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THE  
OUTLET SYSTEM;

ITS EFFECTS ON THE  
COMMERCIAL AND AGRICULTURAL  
INDUSTRIES AND SANITARY  
CONDITIONS

—† of †—

NEW ORLEANS AND THE MISSISSIPPI VALLEY.

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By CAPT. JOHN COWDON.

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NEW ORLEANS:  
PICAYUNE OFFICE JOB PRINT, 65 CAMP STREET.

1881





# MEMORIAL

OF

# CAPTAIN JOHN COWDON,

REPLYING TO

The Report of the Mississippi River Improvement Commission.

FEBRUARY 23, 1881.—Referred to the Committee on Commerce and ordered to be printed.

The work assigned this commission was to take into consideration plans to improve river navigation and prevent overflows. In doing this they were required to examine three plans: "The levee system," "The jetty system," and "The outlet system," and inasmuch as it was known in advance that this commission were not only hostile to the outlet system, but in favor of levees and river jetties, their report was only what might have been expected, and, like many similar reports, would have passed unnoticed but for the reason that they have devoted more than half their loose and reckless statements to an attack on House bill No. 5413, which I had the honor to have presented to Congress, embracing as it did the main features of the outlet system as proposed by myself.

Therefore it is but proper that I should refute some of their groundless assumptions, and in so doing shall confine myself mainly to the published reports and statements of engineers of the United States Army.

It is evident that they were utterly ignorant of the underlying principle of the outlet system as proposed, or had no regard for the actual facts, when they published to the world so many statements that come in direct conflict with existing reports of other engineers. As a specimen, on page 6 of their report, they say: "The outlet system is one of waste, diffusion, and not contractive."

It is right here the issue is made, and the following table, compiled from the report of Major Benyaard, which has been verified as being essentially correct by Mr. H. B. Herr, an officer in the office of Major Benyaard, will show that outlets at and near the lower end of the river, by which large volumes of water are conducted to the Gulf level by short and direct lines, does confine within the natural banks of the river the waters above, and when the outlet at Lake Borgne may be made, and the waters of the Red River shed diverted to the Gulf level even by the Atchafalaya, an existing and natural route, the waters of the valley to Cairo and above will be confined to and within the natural banks of the entire river, at the same time lowering the river bed and deepening and making more permanent its channel, all without the use and expense of levees and river jetties, and at a cost no greater than this commission have already spent for surveys.

YEARS.	Carrollton.		Month Red River.		Natchez.		Vicksburg.		Month White River.		Memphis.	
	Ft.	in.	Ft.	in.	Ft.	in.	Ft.	in.	Ft.	in.	Ft.	in.
Oscillation .....	17	0	47	0	49	0	52	0	47	0	35	9
1873 .....	4	4	7	8	9	2	11	8	3	9	3	3
1874 .....	1	6	0	0	4	0	6	6	0	2	1	9
1875 .....	6	0	5	5	7	4	9	4	1	6	2	7
1876 .....	4	6	2	6	6	0	7	5	1	1	1	0
1877 .....	6	2		(*)		(*)	11	5	2	2	3	6
Total average below high-water mark.....	4	6	4	0	6	8	9	3	1	11	2	6

\*No report.

The above table demonstrates that outlets as proposed do concentrate and not diffuse the water of the valley; and the River Commission, finding it impossible to meet these facts, trying to avoid them by saying, on page 6 of their report, "Before dismissing the subject it is pertinent to say that the statements which have been published to support this scheme regarding the effect produced by the 'Bonnet Carré' outlet, in lowering the flood-angle above and below it, have been greatly exaggerated."

The above report is just what has been published, and is what the commission refers to, and I leave it to the country, to judge as to the truth of what this commission says.

On page 8, they are equally unfortunate, as the following proofs will show. They say:

As a portion of the volume of the river is drawn off by the crevasse, it is impossible that the current below the crevasse can then be as rapid as it was before its occurrence. Being less rapid, it is unable to sustain the whole quantity of matter held in suspension by the more rapid current above. The outlet, and consequently its surplus sediment, falls to the bottom below the crevasse.

In other words, they mean to say the channel of the river below the outlet will fill up. When they wrote and signed that report they knew better, for they could not have been ignorant of the report of General Humphreys, Chief of Engineers, who, with reference to the Bonnet Carré outlet, on pages 418 and 419, said:

The mean discharge of the river above the outlet was 1,100,000 cubic feet per second, while the mean velocity of the river was 5.45 feet per second above, when below the crevasse the velocity was 6.66 feet per second, while the corresponding velocity at the bottom was 4.72 feet per second above the crevasse and 5.80 below; the velocity of the current below the break being more than one foot per second greater than above, and actually an increased velocity of 6 per cent. in the river.

