

The general direction of these hurdles should be perpendicular to the training-wall and the interval between them about 100 yards. Where the depth of water is considerable, it may be advantageous to reduce that interval to as little as 50 yards.

You will please keep full notes of the cost and results accomplished.

Very respectfully,  
By command of Colonel Simpson,

O. H. ERNST,  
Captain of Engineers.

Mr. D. M. CURRIE,  
Assistant Engineer.

Of the eight lines constructed, seven are above dike No. 2, and are either in shoal water or on dry sand-bar during mean and low stages. The eighth is below dike No. 2, and was constructed in deep water, the maximum depth being 23 feet with the river at a stage about 12 feet above low-water. The wattling was pushed down to the bottom when the depth of water was not greater than 8 feet, but that was about the maximum depth to which it was possible to force it by the weight of men standing upon it. Heavy forks were procured, with the intention of using them to push the rods down singly, and to greater depths, but work was suspended on account of high-water before an opportunity to use them was presented.

The line below dike No. 2 was constructed during the first half of May, and mud was deposited there shortly afterward to a depth of 7 feet. The training-wall being above water surface caused still water behind it, and thereby contributed more or less to the deposit.

The river rose to 18 feet above low-water after five lines of hurdles above dike No. 2 had been completed. The rise, coming chiefly from the Missouri, was accompanied by the supply of mud expected from that source. When the water subsided, the whole of that part of the space protected by the hurdles was filled with semi-fluid mud to the top of the wattling. The depth of the mud ranged from 0 to 6 feet, according to the depths of water during the rise.

This mud solidified before the last or June rise, so that it would bear the weight of a man walking carefully on it, and settled from about 1.5 feet to 0, in proportion to its depth. The late rise has covered the space again, and a further deposit may be confidently expected.

The aggregate length of the eight lines of hurdles constructed is 5,500 feet. The following tabulated statement shows the quantities and kinds of materials used in the several works named in the foregoing report:

Localities.	Stone on rip-rap.	Spalls.	Brush.	Piles.	Linear feet of pile timber exclusive of piles.	Number of piles for piling.
	Cub. yds.	Cub. yds.	Cords.	No.		
Sawyer Bend .....	2, 073. 32					
Dam at Cahokia Chute .....	53, 563. 66	865. 06	6, 167. 57	997		
Dike 5, Horsetail Bar .....	4, 929. 44					
Dike 2, Horsetail Bar .....	1, 614. 57					
Training-wall, Horsetail Bar .....	41, 062. 28		6, 445. 83	635		261
Hurdles, Horsetail Bar .....			267. 18	593	709	140
Revetment Arsenal Island .....	10, 012. 48					
Totals .....	113, 255. 75	865. 06	12, 880. 58	2, 225	709	401

The accompanying cross-section of Cahokia Chute, on center line of the dam, was prepared from survey made under your direction by Mr. William Popp, assistant engineer, to whom I am indebted for the execution of the tracing as well as for that of the cross-section of the dam.

Very respectfully, your obedient servant,

Col. J. H. SIMPSON,  
Corps of Engineers, U. S. A.

D. M. CURRIE,  
Assistant Engineer.

B.

PETITION FROM RESIDENTS OF MONROE COUNTY, ILLINOIS.

IVY POST-OFFICE, MONROE COUNTY, ILL.

The undersigned citizens and residents of Monroe County, Illinois, owners and occupants of lands in the locality hereinafter described, respectfully present to you, as United States Engineer in charge of Mississippi River improvement, the following facts, viz:

That for many years last past the Mississippi River has been changing its channel from a point near to and below Rush Tower, on the Missouri side, to a point near to and above Fort Chartres, about 6 miles. In this change of channel the river is widened, bars formed, and navigation of the river endangered. Also, many thousand acres of valuable land have fallen into the river. The banks at places farther back get lower, and there is great danger that the river will break its way to and run through the lakes or lower lands nearer the bluffs, thus subjecting the undersigned and many others to great pecuniary loss, and endangering the safe navigation of the river. Your petitioners therefore respectfully call your attention to this portion of the river (as shown by the accompanying plat), and request that you will, at as early a day as your duty and the public interest will allow, construct such works as will protect and secure the safe navigation of the river, and incidentally secure your petitioners and others against further loss and danger from its continued and recently rapid changes of its channel.

