

LEVEES—MISSISSIPPI, AND OTHER RIVERS.

LETTER

FROM

THE SECRETARY OF THE TREASURY,

ON THE

*Subject of constructing Levees on the Mississippi, Red, Arkansas, and Missouri rivers.*

DECEMBER 16, 1835.

[Read, and laid upon the table.]

TREASURY DEPARTMENT,  
December 9, 1835.

SIR: In obedience to a resolution of the House of Representatives, dated the 2d of March last, directing "the Secretary of the Treasury to cause an estimate to be made of the probable expense of constructing a levee on the public land on the western bank of the Mississippi, and the southern bank of Red river, in the State of Louisiana; also, an estimate of the expense of constructing levees on, or removing obstructions from, the rivers of Arkansas and Missouri, through the public lands, wherever they may be necessary; together with the probable advantages or disadvantages of such works, respectively; the probable effect upon the health and prosperity of the country in which any such works may be constructed; and the probable quantity, quality, and value of land, belonging to the United States, which will be reclaimed by the construction of any such levees, and make report thereof to the next Congress," I have the honor to submit copies of letters from the Department to the Commissioner of the General Land Office, and a copy of his circular, showing the measures taken to fulfil the objects of the resolution; and also his reports, communicating the result of the inquiries in reference to the subjects embraced in it. (No. 1 to 17.)

I have the honor, likewise, to transmit the original letters referred to in the Commissioner's report, together with a tabular statement, prepared by this Department to exhibit, in a summary view, such specific information, required by the resolution, as is contained in those letters. In connection with the objects embraced in the resolution, I would respectfully refer to a communication from this Department to the House of Representatives, dated 44th January, 1829; and which is numbered 99 in the docu-

ments of that body for the 2d session of the 20th Congress; and which contains some general suggestions and facts which may be deemed pertinent and useful.

I have the honor to be,

Very respectfully, sir,

Your obedient servant,

LEVI WOODBURY,

*Secretary of the Treasury.*

Hon. the SPEAKER

*of the House of Representatives.*

No. 1.

TREASURY DEPARTMENT, *March 5, 1835.*

SIR: I transmit a copy of a resolution of the House of Representatives, adopted on the 2d ultimo; and have to request that you will immediately institute the inquiries necessary to enable the Department to give the desired information. The inquiries will be addressed to the Surveyors General within the proper surveying districts, and to the Registers and Receivers in the land districts indicated by the resolution, and to such other sources of information as are to be relied on, and may be accessible to the General Land Office. It is desirable that all the information necessary to comply with the resolution may be in the possession of the Department on or before the 1st of October next. As all the information desired must be obtained without expense, no appropriation having been made for the purpose, the information expected will be only the best which the parties can procure and give by correspondence.

I am, very respectfully,

Your obedient servant,

LEVI WOODBURY,

*Secretary of the Treasury.*

COMMISSIONER of the *General Land Office.*

No. 2.

GENERAL LAND OFFICE, *March 13, 1835.*

SIR: Annexed is a copy of a letter from the Secretary of the Treasury to this office, dated the 5th instant; and, also, a copy of the resolution of the House of Representatives therein referred to.

In pursuance of the instructions of the Secretary of the Treasury, I have to request that you will have the goodness to furnish the Department with any information in your power, touching any of the several points of inquiry embraced in the resolution, as follows:

"An estimate of the probable expense of constructing a levee on the public land on the western bank of the Mississippi river, and the southern bank of the Red river, in the State of Louisiana.

"An estimate of the expense of constructing levees on, or removing obstructions from, the rivers of Arkansas and Missouri, through the public lands, wherever they may be necessary; together with the probable advantages or disadvantages of such works, respectively; the probable effects upon the health and prosperity of the country in which any such works may be

constructed; and the probable quantity, quality, and value of land, belonging to the United States, which will be reclaimed by the construction of any such levees."

In the estimate respecting levees, it is desirable that the points between which it may be recommended to construct them, the length of the line, and the probable expense of construction, per rod, should be clearly and distinctly indicated.

It is highly desirable that any information you may be enabled to afford on these subjects, either from your own personal knowledge and observation, or from the experience of others, in whose judgment and accuracy you can confide, should be as much *in detail* as practicable, and calculated to lead to practical results.

With great respect,

ELIJAH HAYWARD.

TREASURY DEPARTMENT, *March 5, 1835.*

SIR: I transmit a copy of a resolution of the House of Representatives, adopted on the 2d ultimo, and have to request that you will immediately institute the inquiries necessary to enable the Department to give the desired information. The inquiries will be addressed to the Surveyors General within the proper surveying districts, and to the Registers and Receivers in the land districts indicated by the resolution; and to such other sources of information as are to be relied on, and may be accessible to the General Land Office. It is desirable that all the information necessary to comply with the resolution, may be in the possession of the Department on or before the 1st of October next. As all the information desired must be obtained without expense, no appropriation having been made for the purpose, the information expected will be only the best which the parties can procure and give by correspondence.

I am, very respectfully,

Your obedient servant,

LEVI WOODBURY,

*Secretary of the Treasury.*

COMMISSIONER of the *General Land Office.*

The following resolution, offered by Mr. Clay, from the Committee on Public Lands, on the 3d of February, was taken up, read, considered, and agreed to, viz:

*Resolved,* That the Secretary of the Treasury be directed to cause an estimate to be made of the probable expense of constructing a levee on the public land on the western bank of the Mississippi, and the southern bank of Red river, in the State of Louisiana: also, an estimate of the expense of constructing levees on, or removing obstructions from, the rivers of Arkansas and Missouri, through the public lands, wherever they may be necessary; together with the probable advantages or disadvantages of such works respectively; the probable effects upon the health and prosperity of the country in which any of such works may be constructed; and the probable quantity, quality, and value of the land belonging to the United States, which will be reclaimed by the construction of any such levees, and make report thereof to the next Congress.

No. 3.

GENERAL LAND OFFICE,  
November 10, 1835.

SIR: In pursuance of the instructions of your letter of the 5th of March last, transmitting a copy of the resolution of the House of Representatives of 2d February last, in the words following, to wit:

"Resolved, that the Secretary of the Treasury be directed to cause an estimate to be made of the probable expense of constructing a levee on the public land on the western bank of the Mississippi, and the southern bank of Red river, in the State of Louisiana; also an estimate of the expense of constructing levees on, or removing obstructions from, the rivers of Arkansas and Missouri, through the public lands, wherever they may be necessary; together with the probable advantages or disadvantages of such works respectively, the probable effects upon the health and prosperity of the country in which any of such works may be constructed; and the probable quantity, quality, and value of land belonging to the United States, which may be reclaimed by the construction of any such levees, and make report thereof to the next Congress,"—a circular letter was addressed to the Registers and Receivers of the land districts indicated by the resolution, and to such other sources of information as are to be relied on, and may be accessible to the General Land Office, of which a copy is herewith transmitted; paper marked A.

The following are the only replies which have been received, up to date, viz:

From William G. Bozeman, St. Francis co. A. T.	Sept. 27, 1835,
" P. T. Crutchfield, Receiver,	Little Rock, Sept. 4, 1835,
" Allen Martin - - -	Little Rock, Oct. 9, 1835,
" William M. Campbell - -	St. Charles, Mo. May 12, 1835,
" Register and Receiver, -	Fayetteville, A. T. Sept. 26, 1835,
" T. B. Martin - - -	New Madrid, Mo. June 11, 1835,
" William Strong, - - -	St. Francis, A. T. June 3, 1835;

all of which are herewith transmitted for your consideration.

I have the honor to be, most respectfully,

Your obedient servant,

ETHAN A. BROWN,

Commissioner.

Hon. LEVI WOODBURY,  
Secretary of the Treasury.

No. 4.

ST. FRANCIS COUNTY, ARKANSAS TER.

September 27, 1835.

SIR: I received your communication from the General Land Office, dated March 13, 1835, requesting me to give such information to that department as was in my power, "touching any of the several points of inquiry embraced in the resolution of the Congress of the United States, as agreed to, February 3d."

As to the first inquiry laid down in your communication, "an estimate of the probable expense of constructing a levee on the public lands on the

western bank of the Mississippi river," I shall, in this communication, give you the "information" which I have derived from authentic sources, which you may rely on, as I received it from gentlemen of undoubted veracity. As to my "personal knowledge and observation" of the section of country which I shall here describe, it is but little known to me by "personal observation," though I live immediately adjoining it; but by information from other persons, I can give you a very correct description of it, which perhaps may throw some light on the subject of inquiry.

I shall commence at Cape Girardeau, on the Mississippi river, in the State of Missouri, and end at Helena, on the said river, in the Territory of Arkansas, as my professional business has been of that nature which called my whole attention to it. I have not travelled much in the section of country I shall describe; I have lived four years bordering on it.

From Cape Girardeau to Helena is 350 miles, as the Mississippi river meanders, and the land subject to inundation from the large freshets of the Mississippi river, will average thirty miles in breadth, from the first to the latter place. Taking this as an average medium, there are 10,500 square miles, and one mile contains 640 square acres, which gives in round numbers, 6,720,000 square acres of land; which, at \$1 25 per acre, will amount to \$8,400,000. And in 350 miles, there are 112,000 rods, (320 rods in a mile) and the "probable expense of constructing the levee, per rod," I shall put down at \$4 00 per rod, including all the necessary expenses. The amount, then, for constructing the levee from Cape Girardeau to Helena, will cost the General Government \$448,000, leaving a balance for the Treasury of \$7,952,000: this will be a handsome revenue to the Government, for lands at this time not considered worth one cent per acre. There will be many places along the line where the levee will run, that will not need any throwing up. There are, in this section of country, many places of high land, that do not inundate, averaging from fifty to a thousand acres; but when the Mississippi overflows its banks, they are surrounded with water from one to six months in the year; therefore, those places are of no more value in their present situation, than if they did overflow. There is land that will be worth from ten to twenty dollars per acre, under the public hammer, if reclaimed; and in a few years this section of country would be thickly inhabited, and would be the paradise of the southwestern section of the United States. Lying immediately, as it does, on the majestic Mississippi, which is an outlet at all times and seasons of the year to the New Orleans market, and not only there, but to the commercial world, the *farmer* or *merchant* could ship his commodities to any port or market, whether American, European, African, or Asiatic, from his own door.

