

## G G 9.

## IMPROVEMENT OF TOLEDO HARBOR, OHIO.

The original project for this harbor as submitted in 1866 was to connect the city of Toledo with the deep water of Lake Erie by a channel through Maumee Bay, 200 feet wide, with a depth of 12 feet at low-water.

Operations were carried on under this project, the depth being increased to 14 feet, with considerable success until the fall of 1872. During this period the sum of \$174,700 was appropriated for the harbor, the whole of which was expended in surveys and dredging.

In December, 1872, a Board of Engineers was convened at Toledo to take into consideration the subject of the improvement of the harbor. This Board presented three projects, which were described as follows:

1st. A plan for a straight channel through North Cape Point, at a cost of \$1,858,500.

2d. To extend the river through the bay and North Cape Point to Lake Erie, confining the river-water in a new channel by two parallel lines of revetment, consisting of cribwork, &c., running from the mouth of the river to the 17-foot curve in the lake.

This plan the Board deemed the most complete solution of the problem, but its great cost, \$3,074,500, was such that they did not recommend it.

3d. The third plan proposed, and the one recommended on account of its cost, was that of improving the natural channel through Maumee Bay, so as to present a channel 200 feet wide at the bottom, 250 feet wide at the surface, and still wider at the angles, with a depth of 15 feet at low-water. The estimated cost of this project was \$450,000; the length of the channel to be deepened and widened was over 7 miles.

Work was commenced upon this plan in the summer of 1873, and has continued up to the present time.

## OPERATIONS DURING THE FISCAL YEAR.

Proposals were invited in July, 1878, for continuing the excavation in the channel through Maumee Bay, under the appropriation of June 18, 1878, and on the 21st day of August the work was awarded to Mr. E. H. French, of Fulton, N. Y., the lowest bidder; on September 3, a contract was executed for removing 200,000 cubic yards, more or less, of mud, sand, &c., from the channel, at the rate of 9 $\frac{3}{4}$  cents per cubic yard, measured in scows. Operations were commenced during the month of September, and continued with five dredges until the last day of November, when they were suspended on account of the weather; during this period the work was confined to the outer or Fahnstock range, and the elbows at each end, and to the south reach of the range running north and south, to the west of Turtle Island; the Fahnstock range section was completed to a depth of 15 feet at low-water; the dredges removed, between September 4 and November 30, 194,235 cubic yards of mud, sand, &c.

Operations were resumed during the early part of April, 1879, on the south reach of the range west of Turtle Island, and by April 12 the contract of September 3, 1878, was completed, 200,531 cubic yards in all having been removed.

By authority of the honorable Secretary of War, a new contract, similar in terms, was entered into early in April with Mr. E. H. French, for

removing 230,000 cubic yards of mud, sand, &c., and operations were commenced under it on April 14, and continued until the close of the fiscal year; the work during the months of April, May, and June was confined to the range running north and south, west of Turtle Island, and to the long range between it and the Fahnstock range; 181,297 cubic yards of mud and sand were removed during these three months, making a total of 381,828 cubic yards removed during the fiscal year.

A number of large snags, brought down by freshets, were removed from the channel during the month of May, 1879.

The work under the present project is rapidly drawing towards completion.

The original estimate for this project was \$450,000; of this amount, \$390,000 has been appropriated up to the close of the present fiscal year for completing the project, widening the channel at the angles, removing deposits from the inner and outer reaches, &c. Thirty thousand dollars is asked for the year ending June 30, 1881.

I am of the opinion that in order to render this work permanent, and to maintain the required depth through Maumee Bay, it will be absolutely necessary to revet the sides of this channel for 5 or 6 miles; in my next annual report I will submit a plan and estimate for such a work.