(Signed by Philipp A. Mans and forty-two others.)  
General J. H. SIMPSON.

The undersigned is a resident of said county of Monroe, State of Illinois, and has personal knowledge of the truth of the facts set forth in above petition, and therefore urges upon your attention the necessity for some improvement in the river at said point, in the interest both of river navigation and the owners of adjacent property.

Respectfully, &c.,

W. R. MORRISON.

C.

LETTER FROM COMMON COUNCIL OF ALTON, ILLINOIS.

ALTON, ILL., December 10, 1878.

DEAR SIR: We, the undersigned committee, lately appointed by the Common Council of the city of Alton, Madison County, Illinois, would most respectfully call your attention to a few important facts connected with the present alarming condition of Alton Harbor.

For many years there has been a large bar just below our harbor near the Illinois shore, which has oftentimes been almost entirely cut away by the action of the current, and at other times it has rapidly filled up by the accumulation of sand, &c., whenever the current or channel changed again or was diverted over to the Missouri shore.

The head of this bar a few years ago was fully 300 yards below the foot of Alton Harbor, and when the Alton dike was first completed or built 10 feet above low-water mark this bar commenced to gradually disappear, but since the cutting down of this dike by the ice it has been rapidly increasing and filling up, until to-day it extends up into Alton Harbor, destroying fully one-third of our harbor for navigation purposes.

A careful examination of Alton Harbor discloses the startling fact that unless some early measures are adopted that will afford speedy relief this bar will continue to grow and extend up the Mississippi River until our harbor will be totally destroyed, and steamboats will be compelled to abandon our levee and land entirely above our city.

When Alton dike was first completed it accomplished just what was anticipated by the government engineers, for the main current or channel of the river was forced over to the Illinois shore, and passing down through Alton Harbor rapidly cut away Alton Bar, and this bar would have entirely disappeared if the Alton dike had been built above high-water mark; but unfortunately this dike was only built 10 feet above low-water mark, and the ice now having cut it down fully 6 feet, it of course in its present condition totally fails to accomplish the result so confidently expected.

We believe that if this dike should again be built only 10 feet above low-water mark it would be a useless expenditure, because the ice would again cut it down, and

we are confirmed in this opinion by Mr. McMath, the officer detailed by you to make a personal examination of Alton dike.

We confidently believe that if this dike were built above high-water mark that it would be the true solution of all our harbor difficulties, for the natural effect would be, in our opinion, to cut away in a very short time this bar in our harbor that now so obstructs the general navigation of our river. We recognize, general, that you are in possession of all the facts necessary to arrive at a correct understanding of this whole question, and we only respectfully call your attention to the above statement of what we believe is the true condition of Alton Harbor, so that you may see that we are ready and willing to cordially co-operate in any measures you may adopt for the purpose of granting our city some relief against the total destruction of our harbor.

If you should decide, general, that it is necessary to have Alton dike raised above high-water mark, and there is not sufficient government funds in your hands to warrant such an extra expenditure, we desire to assure you that we will do everything in our power to assist in getting a special appropriation from the general government for this object. We are very desirous of having a personal conference with you, and would respectfully ask that you name an early day so that our committee may call and see you at your office, and believing that you will give this whole subject the attention its great importance would justify, we remain,

Very respectfully, your obedient servants,

LUCAS PFEIFFENBERGER.  
G. H. WEIGLER.  
F. SHELBY.  
J. Q. BURBRIDGE.  
R. G. PERLEY.

General J. H. SIMPSON.

D.

PETITION FROM CITIZENS OF SAINT GENEVIEVE, MISSOURI.