As to the "health of the country," it would be greatly promoted, not only in the section reclaimed, but in other sections of country lying adjacent. There are sections of country which, to my certain knowledge, at this time are very sickly; and if the said leveeing was to be completed, there are many sections, which are now subject to fevers of various kinds, would become entirely healthy, or as much so as any low country enjoys.

As to the "prosperity" and value of the lands, there cannot be any exact computation made, it will so far surpass any calculation that can be made at this time. The whole country that I have described can be cultivated, if reclaimed, with the exception of some lakes, and many of them can be drained, if the overflow waters did not come every year, and fill them up; and the reclaimed lakes would make as good farm land as any, and I shall not hesitate in saying, as good as any in the world.

There is another subject I shall call your attention to, not named in your communication,—the removing the rafts out of the St. Francis river, and removing other obstructions, which are at this time an impediment to the navigation of that river with steam-boats. Steam-boats, about from two to three months in the year, can ascend from one hundred to one hundred and fifty miles up the said river at this time. In the time of the winter and spring freshets, there is another essential obstruction to the navigation of the said river. In the years of 1811 and 1812, the land sunk about one hundred feet perpendicular, about fifty miles in length and thirty in breadth. This sunk land, as it is called by the inhabitants, is about one hundred and fifty miles from the mouth of the St. Francis river. This forms different channels through the said sunk land, which makes it dangerous to navigation, as a true channel has not as yet ever been ascertained. The river is navigable from its mouth, where it empties into the Mississippi, for upwards of five hundred miles, if the above obstruction was removed. Meandering through the public lands for several hundred miles, and immediately through the lands that will be reclaimed, as stated above, extending far up in the State of Missouri, which, if the above obstruction was removed, would be an outlet of large quantities of produce from the State of Missouri and the upper parts of the Territory of Arkansas, and would make the public lands lying adjacent to it much more valuable. The section of country above described was never known to overflow until the shakes of the earth in 1811 and 1812; and by the survey of the United States engineer, in laying out the *military road*, from Memphis to Strong's, on the St. Francis river, he found by actual measurement, the bank of the Mississippi, from the point where the road commences, to be sixteen feet higher than the banks of the St. Francis river, where the said road crosses. The eastern bank of the St. Francis river should be leveed one hundred miles up from its mouth, to prevent the back water of the Mississippi from overflowing the public lands that lie between the two rivers, in time of a freshet in the Mississippi.

The probable expense to remove the rafts (three in number) and other obstructions to the navigation in the St. Francis river, would be about \$15,000; and the expense of constructing the levee 100 miles on the east bank of the St. Francis river, at \$4 00 per rod; there is 32,000 rods in 100 miles, which makes the sum of \$128,000—add \$15,000 to 128,000, makes in the aggregate \$143,000; take this from \$7,952,000, the surplus left after paying all the expenses for leveeing the western bank of the Mississippi from the above named points, leaves \$7,809,000, the whole profits to the General Government, after constructing the above works. The St. Francis river runs through the section I have above described.

As it respects Red river, Arkansas river and Missouri river, I know nothing about them, and, therefore, cannot make any communication respecting them.

I have the honor to be,

Yours, with great respect,

WILLIAM G. BOZEMAN.

HON. ELIJAH HAYWOOD,

*Commissioner of the General Land Office.*

No. 5.

RECEIVER'S OFFICE, LITTLE ROCK,  
September 4, 1835.

SIR: From the want of *experience, and practical, personal knowledge*, I am unable to furnish the information, in a satisfactory manner, which you desire in your circular letter of the 13th of March last, wherein you requested me to furnish "an estimate of the probable expense, &c. &c." I have, however, endeavored to procure the information desired, from others in whose judgment and accuracy I have confidence.

I enclose you herewith, a letter from Nicholas Righton, Esq. a practical surveyor, and an old resident of this Territory, in reply to mine, requesting him to furnish me all the information in his power, on the several points of inquiry embraced in your letter of the 13th of March last. I trust, the letter of Mr. Righton, will shed some light on the subjects of your letter. I also enclose you herewith, a copy of my letter to Thomas Mathers Esq. an old resident of the Territory, and formerly a practical surveyor therein, a gentleman of much experience and information, as regards the subjects of inquiry contained in your letter of the 13th of last March. As soon as I receive his reply, which, I have no doubt, will shed additional light on the subjects of inquiry embraced in your letter, I will transmit it to you.

I am, sir, with great respect,

Your obedient servant,

P. T. CRUTCHFIELD.

ELIJAH HAYWARD, Esq.

*Commissioner of the General Land Office.*HELENA, COUNTY OF PHILLIPS,  
Arkansas Territory, May 10, 1835.

SIR: I have received your letter of the 5th inst. by which you request of me to make "an estimate of the expense of constructing levees on, or removing obstructions from, the rivers of Arkansas and Missouri, through the public lands wherever they may be necessary; together with the probable advantages and disadvantages of such works respectively. The probable effect upon the health and prosperity of the country in which any of such works may be constructed, and the probable quantity, quality and value of the lands belonging to the United States, which would be reclaimed by the construction of any such levees." You commencing, however, by saying such "information has been requested by the Treasury Department," wherefore I should most naturally draw this conclusion, that the object in the Department, was, barely to feel the pulse of the western citizens upon the subject, for they must have known that they could not obtain good and useful information through such channels. The subject is too weighty, entirely too ponderous, for any man, (or set of men who possess the ability) to do it justice gratuitously. As to myself, it is true, I have surveyed for the United States, to a large amount, in the Arkansas and Mississippi bottoms; and well know that it is practicable to reclaim, by levees, large tracts of land; and so too peculiarly situated, as to fall within the sphere of advice for the same to be done; but to make an estimate for the cost of such embankments

against the water, and the amount of land which would be reclaimed, I should have to survey the same; then I would have the data upon which I could make the estimate for cost, and the amount of land which would be reclaimed, and could further answer the question as regards quality; however, the quality of the soil in overflowed bottoms is generally good, sometimes rather too sandy.

As to the atmospheric tendency which the reclaiming system would have, I cannot conceive any counteracting principles to its adding regularly to the salubrity or improvement of the air and health, in proportion to the extent of the works.

As to reclaiming upon general principles; that is, confine all the water to the open streams, in our large western rivers, such as Missouri, Arkansas or the Mississippi, would be an undertaking, I believe, too great for our Government; but, for the sake of a position, I will admit that it is practicable, and say that it is now the policy of our Government. The first question now is, how high would a Mississippi levee have to be made; or in other words, if all the water of the Mississippi was confined to the open stream, how much higher would the river rise? It is not likely that this question would get a satisfactory solution in the world; for there would be such a discordance in the calculations, and the results, that there would be no knowing what to believe, and the question still remain unsettled; but I shall here undertake to answer the question by hypothesis, or rather data marked with much simplicity, and the truth of which will be recognised by every man who is acquainted with the western waters. In the first place let it be understood, that the bottom lands of our rivers are very wide. The Mississippi any where below the mouth of the Ohio, about 30 straight miles across, interspersed with deep reservoirs, or overflow in some places for miles together, bearing marks of from 12 to 20 feet in height. These large overflows, or reservoirs, communicate with the rivers by means of bayous, and when the river rises, the water runs from the river, through those bayous, and pours their contents into those large reservoirs, or overflow and fills them up, and when the river falls, the water returns through the same bayous into the main stream, some slight exceptions.

The bottom or beds of those bayous, are generally about 12 feet above low water mark of the river. Now, when the river commences to rise at low water, (or 10 to 15 feet of low water,) it is not uncommon for it to rise four feet in 24 hours, but as soon as it gets up so that the water flows through the bayous to the overflows, it is checked in its rising; in lieu of four feet in 24 hours, it then rises only about 2 feet, and the higher it rises the more of these communicating bayous are brought into action, as their beds are various in regard to depth; so that when the water is within 8 to 10 feet of the top of the high bank, it is shocking to all persons acquainted with the Mississippi to learn that the river is rising at the rate of 12 inches in 24 hours.

Now, if not for the thousand bayous flooding the water from the main river, in lieu of its rising but 12 inches in 24 hours, it would rise four feet, the same it done before the bayous were brought into action; but the higher the river gets, the slower it rises, so that when it is near bank full, the water from the river running over some of its low banks, as well as all the communicating bayous flooding the waters off into the great basins of overflow, that the main river now rises 1 inch in 24 hours, notwithstanding the mighty rivers of the north, east, and west Mississippi, Ohio and Mis-

souri, together with their thousand tributaries, with their foaming mouths poured to overflowing into the lower Mississippi, which is no larger in its channel than either of the others aforementioned.

Now from the above data could be nearly estimated how high the Mississippi would rise, if all its waters were confined to the main stream, but it is sufficiently proven, that our highest bottoms would have to present a front levee of 10 feet at least, to be preserved against the high floods, and the reckless consequence that would follow, can be easily conceived.

I have spun out this branch of the subject so far, that I have not the time to nominally analyze others; wherefore I will conclude by saying that I am an advocate for the reclaiming system judiciously conducted.

N. RIGHTON.

PETER T. CRUTCHFIELD, Esq.

*Copy of a letter from P. T. Crutchfield, Receiver, &c. to Thomas Mathers, Esq.*

RECEIVER'S OFFICE, LITTLE ROCK,  
September 3, 1835.

SIR: I have been requested to furnish the Treasury Department of the Government of the United States, "an estimate of the probable expense of constructing a levee on the public land, on the western bank of the Mississippi river, and the southern bank of the Red river, in the State of Louisiana;" also, "an estimate of the expense of constructing levees on, or removing obstructions from, the rivers of Arkansas and Missouri, through the public lands, wherever they may be necessary, together with the probable advantages or disadvantages of such works, respectively; the probable effects upon the health and prosperity of the country in which such works may be constructed; and the probable quantity, quality, and value of the land belonging to the United States, which will be reclaimed by the construction of any such levees."

I have been requested to furnish information on the foregoing subjects of inquiry, either from my own personal knowledge and observation, or from the experience of others in whose judgment and accuracy I can confide. Having little *personal knowledge* and *experience* touching the foregoing points of inquiry, I am unable to reply to them satisfactorily. Believing, however, that you have great *practical* knowledge and experience relative to the subjects embraced therein, I trust that you will impart it to me, by responding to the above inquiries, as early and as much in detail as may comport with your time and convenience. By doing so, you will confer a favor on the public at large, and oblige me from whom the information is sought.

I am, sir, very respectfully,

Your obedient servant,

P. T. CRUTCHFIELD.

TO THOMAS MATHERS, Esq.

