

damaged, was repaired by replacing 216 feet of sheet piling, and a brush bulkhead 40 feet long was built at its upper end to connect with the Alabama shore.

A break of 100 linear feet in the shore protection at Woolfolk's Bar was repaired, and work was commenced on Upatoir Bar. At the close of the year about 440 feet of brush wing-dams on the Georgia side, and about 200 feet of brush dams on the Alabama side, had been completed.

A blasting barge with derrick and quarters for workmen, a dumping scow, and a magazine-boat were also built.

It is proposed to apply the funds available for expenditure during the fiscal year, as far as they will reach, to the improvement of the following gravel bars: Jennie's Island, Abercrombie's, Shell Creek, Culpepper Island, and Francis; and to employ the blasting party on the following rock shoals: Uchee, Betton's Rocks, Cody's Rocks, Snake Shoals, Averett's, Baltimore Oak-log, Roanoke Island, and Conackee; also to remove snags wherever necessary.

Additional appropriation is required to keep the channel clear of logs; to complete the improvements above enumerated, and to continue the work of scouring out the gravel bars, and blasting navigable chutes through the rock shoals, wherever most needed.

The amount estimated for the entire completion of these improvements is \$105,000.

Since the improvements were first commenced in 1874 the annual expenditures have been about \$5,000 for repairs and to keep the channel clear of snags. This work must be done every year.

It is estimated that an annual expenditure of \$5,000 will be necessary for an indefinite period, to maintain the river in good navigable condition.

July 1, 1878, amount available.....	\$19,958 76	
Amount appropriated by act approved March 3, 1879 .....	15,000 00	
		\$34,958 76
July 1, 1879, amount expended during fiscal year .....	7,503 94	
July 1, 1879, amount available.....	27,454 82	

Amount (estimated) required for completion of existing project.....	105,000 00
Amount that can be profitably expended in fiscal year ending June 30, 1881..	50,000 00

(See Appendix J 4.)

5. *Improvement of Flint River, Georgia.*—The improvements of the river at Lambert's Island, Broad Axe, Bryant's Rocks, Cross Chute, and Red Bluff were completed.

Arnett's bridge was removed, and a new hull was built for the blasting barge.

It is proposed to apply the funds available for expenditure during the fiscal year in completing the channel from Fodderstack to Bainbridge.

The boats will then start at Fodderstack and work as far towards Newton as the funds will allow.

The estimate for the next fiscal year is to complete the work above mentioned, and to continue the improvements above Newton, and on as far towards Albany as the means will permit.

July 1, 1878, amount available.....	\$11,958 76	
Amount appropriated by act approved March 3, 1879.....	7,000 00	
		\$18,958 76
July 1, 1879, amount expended during the fiscal year.....	8,088 27	
July 1, 1879, amount available.....	10,870 49	

Amount (estimated) required for completion of existing project.....	105,000 00
Amount that can be profitably expended in fiscal year ending June 30, 1881..	50,000 00

(See Appendix J 5.)

6. *Improvement of Apalachicola River, Florida.*—During the fiscal year snags were removed at different points along the river, and a raft of drift timber from the upper end of Moccasin Slough, and another one from the river at Styx Island.

A survey was made of the mouth of the river. Chipola Cut-off was improved by the removal of snags and overhanging timber.

It is proposed to apply the funds available for expenditure in opening a canal or cut-off across the peninsula at the head of Moccasin Slough, and removing the point of land on the right bank at Styx Island.

The estimate submitted for the next fiscal year is for the completion of these works and to remove snags wherever necessary. It may be found necessary to improve Bluntstown Bar by a system of wing-dams.

The river bar at Apalachicola could be beneficially deepened.

The amount estimated for the entire completion of the improvements, exclusive of the river bar, is \$47,000.

An annual expenditure of \$2,000 is deemed sufficient to keep the improvements in repair and channel free from snags.

