

dike (No. 3) was therefore built outside of it, and so as to improve the line of the wharf front still further. This was done by contract, and completed June 12, 1877. The channel was also dredged between the steamboat wharf and Deep Run, 50 feet wide and 9 feet deep, the contract being concluded July 26, 1877. Full details of the operations briefly summarized will be found in the several annual reports of the years mentioned.

WORK OF THE PAST FISCAL YEAR.

An appropriation of \$13,500 was made June 18, 1878. Notwithstanding the amount of dredging done at Fredericksburg, the bar below the steamboat wharf was renewed by deposits of sand brought down by freshets from the river valley above, and became so shoal that the steamers were unable to leave, except at high-water. The dikes already built were nearly full, and before any further dredging could be done the construction of new dikes was requisite. Proposals for constructing two dikes were invited by public advertisement, and the following were received:

Abstract of proposals for construction of dikes in Rappahannock River, Virginia, opened at 12 m. on Monday, July 22, 1878.

Number.	Name.	Address.	Dike No. 4.		Dike No. 5.		Total.	Remarks.
			Price per linear foot.	For 750 linear feet.	Price per linear foot.	For 1,400 linear feet.		
1	John J. Shipman.....	Lewinsville, Va.....	\$48 90	\$36,675 00	\$38 90	\$54,460 00	\$91,135 00	Complete December 15, 1878. Commence August 10, 1878; complete November 10, 1878.
2	John B. Ely.....	Baltimore, Md.....	3 70	2,775 00	3 10	4,340 00	7,115 00	
3	G. H. Ferris.....	do.....	3 95	2,962 50	3 65	5,110 00	8,072 50	
4	Chauncey D. Spaid.....	Washington, D. C.....	5 50	4,125 00	5 00	7,000 00	11,125 00	
5	Alfred Lee*.....	do.....	1 57	1,177 50	1 57	2,198 00	3,375 50	
6	Joseph G. Williams.....	do.....	3 47	2,602 50	3 47	4,858 00	7,460 50	
7	William H. Brainard and George D. Rice.....	do.....	4 25	3,187 50	3 45	4,880 00	8,017 50	
8	Edward F. De Graw.....	Fulton, N. Y.....	3 25	2,437 50	2 35	3,290 00	5,727 50	
9	H. E. Culpepper.....	Portsmouth, Va.....	4 18	3,135 00	4 18	5,852 00	8,987 00	
10	Thomas Banks.....	Washington, D. C.....	3 00	2,250 00	2 75	3,850 00	6,100 00	
11	P. Sanford Ross.....	Jersey City, N. J.....	3 60	2,700 00	2 85	3,990 00	6,690 00	
12	Robert P. Heston.....	Washington, D. C.....	3 33	2,497 50	2 67	3,738 00	6,235 50	
13	Edgar M. Payn.....	Albany, N. Y.....	5 00	3,750 00	4 32	6,048 00	9,798 00	

* This bid was an error and was rejected.

† This bidder submitted a letter stating that the bid for Dike No. 4 was intended to be \$4.89 per linear foot, and for Dike No. 5 \$3.89 per linear foot. Informal.

The contract was awarded to Edward F. DeGraw, of Fulton, N. Y. Mr. DeGraw commenced work on Dike No. 4, on the right bank, extending from the lower end of the wharves to Hazel Run, September 7, 1878, and completed the same January 8, 1879. His operations in the river were then suspended by ice, and were not resumed until April 16, 1879, when Dike No. 5, on the left bank (below Dike No. 1) was commenced, and is now in progress. The contractor did not at first obtain the proper quality of lumber, and the work has been seriously delayed in consequence. Proposals were invited October 7, 1878, for the dredging required, and the following bids were received:

Abstract of proposals for dredging in Rappahannock River, Virginia, opened at 12 m. on Wednesday, October 30, 1878.