*Of Conway county, now at Little Rock, A. T.*

No. 6.

LITTLE ROCK, ARKANSAS,  
October 9, 1835.

SIR: In compliance with your request of the 13th March last, touching the expense of constructing levees on the west bank of the Mississippi river, and the southern bank of Red river, in the State of Louisiana; and the constructing of levees on, or removing obstructions from, the rivers of Arkansas and Missouri, through the public lands, wherever they may be necessary, together with the probable advantages or disadvantages of such works; the probable effect upon the health and prosperity of the country in which any of such works may be constructed; and the probable quantity, quality, and value of the land belonging to the United States, which will be reclaimed by the construction of any such levees, I now give answer, containing such information as I have in my possession. With regard to leveeing Red river, in Louisiana, and the removal of obstructions from the Arkansas and Missouri rivers, and the constructing of levees on the Missouri river, I will not undertake to give information, as I am not acquainted with Red river in Louisiana, nor the Missouri river, and am not acquainted with the expense of operating in the removing of obstructions from rivers. But with the situation of the country on the Mississippi and Arkansas rivers, within this Territory, I have some acquaintance—have seen some levees on the Mississippi river, and with the cost of the constructing of which I made some inquiry. Such levees as I saw on the Mississippi river, would cost from one to one and a half dollars per rod. There are points on the Mississippi river yet not leveed, which would cost more to construct levees upon, than those levees I saw, on account of the bank inundating to greater depth; consequently, the levee would have to be proportionately higher, and more than proportionately broad, to give it sufficient strength to withstand the weight of water that would come against it in a high flood. Those levees I have seen on the Mississippi river (in the Territory,) are from one to two and a half feet in height, and from five to eight feet broad on the base. It would, I think, rarely be the case that a levee of more than four feet in height would be required on the west bank of the Mississippi river, in the Territory; and where a levee of four feet in height would be required, it should be at least twelve feet broad at the base, to make it of sufficient strength to withstand the weight of the water. The construction of such a levee, would cost two and a half to three dollars per rod.

The Arkansas river would require, in some instances, larger levees than the Mississippi, but rarely any more than four feet in height, the cost of the construction of which would be about the same as on the Mississippi. The quantity of land that would be reclaimed from inundation, by making a permanent levee on the west bank of the Mississippi river, within this Territory, and the banks of the Arkansas river, would be immense. The most fertile lands are subject to inundation, which, if reclaimed, would not be surpassed, in point of fertility, by any land in the world. I can give no correct estimate of the quantity of land that would be reclaimed from inundation; by making permanent levees on the banks of those rivers, within the bounds of the Territory; but will say that many hundreds of thousands (at least a million) of acres of this superior soil would be reclaimed. As to the effects produced by such works, on the health and prosperity of the country, there is not a doubt with me that they would be of great import-

ance. As to health, the permanent drying of the land, would evidently contribute much to that greatest blessing. The blessing of health, together with the many other advantages which would result from the drying of those lands, to wit: principally, the rapidity with which they would be thrown into successful cultivation, would add incalculably to the prosperity of the country.

I am, very respectfully,

Your most obedient

And very humble servant,

ALLEN MARTIN, *D. S.*

Hon. ETHAN A. BROWN,

*Commissioner of the General Land Office.*

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No. 7.

ST. CHARLES, Mo. *May 12, 1835.*

SIR: I have just received a copy of a circular from you, making inquiries respecting the practicability, utility, and probable cost of constructing a levee to prevent the overflowing of the Mississippi, and certain other western rivers.

I am not possessed of sufficient mathematical skill, statistical information, and knowledge of the nature of such works, to form any thing like an estimate of the cost of such an undertaking, nor do I believe that any safe estimate could be made without a careful examination of the ground by competent engineers. I have had just enough of experience in the business of engineering to know, that men are generally greatly deceived when they attempt to judge by the eye, respecting ascents and descents, and different levels. This is especially so, when the ground is apparently level, or nearly so.

All that can be expected of men who have made no scientific examination of the country, is to give a general statement of the extent and quality of the country that is occasionally inundated, and of the nature of the work required to prevent such inundations. I am aware that there are many persons who are much better qualified to give you satisfactory information on this subject than myself; but I fear that many of those to whom your circular is addressed will not take the trouble to lay before you the facts and important information in their possession. I have therefore taken my pen to contribute my mite of information, on a subject of immense interest and importance to the whole western country.

On the whole course of the Mississippi, there is an immense quantity of first rate land that is sometimes overflowed, and consequently rendered useless, unsaleable, and uninhabitable. This land is generally of the very richest soil that exists in the world, and very advantageously situated for access, exportation, and commerce. If it were drained, it would be forthwith thickly settled, and become the most productive and valuable part of the country. At present these inundations render the bottoms unfit for cultivation, and impair the health of the adjacent country to such an extent, as greatly to retard and prevent the settlement of the neighboring bluffs and uplands. The Mississippi bottoms, in the States of Missouri and Illinois, would produce the greatest abundance of all kinds of grain and

bread stuffs, and are admirably calculated for meadows, and for raising various other productions. Their situation is such, that all their produce could be quickly, safely, and cheaply shipped down the river, to supply the wants of the citizens of our sister States that are engaged in the culture of sugar and cotton. The unusual fertility of the soil, and the commercial facilities and advantages possessed by those living on the Mississippi bottoms, would enable them to establish an extensive trade, highly beneficial to themselves and the southern planters. The general settlement of the bottoms would afford much more desirable accommodations to steam-boats and other vessels engaged in the navigation of the river, and render navigation and travelling on it more comfortable, healthful, and safe.

It would bring into market a large body of superior land now overflowed, and promote the settlement and cultivation of much valuable country, that now lies waste on account of the fears entertained respecting the health of its situation.

In the southern part of this State, the quantity of fine land that is overflowed is much greater than in the northern. But as I am better acquainted with the northern part of the State, I will confine my remarks to that section.

The point of land between the Missouri and Mississippi rivers is entirely alluvial for twenty miles above the confluence. The highlands terminate at the "Mamelles," about three miles below the town of St. Charles. All the strip of country below that point is level, and exceedingly fertile. It varies from two to ten miles in width. No section of country, of equal extent in the United States, possesses greater agricultural and commercial advantages than this country would, if proper measures were taken to prevent the inundations of the Mississippi, and to drain some lakes, such as the "*Marais Croche*," and the "*Marais Temp Clair*." The bottom of the Mississippi is about four miles wide at the "Mamelles," and extends to Clarksville, about sixty miles higher up the Mississippi river. In this distance, it varies from one to four miles in breadth. From Earlsville, there are no bottoms of consequence on the Missouri side of the river, until you come into Marion county, in the neighbourhood of the town of Hanihal. From that point to the mouth of the Des Moines river, there is a similar bottom, which extends some distance up the Des Moines river. This would be a most delightful and productive farming country, if the high floods of the river could be effectually guarded against. In this bottom, as well as in that extending through St. Charles and Lincoln counties, the soil is loose and alluvial, and the work of excavation would be easy, and the cost of canals and embankments comparatively small. In many places, the ground near the river is sufficiently high to render embankment unnecessary, but it would be required in the intermediate places. There are several creeks that empty into the Mississippi through this bottom, which would have to be embanked for a short distance from their mouths. If the high water of the river were kept out, the work of draining the lakes would be cheap and easy.

If this were effected, every foot of the land in this region would be speedily bought by individuals, and reduced into a state of cultivation. If the main work were done by the Government, much work of a similar nature would be done by individual enterprise. If the whole of this country were owned by an individual, it would certainly promote his pecuniary interest to execute this important enterprise; and as the Govern-

ment owns the greater part of the overflowed land, and much valuable land adjacent thereto, policy would dictate the propriety of undertaking the work. The land is unproductive and useless to the Government as it lies, and will continue so, until some energetic measures be taken to render it valuable. It would be much better that the whole of this land should be ceded to the State, or given to individuals or companies, on condition that they drain and embank it, than that it should lie in its present state.

During last winter, I wrote a short account of a new county, recently organized in the southern part of this State, called "*Stoddert*," which I have cut from a paper in which it was published, and enclose to you, as being somewhat connected with the inquiries in your circular.

Respectfully yours, &c.

WM. M. CAMPBELL.

HON. ELIJAH HAYWARD.

### STODDERT COUNTY.

We are indebted to the kindness of a highly intelligent friend for most of the material facts contained in the following article on Stoddert county. This county has been recently established by the Legislature of this State, and, as it is a section of country about which very little has as yet been said, although of very considerable extent, and possessing in a high degree inducements to emigrants and settlers, we have therefore thought proper to give to the description more space than is usually allotted to a single article.

This county is an island surrounded on all sides by rivers, swamps or lakes. It is bounded on the north by a swamp, which separates it from Wayne and Cape Girardeau counties, on the east by an extensive swamp, which separates it from Scott and New Madrid counties, on the south by Arkansas Territory, on the west by the St. Francis river, which separates it from that Territory, and Wayne county in Missouri.

Owing to the insular situation of Stoddert county it is very inconvenient of access. A tolerably good road passes through the swamp on the north, leading from Cape Girardeau to Stoddert, by which nearly all the existing intercourse is carried on with the new county. The inconvenience of access from the direction of New Madrid and Arkansas is great, in consequence of the almost total impracticability of crossing the swamps in their present state. Stoddert county is about ninety miles long and from ten to twenty wide. It is very generally of an alluvial formation; there are no mountains, the hills are not considerable, and are entirely free from rock and stones. Stoddert is the region which was most seriously injured by the earthquakes, which ruined a part of New Madrid. By the extraordinary effects of the earthquakes a large part of the territory sunk and was destroyed, the courses of the creeks and rivers were changed and interrupted, and their waters thrown into the depressed territory, and a number of extensive swamps and lakes formed. The waters of the St. Francis river and other streams were spread over the region to such an extent that it is sometimes difficult to determine where their channels really are. St. Francis river would be navigable for steam-boats to the upper part of the county, if the rafts which obstruct its channel were removed. The in-

habitants of that region sometimes call it Lead Fork. Castor river flows through Madison and Wayne counties, and the northern part of Stoddert, and in the swamp unites with White Water, and forms Little river, which flows south for some distance and empties into the St. Francis. The rafts on the St. Francis river and its branches are formed of immense masses of heavy timber, piled up and compactly driven together, extending across the streams until some of them cover several hundred acres. By the deposit of trash and the decay of timber and vegetation, a soil has been formed on them, and they are covered with living trees, grass and herbage. On some of them a person may cross the St. Francis river without seeing the stream, or being conscious that he is near a water course. The river enters above, flows under the raft, and issues again below as if it had just risen out of the ground.