July 1, 1878, amount available.....	\$8,702 58	
Amount appropriated by act approved March 3, 1879 .....	5,000 00	
		\$13,702 58
July 1, 1879, amount expended during fiscal year .....	4,113 22	
July 1, 1879, amount available.....	9,589 36	

Amount (estimated) required for completion of existing project.....	47,000 00
Amount that can be profitably expended in fiscal year ending June 30, 1881..	25,000 00

(See Appendix J 6.)

7. *Improvement of Choctawhatchee River, Alabama and Florida.*—No appropriation having been made for the last fiscal year, no work was done other than what was necessary to guard and preserve the public property appertaining thereto.

It is proposed to apply the appropriation of March 3, 1879, to the removal of the steamboat wrecks, about 30 and 50 miles, respectively, below Geneva; the improvement of Buzzard Bar Cut-off, the opening of a channel 3 feet deep and 35 feet wide through a rock shoal, about 4 miles below Geneva, and the removal of the most troublesome snags, stumps, and overhanging trees from where work was previously suspended, up to Geneva. Any appropriation that may be made for the next fiscal year should be expended in the completion of the removal of snags and overhanging timber so far as the amount will allow and as may be necessary to give a safe channel for the commerce of the river.

July 1, 1878, amount available.....	\$208 87	
Amount appropriated by act approved March 3, 1879.....	5,000 00	
		\$5,208 87
July 1, 1879, amount expended during fiscal year.....	60 00	
July 1, 1879, amount available.....	5,148 87	

Amount (estimated) required for completion of existing project.....	25,000 00
Amount that can be profitably expended in fiscal year ending June 30, 1881..	15,000 00

(See Appendix J 7.)

8. *Improvement of Alabama River, Alabama.*—After the purchase and construction and preparation of necessary boats and outfit, work was commenced at the cut-off (an outlet from the Alabama to the Tombigbee, about 25 miles by the former, from the proper junction), which was closed by a dam, not quite completed, however, at the end of the year, owing to unforeseen difficulties and accidents that were encountered. The bar in the main river, just below the cut-off, was improved by a dam and wing-dam, giving a good navigable channel through. There were re-

moved 320 logs from the channel of the river, scattered along a distance of 50 miles from its mouth.

It is proposed to apply the appropriation of March 3, 1879, to completing the dam at the cut-off, to the improvement of the river at Hayne's Island, and to removing the troublesome logs from the channel as high, probably, as Cahawba.

It is proposed to apply the estimate for the next fiscal year, ending June 30, 1881, to the thorough improvement of the bar below Mary Taylor's Bar, and to removing the logs from the channel throughout the river. As every winter's flood brings down large amounts of drift, portions of which lodge in the bottom of the river and become snags, it will be necessary to pass over the river every summer with a snag-boat, in order to maintain the improvement made. A yearly appropriation of \$10,000 is estimated to be needed for this purpose.

July 1, 1878, amount available .....	\$25,000 00	
Amount appropriated by act approved March 3, 1879 .....	30,000 00	\$55,000 00
July 1, 1879, amount expended during fiscal year .....		21,687 68
July 1, 1879, amount available .....		33,312 32
Amount (estimated) required for completion of existing project .....	174,741 00	
Amount that can be profitably expended in fiscal year ending June 30, 1881 ..	60,000 00	

(See Appendix J 8.)

9. *Improvement of Black Warrior and Tombigbee Rivers, Alabama and Mississippi.*—On this work, during the fiscal year, a new log-boat was built, also a new quarter boat from the old ones, and others were repaired.

On the Warrior River 7 bars were improved by the construction of 2,190 linear feet of wing-dams, and 713 logs were removed.

On the Tombigbee River, Turkey Shoals, Barneys, Sellars, Osage, and Hacheetigbee bars were improved by raking and constructing wing-dams, giving good navigable channels at each. At these bars 3,305 linear feet of wing-dams were built, and at various points in the river 911 logs were removed.

It is proposed to apply the appropriation of March 3, 1879—

1st. To building a light-draught steam-slug boat that can be used for towing the other boats from point to point.