The undersigned citizens of the city and county of Saint Genevieve, in the State of Missouri, respectfully call your attention to the following facts, and show—

1. That our city, possessing a commercial importance and doing an annual business far greater than many, even in fact a majority, of the minor municipal subdivisions of this country, is wholly dependent upon the Mississippi River as a medium of commerce and a highway by means of which to interchange our commodities for those of other States and communities in this country.

2. That the nearest and only means of railroad communication we possess are by the Saint Louis, Iron Mountain and Southern on the west; the Saint Louis and Cairo Narrow Gauge and the Chester and Tamaroa on the east; that the nearest point to either or any of these railroads is as follows:

The Iron Mountain and Southern at De Lassus or Bailey's Station, each of which places is 31 miles distant and can be reached only by means of a natural dirt road, impassable for any kind of vehicle for one-fourth of the year; that is during the winter months, and during the winter, fall, and early spring months impracticable for profitable transportation purposes, owing to the soft and yielding nature of the soil which it traverses.

3. That the Saint Louis and Cairo Railroad is only accessible at Red Bud, in the county of Randolph and State of Illinois, 22 miles distant; and the Chester and Tamaroa at Chester, 20 miles distant, both of which places to be reached will necessitate crossing the Mississippi River. The landing at Saint Genevieve, except in high-water, is so precarious and changeable that the rates of ferriage necessarily charged thereby render absolutely futile and ineffectual any attempts at commercial intercourse by way of Red Bud. That the road hence to Chester traverses a marshy, boggy, and wet loam, cut up and crossed by innumerable springs, making it, except in midsummer, absolutely impassable for loaded conveyances. That even when the Mississippi River, our natural and only commercial highway, is in fair and ordinary boating stage, it is 2 miles distant from our city to any accessible steamboat landing. That we believe that the improvements made by the United States Government north of our city at or near Turkey Island have been the means of causing the channel of the river to gradually deflect towards the Illinois shore and away from our city; in consequence of which a "bar" has extended above Rock Haven, our only landing, to a point opposite a perpendicular bluff of solid rock, where it would be absolutely impossible to construct, by any outlay of means within our power, a practicable landing. That the only other landing possible in an ordinary stage of the river would be in the Big Common Field, between 1 and 2 miles south of the utmost limits of the city, only accessible after the construction of a macadamized, plank, or other road, necessitating the expenditure of thousands of dollars.

We further respectfully show you that, by statistics carefully compiled from statements of our merchants and business men, our annual trade amounts to \$600,000, representing between 10,000 and 12,000 tons of merchandise of every description, on which has been paid between \$30,000 and \$35,000 freight per annum.

Therefore, in view of the foregoing facts, and of the further fact that no part of any appropriation of Congress for the improvement of Western rivers, or the Mississippi River particularly, has ever been applied to any scheme of improvement resulting beneficially to our city, and believing further that the delegation to Congress by the States of the power "to regulate commerce with foreign nations and among the States," &c., was meant to operate impartially and equitably among all the States and their minor subdivisions, we respectfully request that, if not inconsistent with law and the public welfare nor antagonistic to any plan of improvement of the Mississippi deemed most practicable and feasible in your judgment, a part of the appropriation of Congress under your control be expended, and such works and barriers be erected at or near our city as will, in your opinion, with least outlay consistent with effectiveness, prevent the further deflection of the channel of the river and the complete isolation of our city from all commercial intercourse with the world.

The above is respectfully submitted for your consideration.

CHARLES C. ROZIER, *Mayor*.  
HENRY S. SHAW, *City Attorney*.  
JULES B. GUIGNON, *City Clerk*.  
LOUIS DELCOMMUM, *City Marshal*.  
JACOB YEALY, *City Collector*.  
VALENTIN SEITZ, *Alderman*.  
JOS. BORCKLE, *Alderman*.  
F. C. ALBERT, *Alderman*.  
J. B. C. LE COMPTE, *Alderman*.  
VALENTINE ROTTLE, *Alderman*.  
C. W. HAMM, *Alderman*.  
JOHN L. BOGY, *County Clerk and Probate Judge*.  
JOHN A. SCUDDER, *President Anchor Line, &c.*  
And 249 others.