Under ordinary circumstances the above extract from the report of the Chief of Engineers would be deemed sufficient to refute the second groundless assumption of this commission. But as I do not intend to leave them any further chance to mislead Congress and the country, I will now refer them to what was said on this point by a Board of Engineers in 1875, appointed by Congress to examine into and report on "The reclamation of the alluvial basin of the Mississippi River." On page 9 of their report they say:

But, it is alleged, actual measurements have established that great crevasses do create bars in the river below them, and the several breaks at Bonnet Carré Bend are cited in support of this statement. This is an error of fact. No such evidence really exists. The mistake has been caused by the discov-

ery from soundings made after the crevasse had ceased to flow that the channel below is smaller than that above, and it has been assumed that the difference is due to crevasses. The truth is, there is a natural contraction in the channel at this point, which has remained unchanged for at least a quarter of a century, and it is highly probable that this contraction, combined with the sharp change in the direction of the river and the excessive height and sandy nature of the levees, is the cause of the many breaks at this locality. To put this matter beyond cavil, a resounding of the old lines, as nearly as the want of exact bench marks would permit, was made for the commission by Mr. G. W. R. Baily, of Louisiana, in September, 1874. He made a map of five sections of the river, which were carefully compared with the original plots now on file in the Bureau of Engineer Department of Army at Washington.

The results are presented in the following table, which, considering the fact that the high waters of different floods are used as the datum, shows a surprising accordance, and puts this vexed question forever at rest.

So much for the river just below the crevasse, and as a further proof that the crevasse had not caused the river to shoal at its mouth, I will now refer to the report of Maj. C. W. Howell for 1877, who in the following table, gives the depth of the channel in Southwest Pass, then the main and deepest outlet to the Gulf, where there are no jetties.

	Feet.	Inches.
Page 423, February, depth of channel.....	20	0
Page 423, March, depth of Channel.....	20	6
Page 424, April, depth of channel.....	20	0
Page 424, May, depth of channel.....	20	6
Page 425, June, depth of channel.....	21	0

For the year 20 vessels went to sea drawing from 20 to 21 feet, and two drawing over 21 feet.

I trust the above will show that, should the Lake Borgne outlet be made and discharge more than double the volume of water that was discharged at Bonnet Carré, there need be no fear of shoaling the river mouth. On the contrary, there would be more water pass out at the river's mouth than ever before at the same period of time, for the reason that by the outlet the flood angle of slope is increased, which draws the water down from above the outlet with greater velocity of current, and when it passes the outlet, it being so near the river mouth, just as in low-water when there is no fall at all from New Orleans to the Gulf, its volume will be forced on the Gulf by its own dynamic or moving force, thus accelerated by the increase of the angle of fall created by the diversion of a portion of the water to the Gulf level by so much shorter distance than via the river mouth.

This is a law of hydraulics, the inevitable results of gravitation, velocity and force, but one which this river commission appears not to have comprehended.

I shall now pass on to another error of the commission; on page 10 of their report they say: "In considering the proposed outlet into Lake Borgne it is necessary to refer to the phenomenon attending a class of outlets which cannot be considered as *permanent ones*, and which are similar in their characteristics to those which would attend the proposed one at Lake Borgne, for the reason that the river immediately after occurrence, whether from natural or artificial causes, commences a subdelta formation which, in the course of a few years, effects their complete closure;" and in this connection go on to cite the Jump and Cubits Gap.

Here again I refute this statement by reference to the report of the Board of Engineers for 1875, already referred to. That report says: "The jump was gauged by Lieutenant Davis, Corps of Engineers, in 1874. It was 560 feet wide, and 55 feet deep at the river, with a greatest discharge of 100,000 cubic

feet per second, or nearly equal to that of the Atchafayala." Here, the report says: "Is a *permanent and important high water outlet, formed more than thirty years ago by a crevasse.*" But this the commission asserts has nearly filled up at the river. If this be so it is most extraordinary that after being open thirty years, at the end of which time, or in 1874, should have a discharge of 100,000 cubic feet per second, and then without any apparent cause in five years more should close up. This statement can not be sustained any more than the others I have refuted. But the commission goes on to say these outlets have also filled up the Gulf, which no one denies. But they did not state another fact which all know who had any practical knowledge of these passes. That fact is, throughout this fill to the Gulf there are formed many deep and well defined streams, the united area of which is always equal to the discharge of the river.

The most notable delta outlets and subdelta formations are the Southwest Pass and South Pass, both of which have formed since 1730. The former extending itself out into the Gulf 17 miles since 1730, and the South Pass 13 miles during the same period. These two are permanent subdelta outlets, and just as at the Jump and Cubits Gap the proposed outlet at Lake Borgne will go on filling the Gulf by means of their own and self-created channels, which carries the mud, and there is no more danger of the self-closing of one than the other.

But when they say the outlet into Lake Borgne would soon fill that lake, they certainly never have made any calculations, but, as usual, state things at random. I can tell them that Lake Borgne has an area of 330 superficial square miles by an average depth of about 6 feet, which would give an area of nearly 70,000,000,000 cubic yards, and with a discharge double that of Bonnet Carré, would require 175 years to fill the lake.

But suppose it only required half that period, it would give the people a long rest from overflows and river shoals as well as losses, and paying taxes to build levees, and surveys, and river commissions with their report calculated to mislead Congress and the country.