2d. To commence the improvement of the Tombigbee between Demopolis and Columbus, both by removing logs and deepening shoals.

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

4th. To continue removing logs from the Warrior River.

The estimate for the next fiscal year is for:

1st. Blasting out McGrews, Turners, and Pearson's Shoals on the lower Tombigbee.

2d. Continuing the improvement between Demopolis and Columbus by the removal of snags, overhanging limbs, and construction of wing-dams.

3d. Continuing the improvement of the Warrior River by removal of snags and overhanging limbs, and construction of wing-dams.

July 1, 1878, amount available .....	\$29,144 80	
Amount appropriated by act approved March 3, 1879 .....	20,000 00	\$49,144 80
July 1, 1879, amount expended during fiscal year .....		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 ..	80,000 00	

(See Appendix J 9.)

10. *Improvement of Tombigbee River above Columbus, Mississippi.*—In September, 1878, the work of clearing the river of snags, logs, and overhanging trees, for high-water navigation, was commenced at Aberdeen, Miss., and continued down the river, until interrupted by high-water in November, and could not be resumed until May.

At the close of the fiscal year Waverly, about 11 miles north of Columbus, was reached, giving a clear river for high-water navigation for a distance of 63 miles south from Aberdeen.

A further appropriation having been made for this improvement by act of March 3, 1879, it is proposed to continue the work during the next fiscal year, and extend the same from Columbus to Fulton, Miss.

July 1, 1878, amount available .....	\$12,000 00	
Amount appropriated by act approved March 3, 1879 .....	10,000 00	\$22,000 00
July 1, 1879, amount expended during fiscal year .....		2,851 05
July 1, 1879, amount available .....		19,148 95
Amount (estimated) required for completion of existing project .....	8,332 95	
Amount that can be profitably expended in fiscal year ending June 30, 1881 ..	8,300 00	

(See Appendix J 10.)

11. *Improvement of Pascagoula River, Mississippi.*—An examination has been made of the East Pascagoula River, from its mouth to its head. A report of the result was transmitted to Congress, and printed in House Ex. Doc. No. 95, Forty-fifth Congress, third session.

Nothing further has been done, 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.

As soon as this matter is settled, it is proposed to expend the funds available 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 made of the examination.

July 1, 1878, amount available .....	\$10,000 00	
Amount appropriated by act approved March 3, 1879 .....	14,000 00	\$24,000 00
July 1, 1879, amount expended during fiscal year .....		1,506 30
July 1, 1879, amount available .....		22,493 70
Amount (estimated) required for completion of existing project .....	31,306 30	
Amount that can be profitably expended in fiscal year ending June 30, 1881, as revised in this office .....	25,000 00	

(See Appendix J 11.)

#### EXAMINATION AND SURVEYS FOR IMPROVEMENT.

To comply with the provisions of the river and harbor act of June 18, 1878, Captain Damrell was charged with, and has completed the following examinations and surveys:

1. *Chickasaha River, Mississippi.* (See Appendix J 12.)
2. *Pascagoula River, Mississippi.* (See Appendix J 11.)
3. *Flint River, from Albany to Montezuma, Georgia.* (See Appendix J 5.)

The results of the above-named surveys were transmitted to Congress, and printed as House Ex. Doc. No. 95, Forty-fifth Congress, third session.

4. *Conecuh River, Alabama.* (See Appendix J 13.)
5. *Patsaligo River, Alabama.* (See Appendix J 14.)
6. *Escambia River, Alabama.* (See Appendix J 15.)
7. *Suwannee River, Florida.* (See Appendix J 16.)
8. *Caloosahatchee River, Florida.* (See Appendix J 17.)
9. *Mouth of Hillsborough River, Florida.* (See Appendix J 18.)
10. *Tampa Bay, Florida.* (See Appendix J 18.)
11. *Apalachicola River and Bay, Florida.* (See Appendix J 6.)

The results of this examination were transmitted to Congress, and printed as House Ex. Doc. No. 82, Forty-fifth Congress, third session.