The rapid increase in the commerce of Toledo demands that the same depth of water should be carried up to her docks as is now found in the Saint Clair Flats Canal. It will be as easy to maintain a depth of 16 feet as one of 15 feet through Maumee Bay; and I therefore respectfully recommend that the channel may be further dredged to a depth of 16 feet. The amount to be removed to obtain this depth will be about 500,000 cubic yards of sand, and as the cutting will be light, I estimate that it will cost about 20 cents per yard, or \$100,000 for the whole work. This plan should, I think, be pushed forward promptly and vigorously, and at least \$50,000 could be profitably expended upon it during the next fiscal year.

The last annual report of Lieutenant-Colonel Michler contains a full statement of the commerce of Toledo during the year 1877, and to that I invite attention, as it fully shows the great necessity for the depth of 16 feet in the channel which I now recommend.

During the fiscal year 1879-'80 it is proposed to continue to dredge the natural channel through Maumee Bay to the width and depth projected by the Board of Engineers in 1873.

If an appropriation is made for the year 1880-'81, and my recommendation for a depth of 16 feet is approved, it will be applied to continuing operations and dredging to that depth.

I respectfully recommend that the attention of the Light-House Board be called to the great necessity for more day beacons and range lights to mark the channel through Maumee Bay. There should be beacons to mark every range, and I cannot urge too strongly that immediate attention may be given to this subject.

The following amounts have been appropriated from time to time for this harbor:

June 23, 1866 .....	\$20,000	June 23, 1874 .....	\$75,000
March 3, 1867 .....	20,000	March 3, 1875 .....	75,000
March 3, 1869 .....	29,700	August 14, 1876 .....	60,000
July 11, 1870 .....	50,000	June 18, 1878 .....	50,000
March 3, 1871 .....	50,000	March 3, 1879 .....	20,000
June 10, 1872 .....	15,000		
March 3, 1873 .....	100,000	Total .....	564,700



Of which amount \$538,789.75 has been expended up to the close of the present fiscal year.

Toledo Harbor is in the collection-district of Miami; there is a fixed white light of the fourth order on Turtle Island and three sets of range lights for parts of the channel. The nearest work of defense is Fort Wayne, 45 miles distant, near Detroit, Mich.

The amount of commerce to be benefited by the improvement is enormous, as will be seen by reference to the last annual report of my predecessor.

The amount of revenue collected during the fiscal year was \$9,154.37. The value of the imports was \$7,237.54; the value of the exports was \$1,983,262; 2,071 vessels with an aggregate tonnage of 633,690 tons entered, and 2,061 vessels with an aggregate tonnage of 625,634 tons cleared during the year.

Abstracts of proposals and contracts and a money statement are transmitted herewith.

*Money statement.*

July 1, 1878, amount available.....	\$50,376 35	
Amount appropriated by act approved March 3, 1879 .....	20,000 00	\$70,376 35
July 1, 1879, amount expended during fiscal year.....	42,698 47	
July 1, 1879, outstanding liabilities.....	1,767 63	44,466 10
July 1, 1879, amount available.....	25,910 25	
Amount (estimated) required for completion of existing project.....	30,000 00	
Amount that can be profitably expended in fiscal year ending June 30, 1881..	30,000 00	
Amount (estimated) required to obtain a depth of 16 feet .....	100,000 00	
Amount that can be profitably expended if 16 feet is approved .....	50,000 00	

*Abstract of proposals received and opened at 12 o'clock m. of the 21st day of August, 1878, for improving harbor of Toledo, Ohio, in accordance with advertisements inviting proposals for harbor improvements, dated July 20, 1878.*