I cannot close this without noting what they did or rather what they did not say about levees and their cost. On page 15 they say: "It will cost \$2,020,000 to repair levees and stop crevasses, and admit the levees will have to be raised higher," but avoid telling how much, or the cost, by saying: "No exact estimate of the cost of these higher levees can be made at present for the want of necessary data."

Had they taken the trouble to have referred to the report of Board of Engineers of 1875, to which they had made reference, they would have got all the information they evidently sought to conceal; for on page 21 of that report, they say: "Near the mouth of the Ohio the levees should be made 3 feet above the high water of 1858, and should be gradually increased 7 feet down to Osceola, and on down to Helena, thence to Island 71, increased to 10 feet; thence to Napoleon reduced to 8 feet; thence to Lake Providence, increased to 11 feet; thence to Vicksburg, reduced to 6 feet, and so on down to Natchez; thence gradually reduce to 5 feet to New Orleans: and 4 feet 7 inches on below; a total average of 7 feet higher."

This report did not leave us in doubt about the cost of these higher levees, for on page 31, it says it will be \$45,909,660; then on page 30 it says to repair levees and close breaks and outlets will cost \$3,459,450, and on page 29



it says the surveys, outfit, &c., will cost \$3,000,00, with three years to get ready, or in all about \$50,000,000.

It is remarkable how silent the commission were not only about these facts, but so strange they did not mention the fact that one of its members not two years ago said, to deepen the channel of the Mississippi as proposed, would cost \$50,000,000 more and half a century; or that another member of the commission was a member of another commission appointed by the Secretary of War, some two years ago, to report on the low water navigation of the Mississippi, when that commission indicated that it would cost \$70,000,000 to give a good channel. All these statistics were important, were it only to show Congress how moderate the present demand for only \$1,000,000 to inaugurate a work which, according to their own reports, will cost \$100,000 000 and a period of time that will extend beyond the next generation, and no certainty of ever doing what they claim.

With these corrections of their assumptions, I leave a candid public to judge as to the little importance that may be attached to such a report as that of the so-called river commission.

JOHN COWDON.

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## THE OUTLET SYSTEM.

EDITOR STATES—Lake Borgne has an area of fully 330 superficial square miles and with an average depth of only six feet, would contain nearly seventy billion cubic feet, and with a discharge from the river equal to Bonnet Carre, would require 175 years to fill up, and, grant that this would be the result of that outlet, a clear and well defined channel would form through from the river to the gulf, 40 miles long, which would be seventy miles shorter than by the main river to its present mouth, which is every day extending out into the gulf, and at the rate of one mile every ten years, as has been the case since 1730, when the South West Pass first commenced to form, and at the same rate with the same mud flow, in one hundred years the river will be ten miles longer.

But suppose the discharge from the river should be 200,000 cubic feet per second or double that at Bonnet Carre, or one sixth the volume of the entire river. The result would be the same for the outlet would only discharge during flood periods averaging not more than one-fourth the year or 120 days.

The result of this mud fill in Lake Borgne, would to that extent prevent the fill at the river mouth and consequent elongation and natural elevation of the river banks, and at the same time form land where the next generation would grow rice, Sea Island cotton and sugar, whereas the science of this enlightened generation glories in cat-fish and alligators.

So much for the mud fill of Lake Borgne, which appears to trouble these levee and jetty builders greatly.

They have said that the outlet at Lake Borgne would cause the river's mouth to shoal. On the contrary, I claim that it would cause it to deepen if the jetty system be correct, as more water would be discharged through the river's mouth than is now discharged there in the same period of time. The following facts prove this:

The river's discharge at Carrollton, with present velocity of current, is estimated at 1,100,000 cubic feet per second, which in one hundred and twenty days would give a discharge into the Gulf, through the river's mouth, of eleven trillion four hundred and four billion and four hundred million cubic feet of water.

Now, suppose we divert one-sixth of that volume to the Gulf through the Lake Borgne outlet, with the same velocity it would have to be discharged by the main river into the Gulf in the same period of time, nine trillion and five hundred and four billion cubic feet of water. But by this diversion of one-sixth the volume from the main river we will increase the current one-fourth, or 24 per cent, equal to two trillion eight hundred and fifty billion and two hundred million cubic feet.

Now add this increased volume to the amount as stated that would be left in the river and we will have in 120 days a discharge into the Gulf, through the main river mouth of 12 trillion 356 billion and two hundred million cubic feet or nearly one trillion more discharge than we have had at the river mouth in the same time.

There is no guess work about these estimates, but are deductions made from the practical results of Bonnet Carre, which shows that while the flood angle below the outlet was lowered 4 feet the velocity of the current at the same place was increased 6 per cent. in the whole river, and just in the same way can the current in the whole river be increased to 24 per cent. below the outlet at Lake Borgne, which will lower the flood angle fully 12 feet at New Orleans.

This lowering of the flood angle 12 feet at New Orleans will increase in the same proportion the velocity of the entire river for hundreds of miles above, and will accelerate the entire volume down to the outlet. Then just as when the river is low and within its natural banks the volume of the whole river will be forced on to the Gulf by its own dynamic, or moving force, with the increased momentum caused by the greater acceleration from above.