Some of these rafts rise and fall with the rise and fall of the stream, like a floating bridge. The principal raft is opposite to the lower end of West Prairie, and is about a mile long. There are several smaller rafts lower down the St. Francis, and on its tributaries. It is considered very practicable to avoid the obstruction in the navigation of the St. Francis and its branches, by cutting channels around the rafts. As they are situated at the bends of the river, and the soil is alluvial, the expense would be considerable, and the benefits and advantages great.

A considerable part of the counties of St. Francis, Perry, Cape Girardeau, Madison, Wayne, Scott, New Madrid, and Stoddert are watered by this river and its tributaries, and as much the greater part of the territory on its waters is still the property of the United States, an appropriation by Congress for the removal of the rafts, and the improvement of the navigation, would be not only just and reasonable, but highly political and expedient. No part of the county of Stoddert has been surveyed or brought into market by the General Government.

There are no private land claims in the county, except a very few old Spanish grants. The inhabitants live on the land as squatters, with the expectation of availing themselves of pre-emption rights, whenever the land shall be brought into market. A large part of Stoddert is heavily timbered with valuable kinds of timber. The northern part of the county is alternately swamps and ridges. There are within its boundaries two rich prairies of considerable extent. West prairie, about the centre of the county, is twenty miles long and five wide. Grand prairie, in the southern part of the county, is about twelve miles long and extends into Arkansas. The soil of these prairies is loose, sandy and exceedingly productive. The timbered land is all of the richest kind of soil, equal in fertility to any part of the world. The climate is that of the northern part of Tennessee, and the productions similar. Sometimes there is ice, frost, or snow in this region, but not in great quantities. The wood-land, prairies, and swamps, afford a varied and inexhaustible range of the finest kind, for horses, hogs, and cattle of all kinds, both winter and summer. The cane brakes also afford valuable range for stock. Cattle never require to be housed and fed here in winter. Immense stocks of hogs can be raised with great ease. Corn is produced in large abundance; other crops might be advantageously cultivated, and most kinds of stock may be raised with very little labor, trouble, or expense. The soil and climate are admirably adapted to the culture of cotton, in which article it can compete advantageously with any part of the southern States. The soil of Stoddert is fertile, its climate pleasant,

its products plentiful, and its opportunities for trade in stock to the lower country valuable. Its territory holds out inducements to emigrants who expect to engage in stock raising or the culture of cotton. When the navigation of St. Francis river shall have been cleared out, it will possess very advantageous means of trade and intercourse with New Orleans, as the navigation will never be obstructed by ice.

Game, of various kinds, is abundant. There are immense numbers of bears and deer, some elk, and a few scattering buffalo. In the swamps are great numbers of muskrats and otters and a few beavers. The principal trade is in peltries. For many years past there have been taken from these swamps, furs to the amount of from \$20,000 to \$30,000, and sold at New Madrid and other places. Owing to the difference of climate and situation, there are, in this region of the State, a number of fowls, wild animals, and vegetable productions of different species and descriptions from those that are found in the northern and western parts of Missouri. Until within a few years past, this section of the State was inhabited almost exclusively by Indians, but they have nearly all removed to the territory assigned to them west of the State of Missouri. There is still one Indian village situated on the edge of the swamp, between West and Grand prairies. It is composed of fragments of tribes of Senecas, Shawnees, Muscogeas, Delawares, and Cherokees. They have resided long in the village, and their number is reduced to about fifty. They are peaceable, inoffensive, and have made some progress in agriculture and the ruder arts of civilization. They subsist by farming on a small scale, stock-raising, hunting, and the trade in peltries. They have had no opportunities of education, or of any kind of literary or religious instruction. The tribe owns no land here, and they only remain by the sufferance of the Government and its citizens. Some of them are shrewd men, and very desirous of becoming permanently settled citizens of the country. Chiletican is principal chief, and exercises a species of patriarchal government over them.

Until lately the inaccessible situation of Stoddert kept off all population. Some speculators fixed upon this county as the situation for a terrestrial paradise separated from the evils of society; others viewed it as only a fit resort for outlaws and fugitives from justice.

It has, however, recently began to attract a population of a valuable and substantial description, and by the influx of inhabitants and progress of society, promises to become a flourishing county. The present population is supposed to be about one thousand. They are principally emigrants from Carolina, Tennessee, Kentucky and other quarters. The soil, climate, and productions peculiarly suit the feelings, habits and constitutions of emigrants from those States and other portions of the southern country.

A large portion of that part of Stoddert which is now a swamp, might be readily reclaimed and rendered valuable and productive. Several of its streams might be rendered navigable for boats. It is said that there are indications of lead and iron ore in parts of the swamps that have sunk, and about the "*earthquake hills*." This region affords a fine field for the researches of the curious, and the enterprise of the trader and emigrant. The adjacent counties of Lawrence and Phillips, in Arkansas, contain considerable population, and there is a considerable region of country in that Territory west of Stoddert.

A measure has been proposed in Congress by General Ashley to construct a road across the great swamp from New Madrid to Stoddert. If this

should be effected it would attract an immense amount of travelling and emigration to Arkansas and Missouri. It would render the road from New Madrid to Batesville, in Arkansas, shorter by more than one half the distance. It would require to be made across the swamp about nine miles, and would thus connect good roads in Kentucky with fine roads in the best part of Arkansas. It would be advantageous to the Government of the United States to make this road, if they appropriate the whole of the land in Stoddard county for that purpose. This region only needs to be known in order to attract much emigration.

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No. 8.

LAND OFFICE AT FAYETTEVILLE,  
September 26, 1835.

SIR: Your circular letter of the 15th March last, in relation to the construction of levees on the Mississippi, Missouri, and Arkansas rivers, has been received, and in reply thereto, we can only say, that our situation is so remote from those rivers, that we are unable to give any correct opinion, or form any correct estimate, in relation to the subject of inquiry.

We are, with great respect,

Your obedient servants,

WM. K. BALL, *Reg'r.*

By MATTHEW LEIPER, *Rec.*

To the COMMISSIONER of the *Gen'l. Land Office.*

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No. 9.

NEW MADRID, Mo.

June 10, 1835.

DEAR SIR: I received your letter of the 13th of March, containing a resolution from the Committee on Public Lands, touching divers inquiries, &c. in answer to which I must confine myself pretty much to the county of New Madrid, which is the extreme southern county of the State of Missouri, and occupies a front on the Mississippi river of about 70 or 75 miles, including its meanderings, and 45 or 50 on a direct line, two-thirds of which distance is occasionally subject to inundation; which liability is annually diminishing, from some unknown cause, probably its gradual increase of width, depth of channel, removal of the obstructions thrown up in the bed of the river in the time of the earthquakes. Ten years ago, when I first came to this county, great quantities of lands, occupying a front on the river, and at that time considered worthless and invaluable, from the great depth of the annual overflow covering them, are at this time (except in very uncommon seasons) dry and arable land, and held in high estimation by the occupants. Most of the land which is termed refused, i. e. which was never surveyed by the United States Government, was deeply overflowed in 1828, very partially in '32, and not at all since, except at particular low

places at the mouth of the bayous, creeks, &c. Every deep overflow leaves behind it a deposit, of from three to ten inches, just in proportion to the length of time and the depth the country is covered with the muddy water of the Missouri. Hence, the raise of the low lands and the gradual diminution of the overflow. The greatest rise of water that ever takes place in the Missouri, Upper Mississippi, Ohio, Cumberland, or Tennessee, singly, has but slight effect to produce inundation here; but when these upper rivers raise simultaneously (as in 1815) at the same time, a universal flood is the consequence, when all the feeble efforts of man must stand in quiet submission. These circumstances are, however, like "angels' visits, few and far between," so that little dread and apprehension of injury arises from them. New Madrid is situated at the mouth of bayou St. John, near the middle of a large bend in the river; and except about two sections of surveyed land on the opposite side of the bayou from the town, all the scope of country of 30 miles fronting the river (20 direct), and 20 back, laying east and N. E. to the mouth of James bayou, from thence W. and S. W. embracing a great tract of country, is all refused land, that has neither been surveyed nor brought into market as yet; and if it could be drained, by the means of a levee, would reclaim at least 200 sections. I think the general average height of a levee to answer every purpose, would not be over five feet, and the cost of that per rod not over \$2 00; so that the expense of a levee from New Madrid to James bayou, (the mouth,) the N. E. corner of New Madrid county, would not be over \$20,000, thereby leaving a nett balance to the Government of \$140,000. The whole extent of this territory just spoken of is occupied by settlers every mile fronting the river. The country back from the river between the two bayous, St. John and St. James, holds a pretty near equal height to that on the bank, generally speaking, some higher and some lower; so that, in ten miles, there is not probably a descent of more than ten feet, which would lead to some doubts as to the salutary effect a levee would have, as there would seem to be no drain to the water that oozes up through the ground during an inundation, and the rain water that falls frequently in such great abundance as to inundate large tracts of low boggy country, six and seven feet deep in water. It is, however, absorbed into the earth and taken by evaporation much quicker than the doctrines that govern those subjects would seem to admit. This section of country just spoken of approaches directly to the town of New Madrid, embracing a tract over 20 miles square, laying N. and E. As to the probable effect these improvements would have on the health of the country, on both sides of the bayous, it is manifest to every eye. Whatever may have the effect to render this tract dry and arable, would of course check animal and vegetable decomposition, and cut short miasmatic diseases, at least in some measure. The section of country from bayou St. James to the mouth of the Ohio, and for some distance above that, are subject pretty much to the same observations as the one just spoken of, except some ten or fifteen miles front in the neighborhood of Wolf Island, which lands have been surveyed, and are now in market, or at least have been entered and sought after with great avidity.

The distance from bayou St. James, to the mouth of Ohio, is about forty miles; and probably the private lands may occupy one third or more of this distance, Spanish grants and Congressional entries. No accurate calculation could be made without admeasurement, as to the quantity of land that would be reclaimed by a levee from this to the mouth of the Ohio;

not less however, than five hundred sections of the first quality; and the cost of the levee, say seventy-five or eighty miles, would fall far short of the amount of proceeds arising from the sale of one hundred sections.