General JAMES H. SIMPSON,  
*Colonel Engineer Corps, U. S. A.*

E.

LETTER FROM MAYOR AND COMMON COUNCIL OF CAPE GIRARDEAU, MISSOURI.

We, the Mayor and Council of the city of Cape Girardeau, respectfully represent that serious damage is likely to result to this city and to property on the Illinois shore opposite this city, from the effect of the dike built by the United States Government at Devil's Island, a few miles above this city, deflecting the main current and channel of the Mississippi River against the Missouri shore, above Cape Rock, by which it is again deflected so that it does not flow in full volume against and along the shore and wharf of the city of Cape Girardeau, as heretofore, but against and along the Illinois shore opposite, thus rapidly abrading the said Illinois shore and permitting the formation of a sand bar and the filling up of the channel along and in front of the wharf or landing of this city to such an extent that the total ruin of the landing is threatened.

We therefore pray that you will take measures at as early a date as practicable to avert the danger and damage threatened to this city by the causes aforesaid, which we would respectfully suggest might be done by a dike built out from the Illinois shore from a suitable point to deflect the current and main channel of the river back to the Missouri shore along the front of this city.

Respectfully,

G. H. CRAMER, *Mayor*.  
LEO DOYLE,  
WILLIAM WARNER,  
W. H. WILLER,  
FRITZ HENNINGER,  
GEORGE HIRSCH,  
WILLIAM THENERKAUF,  
FERD. HANNY,  
*Councilmen.*

General SIMPSON.

## N 2.

## IMPROVEMENT OF OSAGE RIVER IN MISSOURI AND KANSAS.

By the river and harbor act approved June 18, 1878, \$20,000 were appropriated for the improvement of the Osage River in Missouri and Kansas. In order to comply with the terms of the appropriation, it was necessary to make a survey of such part of the river within the boundaries of Kansas as might be considered capable of being made navigable, and to extend the survey to a connection with the part of the river previously surveyed—below Osceola, Mo. Of the \$20,000 appropriated, \$7,500 was set apart for the necessary survey, and the balance, \$12,500, was applied to the improvement of the lower part of the river. The project for the expenditure of this sum contemplated the removal of numerous snags from the channel, the cutting of leaning timber along the banks, and the construction of cross-dams and training-walls at certain shoals.

Work was commenced at Bois Brulé Shoal in the latter part of August, by the chartered steamer Emma.

At this locality 25 snags were removed from the channel and 255 leaning trees cut and removed from the bank.

Similar work was done at White Oak Shoal in the removal of 9 snags and 65 leaning trees.

The next work was at Sugar Creek Shoal, where 55 snags and 586 leaning trees were removed.

At Moore's Flats the river is excessively wide, and, of consequence, very shoal. The plan adopted for its improvement was the construction of a log dam extending from the right bank 480 feet into the river, where it joined a training-wall parallel to the left bank, 650 feet in length. The height of the cross-dam is 3 feet and the training wall 3½ feet above low-water mark. The dam was built of logs, backed with gravel, and the whole covered with stone. A stone apron 30 feet wide and 1½ feet deep was laid below the dam to prevent scour.

The training-wall was built of cribs 10 feet wide at the base and 6 feet at the top, filled with gravel to within 1 foot of the top and then covered with stone. An apron of stone was also laid along the channel side of the cribs to guard against undermining.

The upper part of this shoal was so hard that it was necessary to scrape a channel 50 feet wide for a length of 450 feet.

On the completion of the work at Moore's Flats, the water being very low and the season far advanced, the working force was instructed to pass down the river and repair the work of previous years.

A breach in the cross-dam at Dixon's Shoal 60 feet in length was closed and the bank above and below the dam revetted to a distance of 150 feet.

At Bolton's Shoal numerous logs and snags which had lodged in the chute were removed.

The remainder of the working season was spent in closing a breach in the cross-dam and in extending the training-wall at Shipley's Shoal.