There is no way of escaping these results, as the water will be down and within the natural banks of the river, and no way of getting out. So this great volume, 120 to 140 feet deep is bound to be forced on to the Gulf with a current corresponding to the accelerated driving or forcing power from above.

These are results that follow natural laws, which govern the true science in all hydrophic engineering; and when men set up such assumptions as have the so-called River Commission, they either do not know what they are talking about, or are intentionally trying to deceive the public in general and Congress in particular.

But we will now look at this question from another standpoint, and for the sake of argument, admit that fully half the volume of the river would be diverted from the river mouth.

Then could not the Jetty contractor raise a little higher the dams he had placed across the Southwest Pass and Pass-a-l'Outre, in order to create a head-rise, so as to force more water down South Pass? By these obstructions he has not only caused these two passes to shoal up so that none but small vessels can use these passes, but has so obstructed the outflow of water at the river's mouth, as to back the water up to New Orleans, raising the flood line on the lower coast higher than ever before. When by the outlets above the City the flood line has been lowered several feet and actually saved New Orleans from overflow.

If he will close all these passes, save the South Pass, he then can have more water going through that pass than he now has. For not only half but two-thirds the volume of the river will be diverted through Lake Borgne, and at the same time do no harm to the coast up to New Orleans, for the outlet at Lake Borgne, like a great safety valve, will take off just all the water and no more that may be above the Gulf level.

Therefore, from this standpoint the Jetties would be benefited. But the outlet at Lake Borgne would aid the jetties or any other work at the river's mouth in another way, for not only all the mud (as before stated) that may be deposited in Lake Borgne or by any other means diverted from the river's mouth would, to that extent, decrease the mud fill at the river's mouth, and just in that proportion would there be more water in the navigable pass, independent of jetties or any other work that may be done to procure a deep channel.

On this we have a clear proof, for, at the lowest stages of the river we have always had from one to two feet more water on the bar than we do have at flood tide. So, if we can get clear of the mud fill at the river mouth and with one good dredge boat, such as the Baily, we can get more water on the bar, with clear water from the Mississippi, with three-fourths of the volume directed into Lake Borgne, than we now get with jetties and Baily combined, with all the muddy waters of the entire volume of the river flowing into the gulf through the passes.

These results, to a great extent, can be accomplished when the system proposed may be carried out, of which the Lake Borgne outlet will be the foundation work, for by it fully one-half, and, perhaps two-thirds of the present mud flow into the gulf through the Mississippi river mouth will be stopped.

First—The banks of the river will not cave so much as now for the reason that the channel will become deeper and more permanent.

Second—The muddy water coming into the Louisiana bottom lands above Red river and south of the Arkansas and west of the Mississippi river, that may be diverted from these rivers from Pine Bluff to Napoleon and on down to the mouth of Red river and its tributaries will be diverted from the mouth of the Mississippi to the Gulf through the Atchafalaya and other water ways that can easily be made to bring the water to the Gulf, which is the only true way to prevent overflow, and deepen river channels.

Third—Then the St. Francis and Yazoo Valley will become the great clarifiers of muddy water drawn from the Mississippi river at points above, and returned clear of mud at points below, such as Helena and at Vicksburg.

In this way all of which not only stop the mud flow into the Gulf through the river mouth, but re-utilize the mud makes the country more healthy and makes the floods scour out the channels of the river instead of filling them up as now when the river is high, when the benefits to New Orleans locally by the outlet at Lake Borgne will be many.

First—All water craft that can now navigate the lakes, Pearl river and the Mississippi Sound and Florida Gulf coast causing great saving of time, distance and other expense come to the wharf in front of the city.

Second—It would so lessen the flood waters of the Mississippi that the present system of sewerage and drainage of the whole city could be most successfully accomplished.

Third—It would, as it were, place New Orleans on high land which would

not only give double present value to all real estate, but in a few years double these values by making it one of the cleanest, best drained and healthy commercial cities on this continent, and its value as a sanitary measure cannot be computed by dollars.

Fourth—It will demonstrate at small expense and short period of time, how the whole Valley of the Mississippi can be reclaimed from overflow, made more healthy, and deepen and otherwise permanently improve the channel of the Mississippi river from the Gulf of Mexico to Cairo, and harm no invested interest, not even in the immediate vicinity of the outlet.

Fifth—This can be shown by the following statement: In constructing the outlet, two large levees, one on each side of the outlet, fully one mile apart, extending from the bank of the river to the lake, should first be built. These would prevent the spread of the water over the lands above and below and in the rear of the outlet, and prevent any damage to any and all plantations in that vicinity from that cause.

Sixth—The water entering Lake Borgne from the Mississippi could no more raise the water surface of that lake than does the waters of the Mississippi river raise the Gulf level at its mouth, for Lake Borgne is only an inlet of the Gulf, having an area of over three hundred square miles with an outlet into the Gulf of from six to eight miles wide.

Seventh—The same objection was urged by some engineers to the Bonnet Carré outlet into Lake Pontchartrain. They said the outlet would raise the water in that Lake four feet, and that this would overflow New Orleans, when actual experience has since shown that the outlet at Bonnet Carré never raised the water in that lake an inch, for the simple reason that it flowed out at the lower end as fast as it came in at the upper end.