Great care would have to be used in running the levee at some distance from the bank of the river in the bends, (say from one to two hundred yards,) so as to avoid being destroyed by the falling banks. The country from New Madrid down the river, for the distance of twenty-five miles, is but little subject to inundation, the banks and the country back being generally high, so as to render any levee entirely unnecessary. This space of twenty-five miles is entirely occupied by private lands, Congressional entries, and Spanish grants. The country from where these high lands terminate is subject pretty much to the same remarks as the country to the mouth of the Ohio, except that the descent back is greater towards the low lands of Little river, a branch of the St. Francis, and the water finds its outlet in this way. The distance here to levee to the southeast corner of the county is about twenty-five miles, intersected however with spots of several miles not requiring it; at least, one not over three feet would be sufficient. Bayou Pemisco empties into the Mississippi fifteen miles above the southeast corner of the county, and presents a low flat aspect at its mouth for two or three miles that would require a levee of ten feet. The amount of land to be reclaimed by this levee back with the Arkansas line, thence north intersecting the high lands in the middle of the county, would be even greater than the country described above, with the same salutary effect as regards health.

Twenty miles back of the Little prairie, in a northwest course, is the West prairie, Grand prairie, &c. and but for the low lands that cut it off and separate it from the river in a direct line, would be one of the richest and most fertile counties of Missouri (now Stoddert).

In conclusion, upon a fair calculation, forty thousand dollars would levee all that is necessary to levee in New Madrid county fronting the river, and would reclaim five hundred or one thousand sections of land, worth \$1 25 per acre, on a general average. Some situations on the river, on those refused lands, are now worth from one to three thousand dollars for the bare occupant right to half a mile front, and one or two back. These lands afford homes for thousands of families free from taxation, and the shierff's reach; over which the poor but happy man can walk in proud independence as proprietor of the soil, without money and without price. I can see no propriety in constructing levees on the Missouri, as the high lands approach always within three miles of the river; on one side or the other, much nearer, at least as far as my observation extends, about three hundred miles up. Of the waters of Red river and Arkansas I know nothing, and therefore can offer no reflections on the subject of improvements there.

Very respectfully,  
Your obedient servant,

T. B. MARTIN.

ELIJAH HAYWARD, Esq.

No. 10.

ST. FRANCIS, June 3, 1835.

SIR: Your communication directed to me, dated 13th March, has been

duly received and considered; and in reply, I have been settled on and in the vicinity of the Mississippi for the last twenty-eight years, and am pretty well acquainted with the local situation from Cape Girardeau, in the State of Missouri, to the mouth of the Arkansas, a distance of something near four hundred and sixty-five miles by way of the river. Of this distance, I believe it to be practicable to levee three hundred and fifty miles; that is, from Cape Girardeau to the town of Helena, as at Helena the high lands running down the St. Francis river from its head on its west bank, intersecting the Mississippi at this point; from Cape Girardeau to Helena, there are but few places but what can be leveed with little expense, comparatively speaking, as in many places there are high ridges of land running parallel with the river that would not require a levee of more than from one to three feet in height. I believe one half the distance would be protected with a levee averaging three feet; say the other half would require a levee of six feet, which I am conscious would be as high as would be required. The amount that would be required to levee from Cape Girardeau to Helena, three hundred and fifty miles, I believe would not exceed \$500,000. But in order to reclaim this section of the country, there must be a levee run up the east bank of the St. Francis river, say one hundred miles, which would require the further sum of about \$166,000. There would also be other objects which would have to be taken into consideration, to reclaim and qualify for farming, navigation, &c. this section of the country. About three hundred miles up the St. Francis from its mouth, are three rafts of timber formed across the river; the most extensive one does not exceed one mile in length. Those rafts are formed at the head of the back water on the St. Francis, from the overflow of the Mississippi. By leveeing the Mississippi, and clearing out those rafts, they never would impede this stream again. In the vicinity of this raft, what is called the big swamp, in the southeast corner of the State of Missouri, empties in. This swamp is something like eighty miles in length, situate adjoining the ridge of high lands lying in the fork of the St. Francis and Mississippi, and running parallel with the Mississippi swamp, is made from the waters of those hills, which can be easily reclaimed by cutting a canal adjacent to the high lands, to intersect a small stream situated in the bottom called Little river, which empties in the St. Francis a short distance below the raft. To cut this canal would require say \$250,000. There is also one other object to be taken into consideration. A short distance below the raft on the St. Francis, in 1811 and 1812, the earthquakes sunk a considerable portion of these low lands, so much so that it destroyed the channel of the St. Francis for near thirty miles. The channel is divided into a number of streams, none of which are large enough for large boats to pass. By filling up all those channels except one, and cutting it deeper, it would afford a good navigation the most part of the year for tolerably large steam-boats. I believe that this object might be effected say for \$50,000. The St. Francis river, if cleared of the obstructions above named, is one of the finest streams of its size in the western country. It would afford a splendid navigation for the distance of from four to five hundred miles; and if reclaimed, there is no country under the heavens, for its extent, affords more good lands; and the southern counties of the State of Missouri would be greatly profited, as it would afford them a safe navigation as it were from their doors. The country that would be reclaimed from these two points would be vast; say a country of three hundred miles in length, averaging thirty miles in width.

By making the improvements as herein detailed, it would be hard to estimate the value of the country reclaimed. It must be borne in mind that by making these improvements, that it would in a great degree make the country healthy. Only to think that 36,000 families can be settled down for life on lands that improve and get better for fifty years to come, and that on lands now considered to be worth nothing. There is something very remarkable in the vast overflow between the St. Francis and Mississippi. From the best information I can get, and from my own knowledge, the bottoms of the St. Francis did not overflow until since the earthquakes in 1811 and 1812. It appears the country between the St. Francis and Mississippi was sunk so that the high water made its way into the St. Francis several places, the first of which is near New Madrid; and from there in different places within fifteen miles of Memphis, it has been ascertained by engineers, from running a level from the bank of the Mississippi to the bank of the St. Francis, that the bank of the Mississippi is sixteen feet above the bank of the St. Francis. Where the banks are equal as regards the overflow, one hundred miles above the mouth of the St. Francis, I believe that the required levee between Cape Girardeau and Helena, will not exceed four feet in height on an average; and I am bound to believe that it could be done for less than four dollars and fifty cents per rod; but I believe the best plan for the Government to ensure the work for the least sum, would be to purchase negroes and provisions and employ overseers.

As regards the improvement on the Mississippi south of Helena, I believe it may be done, but the expense will be considerably increased beyond the estimate before laid down; and as there are many others I presume better acquainted than myself to inform you, I will forbear giving any further indication.

I have a slight knowledge of the Arkansas, but not of that particular character to enable me to give you the necessary information. I am not acquainted with the Missouri, and am unprepared to advise in relation thereto. I hope that my slight sketch may be of some service.

I am, very respectfully,

WILLIAM STRONG.

ELIJAH HAYWARD, Esq.

No. 11.

TREASURY DEPARTMENT,  
November 14, 1835.

SIR: In looking over the answers to your circular of the 13th March last, on the subject of the resolution of the House of Representatives, dated the 2d of that month, I perceive that none of them have any reference to the southern bank of Red river, in the State of Louisiana; and as in replying to the resolution, it will be proper to account for the reason for the absence of the required information on that head, I will thank you to state what steps were taken to procure it, and the cause of the failure. It has occurred to me that a Mr. Brooks, now in this city, and who has resided for several years in the interior of Louisiana, may be acquainted with the locality of that region, and be able, on application to him, to communicate some information on the subject. I shall be glad therefore you would seek an

interview with him for that purpose, and report the best estimate you can form as to that section.

I am, very respectfully,

Your obedient servant,

LEVI WOODBURY,

*Secretary of the Treasury.*

To the **COMMISSIONER** *General Land Office.*

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No. 12

GENERAL LAND OFFICE,

November 16, 1835.

SIR: In relation to the subject of your letter of the 14th inst. I have the honor to inform you that the circular letter of 13th March last, to which you refer, was transmitted to the following sources of information:

To the Registers and Receivers of the Land Offices in the States of Louisiana, Missouri, and the Territory of Arkansas.

To the Senators and Representatives from the same States, and to the Delegate from the Territory, and also to the Governors of each; to whom was also furnished an additional number of copies for distribution to such other sources of information as they might see proper to direct them to, amounting in all to one hundred and eighty-three copies.

Agreeably to your suggestion, I purpose to consult Jehiel Brooks, Esq. who has resided for many years in the interior of Louisiana, as to the probable expense of constructing a levee on the public lands on the southern bank of Red river in that State.

I am, respectfully, sir,

Your obedient servant,

ETHAN A. BROWN.

HON. LEVI WOODBURY,

*Secretary of the Treasury.*

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No. 13.

GENERAL LAND OFFICE,

November 16, 1835.

SIR: I have the honor to transmit a reply from the land officers at Jackson, Missouri, on the subject of the circular letter of the 13th March last, respecting the resolution of the House of Representatives, passed on the 3d day of February last.

I am, very respectfully, sir,

Your obedient servant,

ETHAN A. BROWN,

*Commissioner.*

HON. LEVI WOODBURY,

*Secretary of the Treasury.*

LAND OFFICE, JACKSON, Mo.

October 20, 1835.

The undersigned, Register and Receiver of the Land Office at Jackson, Missouri, in obedience to instructions from the Land Office Department of the 13th March last, respectfully submit the following report :

Having no means to obtain the information required by that portion of the instructions relating to the State of Louisiana, have confined their inquiries to that portion relating to this State, and more particularly to the inundated lands in this immediate land district.

To construct a levee on the margin of the Mississippi river, so as to effect the object of the Department, if indeed practicable, will be attended with great expense, and from the instability of the banks, (being principally composed of sand,) and the great rapidity of the current of the river, would, in the opinion of the undersigned, be of little utility. It is true, levees are permanently constructed on the Mississippi in Louisiana, but it should be taken into consideration that the material of which the banks are composed higher up the river is very different, and the current much more rapid.

From the best information the undersigned have been enabled to obtain, a levee cannot be constructed at a less average expense than from two thousand five hundred to three thousand dollars per mile, and when completed cannot be considered permanent.

The undersigned, however, would respectfully suggest, that the object of the Department in reclaiming the inundated lands in this district could be effected by a mode entirely practicable, and at comparatively little expense, and beg leave to refer to the enclosed letter of Mr. John Rodney, who having surveyed the public lands in the vicinity of the Great swamp, and whose residence in that section of country for many years has given him opportunities to obtain much practical information; and would further suggest, that a survey by a competent person of the inundated lands, in what is generally known as the Great swamp, be ordered, having no doubt not only of the entire practicability of the plan suggested by Mr. Rodney, but that it would result in advantage to the Government, and incalculable benefit to this section of country, reclaiming a vast extent of land of the highest productive quality, and at the same time furnishing an easy and safe navigation.