Number.	Name.	Address.	Price per cubic yard.	Time of commencement.	Time of completion.	Number and kind of machines.	Daily work, cubic yards.
1	G. H. Ferris	Baltimore, Md.	\$0 26 $\frac{1}{2}$	Mar. 1, 1879	July 1, 1879	1 dipper	300
2	Daniel Constantine	do	23	Nov. 20, 1878	June 30, 1879	1 Osgood	400

The contract was awarded to Daniel Constantine, of Baltimore, Md., who commenced work November 25, 1878, and continued until the ice caused a suspension, December 24, 1878. Operations were resumed January 29, 1879, upon the opening of navigation. The bar between the lower end of dike No. 3 and the ferry slip was entirely removed and a channel was dredged along dike No. 4. The sand was deposited behind dikes 1, 3, and 4, and the dredging concluded April 9, 1879. A survey of Spottswood Bar was made in April, 1879, and the ruling depth found to be 7 feet at low-water.

An appropriation of \$10,000 was made March 3, 1879. The work proposed during the present season is as follows:

The construction of wing-dams at Spottswood Bar, to contract the channel and deepen the same, and of dikes at Frederickswood Bar, to protect the banks from erosion below Hazel Run, and to contract the channel at steamboat wharf.

There are some logs and snags at Spottswood Bar which have caused the sinking of a steamer and which will be removed by hired labor.

ESTIMATE FOR COMPLETING THE IMPROVEMENT.

The permanent improvement of the navigation of the Rappahannock at Fredericksburg proved to be a more formidable undertaking than was anticipated when the original survey and estimate were made. Situated nearly at the head of tide water, it receives the large deposits of sand and *débris* of the numerous freshets, and it has required the appropriation of each year to remove this annual accumulation of sediment left on the bar. The annual appropriations have been expended with the object of keeping the channel open, and have effected a permanent improvement in depth of about 1 to 2 feet. The steamers which were, before this improvement, obliged to lie up below the landing at extreme low-water are no longer subject to this inconvenience.

The dikes already built, however, and those proposed for the present

season, will, with some dredging, probably insure the maintenance of the required depth at Fredericksburg.

The improvement of the bars below should now be undertaken, and I submit herewith a revised estimate for the completion of the entire river. Between Fredericksburg and Port Royal, where the river is fluvial in its character, a channel 100 feet wide and 10 feet deep at low-water will be secured by dredging and wing-dams. Below Port Royal the river becomes an estuary or arm of Chesapeake Bay. As this part of the river is navigated by a large class of vessels, the channel should be 15 feet deep and have an average width of 200 feet. Training dikes will be employed, which are better adapted to the preservation of the depth in the tides of the river than spur dikes. In the project for each locality dredging will be included in the estimate, and the dikes are designed to preserve the depth thus obtained.

The arrangement of dikes and dams will be such as to facilitate the passage of the tidal wave up the river.

ESTIMATE OF COST OF COMPLETING IMPROVEMENT OF RAPPAHANNOCK RIVER, VIRGINIA.

<i>Fredericksburg Bar.</i>	
100,000 cubic yards dredging, at 25 cents	\$25,000
2,500 linear feet dike and wing-dams, at \$4	10,000
	35,000
<i>Spottswood Bar.</i>	
40,000 cubic yards dredging, at 25 cents	\$10,000
1,000 linear feet wing-dams, at \$4	4,000
	14,000
<i>Castle's Ferry Bar.</i>	
20,000 cubic yards dredging, at 25 cents	\$5,000
1,300 linear feet wing-dams, at \$4	5,200
	10,200
<i>Moss Neck Reach.</i>	
17,000 cubic yards dredging, at 25 cents	\$4,250
1,000 linear feet dams, at \$4	4,000
	8,250
<i>Farleyvale Reach.</i>	
14,000 cubic yards dredging, at 25 cents	\$3,500
1,500 feet wing-dams, at \$4	6,000
	9,500
<i>Nauzatice Reach.</i>	
200,000 cubic yards dredging, at 15 cents	\$30,000
4,000 linear feet dike, at \$2.50	10,000
	40,000
<i>Naylor's Hole.</i>	
860,000 cubic yards dredging, at 15 cents	\$129,000
6,000 linear feet dike, at \$3	18,000
	147,000

SUMMARY.