And to comply with provisions of the river and harbor act of March 3, 1879, has been charged with, and is now engaged upon the following, the results of which will be duly submitted when received:

1. *Charlotte Harbor and Pease Creek, Florida.*
2. *Withlacoochee River, Florida.*
3. *Warrior, from Tuscaloosa to Forks of Sipsev and Mulberry, Alabama.*
4. *Sipsev River, Alabama.*
5. *Choctawhatchee River, Alabama, from Geneva to Newton.*
6. *Pea River, Alabama, from Geneva to Elba.*
7. *Noxubee River, Mississippi.*
8. *Coosa River, from the bridge of Selma, Rome and Dalton Railroad, to city of Wetumpka, Alabama.*

IMPROVEMENT OF THE HARBOR OF NEW ORLEANS; OF PEARL RIVER, MISSISSIPPI, AND BAYOU LAFOURCHE, LOUISIANA; OF SABINE PASS, SABINE RIVER, ENTRANCE TO GALVESTON HARBOR, SHIP CHANNEL IN GALVESTON BAY; NECHES AND TRINITY RIVERS, AND PASS CAVALLO, AND ARANSAS PASS AND BAY, TEXAS.

Officer in charge Major C. W. Howell, Corps of Engineers, with Capt. C. E. L. B. Davis, Corps of Engineers, under his immediate orders.

1. *Improvement of harbor of New Orleans.*—This work is designed to protect the wharves and harbor of the city of New Orleans from the incursions of the river.

The work was commenced October 1, 1878, under an appropriation of \$50,000, made by act of June 18, 1878, and at the close of the fiscal year had covered a superficial area of the slope of the river-bed of about 170,000 square feet, extending 886 running feet along the river front.

The officer in charge reports that the portion of the river bank protected has not caved during the year.

Great delays were occasioned by the crowded state of the wharves in front of which work was being prosecuted; high water in the river; failure of contractors to deliver material at specified times, and numerous other causes incidental to a new and experimental work of this character, where methods for its prosecution had to be devised and perfected.

The experience of the past year will, it is thought, enable the work to be conducted during the present year at a greatly reduced cost per foot of river front protected.

Details of the work are fully described in the report of the officer in charge.

July 1, 1878, amount available.....	\$50,000 00	
Amount appropriated by act approved March 3, 1879.....	60,000 00	\$110,000 00
July 1, 1879, amount expended during fiscal year.....	34,679 09	
July 1, 1879, outstanding liabilities.....	389 52	35,868 61

July 1, 1879, amount available.....	74,931 39
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Amount (estimated) required for completion of existing project.....	363,000 00
Amount that can be profitably expended in fiscal year ending June 30, 1881.	200,000 00
(See Appendix K 1.)	

2. *Improvement of Pearl River, Mississippi, from Jackson to Carthage.*—In the river and harbor act of March 3, 1879, \$6,000 was appropriated for this work, which will be expended in attempting to improve navigation at the most obstructed points of the river between Jackson and Carthage. Not much good, however, can be expected to result from the expenditure of this small amount, as it will be seen from the report of the officer in charge of the survey of Pearl River, that from Carthage to Jackson, a distance of 105 miles, the following obstructions to navigation should be removed from the channel and banks of the river:

Seven hundred and seventy-two trees, 268 snags, 487 drift piles, 19 towheads, and 69,800 feet of length of bank covered with overhanging willows, besides the closure of numerous bayous now draining the water from the main channel of the river.

To do this work the officer in charge, in his preliminary report of survey, estimated \$21,000 as necessary, which estimate is repeated in his final report of the survey.

Amount appropriated by act approved March 3, 1879.....	\$6,000 00
July 1, 1879, amount available.....	6,000 00

Amount (estimated) required for completion of existing project.....	15,000 00
Amount that can be profitably expended in fiscal year ending June 30, 1881.	15,000 00
(See Appendix K 2.)	