They also beg leave to refer to the enclosed letter from Dr. Thomas Neale, whose views of the effects upon the health of the country is founded upon the experience of thirty years' residence in this section of country, all of which is respectfully submitted.

FRANK J. ALLEN, *Register.*  
RALPH GUILD, *Receiver.*

JACKSON, Mo. Oct. 14, 1835.

GENTLEMEN: In compliance with your request I now briefly present to you views in regard to the influence on the health of the inhabitants of Cape Girardeau county which the clearing and draining the lands of the Great swamp would be productive of. The present condition of the Great swamp to engender disease, and the salutary influence on the health of those residing near it, when drained and in a state of cultivation, are evident to the most ordinary observer.

The immense mass of vegetable matter which annually grows in the swamp and on its margin, when decomposed, is unquestionably a prolific source of disease to those living within its destructive influence. The season most favoring the decomposition of vegetable matter is the summer, and the agents which nature employs for that purpose are heat and humidity, and at that season of the year they are always present in the swamp region.

The undrained situation of the Great swamp, and the peculiar humid state of the atmosphere in and around it, aided by the action of an intense summer sun on vegetable matter, and stagnant water covering superficially its surface, are calculated to impart great activity to marsh effluvia, which is highly deleterious to human health and life. During the season when fever prevails in this county, it has been always observed to be of a more malignant character during the prevalence of south winds than under other circumstances. This is accounted for upon the principle that the extensive morbid exhalations of the swamp are wafted by the south winds to the settlements lying in an opposite direction.

The draining and cultivation of the Great swamp would disencumber it of its superabundant decayed and decaying vegetable matter, and of its noxious stagnant waters. What benefit, it may be asked, would result from the new order of things as above stated? It is believed that it would improve the health of the country fifty per cent. by rendering the atmosphere more salubrious, and the advantage in an agricultural point of view would be immense, for it is as fertile a region as is on the globe. Much might be written to illustrate this subject, but as medical gentlemen now generally agree as to the causes that produce fever, it is presumed that the cursory remarks here presented will be deemed sufficient.

I am, gentlemen, very respectfully,

Your obedient servant,

THOMAS NEALE.

MESSRS. FRANK J. ALLEN AND RALPH GUILD,  
*Register and Receiver.*

GREAT SWAMP, SCOTT COUNTY, Mo.

August 28, 1835.

MESSRS. FRANK J. ALLEN and RALPH GUILD,  
*Register and Receiver of the Land Office, Jackson:*

Having been solicited by you to give some information on the subject of leveling and draining the swamp and earthquake lands lying in the south, east part of the State of Missouri, and also lying within the bounds of your Land Office:

It will, of course, be expected, that the office within whose bound the swamps lie, will give the fullest and most detailed description of them, and would be most able to advise and suggest a plan to reclaim them. I therefore, take the liberty to state to you, what I know from ocular examination, and also, what would be my plan of reclaiming them, in the cheapest and most practicable method.

Beginning at the head of the Great swamp, about three miles west of the Mississippi river near the range line, between ranges thirteen and fourteen, township thirty, north, as it being the highest part of the swamp,

to construct a small levee across the lowest part or bed of the swamp, to prevent the overflow or back water of the Mississippi from passing down the swamp, the length of the levee would not exceed one mile, the highest part of the levee, in the lowest place, would not exceed six feet, and that only a small distance; the balance of the levee, each way from the lowest part of the swamp, would become still of less height, until it would come to the surface of the highest part of the swamp, so that the whole line of levee would not average more than a height of three feet, by a width of eight feet, which would be sufficient to keep out the water at all stages of the Mississippi river. The probable cost of constructing said levee, at the estimate of one cent for removing each cubic foot of earth or other substance that would intervene, will amount to eleven dollars and eighty-eight cents per rod or perch, and consequently, the whole levee would amount to three thousand eight hundred and one dollars and sixty cents.

This levee is all that is necessary to prevent the water of the Mississippi from flowing down the swamp, and of course there would be no other water to drain off the swamp, except what might fall into it by rain and the small creeks and rivulets that fall into it on each side, which all descends down the swamp in a southwest direction, and almost forms a natural canal, until it enters Hubbles creek, which is a distance of about eight miles. This natural canal, improved and cleared out to about the width of eight feet at top and four at bottom, and six feet deep, would be all sufficient to carry off all the waters that would collect in the swamp between the first mentioned levee and Hubbels creek, by the assistance of a few small drains cut from the body of standing water to intersect said canal.

The canal at the same rates of one cent for each cubic foot of earth at a distance of eight miles, would amount to the sum of fifteen thousand two hundred dollars, for the second section of eight miles of canal. Thence down Hubbles creek to its intersection with White Water, a distance of about six miles, allowing the clearing out of the bed of the creek, of logs and other obstructions, at about the same rates per mile, will amount to eleven thousand four hundred dollars, and from that point, White Water will be fully sufficient to drain off all waters that would accumulate, by the assistance of the same process of widening and deepening the channel so as to confine all the waters within its banks, and it would also afford a good navigation as high up as the foot of the high lands on White Water. The clearing out of the same down to what is called the large body of earthquake lands, opposite a point on the Mississippi, six miles below New Madrid, to the mouth of Portage bay, about thirty miles distance, at the same rates per mile, of the former sections, will amount to the sum of fifty-seven thousand dollars, and would completely drain and reclaim all the swamp lands that low down, and cause the whole of the lands to be arable and fit for cultivation, and in fact, will entirely become the most desirable lands in our country. Thence a canal cut through the Portage bay to cause the whole collection of waters to mouth in at that place, would curtail a great deal of the further expense of continuing it down the natural bed of the large body of standing water that lies south of that.

The canal down to Portage bay would necessarily be about six miles in length, and would give the water a reaction in said bay, in as much as the bay is shallowest at its head, it has no supply of water only from the Mississippi river in time of high floods, and throwing up a levee across the bed of Little river, immediately below the junction of the Portage bay, would

cause all the waters that supply that large body of standing water to vent out at the mouth of the bay, and of course, the head of the bay would become the mouth of all the waters of the swamp north of it, and would cut off the supply of water to the swamp south of it. The six miles of canal, and cleaning out the Portage bay, at the above rates quoted, would amount to the sum of eleven thousand four hundred dollars; and for constructing the cross levee to turn the water down Portage bay, say a levee of two miles in length, at an average height of six feet, at the rate of one cent for each cubic foot of earth or other substance removed, would amount to the sum of three thousand eight hundred dollars; which sums altogether amount to one hundred thousand six hundred dollars; which would, in all probability, drain and reclaim about what would be equal to twenty townships of land, equal to four hundred and sixty thousand eight hundred acres of public lands; which, taken at the Government price, will amount to five hundred and seventy-six thousand dollars; from which subtract the probable cost of reclaiming, leaves a balance in favor of Government of four hundred and seventy-five thousand six hundred dollars of the public land reclaimed; and not only that profit would result to the Government, but then an equal to that quantity of land lying adjoining those swamps, that are not included in this estimate, that will, in all probability, come into demand immediately after the operation on these swamps, should or would be performed; as it is well ascertained, that many purchasers from different States, seem very anxious to become land holders on the margin of the Mississippi river in the State of Missouri, and all the other navigable waters of the State, if those large bodies of swamps and standing waters are drained off and formed into navigable streams, and thereby the whole cause of sickness removed from the south part of the State of Missouri.

Respectfully,  
JOHN RODNEY.

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No. 14.

GENERAL LAND OFFICE,  
November 20, 1835.

SIR: I have the honor to transmit enclosed a letter from Mr. Brooks, of Natchitoches, in answer to an inquiry directed to him from this office, (agreeably to your suggestion,) concerning embankment on the southern shore of Red river.

I have the honor to be, sir,  
Your obedient servant,  
ETHAN A. BROWN.

To the SECRETARY of the Treasury.

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NEAR WASHINGTON CITY,  
November 19, 1835.

SIR: I received your communication of the 16th instant. with the accompanying circular, &c. &c. last night, and am sorry to say that I find

myself badly prepared at this time to reply to its various contents satisfactorily.

The resolution itself seems ambiguous: for, as nearly all of "the public land on the western bank of the Mississippi, in the State of Louisiana," is north of the mouth of Red river, I cannot discern its relation, as to a levee, with "the southern bank of Red river;" nor why the northeast bank of that stream should not also be taken into the consideration, when equally as much, if not a greater part of the public land lies on that side.

But if the resolution only mean the country immediately below the mouth of the Red river, which is submerged the greater part of time, occasioned by the junction of the two rivers, then I would say, that in my poor judgment, the land reclaimed would not compensate the expense of the work, while the shutting out the wide spread of water in that direction, must of necessity, extend the overflow proportionally north and west, and probably jeopard the eastern bank of the Mississippi for some distance below: for, it must always be borne in mind, that alluvial formations are uniformly graded according to the local influences of the water. Now it is a fact well settled in the mind of every observer, that originally, the Red river and Mississippi were not united; that the valley of Red river was comparatively the lowest; and that their accidental junction has given a factitious elevation to the waters of both, but of greatest extent upon Red river. I once had occasion to travel through this low region of country, diagonally, from the northernmost part of the Avoyelles prairie, to the Mississippi river, some miles above the mouth of Red river. It was an uncommonly dry season, which enabled me to perform it on horse back. And while in the valley of Red river, proper, the high water mark upon the trees was from fifteen to twenty feet from the ground, which rapidly diminished as I approached the Mississippi.

The "expense of constructing a levee" must depend entirely on its dimension, whether made or cleared, or wood land, and the season of the year when the work could be carried on; but I am too little informed in the detail, to venture even a conjecture as to its probable expense, through such a country. Still as to the Red river, throughout, I cannot refrain expressing, that my decided impressions are against the utility of the measure, as appears to be contemplated in the resolution, even if applied to both banks, so far as the interest of the Government is involved.

As to its "effects upon the health of the country," I will barely remark, that, in those fertile alluvial sections, sickness is not so much occasioned by inundations, as by the excessive exuberance of vegetable growth.