Eighth—And here again Lake Borgne would have great advantage over Lake Pontchartrain, for the reason that the distance from Bonnet Carré to the Gulf proper is more than double what it is from the proposed outlet into Lake Borgne.

Besides, the discharge from Lake Pontchartrain has to pass through the Rigolets, which obstructs the free, full and more rapid flow of water, where on the other hand, Lake Borgne has a place of discharge fully six miles wide and only half the distance to flow to reach the deep Gulf.

Ninth—I trust the above statement more than meets all the objections worthy of notice, and will satisfy all fair minded people, that by having the outlet into Lake Borgne made, we have much to gain and nothing to lose, should it only accomplish half or even the third I claim it will accomplish. It should be tried, as it will cost so little, even as an experiment as compared with all other experimental plans yet presented. It cannot interfere with any proposed or existing work for the improvement of our great river and the reclamation of its rich and fertile valley from overflow, disease and death, and how any person not an enemy to the interests of New Orleans and this valley can oppose the making of this outlet into Lake Borgne is a mystery to me. But with this, as has been the case with all other measures calculated to benefit mankind, people will make objections, for the march of human progression is like that of a great army, always retarded by those who straggle and won't keep up.

I am, respectfully,

JOHN COWDON.

## SOUNDINGS OF THE JUMP AND CUBITT'S GAP.

EDITOR STATES—In connection with the above article refuting some of the assumptions of the so-called-River Commission I beg to occupy a little more of your space to make the following statement as a further proof that the River Commission has no regard for actual facts when they do not conform to their wishes in opposing the Lake Borgne outlet.

They say the same results will occur at this outlet that has occurred at the Jump and Cubitt's Gap. The Jump was made 40 years ago, that of Cubitt's Gap during the war or about 18 years ago. They say on page 12 of their report of March 9, 1880, "at the river entrance to the Jump the depth is but 3 or 4 feet, and in a few years will be fully closed by the river deposits."

Not believing a word of this, last Saturday I got Captain M. McSwiney, a well-known coast, lake and river pilot, to go with me and ascertain the truth. We reached the Jump Sunday morning, on the steamer Isabel, and with her yawl made the following soundings:

About one hundred yards above the jump, and the same distance out in the river, we found a depth of 11 fathoms. As we drifted with the current we found same depth until it drew us into the head of the outlet. There, in going down the jump, fully one-third of a mile, the least sounding we got was 36 feet. We then came back up one-third of the way, made cross soundings of fully 500 feet, and the least depth was 30 feet.

The current down the pass or river, for that's what it is, was about as strong as down the main river, and the discharge was not less than forty or fifty thousand cubic feet per second.

Does this pass of forty years look so much like closing where the head rise at highest stage of the water was not over three feet?

The commission on same page, say: "That owing to the shoaling of the river below the jump, the Light House Board placed two buoys to warn vessels away from shoals which exist there."

In reply to that fabrication I would state that the channel of the river has always been on that side of the river, and that as soon as we could row out into the channel, not requiring five minutes time, we sounded in the channel and found 15 fathoms, and so continued for three miles down, then, on the opposite side of the river and fully half a mile from the main channel of the river where it has always been, there we saw a buoy which marks the place of a sunken boat.

From there on down to just above Cubitt's Gap we sounded in the channel; it gradually shoaled to forty-eight feet. We then drifted with the current, finding same soundings until the suck from Cubitt's Gap drew us into it, deepening at the shore line to twelve fathoms, and increased to fifteen fathoms, or double the depth of the river at that point, in drifting back five hundred or six hundred feet.

The current through the outlet was fully five miles an hour. We could hear the roar of the water for the third of a mile from it. The outlet is now fully three-fourths of a mile wide, and is getting wider all the time, and now has a greater discharge than South Pass. Does this look much like closing up soon?

We then pulled out in the current about the same distance from shore we were when we sounded above the outlet, and there got 8 fathoms water with hard bottom. This continued while we drifted fully a mile and a half.

Then as the river began to widen it began to shoal up the nearer we got to the head of the passes until just above the head of the first jetty we got 5 fathoms. We drifted with the current, sounding all the time and as we got into the draft of South Pass it gradually deepened to 34 feet, which brought us to the head of the upper or west jetty, where the current of Southwest Pass drew us down that pass. At this point we got 36 feet and soon deepened to 48 feet and so continued for half a mile down Southwest pass when the Isabel came along and picked us up. So that ended our sounding.

The shoaling that I mention is not caused from either of these outlets, but a natural cause. Commencing at Fort St. Philip, where the river is 140 feet deep and shoaling up to 30 feet in going to the head of the passes in a distance of 20 miles. Such is the history of that shoaling since 1720, the earliest account we have.

This shoaling moves on out as the river advances into the Gulf. It was once at New Orleans, and when the river extends 20 miles further out into the Gulf this same shoal will be advanced just that far. I am particular to mention this in order that people may not be deceived by the term shoaling as we approach the head of the passes. But this shoaling of that point may be greatly increased, as it has been, by unnatural causes, such as the sills the jetty contractor placed across the head of Southwest Pass and Pass-a-l'Outre.