The breach, which was 156 feet long and from 9 to 23 feet deep, was closed by building a log raft in place and sinking it with gravel. When closed a backing of gravel and covering of stone was placed as usual. Sixty feet of the old training-wall was repaired and 220 feet added to its length when the coming on of winter brought the work to an end.

The result of the year's work is 16 miles of river opened to low-water navigation and the maintenance of the previously obtained channel for 29 miles, or a total improved navigation for 45 miles.

With the means provided by act approved March 3, 1879, it is intended to extend the improvement 15 miles to Tuscumbia, the work being distributed over 10 different localities.

Although the language of the appropriation specifies Kansas as well as Missouri, it is considered that the only rational application of the means is to secure a continuous navigation, and that Kansas will eventually share in the benefits of the present work, although it does not lie within the boundaries of that State.

The survey of the upper part of the river was completed from Ottawa, Kans., to Osceola, Mo., a distance of 196 miles, and a report thereon submitted to the Chief of Engineers, under date of February 13, 1879.

No estimate of the cost of completing the improvement upon the system practiced hitherto has been or can be made. As it seems to be the will of Congress that the improvement of the open channel should continue, an estimate of \$50,000 is submitted as being the amount which could be most profitably expended during the fiscal year ending June 30, 1881.

*Money statement.*

July 1, 1878, amount available.....	\$20,000 00	
Miscellaneous receipts.....	15 75	
Amount appropriated by act approved March 3, 1879.....	20,000 00	
		\$40,015 75
July 1, 1879, amount expended during fiscal year.....		19,224 65
July 1, 1879, amount available.....		20,791 10
Amount that can be profitably expended in fiscal year ending June 30, 1881.		50,000 00

## N 3.

SURVEY OF THE MISSISSIPPI RIVER TO ASCERTAIN THE PRACTICABILITY, COST, AND UTILITY OF A DIKE FROM BLOODY ISLAND, OPPOSITE THE CITY OF SAINT LOUIS, MISSOURI, NORTH TO THE DIKE OR DAM OPPOSITE BROOKLYN, ON THE ILLINOIS SHORE.

ENGINEER OFFICE, UNITED STATES ARMY,  
Saint Louis, Mo., February 8, 1879.

GENERAL: The river and harbor act of June 18, 1878, provided for a survey "to ascertain the practicability, cost, and utility of a dike from Bloody Island, opposite the city of Saint Louis, Mo., north to the dike or dam opposite Brooklyn, on the Illinois shore"; and by your letter of July 8, 1878, this survey was assigned to me. It has now been completed, and I have the honor to forward herewith the resulting map and to submit the following report.

The act does not define the object of the dike, and it might, at first glance, be assumed that it was intended to maintain the harbor of Saint Louis. But it is known here that the exciting cause of this inquiry is the fear entertained by some of the inhabitants of East Saint Louis that the Mississippi will break into Cahokia Creek, above East Saint Louis, and cut that city off from the Illinois shore. The correspondence upon this subject between Mr. John B. Bowman, corporation counsel for East Saint Louis, Hon. Henry Overstolz, mayor of Saint Louis, and myself was transmitted to you with my letter of May 16, 1876. In that correspondence it appears that the authorities of Saint Louis are asked to co-operate with those of East Saint Louis in inducing

the general government to build the dike on the ground that the harbor of Saint Louis is in danger; and it seems to be assumed that one and the same dike will remove the alleged danger from both cities. It accordingly becomes necessary to consider the proposed dike in its capacity of a work of protection as well as of a harbor work.

Regarding it first as simply a harbor work, its object may be either the negative one of preventing the river from deserting the present channel, or the positive one of contracting the present channel so as to give deeper water in it. I have had represented on the map all the principal dikes now connecting Bloody Island with the Illinois shore. The contingency of the river leaving its present free channel to break through that array of obstacles is so remote that I do not think it worthy of serious consideration at this time.