In short, as to improving the present condition of the Red river valley, (except near its mouth,) and where the largest tracts of public land abound, all that is necessary to reclaim the overflowed part is, to widen and deepen the channel of the stream, which, to my mind, is much the most feasible operation.

I know not, sir, to whom I owe an apology most; to the originator of the resolution, or to yourself, for the long detention upon vague generalities, doubts and uncertainties, and therefore, will not increase my imprudence, by the attempt at so unprofitable a discrimination; but conclude with the prediction that, should the Government carry out the present plan of operations on the Red river, to the full extent of their utility, it will inevitably

develop, by its process, the advantages of any other plan of future improvement.

I am, sir, with esteem and respect,

Your most obedient servant,

J. BROOKS.

ETHAN A. BROWN, Esq.

*Commissioner of the Gen. Land Office.*

No. 15.

GENERAL LAND OFFICE, Nov. 25, 1835.

SIR: I herewith transmit a communication from Henry T. Williams, Esq. Surveyor General of Louisiana, in compliance with the request of the circular letter of the 15th of March last, with an estimate of the expense of constructing a levee on the west bank of the Mississippi river, below the efflux of the Atchafalaya, accompanied by a plat; and his letter of the 9th instant, intended to correct an error presumed to exist in the original estimate.

I am, very respectfully,

Your obedient servant,

ETHAN A. BROWN,

*Commissioner.*

HON. LEVI WOODBURY,

*Secretary of the Treasury.*

No. 16.

SURVEYOR GENERAL'S OFFICE,

*Donaldsonville, Nov. 1, 1835.*

SIR: In compliance with the request in the circular letter from your office, of the 13th of March last, I beg leave to submit, for the examination of the Secretary of the Treasury, the enclosed plat, and estimate of expense for constructing a levee on the west bank of the Mississippi river, below the efflux of the Atchafalaya.

The proposed levees are designated on the plat by parallel red and yellow lines; which, with the lands known to be owned by private individuals, will make the levee complete as far as the Atchafalaya; and in addition of the remote benefit to the land on the west side of the Atchafalaya and south of Grand river, will materially improve the district between the Mississippi and Atchafalaya, which is represented on the plat, and estimated at 675,000 acres, two-thirds of which (to wit, 450,000 acres) is believed to be Government land.

I have thought proper to divide the work into lots, which will be designated on the map by appropriate numbers.

No. 1, is a proposed levee across Racourcie bend, upon private land, so situated that the claimant could not be compelled to make the cross levee. It is 2,640 yards long; 400 yards requires a levee 10 feet high, and the balance averaging 5 feet	Cubic yards. 23,866
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No. 2, a levee from the west Bouligny's upper line, to the lower line of Gen. Lafayette's Latenache tract, being 4,576 yards, and requiring an average levee of 5 feet	31,777
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It is believed that there are some pre-emptions on this line, but the improvements are very small.

No. 3, an embankment at the mouth of the Latenache, 100 feet long, by an average height of 25 feet - - - - - 4,814

No. 4, an embankment near the mouth of bayou Moreau, 100 feet long, and averaging 25 feet high - - - - - 4,814

No. 5, a levee from the upper end of the private claim of S. Devanport, to the lower side line of lands, said to have been granted to Gen. Lafayette; part of this is believed to have been covered by pre-emption rights, under the act of 1830 and 1834; the length of levee required, will be 3,586 yards, averaging 4 feet high - - - - - 15,141

No. 6, 10,516 yards long; this passes through land believed to have been granted to General Lafayette, but unimproved; 600 yards should average 10 feet high, and the balance 4 feet - 56,201

No. 7, 2,596 yards long; part of this is believed to be covered with pre-emptions under the acts of 1830 and 1834; the levee should average 5 feet high - - - - - 16,585½

No. 8, an embankment near the mouth of the little Atchafalaya, averaging 25 feet high and 200 feet long; nearly the whole line passes through timbered land - - - - - 9,628

The above estimates are made on a calculation of four times the height for the base, and a level surface at the top of 3 feet, which is believed to be sufficiently strong.

The total number of cubic yards will be 143,571; which, estimated at 25 cents per yard for embankment and clearing, will be \$40,706 75; to which should be added \$4,000 for surveying and laying off the line, and for contingent expenses.

These estimates have been made on personal knowledge of the country, acquired by actual survey, and are respectfully submitted.

To reclaim the land effectually, it will be necessary to continue a levee, averaging 4 feet high, down the east side of the Atchafalaya about 40 miles, which will be 297,244 cubic yards, and will cost \$74,311; but the resolution of Congress does not refer to this improvement, and it is believed that if the levee were made on the margin of the Mississippi, it would be continued by individual enterprise.

My knowledge of the west bank of the Mississippi above the mouth of the Atchafalaya and the south bank of Red river, is not sufficient to justify my offering any remarks on the expense of leveeing them; but presuming that it may be attended to by some other person, for the south bank of Red river, I have annexed to my plat a sketch of the country that would be benefited by such an improvement, and have marked by a yellow line the route that is believed to be least expensive.

I am, with great respect,

Sir, your obedient servant,

H. WILLIAMS,

*Surveyor General, La.*

E. A. BROWN, Esq.

*Commissioner of the General Land Office.*

P. S.—A large proportion of the line of levee upon Red river and bayou de Glaze, has been and will be made by individuals.

SURVEYOR GENERAL'S OFFICE,  
*Donaldsonville, November 9, 1835.*

SIR: On review of the copy of my letter of the 1st instant, I find the following errors which are presumed to exist in the original, to wit:

In estimate No. 2, it was transcribed 4,576, it should be 4,974 yards.

The total cubic yards transcribed 143,571, it should be 162,827.

I omitted also to state that I allowed in my calculations, 4 feet level surface for the embankments at the mouths of the bayous, to afford a single track for horses during high water.

May I beg the favor of you, to have the corrections made either in the body of the letter, or by marginal note? By so doing, you will greatly oblige.

Sir, most respectfully,  
Your obedient servant,

H. T. WILLIAMS.  
*Surveyor General.*

ETHAN A. BROWN, Esq.  
*Commissioner General Land Office,*

*November, 17, 1835.*

A levee to commence where the range line between range four and five strikes the Arkansas river, on the south side; thence down on the south side of Arkansas to strike the Mississippi river, one mile east of the meridian line, thence down the Mississippi river with the dotted line of the map furnished, to the south boundary of Arkansas. The distance would be about ninety-five miles. This levee should be eleven feet at its base, and four feet wide at the top, and six feet high, and at fifteen cents per square yard, for throwing up dirt, it would cost one hundred and twenty-four thousand four hundred and fifty dollars. In making this levee there also would be about eight bayous to levee, which would cost about fifty thousand dollars in addition to the first sum named, which would make the entire cost 174,450 dollars. This levee would reclaim about (551,000) five hundred thousand and fifty-one thousand acres of land, of which about five hundred thousand belongs to the Government, and would be worth at *least* a million of dollars, if this levee was made, and would add greatly to the prosperity and health of the country.

SILAS CRAIG.

*TABULAR STATEMENT, showing the information called for under a resolution of the House of Representatives, adopted 2d of March, 1835, as relates to the particular points presented in the resolution.*

Rivers.	Levees and canals.	Cost per rod.	Whole cost.	Cost of removal of obstructions and improvement of channels.	Number of acres reclaimed.	Value of reclaimed land.	Remarks as to health, &c.
Eastern bank of St. Francis.	Levee from 100 miles from its mouth to its junction with the Mississippi.	\$ 4 00	\$128,000 00	\$15,000	Not stated	Not stated	Information furnished by Wm. Bozeman. Land of superior quality; and its reclamation will improve the health of the country.
Eastern branch of the St. Francis.	Levee to and from the same points as above.	.	166,000 00	.	Not stated	Not stated	Information furnished by William Strong. Land of superior quality, and favorable effect of the work upon the health of the country.
Arkansas river and west bank of the Mississippi.	Levee from a point on the Arkansas river, between range lines 4 & 5, to the southern boundary of Arkansas, 95 miles, and leveeing bayous.	.	174,450 00	.	500,000	1,000,000	Favorable effect on the health, and prosperity of the country. Information furnished by Silas Craig.
Western bank of the Mississippi.	Levee from Helena to Cape Girardeau, distance 350 miles.	4 00	448,000 00	.	6,720,000	8,400,000	Land of superior quality, and of opinion the salubrity of the country will be improved by the work. Information by Wm. Bozeman.
Western bank of the Mississippi. (Duplicate.)	Levee to and from same points.	4 50	500,000 00	.	5,760,000	Not stated	Same remarks. Information by William Strong.
Western bank of the Mississippi.	Levee from Bayou St. Johns to Bay. St. James.	2 00	20,000 00	.	128,000	160,000	Land good; its reclamation will produce favorable effects on health. Information from T. B. Martin.

Ditto,	-	Levee from Bayou St. James to the mouth of the Ohio.		75,000 00		320,000	Not stated	Same remarks. Information from the same source.
Ditto,	-	Levee from a point 25 miles below New Madrid to the Arkansas line.		20,000 00		320,000	400,000	Same remarks, by same source.
Ditto,	-	Levee and canal from the head of the Great Swamp to the Arkansas line.		100,600 00		460,000	576,000	Salubrity of the country improved by the proposed work; land fertile. Information by John Rodney, and land offices at Jackson, Missouri.
Ditto,	-	Levee from the Mississippi State line to that of Louisiana, and along the bank of the Arkansas river.	3 00	Not stated		1,000,000	Not stated	Land of fertile quality, and health of the country improved by levees. Information from Allen Martin.
Ditto,	-	Levee from and to certain points below the efflux of the Atchafalaya, as designated on the accompanying maps.		44,706 75		Not stated	Not stated	Information by H. T. Williams, surveyor general.
Red river -	-							Information by J. Brooks, who gives no specific facts in regard to the expense of the work referred to, and expresses an opinion against the utility of levees, and thinks the deepening and widening the channels all that is necessary to reclaim the land.