No.	Name of bidder.	Price per cubic yard.	Date of commencement.	Date of completion.	Remarks.
1	Chicago Dredging and Dock Company.	\$0 20	Sept. —, 1878	Dec. —, 1878	Dates of commencement and completion of work not stated.
2	Jesse Simms .....	20			Do.
3	Elias Simms .....	19	10 days after contract is awarded.		Date of completion not stated.
4	John Hickler and Richard Anoldt.	18	Sept. 1, 1878	June 1, 1879	
5	Patrick Smith .....	16	Sept. 1, 1878	Dec. 1, 1879	
6	Hosea F. Stock .....	15	Sept. 1, 1878	Sept. 1, 1879	
7	William Richardson ..	14	Sept. 1, 1878	Sept. 1, 1879	
8	J. C. and J. H. Davis ..	12			The individual names of the members of the firm not written out nor signed in full, and Christian names not given; seals of wax or wafer not affixed to signature of firm; guaranty not filled out complete; witnesses to guarantors are wanting, and the certificate to guarantors not signed by any person, official or otherwise; no dates for commencing or completing the work.
9	E. H. French .....	9½	Sept. 1, 1878	June 30, 1879	Contract awarded.

*Abstract of contracts for improving harbor at Toledo, Ohio, in force during fiscal year ending June 30, 1879.*

Name and residence of contractor.	Date of contract.	Subject of contract.	Mud, sand, &c., per cubic yard in scoops.	Remarks.
E. H. French, Fulton, N. Y. ...	Sept. 3, 1878	Dredging ...	\$0 09½	Contract completed and closed April 12, 1879.
Do.....	Apr. 1, 1879	do .....	0 09½	

G G 10.

IMPROVEMENT OF PORT CLINTON HARBOR, OHIO.

The plan for the improvement of this harbor consists of confining the flow of the Portage River near its mouth by a close revetment of thick plank supported by rows of piles and heavy timber, and protected at the bottom by fascines and a riprap of stone; where the revetment reaches the deeper water in the lake, pieces of crib-work or piling parallel to each other will be constructed.

The work under this plan was commenced in 1875, and a dike or revetment 840 feet long was constructed, running from the shore on the west side in a direction N. 57° 50' E. into the lake, and terminating in a strong bulkhead. In June, 1877, work was commenced on the east revetment, which started from the shore on the east side at a point about 600 feet from the shore end of the west dike and ran in such a direction as to gradually contract the water-way, so that in the outer portion the width between the dikes would be 200 feet; 550 feet of dike was constructed in 1877, and an opening left across the natural channel 150 feet wide, which it was intended should be used until a new channel was opened between the piers.

OPERATIONS DURING THE FISCAL YEAR.

On July 1, my predecessor, Lieutenant-Colonel Michler, submitted a project for work under the appropriation of \$10,000 of June 18, 1878, which was approved by the Chief of Engineers.

It was proposed to continue the revetments already commenced, and to dredge a channel between them out to a depth of 10 feet in the lake.

Operations were commenced upon the dredging on July 26, and continued until August 26, by which time a channel about 2,000 feet long, 60 feet wide, and 10 feet deep was completed, by removing 19,487 cubic yards of mud and sand.

Towards the close of the season of 1878, a bar was formed near the outer end of this channel, which was removed.

Operations were commenced upon the prolongation of the piers in August, and by the last of September the west pier had been extended 300 feet, the east pier 205 feet, and the opening 150 feet wide left in the east pier across the old channel had been closed, making a total length of 655 feet of revetment constructed during the season.

At the close of operations in 1878, the west revetment was 1,140 feet long, the east revetment 955 feet long, and the channel at the outer ends of the revetments was about 225 feet wide.

During the 11th, 12th, and 13th of September, a violent gale occurred on Lake Erie, but the revetment sustained no damage.

The following materials were used in the work during the season:

- 6,824 linear feet of piles.
- 47,343 feet, board measure, of sheet piling.
- 15 cords of mill clippings.
- 4,273 pounds of drift bolts and spikes.
- 381 cords of stone.

During the present season it is proposed, provided the appropriation of March 3, 1879, is available in time, to construct 300 linear feet of pile-pier on the prolongation of the present west revetment, and to extend the east revetment about 400 feet; as deeper water is reached, the work



on the west side must be made stronger, while that on the east side will be protected by the west pier and the headland to the eastward.