Fredericksburg Bar	\$35,000
Spottswood Bar	14,000
Castle's Ferry Bar	10,200
Moss Neck Reach	8,250
Farleyvale Reach	9,500
Nauzatico Reach	40,000
Naylor's Hole	147,000
	<hr/>
	263,950
Contingencies, 10 per cent.....	26,395
	<hr/>
	290,345

The large amount estimated for the improvement of Nauzatico Reach and Naylor's Hole is due to the fact that training dikes may be necessary to preserve the depth attained by dredging. The dredging should be first executed, and if the new cut is found to preserve its depth, the dikes may be dispensed with, and the aggregate of the estimate will be reduced by deducting their cost, amounting to \$28,000.

This improvement, when completed, will need only repair to dikes, and an occasional use of the dredge for the preservation of the depth; but the amount of this work, though small, cannot be predicted.

I would respectfully recommend an appropriation of \$50,000 for the next fiscal year.

STATISTICS OF TRADE.

The subjoined report of the committee on commerce and navigation of the city council of Fredericksburg exhibits in detail the statistics of trade for the year 1878.

Tappahannock is the nearest port of entry. The collections in this collection-district, during the fiscal year, were \$919.44.

Money statement.

July 1, 1878, amount available	\$13,500 00	
Amount appropriated by act approved March 3, 1879	10,000 00	
	<hr/>	\$23,500 00
July 1, 1879, amount expended during fiscal year	10,398 03	
July 1, 1879, outstanding liabilities	355 34	
	<hr/>	10,753 37
July 1, 1879, amount available	12,746 63	
	<hr/>	
Amount (estimated) required for completion of existing project	290,000 00	
Amount that can be profitably expended in fiscal year ending June 30, 1881.	50,000 00	

REPORT OF THE COMMERCE AND MANUFACTURES OF THE CITY OF FREDERICKSBURG, VIRGINIA, AND THE RAPPAHANNOCK RIVER, FOR THE YEAR 1878.

JANUARY 28, 1879.

Your committee on commerce and navigation herewith report the following statistics and estimates of the trade and manufactures of Fredericksburg and the Rappahannock River.

Our town, situated at the head of navigation on the said river, which courses 92 miles to the Chesapeake through a valley unsurpassed for fertility and variety of its valuable products and resources, located midway between the cities of Washington and Richmond, and drawing by rail the trade of the best portion of the Piedmont country, must become an important center of commerce and manufactures. The entire water-power of the Rappahannock is brought through dam and canal of the most improved

and durable plan and utilized for manufacturing purposes within its corporate limits. We have in operation three first-class merchant flour mills, a woolen mill and cotton mill (temporarily idle), a paper-bag factory, two large founderies (machine shops and plow works), two sumac mills and tanneries, one large pickle factory, a planing and sassafras mill, a tobacco factory, without enumerating sundry others of a general character, besides more than 100 wholesale and retail mercantile houses, representing every department of trade. One line of steamers ply semi-weekly to Baltimore, connecting with all routes north and south, foreign and coastwise. Many sail vessels are engaged in transporting the increasing products of our factories, fields, forests, and rivers.

Statement of the commerce and manufactures for the year 1878.