Soundings are also given for that portion of the harbor of Saint Louis which would be affected by any works below the Brooklyn dike. These show that there is now no difficulty with the general navigation, and that no further contraction at that place is immediately required. The shoal which appears at the Saint Louis wharf would be but slightly affected, and it is only a small part of the general shoal which extends in front of the north wharf and which would not be affected by any works below the Brooklyn dike. Its proper remedy involves a material change in the location of the wharf line. (See my report of April 10, 1878, with historical memoir.)

To finally complete the improvement of the river at this locality and to thoroughly reclaim the land, a low longitudinal dike will be required; but it must extend several miles above the Brooklyn dike, and the construction should be commenced at the upper end. But there seems to be no good reason for the general government to complete that part of the improvement, since it is not interested in the complete reclamation of the land, and the river is already sufficiently contracted to insure good general navigation, while it is not believed that the work would relieve the northern Saint Louis wharf. At all events only a low dike would be admissible, as a high dike would check the deposit and might prove a serious and permanent injury to the business interests of the locality.

Moreover it should, if constructed at all, be located upon the line of the east bank as finally fixed. I endeavored to show in my report of April 10, 1878, with its accompanying documents, that the position heretofore fixed upon for that line was faulty. Its position must depend, however, upon the location of the Saint Louis wharf, and the city authorities have now under consideration the subject of changing the location of that wharf.

If the wharf line is changed the Illinois shore would no doubt be placed somewhere near the full red line H H, shown on the map. Its position as heretofore fixed is shown by the full blue line C D. A low longitudinal dike would be located upon one or the other of these lines. If a high dike, it would be thrown back about 80 feet, as shown by the dotted lines F G and A B, to give room for a levee with a slope of 1 on 5.

Viewing the proposed dike as a work of protection, the danger apprehended exists only at high-water. A low dike, wherever placed, would not afford protection; a high one is required. If such a dike were admissible at all upon the line indicated, viz, from Bloody Island to the dike or dam opposite Brooklyn, it would merely transfer the point of entrance of the river to the endangered ground that much up-stream. It would still be necessary to connect it with the main shore by a high

dike. The latter being built upon a site covered with water, notwithstanding that it would have the present low dike for a part of its foundation, would be far more costly than one entirely new built lower down where the site at ordinary stages is dry land. These works would inclose an area about a mile long and nearly half a mile a wide, upon which all deposits from the river would cease, leaving portions of it covered with stagnant water, and adding largely to the cost of reclaiming it.

To accomplish the object of protecting the city of East Saint Louis—for I think it is plain that there is very little danger to the channel of the Mississippi—the proper position of the dike would seem to be the one, M N, indicated on the map, running from the head of Bloody Island to the firm land by the shortest line.

It would be a work for the protection of lands and not for the improvement of the navigation of the Mississippi or the maintenance of the harbor of Saint Louis.

The conclusions, then, are that as a harbor work a low dike only is admissible; that it is not now necessary, and, if the subject of locating the river bank may be regarded as having been reopened, its construction now is highly injudicious, since it may hereafter prove an obstacle; that the inhabitants of East Saint Louis require a high dike; that such dike should not be built in the position indicated; and that in any other position it is a work simply for the preservation of lands.

The construction of the dike is practicable upon either of the lines mentioned.

An estimate of cost is submitted for a high dike 30 feet above low-water upon each of the lines.

For lines E B A H K	{	E B, 650 feet, at \$47 .....	\$30,550
		B A, 5,250 feet, at \$75 .....	393,750
		A H, 790 feet, at \$75 .....	59,250
		H K, 1,660 feet, at \$40 .....	66,400
			<hr/>
			549,950
			<hr/>
For lines G F K	{	G F, 7,000 feet, at \$47 .....	329,000
		F K, 1,580 feet, at \$49 .....	63,200
			<hr/>
			392,200
			<hr/>
For lines M N, earth embankment, 2,230 feet, revetted with stone, 2,230 feet, at \$6 .....			13,380

Very respectfully, your obedient servant,

J. H. SIMPSON,  
Colonel of Engineers.

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