Upon the opening of the season of 1879, it was found that the outer portion of the channel dredged in 1878 had filled up, so that there was only about 5 feet water on the outer bar. Although urged to dredge through this bar by those interested in the harbor, I have declined to do so, on the ground that any such improvement before the piers are completed would be only temporary in its character.

The estimated cost of the present project was \$120,000; since work was commenced under it, the following appropriations have been made:

Act of March 3, 1875 .....	\$5,000
Act of August 14, 1876 .....	5,000
Act of June 18, 1878 .....	10,000
Act of March 3, 1879 .....	10,000
Total .....	30,000

Of this amount, \$19,799.50 has been expended up to June 30, 1879.

After the completion of the work proposed under the appropriation of March 3, 1879, there will yet remain to be built 500 feet of the west pier, and 850 feet of the east pier; and a channel 150 feet wide and 10 feet deep should be dredged for a length of 2,000 feet between the piers; the current of the Portage River will afterwards keep this channel open.

The estimated cost of this work is \$55,000, all of which can be profitably expended during the fiscal year ending June 30, 1881.

Port Clinton is a port of entry in the collection-district of Sandusky, Ohio.

The nearest work of defense is Fort Wayne, below Detroit, Mich., 60 miles distant. The nearest light-house is at Green Island, 10 miles distant.

I have no way of estimating the amount of commerce which will be benefited by the completion of this work.

No revenue was collected during the fiscal year except the ordinary fees for entries and clearances.

There were no foreign imports nor exports during the year; 306 vessels, with an aggregate tonnage of 12,846 tons, entered, and 309 vessels, with an aggregate tonnage of 13,056 tons, cleared during the year.

A money statement is transmitted herewith:

*Money statement.*

July 1, 1878, amount available .....	\$10,008 43	
Amount appropriated by act approved March 3, 1879 .....	10,000 00	
		\$20,008 43
July 1, 1879, amount expended during fiscal year .....		9,807 93
July 1, 1879, amount available .....		10,200 50
Amount (estimated) required for completion of existing project .....		55,000 00
Amount that can be profitably expended in fiscal year ending June 30, 1881 .....		55,000 00

GG II.

IMPROVEMENT OF SANDUSKY CITY HARBOR.

The first appropriation for the harbor of Sandusky, Ohio, was made by the act of May 20, 1826, wherein the sum of \$400 was allotted for a survey.

No further action was taken until 1844, when, by the act of June 11 of that year, the sum of \$15,000 was appropriated and work was commenced.

The plan consisted of a pier or crib-work for the protection of Peninsula Point, a projection from the north side of Sandusky Bay, between which and Cedar Point on the southeast was the entrance to the harbor.

Operations were continued on this crib-work until 1854, the total expenditure having been \$30,000.

In 1864 a survey of the harbor was made and no vestige was found of the crib-work previously built, that and the peninsula which it protected having been carried away.

In 1866 work was recommenced, dredging the channel through the bar off Cedar Point, and has been continued from time to time since that period, excavating in the natural channel to the eastward of Johnson's Island up towards the docks of the city of Sandusky.

At first the project was to obtain a channel 200 feet wide, with a depth of 14 feet. This was afterwards increased to 15 feet; but this proposed depth stopped at the 12-foot curve, over a mile from the wharves of the city, and vessels drawing over 11 feet were obliged to lighten their cargo for that distance.

In his annual report for 1876, Lieutenant-Colonel Blunt strongly recommended the continuance of work so as to complete a channel 200 feet wide and 15 feet deep at low-water up to the docks. His estimate for completing the required channel, including this addition, was \$105,000.

This recommendation was approved, and the channel has been continued on a direct course toward the line of docks at the foot of Columbia avenue, the last range, known as the "illuminated clock range," being 7,150 feet long, and the distance along the line of deepest water from the bar to where the 15-foot channel now ends, a point about 400 feet from the line of docks, being about  $4\frac{1}{4}$  miles.

OPERATIONS DURING THE PRESENT FISCAL YEAR.