Merchandise, foreign and domestic, including groceries, dry goods, hardware, &c., valued at	\$1,005,500
Wheat, 420,000 bushels, valued at	\$435,000
Corn, 450,000 bushels, valued at	225,000
Oats, 6,000 bushels, valued at	2,000
Rye, 2,500 bushels, valued at	1,500
	<hr/>
	663,500
Iron, pig and scrap, 1,250 tons, valued at	25,000
Sumac, crude, 1,800 tons, valued at	36,000
Bark, 1,000 cords, valued at	10,000
Lumber and ship timber, 5,000,000 feet, valued at	50,000
Wood, 20,000 cords, valued at	40,000
Hoops—hogshead, tierce, barrel—550,000, valued at	95,000
Beef and other cattle, valued at	15,000
Sheep and lambs, 3,100, valued at	9,300
Horses and mules, valued at	12,000
Wool, 30,000 pounds, valued at	9,000
Eggs, 3,000 barrels (240,000 dozen), valued at	48,000
Poultry and game, 4,000, valued at	12,000
Dried fruit, peas, and beans, valued at	6,500
Furs—mink, otter, rabbit, &c.—valued at	15,000
Railroad ties, 80,000, valued at	40,000
Sassafras roots, valued at	5,000
Fertilizers, 1,200 tons, valued at	42,000
Coal, 3,000 tons, valued at	15,000
Hides, 2,500, valued at	7,000
	<hr/>
	491,800
Barrel timber, 250,000 bolts, valued at	3,000
Dressed staves and heading, 360,000, valued at	2,720
Birch straps, 80,000, valued at	800
	<hr/>
	6,520
Manufactures:	
Flour, 60,121 barrels, valued at	394,517
Corn meal, 41,400 bushels, valued at	26,090
Mill feeds, 124,202 bushels, valued at	24,300
Flour-barrels, 49,700, valued at	21,405
	<hr/>
	466,312
Sumac, ground, 1,600 tons, valued at	88,000
Bark, ground, 750 tons, valued at	11,250
Leather, 3,000 sides, valued at	9,000
Bone, 50 tons, valued at	2,000
	<hr/>
	110,250
Plows, 12,500, valued at	37,500
Plow-castings, &c., 650 tons, valued at	39,000
	<hr/>
	76,500
Steam-engines, mill and gold-mine machinery and castings, 720 tons, valued at	72,000
Pickles, in glass, valued at	20,000
Paper bags, 12,000,000, valued at	10,000
Carriages, wagons, &c., valued at	15,000
	<hr/>
	117,000
	<hr/>
	2,937,382

There are 29 wharves and numerous other landings on the Rappahannock, from which a large aggregate of trade of every description is handled, including several oyster, fruit, and vegetable canning establishments, Landreth's seed farms, and the

great fish and oyster traffic, which, for lack of time, cannot be correctly estimated in this report. It is proper to mention that the value of merchandise and produce transported to and from Baltimore by two semi-weekly steamers alone reached the sum of \$1,175,000 for the past year.

With the extension of the Fredericksburg and Piedmont Railroad (anticipated in the near future) to the rich agricultural, mineral, and coal region of the Shenandoah Valley, the volume of tonnage for transportation by the Rappahannock River will be enormously enlarged.

All of which is respectfully submitted by the committee.

J. B. FICKLEN.
J. G. HURKAMP.
CHAS. WALLACE.

To the Hon. MAYOR AND COMMON COUNCIL
Of Fredericksburg, Virginia.

G 9.

IMPROVEMENT OF URBANA CREEK, VIRGINIA.

This is a tidal tributary of the Rappahannock River, situated about 16 miles from its mouth. For many years a bar has existed at Urbana, and occurs where the stream makes its way across the flats of the main channel of the Rappahannock. A survey of the bar was made in December, 1874, and the report will be found in the Report of the Chief of Engineers for 1875, Part I, page 139. The least depth of water was, at that time, 6½ feet. After passing the bar the depth rapidly increases, varying from 9 to 20 feet. The creek takes the character of an estuary, and is, properly speaking, a harbor, being the only harbor of refuge on that side of the Rappahannock for a distance of 60 miles.

Urbana has a considerable trade with domestic ports, and large shipments of timber, oysters, &c., are made each year.

Vessels are, however, unable to load wholly in the harbor, but are obliged to complete their cargoes outside the bar, at no little delay and expense. The two steamers plying between Rappahannock River and Baltimore stop at a wharf 1 mile from the town, but are unable to cross the bar. This causes expense for hauling, which would be saved if the steamer could reach the Urbana wharf. As the channel is somewhat exposed to the action of storms, it may be found necessary to construct a dike of oyster-shells or carbolized timber to protect it. This can only be determined after observing the effect of the dredging, and a definite recommendation on this point is deferred until after the work has been completed and further examination made.

An appropriation of \$5,000 was made for this work March 3, 1879, which will be applied to the commencement of the channel as soon as it is made available. The original estimate was \$22,100, but as prices have been somewhat reduced since this was made, the total cost of the dredging will probably not exceed \$20,000. As no funds have been available, an examination of the bar to ascertain whether any changes have occurred has not been made. For the year ending June 30, 1881, an appropriation of \$10,000 is recommended.

Urbana is a port of entry, and is in the collection-district of Tappahannock. The collections for the last fiscal year were \$919.44.