In sounding we found that the east end of this mud sill across Southwest Pass has been carried away by the current, which no doubt accounts for more water going down that pass this year than since these unlawful obstructions were placed there. Coming up the swells of our little steamboat made large breaks on the remaining portions of this mud sill, and from the roof we could see the breaks caused by the one in Pass-a-l'Outre clear across that pass.

I give the facts just as they are, and if there be any one man in New Orleans who doubts what I say, and will take the trouble to go with me, I will guarantee that he will see just what we have herein stated, and here we leave it for all honest men to judge of the value that may be placed on any report that this misnamed River Commission may make, whose object appears to be more to defeat the making of the outlet into Lake Borgne, which will save the valley, than for any improvement of the Mississippi river.

I am Respectfully,

JOHN COWDON.

M. McSWINEY.

I certify to the above as being correct.  
New Orleans, May 16th, 1881.

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## THE ATCHAFALAYA—MOUTH OF RED RIVER.

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### THE SECOND AND THIRD SYSTEM OF OUTLETS.—THE SLUICE WAYS AND FUTURE RESULTS.

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After the Lake Borgne outlet the next great safety valve is that of the Atchafalaya which, if properly controlled, will be an important factor in the accomplishment of this great system, and its importance deserves more than a mere casual notice.

In 1839 it was but a mere bayou, fordable a portion of the year with a

fence rail, whereas now it is a great river 100 feet deep by 1000 feet wide, with a rapid current and discharge of from three to four hundred thousand cubic feet per second.

It has not only the capacity to carry off to the Gulf the waters of the Red River shed, but also a large volume from the Mississippi river. To close its connection with the Mississippi river would not only cause disastrous overflows of the river coast to New Orleans and below, but would work a great hardship to the planting interests of all that portion of Louisiana, especially to the consumers of coal, for it is only through that channel can fleets of coal boats reach the large sugar estates of the Teche, as well as the many steamships that enter the Atchafalaya bay. Indeed, its closure, or its connection with the Mississippi entirely severed, would produce a commercial and financial loss to that country amounting to millions annually.

But as valuable as this river may be to the commercial interests of New Orleans, and agricultural possessions of that section embracing nearly all Southwestern Louisiana—when, on the other hand, conditions most certainly will arise, if not properly controlled in time, that will make this river a potent lever of destruction to New Orleans and that country, for the way it has enlarged and draws from the Mississippi, reaching the Gulf level with a fall of over fifty feet in going less than one-third the distance it is to the mouth of the Mississippi river.

There is great danger that under certain conditions liable to occur any year that may attract the Mississippi river to that shorter route to the Gulf, and leave New Orleans an inland mass of buildings without commerce.

There is but one certain way of preventing this great calamity; that is, to lower the flood line of the Mississippi at the mouth of Red River from 15 to 18 feet, and this can only be done by the Lake Borgne outlet and such other safety valves as may be found practicable and necessary from New Orleans to the mouth of Red River, as a foundation work.

When this may be done the work of securing perpetual and ample low water navigation from Red River and its tributaries to the Mississippi, and from the Mississippi to the Atchafalaya in low water, as well as an enlarged and open safety valve for a portion of the floods of the Mississippi, through the Atchafalaya to the Gulf, will be an easy matter of accomplishment.

Take the accompanying map of lower Louisiana, and you will see Spanish Lake leading from Red River, a few miles above Old River, to within less than half a mile of the Mississippi river, five miles above the present Red River landing on the Mississippi river.

Take a good dredge-boat, cut a small channel through from the lake to the river. Then, after that connection has been made, make a low water dam across Red River, after the fashion of the beavers, (the best engineers for such work we know of,) just below the intersection with Spanish Lake. This will force the water of Red River when low out to the Mississippi, giving a good channel, and not interfere in any way with the flood flow of water, for the dam need not be more than two feet higher than the low water mark of Red River.

Just to the extent that the water of Red River, when low, may be diverted from the Atchafalaya by this low water dam, will the Atchafalaya be lowered, and the more this may be done, the greater will be the attraction or draft of water from the Mississippi, which would not only make good low water communication perpetual from the Mississippi to the Atchafalaya, but

would make more capacity for the outflow of water from the Mississippi when at flood periods, without any danger, as now, of the diversion of the Mississippi from its present channel and mouth, to the Gulf, through the Atchafalaya.

This whole work can be done in one low water period, and not cost the third of the money that has been worse than wasted at the mouth of Red River by red tape and educated ignorance, within the last five years.

In one or two years this system of outlets direct to the Gulf, by shorter lines than via the river mouth, will have lowered the flood line 12 to 14 feet at New Orleans, and from 15 to 18 feet at the mouth of Red River, establishing perfect and perpetual low water navigation between the Mississippi, the Atchafalaya, Red, Ouachita rivers and tributaries, and at the same time reclaim from overflow not only nearly all the Atchafalaya and other valuable lands of that section, but place New Orleans on high ground, demonstrating that levees on the banks of the Mississippi river will be as useless to protect the country from overflow as they will be inefficient to deepen the channels of the Mississippi river from New Orleans to Cairo.