The act of June 18, 1878, having provided the sum of \$20,000 for the improvement of this harbor, proposals were invited in July, 1878, for dredging in the natural channel through the bay, and on September 3 a contract was executed with Messrs. J. C. and J. H. Davis, of Toledo, Ohio, for removing 100,000 cubic yards of clay, mud, &c., at 12 cents per cubic yard.

Work was commenced upon the "illuminated clock range" on September 18, and continued until November 30, when it was suspended on account of the weather; 60,160 cubic yards of clay, mud, &c., were removed during the season. Operations were resumed early in April, and the contract of September 3, 1878, was completed on May 22, the contractors having removed in all 101,424 cubic yards.

By authority of the honorable Secretary of War a new contract similar in terms was executed with the same parties for removing 40,000 cubic yards of clay, &c., and work was commenced on May 23 on the clock range and continued until June 25, when a channel about 175 feet wide and 15 feet deep at low-water was completed; 132,897 cubic yards in all were removed from this section.

During the latter part of June the dredges were removed to the outer bar for the purpose of widening and deepening the channel through it, and by the close of the fiscal year they had commenced work upon it.

The total amount removed from the harbor of Sandusky during the fiscal year was 132,973 cubic yards of clay, sand, &c.

The channel is now in good condition and a depth of 15 feet can be



carried from the deep water of the lake up to within about 400 feet of the line of docks.

The original estimate made in 1876 by Lieutenant-Colonel Blunt to complete this channel up to the docks was \$105,000; since that time \$51,000 has been appropriated; owing to the reduced price for which the work has been done, the project is now nearly completed.

To finish the clock-range channel to the full width of 200 feet and to carry it up to within 100 feet of the docks so that wharf-owners may either build or dredge out to it, and to widen the channel through the outer bar and remove such deposits as may from time to time occur during the next two years, the sum of \$20,000 is asked for the fiscal year ending June 30, 1881, which will complete the work heretofore projected.

It is my opinion that this channel should be continued parallel to the wharves, so that vessels coming in may run at least near the docks to which they are consigned. I recommend that it shall be continued to a point within 100 feet of the line of docks and then be continued parallel to these docks.

I am also of the opinion that a good pile revetment will be required on each side of the channel from its commencement out to deep water in the lake in order to keep it from being eventually filled up. It is my intention to make a thorough survey of the harbor during the present season, and in my next annual report I will submit plans and estimates for what I have above suggested.

During the present season it is proposed to complete work upon the channel through the outer bar as far as funds will admit by removing about 8,000 cubic yards of sand, and to make a complete survey of the harbor.

The appropriation asked for the fiscal year ending June 30, 1881, will be devoted to dredging in the clock-range channel, prolonging it to within 100 feet of the line of docks, to widening and deepening the channel through the bar, and to removing such deposits as may be made during the next 2 years.

The following appropriations have been made for this harbor:

May 20, 1826.....	\$400	March 3, 1873.....	\$25,000
June 11, 1844.....	15,000	June 23, 1874.....	25,000
August 3, 1852.....	15,000	March 3, 1875.....	25,000
June 23, 1866.....	38,580	August 14, 1876.....	25,000
July 11, 1870.....	10,000	June 18, 1878.....	20,000
June 10, 1872.....	13,000	March 3, 1879.....	1,000

Total..... 212,580

Of which amount \$210,385.19 has been expended up to the close of the present fiscal year.

Sandusky Harbor is in the collection-district of Sandusky, Ohio; there is a lighthouse on Cedar Point, at the entrance to the harbor, with a fixed white light of the fifth order.

Fort Wayne, below Detroit, is the nearest work of defense.

I am unable to give the amount of commerce that will be benefited by the improvement of the harbor, but the records of the custom-house show it to be considerable. The amount of revenue collected during the fiscal year ending June 30,

1879, was .....	\$5,102 64
The value of the foreign imports was .....	19,409 00
The value of the foreign exports was .....	63,125 00

One thousand four hundred and thirty vessels, with an aggregate tonnage of 263,516 tons, entered, and 1,442 vessels, with an aggregate tonnage of 265,674 tons, cleared during the year.