The following statistics give a summary of the trade during the past year:

Oats, corn, and wheat shipped, as near as can be ascertained.....	Value.
Country produce of all kinds—eggs, chickens, fruit, vegetables, wool, &c.	\$27,000 00 30,000 00

Wood, staves, lumber, railroad ties, bark, shingles, ivy roots, &c.....	19,000 00
Ship timber.....	10,000 00
Oysters shipped.....	25,000 00
Goods received, including general merchandise, farming implements, furniture, fertilizers, &c.....	75,000 00
Total.....	186,000 00

There are about 150 vessels that load here and off the mouth of the creek a year.

Two steamers touch here four times a week, plying between Baltimore and Fredericksburg. Another company is looking into the trade of the river with a view of putting on a steamer to ply between Fredericksburg and Norfolk, connecting with ships in Norfolk direct for New York.

Money statement.

Amount appropriated by act approved March 3, 1879.....	\$5,000 00
July 1, 1879, amount available.....	5,000 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.	10,000 00

G 10.

IMPROVEMENT OF HAMPTON RIVER, VIRGINIA.

A survey of the bar at the mouth of Hampton River, which forms the obstruction to navigation, was made in December, 1874, and the report and estimate based thereon will be found in the report of the Chief of Engineers for 1875, Part II, page 152.

The first appropriation for the improvement was made June 18, 1878, amounting to \$10,000. The plan of improvement was to dredge a channel 9 feet deep and of such width as might be practicable with the available funds, through the bar. Proposals were invited under date of June 29, 1878, and the following bids received and opened July 22, 1878.

Abstract of proposals for dredging in Hampton River, Virginia, opened at 12 m. on Monday, July 22, 1878.

Number.	Name.	Address.	Price per cubic yard.	Time of commencement.	Time of completion.	Number and kind of machines.	Daily work, cubic yards.
1	Franklin B. Colton..	Philadelphia, Pa..	\$0 20	Sept. 15, 1878	June 30, 1879	1 scoop dredge	500
2	G. H. Ferris.....	Baltimore, Md.....	19½	Dec. 1, 1878	June 30, 1879	1 dipper dredge	400
3	George F. Brott.....	Washington, D. C.	19	Sept. 1, 1878	Jan. 30, 1879	1 clam shell...	2,500
4	C. D. Spaid.....	do.....	14	Sept. 1, 1878	Dec. 31, 1878	1 dredge, 4 scows.	
5	H. E. Culpepper.....	Portsmouth, Va....	14½	Aug. 10, 1878	Nov. 1, 1878	2 Osgood dredges.	
6	Brainard & Rice....	Washington, D. C.	12	Sept. 10, 1878	Nov. 10, 1878	New Jersey shore dredges, clam scoops, and buckets.	

The lowest bidders were Messrs. Brainard & Rice of Washington, D. C., with whom a contract was entered into August 9, 1878, at 12 cents per cubic yard. The time for commencing was September 10, 1878.

The contractors, however, did not commence at this date, but requested more time to complete their arrangements. After repeated failures to carry out their promise they were finally notified that unless the work was commenced by them on or before November 4, 1878, the contract would be annulled. The work was not commenced on the day fixed and the contract was, by authority of the Chief of Engineers, annulled. It appeared upon investigation that Brainard & Rice were entirely irresponsible, and possessed no dredges or machinery for doing the work which they had undertaken.

Authority was also granted by the Chief of Engineers to invite proposals from responsible parties prepared to do the work in accordance with the provisions of section 3709 of the Revised Statutes. The following proposals were received January 16, 1879.

Abstract of proposals for dredging Hampton River, Virginia, opened at 12 m. on Thursday, January 16, 1879.

Number.	Name.	Address.	Price per cubic yard.	Time of commencement.	Time of completion.	Number and kind of machines.	Daily work, cubic yards.
1	Franklin B. Colton..	Philadelphia, Pa..	\$0 18	Mar. 1, 1879	June 1, 1879	1 Osgood.....	
2	H. E. Culpepper.....	Portsmouth, Va..	15	Apr. 1, 1879	Aug. 15, 1879	1 or more Osgood.	
3	Edwin W. Ferris....	Baltimore, Md....	30	Apr. 1, 1879	Oct. 1, 1879	1 Osgood.....	400
4	Geo. C. Fobes & Co.	do	16	Feb. 1, 1879	June 30, 1879	1 grapple.....	800

The contract was awarded to Mr. H. E. Culpepper, of Portsmouth, Va., and work was commenced by him after the close of his contract for dredging on the Chickahominy River, May 21, 1879, with 2 Osgood dredges. The work is now in progress.