3. *Improvement of Bayou Lafourche, Louisiana.*—The work of removing snags, &c., from the bayou, under the appropriation of June 18, 1878, was commenced at Donaldsonville, and continued to within a short distance of Lafourche crossing of the Morgan's Louisiana and Texas Railroad, when high water rendered it necessary to suspend work for the remainder of the fiscal year.

During the present year the work of removing snags, stumps, &c., will be continued down the bayou until the appropriation of last year is exhausted.

With the appropriation of March 3, 1879, an attempt will be made to deepen the channel through the upper 10½ miles of the bayou; by dredging, and should any balance of the appropriation remain, it will be applied to removing obstructions in the lower bayou.

July 1, 1878, amount available.....	\$10,000 00	
Amount appropriated by act approved March 3, 1879.....	10,000 00	\$20,000 00
July 1, 1879, amount expended during fiscal year.....	5,998 19	
July 1, 1879, outstanding liabilities.....	184 00	6,182 19

July 1, 1879, amount available.....	13,817 81
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*Amount (estimated) required for completion of existing project.....	10,000 00
Amount that can be profitably expended in fiscal year ending June 30, 1881.	10,000 00
(See Appendix K 3.)	

\* Removing snags lower bayou.

4. *Improvement of Sabine Pass, Texas.*—The work of dredging on the bar at the mouth of this pass and through the reef in the body of the pass was continued during the fiscal year until February, when the dredge-boat Essayons was sent to New Orleans to undergo repairs and await further appropriation.

Particulars concerning repairs to the Essayons are given in the report of the officer in charge.

At the time of suspension of work the condition of the channel was as follows:

A good 12-foot channel from the Gulf to Sabine Harbor and a 15-foot channel, well-buoyed, practicable for steam vessels, throughout its entire length, where, before the work of dredging was commenced, the average depth of channel was but between 6 and 7 feet.

By act of March 3, 1879, \$25,000 was appropriated for this work, a portion of which was used for repairing the Essayons. The small balance of the last appropriation will not warrant the return of the Essayons to Sabine Pass for resumption of work, and the boat will, therefore, remain laid up at New Orleans to await further appropriation.

The result of work during the past year leads to the conclusion that a dredged channel protected by lateral works to prevent filling may be made permanent.

In the event of an appropriation for continuing the work of dredging during the next fiscal year, it is recommended by the officer in charge "that it be made so as to cover probable works for protection, as well as for dredging, and made so as to be applicable to one or both."

July 1, 1878, amount available.....	\$42,852 20	
Amount appropriated by act approved March 3, 1879.....	25,000 00	\$67,852 20
July 1, 1879, amount expended during fiscal year.....	49,131 60	
July 1, 1879, outstanding liabilities.....	311 37	49,442 97
July 1, 1879, amount available.....		18,409 23
Amount (estimated) required for completion of existing project.....		277,317 00
Amount that can be profitably expended in fiscal year ending June 30, 1881, as revised in this office.....		50,000 00

(See Appendix K 4.)

5. *Improvement of Sabine River, Texas.*—Under act of June 18, 1878, \$10,000 was appropriated for the work.

On account of the small appropriations for each, this work and the Neches and Trinity rivers were advertised together, as no contractor would be apt to bid on one work alone, unless at an exorbitant rate per cubic yard. The work was advertised August, 1878, and the contract awarded to parties who failed to comply with the terms of their agreement. Their contract was annulled and the work readvertised in March, 1879. Another party was awarded the contract under the second advertisement, and is now engaged in dredging a channel through the bar at the mouth of the river.

The appropriation of March 3, 1879, will be expended in improving the Narrows of Sabine River above Orange or the bar at the mouth of the river, as may appear most to the interest of commerce after the survey is made.

July 1, 1878, amount available.....	\$10,000 00	
Amount appropriated by act approved March 3, 1879.....	6,000 00	\$16,000 00
July 1, 1879, amount expended during fiscal year.....		453 19
July 1, 1879, amount available.....		15,546 81

Amount (estimated) required for completion of existing project.....	\$40,000 00
Amount that can be profitably expended in fiscal year ending June 30, 1881, as revised in this office.....	10,000 00

(See Appendix K 5.)