But should the outlets below Red River and the Atchafalaya not lower the flood angle at Memphis and Cairo as much as I anticipate, we will have a remedy in what may be termed the third or upper section of safety valves, which may be opened from the Arkansas, just below Pine Bluff, to Bartholomew, where the fall to the Gulf is 225 feet, and other outlets can be opened from the Arkansas river via Beuf river and the head waters of the Bayou Macon, and down the Mississippi to near the mouth of Red River.

But before this can be done so as not to give drainage to all that country through which these streams flow to Black River, thence into Red and the Gulf through the Atchafalaya, another system of outlets will have to be made, so the Atchafalaya will have nothing to discharge but the Ouachita and tributaries, which embraces all bayous that may conduct water from the Arkansas and Mississippi rivers as above stated.

In order to do this the floods of Red River must be diverted from the Atchafalaya to, and permitted to seek the Gulf by other channels.

Now take the map and we will see how this can be accomplished at small expense and no great period of time.

The first is to make the cut, said to be only half a mile long, from Grand Lake to the Teche; follow that stream about five miles; then by another cut not over two miles long, into a large bayon which leads into Carte Blanche bay on the Gulf coast, this will shorten the flow of water from the Atchafalaya forty miles over the present route to the Gulf. It will of itself greatly relieve all the Atchafalaya country, and should be done now.

The cut marked on the map, from Bayou Beuf to the Calcasieu would, in my opinion, be the most effectual way of diverting the floods of Red River to the Gulf. The fall from the intersection of these bayous with Red River to the Gulf, is all of 100 feet, and the distance to the Gulf level is not the fifth it is via the mouth of the Mississippi, or half it would be via the Atchafalaya. But this the River Commission, true to its opposition to the outlet system, says can not be done, as Major Benyaurd, who they sent to find out how not to do, reports that the bed of the Calcasieu was 60 feet higher than the low water mark of Red River at Alexandria. This I think is no doubt correct, for look at the map and you will see that he ran his line from Alexandria 24 miles due west, and struck the Calcasieu up in the piney woods, where doubtless it is not a respectable branch.



But as I do not propose to adopt that line, I am at a loss to see how such a report can in any way affect my purpose, for, as may be seen on the map, the cut that I propose would leave the Bœuf 30 or 40 miles below its intersection with Red River, run due south, striking the Calcasieu 40 or 50 miles lower down, than Benyaurd's survey shows. I would take the water from Red River when high, and at a point fully 50 feet higher than the low water mark at Alexandria, and striking the Calcasieu much lower down, would from there overcome the other difference of ten feet; so, after all, I would not be trying to make water run up hill, as has been so industriously circulated by these jobbers. I have said the so-called River Commission instructed Major Benyaurd to make the survey in the way he did. Of course I do not know this to be true, but infer that it is so for the reason that I give him credit for having more sense than to have made that survey unless so instructed.

I am aware that the cut would be made through a high ridge and might cost as much as \$2,000,000. What if it did cost twice that amount, is there any other way the commercial and agricultural interests of the whole country could be so much promoted? Certainly not by the use of even \$50,000,000 on the plans of the commission.

When I look at the map and see how effectually the floods of Red River may be drawn off from above, and diverted from below, and completely controlled so as not to interfere with the low water navigation of Red River, and at the same time aid so materially the great system of controlling the floods of the entire valley of the Mississippi, and improving the low water navigation of the Mississippi river—it reminds me of one of the grandest achievements of Alexander of Macedon, as related by Gillis in his History of Greece. He says: "From war to the Mother of Arts he had learned to improve the benefits of peace. While preparations were being made for more distant expeditions he sailed down the Euphrates, carefully examining the nature of the soil, and having discovered at the distance of about four miles from the inoculation of the Euphrates and the Policopas, where he found a hard and rocky bottom, here he commanded a canal to be cut which served to moderate the inundation at one season, without too much drainage at another season."

The work I propose would have the same effect that did the canal cut by Alexander, and doubtless the hard bottom which forms the bed of the shoals just above Alexandria, in Louisiana, may extend across to and will form the bottom of the proposed cut to the Calcasieu.

Although Alexander lived in an age of barbarism, for doing this he was never called crazy, while on the other hand, in this age of most extraordinary civilization and advancement of arts and science, for proposing the same thing, I have been called crazy by many of the greatest turnip-headed people of the mighty Mississippi Valley, who believe in a science of engineering which teaches that a quart of water can be put into a pint cup, or that to lower the flood line of a river it must first be raised, and to increase the current the angle of fall must be decreased.

The heathen Chinaman believed in mud walls 100 feet high to hold the floods of the great Hoango; even so does the so-called science of this age for the mighty Mississippi.

But should this route, after a proper survey, from any cause be deemed impracticable, there is still another way by which the same ends may be accomplished.

Take the map, commence at the Gulf in Vermilion bay, follow up the

Vermilion river to where it approaches to within four miles of the Teche, make the connecting cut, go up the Teche, make two cuts to straighten and the third cut to connect with Red River at its most southern bend—this, without harming any one, will conduct to the Gulf the floods of Red River, and complete the outlet system, which takes water from the river never to return, draining the valley, and at the same time deepening and making more permanent the channels of the Mississippi river from New Orleans to Cairo, in two or three years time and at small expense.