An additional appropriation of \$2,000 was made March 3, 1879.

A survey of the bar was made in October, 1878, and it was found that the depth of water over it had increased somewhat since 1874, so that the amount of dredging will be less than at first anticipated. The location of the bar is, however, exposed to the action of easterly and southeasterly storms; and, should it be found that they fill in the channel, it may be necessary to build a jetty of strong construction to protect, as well as to confine the tidal currents to, this excavated channel.

As the work is being executed at a price much below the original estimated cost per yard, the appropriation already made will be sufficient for the dredging, and will afford a good channel. I would, therefore, prefer to watch the effect of the present work before asking for another appropriation. The original estimate was \$16,000.

Appropriations have been made as follows:

June 18, 1878.....	\$10,000
March 3, 1879.....	2,000

Hampton is 2 miles from Fort Monroe, and is in the collection-district of Norfolk, which is the nearest port of entry.

The collections in this district during the last fiscal year were \$42,050.81.

Statistics of trade were requested, but none have been received. Reference is therefore made to those accompanying the report of the survey (Report of Chief of Engineers for 1875, Part II, page 152).

Money statement.

July 1, 1878, amount available.....	\$10,000 00	
Amount appropriated by act approved March 3, 1879.....	2,000 00	\$12,000 00
July 1, 1879, amount expended during fiscal year.....	2,073 92	
July 1, 1879, outstanding liabilities	164 61	2,238 53
July 1, 1879, amount available		9 761 47

G II.

IMPROVEMENT OF CHICKAHOMINY RIVER, VIRGINIA.

This improvement was commenced during the last fiscal year under the appropriation of \$5,000 made June 18, 1878. The original estimate was based simply upon an examination of the river, and it was therefore necessary first to make surveys of the several obstructions. Accordingly, in July, 1878, surveys of Binn's Bar, Old Fort Bar, and Windsor Shades Bar were made. At Binn's Bar, 2 miles below Windsor Shades and 23 miles from the mouth of the river, the least depth found was 4 feet. The least depth at Old Fort Bar was 5.4 feet, but the natural channel had not sufficient width.

The least depth at Windsor Shades Bar was found to be 4.6 feet. Proposals for dredging channels through these bars were invited by public advertisement, and the following were received October 30, 1878:

Abstract of proposals for dredging in Chickahominy River, Virginia, opened at 12 m. on Wednesday, October 30, 1878.

Number.	Name.	Address.	Price per cubic yard.	Time of commencement.	Time of completion.	Number and kind of machines.	Daily work, cubic yards.
1	G. H. Ferris.....	Baltimore, Md....	\$0 20	Mar. 1, 1879	July 1, 1879	1 dipper.....	300
2	H. E. Culpepper.....	Portsmouth, Va..	14	Dec. 1, 1878	May 20, 1879	
3	Daniel Constantine.	Baltimore, Md....	14	Nov. 20, 1878	Feb. 20, 1879	1 Osgood.....	500

Contract awarded to Mr. H. E. Culpepper, of Norfolk, Va.

During the winter of 1878-79 ice formed in the Chickahominy and delayed the commencement of the work until February 8, 1879. The contractor commenced with one Osgood dipper dredge at Binn's Bar. The material here was soft mud, and was excavated readily. The channel was dredged to a width of 100 feet with a depth of 8 feet at low-water. Old Fort and Windsor Shades Bars were next dredged to the same depth and a width of 60 feet. The material found here was sand.

A second dredge was put on the work by the contractor April 17, and the dredging was completed, as far as the funds allowed, May 5, 1879. As to the future work on this improvement, the channel already excavated should be widened, and it is also important that several dikes be built for the purpose of closing subsidiary channels, through which the tide now flows. The estimated cost of this work is \$10,000.