Abstracts of proposals and contracts and a financial statement are transmitted herewith.

Money statement.

July 1, 1878, amount available .....	\$22,905 10	
Amount appropriated by act approved March 3, 1879.....	1,000 00	\$23,905 10
July 1, 1879, amount expended during fiscal year .....	21,331 71	
July 1, 1879, outstanding liabilities.....	378 58	21,710 29
July 1, 1879, amount available.....		2,194 81
Amount (estimated) required for completion of existing project.....	20,000 00	
Amount that can be profitably expended in fiscal year ending June 30, 1881.	20,000 00	

Abstract of proposals received and opened at 12 o'clock m. of the 21st day of August, 1878, for improving harbor of Sandusky, Ohio, in accordance with advertisement inviting proposals for harbor improvements, dated July 20, 1878.

Number.	Name of bidder.	Price per cubic yard.	Time of commencement.	Time of completion.	Remarks.
1	Chicago Dredging and Dock Company.	\$0 19	Sept. —, 1878	Dec. —, 1878	No seal to signature of firm or vice-president.
2	Patrick Smith.....	18	Sept. 1, 1878	Dec. 1, 1879	No date for completing work.
3	Elias Sims .....	18	10 days after contract is awarded.		
4	Franklin Lee.....	18	Sept. 1, 1878	Sept. 1, 1879	
5	Jesse Sims .....	15			The certificate that the guarantors are good and sufficient sureties for the amount, not signed by any person, official or otherwise. Dates of commencement and completion of work not stated.
6	William Richardson...	15	Sept. 1, 1878	Sept. 1, 1879	The individual names of the firm not written out, not signed in full, and Christian names not given. Seal of wax or wafer not affixed to signatures. Guaranty not filled out complete. Witnesses to guarantors are wanting, and the certificate to guarantors not signed by any person, official or otherwise. No dates for commencing or completing work. Contract awarded.
7	E. H. French.....	14	Sept. 1, 1878	June 30, 1879	
8	John Hickler and Richard Arnoldt.	13	Sept. 1, 1878	June 1, 1879	
9	J. C. and J. H. Davis..	12			

Abstract of contracts for improving harbor at Sandusky, Ohio, in force during fiscal year ending June 30, 1879.

Name and residence of contractor.	Date of contract.	Subject of contract.	Sand, clay, &c., per cubic yard, in scows.
J. C. and J. H. Davis, Toledo, Ohio.....	Sept. 3, 1878	Dredging	\$0 12*
J. C. and J. H. Davis, Toledo, Ohio.....	May 22, 1879	do	12

\* Contract completed and closed May 20, 1879.



## GG 12.

## IMPROVEMENT OF HURON HARBOR, OHIO.

The attention of the general government was called to the mouth of Huron River, where the usual bar was found, in 1826, and the first appropriation of \$5,000 was made by the act of May 20 of that year.

The plan of improvement proposed was that of parallel piers running from the shore on each side of the mouth of the river out to the 12-foot curve in the lake.

Operations were commenced in 1827 and continued from time to time until 1845, when the project was completed and a good channel with a depth of 12 feet at low-water obtained.

In 1852 an appropriation of \$10,000 was made and applied to the repair of the piers.

No further work was done until 1865, when an examination of the harbor showed the piers to have been seriously damaged and to require extensive repairs; work was commenced in 1867 and completed in 1868, at which time the harbor was in excellent condition. Since that date, operations have been confined to minor repairs made in 1874, 1876, and 1878.

The piers are about 150 feet apart, except near their outer ends, where the west pier flares to the westward, and there is a good wide channel with a depth of 16 feet between them, and of 15½ feet on the outer bar.

The east pier is 900 feet long, and the west pier 1,300 feet long.