6. *Improvement of Neches River, Texas.*—This work was advertised in August, 1878, under the appropriation of June 18, 1878.

The parties to whom the contract was first awarded failing in their agreement, the work was readvertised, and the contract awarded to the party now engaged in dredging at the mouth of the Sabine River.

The appropriation of March 3, 1879, will be applied to further improving the channel through the bar at the mouth of the river which shall have been made by the present contractor.

July 1, 1878, amount available.....	\$8,000 00	
Amount appropriated by act approved March 3, 1879.....	5,000 00	\$13,000 00
July 1, 1879, amount expended during fiscal year.....		337 92
July 1, 1879, amount available.....		12,662 08
Amount (estimated) required for completion of existing project.....		13,318 05
Amount that can be profitably expended in fiscal year ending June 30, 1881.....		13,300 00

(See Appendix K 6.)

7. *Improvement of entrance to Galveston Harbor, Texas.*—The gabionnade over the inner bar of this harbor maintained the same good channel during the year as that reported last year, viz, from 20 to 20½ feet in depth. Work was therefore confined to extension of the Boliver Point gabionnade over the outer bar; 354 gabions were sunk during the year, leaving at its close a gabionnade over the outer bar 7,332 feet in length.

Owing to exhaustion of the appropriation for the fiscal year ending June 30, 1878, work was suspended December 1, 1877, and not resumed until June, 1878.

At the time of the suspension there were a large number of gabions left on hand, which were used in construction of the gabionnade when work was resumed.

Of these, 121 were washed away during the past year. An examination revealed the fact that the pine stakes used in manufacturing these gabions had dry-rotted during the six months they were exposed to the weather while work was suspended, and consequently were not able to withstand the shock of the waves.

The large number of gabions on hand at the time of suspension of work in 1877 had been allowed to accumulate under the supposition that work would be continuous.

The results of the work during the past year were not such as those obtained by the inner-bar work had led the officer in charge to anticipate, and it is thought that the method of construction so successful on the inner bar requires modification in its application to the outer bar. The subject of modification is now before a board of engineers for consideration and report. Five hundred and seventy-one gabions were manufactured during the year, and 605 on hand ready for sinking in gabionnade at the close of the year.

The officer in charge reports that surveys of the outer bar during the year do not show any change that can be attributed to the influence of the gabionnade, and that such change cannot be expected until it is extended farther out.

July 1, 1878, amount available.....	\$119,337 28	
Amount appropriated by act approved March 3, 1879 .....	100,000 00	\$219,337 28
July 1, 1879, amount expended during fiscal year .....	93,616 26	
July 1, 1879, outstanding liabilities .....	8,258 22	
		101,874 48
July 1, 1879, amount available.....		117,462 80
Amount (estimated) required for completion of existing project.....	682,446 43	
Amount that can be profitably expended in fiscal year ending June 30, 1881.	200,000 00	

(See Appendix K 7.)

8. *Improvement of ship channel in Galveston Bay, Texas.*—By act of Congress approved August 14, 1876, appropriating \$72,000, and act of Congress approved June 18, 1878, appropriating \$75,000, a total of \$147,000 was made available for this work.

Expenditure of the appropriation for 1876 was suspended for reason given in report of the Chief of Engineers for the year 1878.

The work has since been advertised and contract awarded to Messrs. Geo. C. Fobes & Co., of Baltimore, Md., who are now engaged in excavating a channel 12 feet deep at mean low-tide and 100 feet wide at bottom from the head of Boliver channel to the United States cut through Red Fish Bar.

The agreement provides that the contract shall be completed on or before January 1, 1880.

The appropriation of March 3, 1879, for this work will be expended in excavating a channel of the same dimensions as that now engaged upon through Upper Galveston Bay from the cut in Red Fish Bar to the cut in Morgan's Point.

