
Dredging of channel, 100 feet wide by 7½ feet deep, 34,800 cubic yards, at 50 cents	17,400 00
	42,792 40
Lieutenant Quinn's estimate of necessary outfit	6,500 00
	49,292 40
Add	707 60
	50,000 00

This is but a small expenditure when judged by the great commercial benefits that must result from the construction of the work.

I would therefore respectfully recommend that so much of this amount as can be economically and judiciously expended during the coming year be at once appropriated for the prosecution of the improvement.

I am, major, with great respect, your obedient servant,

Maj. A. N. DAMRELL,
Captain Corps of Engineers, U. S. A.

POWHATAN ROBINSON.

J 12.

EXAMINATION OF CHICKASAW RIVER, MISSISSIPPI.

UNITED STATES ENGINEER OFFICE,
Mobile, Ala., February 6, 1879.

SIR: I have the honor to report that the examination of the Chickasaw River, Mississippi, provided for by the act of Congress approved June 18, 1878, and assigned to me by letter dated July 8, 1878, has been completed.

The examination was carried from Shubuta, on the Mobile and Ohio Railroad, in Clark County, Mississippi, to its mouth at the head of the Pascagoula River, a distance of about 130 miles, as estimated by the assistant in immediate charge.

Shubuta was assumed as the upper terminus, because a little below that point there is a railroad bridge belonging to the Mobile and Ohio Railroad, crossing the river without a draw, and is therefore impassable as it stands.

The river was found to be, throughout the whole length examined, unusually susceptible of improvement, being free from shoals, the only obstruction being snags, stumps, and overhanging trees.

The upper section of the river, however, about 50 miles from Shubuta to Warren's Mill, 1½ miles above the mouth of the Buckatunna, can only be improved at a reasonable cost, for navigation, when the water is above the ordinary stage of low-water, the channel being only about 60 feet wide, although nowhere less than 2 feet deep.

The lower section, from Warren's Mill to the mouth, about 80 miles, can be improved so as to give a low-water channel of ample width and depth for the ordinary light-draught river steamers.

The estimated cost of improving this river is as follows:

Upper section, 50 miles, at \$110 per mile	\$5,500
Lower section, 80 miles, at \$75 per mile	6,000
	11,500

No allowance is made for outfit, as that purchased for use on the Pascagoula River could be afterwards used for this river.

A mere examination was deemed sufficient for this river, as it was found nothing was needed for the improvement but the removal of snags, stumps, and overhanging trees, the cost of removal of which could be easily estimated by a person of good judgment, accustomed to such work, by mere observation, and therefore no instrumental work was done and no maps prepared.

The progress of the work was impeded very much by the local quarantine against yellow fever, and by the unusual amount of sickness among the members of the party in the field.

The detailed report of Mr. Powhatan Robinson, who was in immediate charge of the examination, is inclosed herewith for more complete information. He reports he was unable to obtain any reliable commercial statistics along the river. He reports the country sparsely settled, but fertile; that the principal interests to be benefited are the shipping of lumber, resin, and turpentine, of all of which there are immense supplies.

Pascagoula is the nearest port, and is the natural port for the commerce of this river, the commercial statistics of which, for the fiscal year 1877, are as follows:

One hundred and seventy-one vessels cleared, and lumber exported to the value of \$221,268.93.