During the present fiscal year, operations have been confined to the repair of the decking of the piers, renewing decayed plank and those carried off by the force of the sea. The following materials were used for repairs:

8,549 feet, board measure, of pine plank.  
618 feet, board measure, of oak timber.  
450 pounds of spike.

At present the piers are in tolerably good order, but the superstructure will soon require renewal throughout.

The breakwater at the inner end of the west pier, which was built to prevent the lake breaking through into the river around the piers, has been badly damaged and should be repaired at an early day, or a strong pile protection, backed with stone, substituted for it.

The estimated cost of this breakwater and of renewing the superstructures on both piers is as follows:

300 feet of pile protection, at \$10 per foot.....	\$3,000
Renewing 2,200 linear feet of superstructure, at \$10 per foot.....	22,000
Total.....	25,000

This work will not be required immediately, but should be commenced at an early day and continued at the rate of 500 linear feet annually until completed.

If funds are available during the fiscal year ending June 30, 1881, they should be applied to the construction of the pile protection near the inner end of the west pier, and to the renewal of a portion of the superstructure of the west pier.

The following amounts have been appropriated for this harbor up to the close of the present fiscal year:

May 20, 1826.....	\$5,000 00	July 7, 1838.....	\$5,000 00
May 23, 1828.....	4,413 35	June 11, 1844.....	5,000 00
March 3, 1829.....	5,935 00	August 30, 1852.....	10,000 00
April 23, 1830.....	1,880 36	June 23, 1866.....	39,000 00
March 2, 1831.....	3,480 00	June 23, 1874.....	1,500 00
July 3, 1832.....	1,500 00	March 3, 1875.....	1,000 00
June 28, 1834.....	6,700 00	June 18, 1878.....	1,000 00
July 2, 1836.....	4,300 00		
March 3, 1837.....	2,565 00	Total.....	98,273 71

Of this amount \$97,445.84 has been expended up to June 30, 1879.

To renew the superstructure of both piers and to construct pile protection at the inner end of the west pier \$25,000 will be required, of which amount \$8,000 can be profitably expended during the fiscal year ending June 30, 1881.

Huron Harbor is in the collection-district of Sandusky, Ohio. Fort Wayne, Michigan, about 70 miles distant, is the nearest work of defense. There is a fixed white light of the fourth order on the outer end of the west pier.

I have no means of estimating the amount of commerce and navigation that will be benefited by this improvement except the record of the custom-house, which does not show extensive commerce.

The amount of revenue collected during the fiscal year ending June 30, 1879, was \$34.75.

The value of the imports during the year was \$150.

No exports were reported; 65 vessels, with an aggregate tonnage of 5,232 tons, entered, and 66 vessels, with an aggregate tonnage of 5,725 tons, cleared during the year.

A money statement is transmitted herewith.

*Money statement.*

July 1, 1878, amount available.....	\$1,189 17
July 1, 1879, amount expended during fiscal year.....	361 30
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July 1, 1879, amount available.....	827 87
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Amount (estimated) required for completion of existing project.....	25,000 00
Amount that can be profitably expended in fiscal year ending June 30, 1881.....	8,000 00

## GG 13.

## IMPROVEMENT OF VERMILLION HARBOR, OHIO.

The original plan for the improvement of the harbor of Vermillion consisted in running out piers to a depth of 12 feet water in Lake Erie, from the shore to the mouth of Vermillion River, and by thus contracting the channel, to obtain a depth of 10 feet water through the bar.

This work was commenced in the fall of 1836, the estimated cost, exclusive of such dredging as might be required, being \$74,342.34.

Operations were carried on from time to time until the close of the year 1852, when the west pier was 1,396 feet long, the east pier about 700 feet long, and there was a depth of 8½ feet water in the channel.

From 1852 to 1866 no work was done by the United States.

In 1865 an examination was made of the harbor by Colonel Cram, who found the piers in very bad condition and a depth of only 7 feet on the bar at the entrance to the harbor. He presented a project for the complete repair of the piers at an estimated cost of \$15,315.74. These