July 1, 1878, amount available.....	\$147,000 00	
Amount appropriated by act approved March 3, 1879.....	80,000 00	\$227,000 00
July 1, 1879, amount expended during fiscal year.....	2,606 88	
July 1, 1879, outstanding liabilities.....	11,524 79	
		14,131 67

July 1, 1879, amount available.....	212,868 33	
Amount (estimated) required for completion of existing project.....	194,326 42	
Amount that can be profitably expended in fiscal year ending June 30, 1881.	81,000 00	

(See Appendix K 8.)

9. *Improvement of Trinity River, Texas.*—Under the appropriation of June 18, 1878, this work, as in the case of the Sabine and Neches rivers, was advertised in August, 1878.

On failure of the first contractors the work was readvertised and a second contract awarded to the party who has the contract for the Sabine and Neches rivers.

The appropriation of March 3, 1879, will be expended in continuing the work of dredging a channel across the bar at the mouth of the river.

July 1, 1878, amount available.....	\$10,000	
Amount appropriated by act approved March 3, 1879.....	2,500	\$12,500 00
July 1, 1879, amount expended during fiscal year.....	150 08	
July 1, 1879, amount available.....		12,349 92
Amount (estimated) required for completion of existing project.....	33,500 00	
Amount that can be profitably expended in fiscal year ending June 30, 1881, as revised in this office.....	15,000 00	

(See Appendix K 9.)

10. *Removing obstructions to navigation at Brazos Santiago, Texas.*—In the river and harbor act of June 18, 1878, \$6,000 was made available for this work.

It was let out at contract and completed the latter part of December, 1878.

The obstruction to navigation consisted of the wreck of the bark *Reine des Mers*, which was removed and the *débris* placed on shore or carried to sea.

July 1, 1878, amount available.....	\$6,000 00
July 1, 1879, amount expended during fiscal year.....	6,000 00

(See Appendix K 10.)

11. *Improvement of Pass Cavallo Inlet to Matagorda Bay, Texas.*—By acts of August 14, 1876, June 18, 1878, and March 3, 1879, \$20,000, \$25,000, and \$25,000, respectively, were appropriated, making a total of \$70,000 available for the work, less cost of survey ordered to ascertain what changes had taken place since last survey.

This amount being inadequate for commencement of the work according to the plans submitted by the officer in charge, the subject has been submitted to a Board of engineer officers for consideration and report. Expenditure of the amount available will therefore be deferred until the report of the board has been considered.

July 1, 1878, amount available.....	\$45,000 00	
Amount appropriated by act approved March 3, 1879.....	25,000 00	\$70,000 00
July 1, 1879, amount expended during fiscal year .....		2,331 41
July 1, 1879, amount available.....		67,668 59

Amount (estimated) required for completion of existing project.....	600,325 00
Amount that can be profitably expended in fiscal year ending June 30, 1881.	150,000 00

(See Appendix K 11.)

12. *Improvement of Aransas Pass and Bay up to Rockport and Corpus Christi, Texas.*—The whole subject of this improvement has been submitted to a Board of engineer officers for consideration, and the expenditure of the amount deferred until the report of the Board has received consideration.

Amount appropriated by act approved March 3, 1879.....	\$35,000 00
July 1, 1879, amount available.....	35,000 00
Amount (estimated) required for completion of existing project.....	151,845 00
Amount that can be profitably expended in fiscal year ending June 30, 1881, as revised in this office .....	100,000 00

(See Appendix K 12.)

## EXAMINATIONS AND SURVEYS FOR IMPROVEMENT.

To comply with provisions of the river and harbor act of June 18, 1878, Major Howell was charged with, and has completed the following examinations and surveys:

1. *Pearl River, Mississippi.* (See Appendix K 2.)

2. *Tangipahoa River, Louisiana.* (See Appendix K 14.)

Preliminary reports of the results of these surveys were transmitted to Congress and printed in House Ex. Doc. No. 98, Forty-fifth Congress, third session.

3. *Brazos River in Texas, from eight miles above its mouth down through its mouth to the outer edge of the bar in the Gulf of Mexico.* (See Appendix K 13.)