It also prepares the way for what we may term the sluice way system, which draws muddy water from the river in controlled quantities through bayous, and returns it to the river again clear, at points below, such as Helena for the St. Francis valley, and Vicksburg, at the mouth of the Yazoo, for the bottom lands of that valley.

Then the people, for their own commercial convenience, will open on both sides of the river, from Vicksburg to Cairo, such places as the Yazoo Pass, which will not only give them good water to drink, but make the country more healthy, and after depositing the sediment in the low places, the water will pass back to the river clear, and as stated, to that extent will reduce the mud fill in the Gulf.

These upper sluice ways will greatly aid the outlets below, in reclaiming from overflow all the bottom lands on the lower Ohio, the American bottom, Sny and Illinois river bottom lands, just as will the third or upper system of outlets reduce the flood line in the Arkansas, White and the Mississippi rivers as high as the mouth of White river and Helena.

This will render useless levees on the banks of the Mississippi from Cairo down to the river's mouth, and but little use for levees on the banks of interior bayous, that the people may see proper to reopen to the river, and nearly all the lowlands of this valley.

Even the bottoms of existing lakes will be freed from water and soon brought under cultivation, for when this valley is freed from overflows, levees and levee taxes, crevasses, buffalo gnats, mosquitoes, malarial fevers, and all other expenses and difficulties resulting from overflows, as it will be by the outlet system, then rich lands will invite all civilization, and will soon be made to produce sugar, rice, cotton and grain, where now dwelleth the alligator, the serpent and bull-frog, and will so continue if the people wait on the science of this River Commission, who can never accomplish with \$100,000,000 and half a century, what can be done in one or two years, with a few hundred thousand dollars on the plan proposed.

The difference of the two systems may be summed up as follows:

First—That of the commission raises the surface and bed of the river, can only work a small portion of the year, makes obstructions in the river dangerous to navigation, and is a contrivance of man liable to be destroyed and at the same time the river fills up during high water. Whereas, on the other hand the proposed outlet system lowers the surface of the water and bed of the river, is one of nature, removes obstructions, works every hour of the year, utilizing the high water to wash off the sand bars that will be further deepened during low water.

Second—The levee system practically overflows the country and damages navigation. The outlet system practically drains the country and improves navigation.

Third—That the Commission only deepens the particular bar on which

they may work, and admitting it may be successful, it does not improve navigation in the whole river so long as there may be one shoal place. They represent that there are from 40 to 50 of these shoal places from Cairo to New Orleans, and at two shoals a year the way they have started it would require from 20 to 25 years to get a good channel from Cairo to New Orleans provided they succeeded at all places, and the high water and drift logs did not fill up or destroy their works, or the channel of the river did not go some other place, or their mattresses did not float off, all of which contingencies are very certain to take place.

During all this time we are to have no navigation; in this no interest of the country will be benefited, but the cross Railroads, the Engineer, Contractors, Dead Beats and the lobby bummers will have a good time and will grow rich, and the people poorer. When on the other hand by the outlet system proposed the channel of the river in all these shoal places will be deepened at one and the same time by the concentrated and natural action of the water. Navigation will get better, the people will get rich, and every interest in the country will be benefitted except that of the Trans-Continental Railroad Engineers, Contractors, Dead Beats and Lobby Bummers.

Fourth—The Commission's Levee or Jetty system is practically one of diffusion by damming up the water overflowing the country by great crevasses, and they say "causing the river to shoal" and widen rendering navigation more difficult and if carried out on the plans of Engineers will soon raise the flood line of flow up to line B as shown in the diagram. It being 3 feet higher at Cairo, 7 feet at Osceola and Memphis and Helena, 10 feet at Island 71, 8 feet at Napoleon, 11 feet at Lake Providence, 6 feet at Vicksburg and Natchez, 7 feet at mouth Red River, 5 feet on to New Orleans and less below than the present flood line A as seen in the diagram. This will raise the water in the river seven feet higher than ever before from Cairo to New Orleans at a cost of \$50,000,000, causing still greater overflows by more and larger crevasses.

When on the other hand, by making the outlet into Lake Borgne and carrying out the system, commencing at the lower end re-deepen the river's channel, prevent overflow by restoring the flood line C of ages ago as defined on the diagram, which will as naturally become the flood line flow when the flood tide mouth of the river may be made into Lake Borgne by that outlet, as in line A, the present natural line of flow extending 110 miles further out to the Gulf. This can be demonstrated with one high water period and \$250,000.

In conclusion, I claim that the whole system of engineering as applied to the Mississippi river is not only wrong in principle, but contrary to all known laws of Gravitation, Velocity, Force and Common Sense, which is the greatest of all laws governing the Mississippi River. We want less educated ignorance and more practicability.

I challenge Engineers and all others who believe in Levees and Jetties to refute what I have herein stated. If they cannot do that it is time they stop trying to humbug Congress and deceive the people.