TREASURY DEPARTMENT, *December 9, 1835,*

ЛЕТУШКА ПРОВИДЕНІЯ. Декабря, 9 1834

№	Имя	Содержаніе	Въсѣдл.						
№ 1	Иванъ	Содержаніе	100	100	100	100	100	100	100
№ 2	Петръ	Содержаніе	200	200	200	200	200	200	200
№ 3	Александръ	Содержаніе	300	300	300	300	300	300	300
№ 4	Михаилъ	Содержаніе	400	400	400	400	400	400	400
№ 5	Иванъ	Содержаніе	500	500	500	500	500	500	500
№ 6	Петръ	Содержаніе	600	600	600	600	600	600	600
№ 7	Александръ	Содержаніе	700	700	700	700	700	700	700
№ 8	Михаилъ	Содержаніе	800	800	800	800	800	800	800
№ 9	Иванъ	Содержаніе	900	900	900	900	900	900	900
№ 10	Петръ	Содержаніе	1000	1000	1000	1000	1000	1000	1000

[ To be annexed to Document No. 11. ]

## LETTER

FROM

## THE SECRETARY OF THE TREASURY,

TRANSMITTING

*The information required by a resolution of the House of the 24th December last, in relation to lands on the Mississippi, in the State of Louisiana, which are rendered unfit for cultivation by the inundations of said river.*

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 JANUARY 15, 1829.

Read, and laid upon the table.

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 TREASURY DEPARTMENT,

January 14, 1829.

SIR: In obedience to the resolution of the House of Representatives of the 24th of December last, directing the Secretary of the Treasury to "communicate to the House any information in his possession, showing the quantity and quality of the public lands in the State of Louisiana which are rendered unfit for cultivation from the inundations of the Mississippi, the value of said lands when reclaimed, and the probable cost of reclaiming them," I have the honor to transmit, herewith, a report from the Commissioner of the General Land Office, dated the 12th instant; the statements and views contained in which are deemed to be of much interest on the subject embraced by the resolution.

I have the honor to be, with great respect,

Your obedient servant,

RICHARD RUSH.

The Hon. the SPEAKER

*of the House of Representatives of the United States.*


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 GENERAL LAND OFFICE,

January 12, 1829.

SIR: In compliance with a resolution of the House of Representatives, "directing the Secretary of the Treasury to communicate to this House any information in his possession, showing the quantity and quality of the public lands in the State of Louisiana which are rendered unfit for cultivation from the inundations of the Mississippi, and the value of said lands when reclaimed, and the probable cost of reclaiming them," I have the

honor to report, that the Mississippi, in its course between the 33d degree of north latitude, the northern boundary of Louisiana, and the Gulf of Mexico, inundates, when at its greatest height, a tract of country, the superficial area of which may be estimated at 5,429,260 acres: that portion of the country thus inundated which lies below the 31st degree of latitude may be estimated at 3,183,580 acres: and that portion above the 31st degree of north latitude may be estimated at 2,245,680 acres, of which 398,000 acres lie in the State of Mississippi. This estimate includes the whole of the country which is subject to inundation by the Mississippi and the waters of the Gulf. A portion of this area, however, including both banks of the Mississippi, from some distance below New Orleans to Baton Rouge, and the west bank nearly up to the 31st degree of latitude, and both sides of the Lafourche for about fifty miles from the Mississippi, has, by means of levees or embankments, been reclaimed at the expense of individuals. The strips of land thus reclaimed are of limited extent; and estimating their amount as equal to the depth of forty acres on each side of the Mississippi and Lafourche, for the distance above stated, they will amount to about 500,000 acres, which deducted from 3,183,580 acres, will leave the quantity of 2,683,580 acres below the 31st degree of latitude, which is now subject to annual or occasional inundations; this, added to the quantity of uninundated lands above the 31st degree of latitude, makes the whole quantity of lands within the area stated, and not protected by embankments, equal to 4,929,160 acres.

By deepening and clearing out the existing natural channels, and by opening other artificial ones, through which the surplus water that the bed of the Mississippi is not of sufficient capacity to take off may be discharged into the Gulf, with the aid of embankments and natural or artificial reservoirs, and by the use of machinery (worked in the commencement by steam, and as the country becomes open and cleared of timber by wind mills,) to take off the rain water that may fall during the period that the Mississippi may be above its natural banks, it is believed that the whole of this country may be reclaimed, and made, in the highest degree, productive.

The immense value of this district of country, when reclaimed, is not to be estimated so much by the extent of its superficies as by the extraordinary and inexhaustible quality of the soil, the richness of its products, and the extent of the population which it would be capable of sustaining. Every acre of this land lying below the 31st degree of north latitude might be made to produce three thousand weight of sugar; and the whole of it is particularly adapted to the production of the most luxuriant crops of rice, indigo, and cotton. Good sugar lands on the Mississippi, partially cleared, may be estimated as worth \$100 per acre, and rapidly advancing in value. The rice lands of South Carolina, from their limited quantity, are of greater value. It is believed that the exchangeable value of the maximum products of these lands when placed in a high state of cultivation, would be adequate to the comfortable support of 2,250,000 people, giving a population of one individual for every two acres; and it is highly probable that the population would rapidly accumulate to such an extent as to banish every kind of labor from agriculture except that of the human species, as is now the case in many of the best districts of China: and this result would also have been produced in many parts of Holland, had not that country become, from the nature of its climate, a grazing country.

The alluvial lands of Louisiana may be divided into two portions: the first, extending from the 33d to the 31st degrees of north latitude, in a direction west of south, may be termed the upper plain, is 120 miles in length, and generally from 25 to 30 miles in breadth, and at particular points is of still greater width. That portion below the 31st degree of north latitude may be termed the lower plain. It extends in a direction from northwest to southeast for about 240 miles, to the mouth of the Mississippi; is compressed at its northern point, but opening rapidly, it forms at its base a semicircle, as it protrudes into the Gulf of Mexico, of 200 miles extent, from the Chafalaya to the Rigoletts. The elevation of the plain at the 33d degree of north latitude above the common tide waters of the Gulf of Mexico, must exceed one hundred and thirty feet.

This plain embraces lands of various descriptions, which may be arranged into four classes:

The first class, which is probably equal in quantity to two-thirds of the whole, is covered with heavy timber, and an almost impenetrable undergrowth of cane and other shrubbery. This portion, from natural causes, is rapidly drained as fast as the waters retire within their natural channels, and, possessing a soil of the greatest fertility, tempts the settler, after a few years of low water, to make an establishment, from which he is driven off by the first extraordinary flood.

The second class consists of cypress swamps: these are basins, or depressions of the surface, from which there is no natural outlet; and which, filling with water during the floods, remain covered by it until the water be evaporated, or be gradually absorbed by the earth. The beds of these depressions being very universally above the common low water mark of the rivers and bayous, they may be readily drained, and would then be more conveniently converted into rice fields than any other portions of the plain.

The third class embraces the sea marsh, which is a belt of land extending along the Gulf of Mexico from the Chafalaya to the Rigoletts. This belt is but partially covered by the common tides, but is subject to inundation from the high waters of the Gulf during the autumnal equinoctial gales: it is generally without timber.

The fourth class consists of small bodies of prairie lands, dispersed through different portions of the plain; these pieces of land, generally the most elevated spots, are without timber, but of great fertility.

The alluvial plain of Louisiana, and that of Egypt, having been created by the deposit of large rivers, watering immense extents of country, and disemboguing themselves into shallow oceans, moderately elevated by the tide, but which, from the influence of the winds, are constantly tending in a rapid manner to throw up obstructions at the mouths of all water courses emptying into them, it is fairly to be inferred that the alluvial plain of Egypt has, in time past, been as much subject to inundation from the waters of the Nile, as that of Louisiana now is from those of the Mississippi; and that the floods of the Nile have not only been controlled and restricted within its banks by the labor and ingenuity of man, but have been regulated and directed to the irrigation and improvement of the soil of the adjacent plain; a work better entitled to have been handed down to posterity by the erection of those massive monuments, the pyramids of Egypt, than any other event that could have occurred in the history of that country.

That the labor and ingenuity of man are adequate to produce the same results in relation to the Mississippi river and the plain of Louisiana, is a position not to be doubted; and it is believed that there are circumstances incident to the topography of this plain that will facilitate such results.

The Mississippi river, entering this plain at the 33d degree of north latitude, crosses it diagonally to the high lands a little below the mouth of the Yazoo; from thence, it winds along the highlands of the States of Mississippi and Louisiana to Baton Rouge, leaving in this distance the alluvial lands on its western bank; from a point a little below Baton Rouge, it takes an easterly course through the alluvial plain, and nearly parallel to the shores of the Gulf of Mexico, until it reaches the English Turn; and from thence, bending to the south, it disembogues itself into the Gulf of Mexico by six or seven different channels. The banks of the Mississippi, which are but two or three feet above common tide water near its mouth, gradually ascend with the plain, of which they constitute the highest ridges, to the 33d degree of north latitude, where they are elevated above the low water mark of the river from thirty to forty feet. The banks are, however, subject to be overflowed throughout this distance, except at those points protected by levees or embankments: this arises from a law incident to running water courses of considerable length, which is, that the floods in them acquire their greatest elevation as you approach a point nearly equidistant from their mouths and sources. The depth of the Mississippi is from 120 to 200 feet, decreasing, as you approach very near the mouth, to a moderate depth. Exclusive of a number of small bayous, there are three large natural canals or channels, by which the surplus waters of the Mississippi are taken off to the Gulf. The first of these, above New Orleans, is Lafourche, which, leaving the river at Donaldsonville, reaches the Gulf in a tolerably direct course of about 90 miles. The Lafourche is about 100 yards wide; its bed is nearly on a level with the low water mark where it leaves the river; its banks are high, and protected by slight levees; and in high floods it takes off a large column of water. Above Lafourche, the Bayou Manchac, or Iberville, connecting with the Lakes Maurepas and Ponchartrain, takes off into the Gulf, through the Rigoletts and other passes, a considerable portion of the surplus water of the Mississippi: the bed of this bayou is 14 feet above the level of the low water of the Mississippi; and as it reaches tide water in a much shorter distance than the Mississippi itself, it would take off a large column of water if its channel was not very much obstructed.\* Nearly opposite to Manchac, but lower down the river, is Bayou Plaquemine, a cut-off from the Mississippi to the Chafalaya; but as there is a considerable declination, in this part of the plain, of the alluvial lands, and being unobstructed in its passage, it is rapid, and takes off a large body of water; where it leaves the river, however, its bed is five feet above the level of the low water mark. About 88 miles above Manchac, and just below the 31st degree of latitude, is the Chafalaya. This is one of the ancient channels of the Mississippi river, and being very deep, carries off at all times great quantities of water; and were its obstructions removed, it would probably carry off a much larger quantity. As the distance from the point where the Chafalaya leaves the Mississippi, along its

\* The difference between the highest elevation of the waters at the efflux of the Manchac, and the lowest level of the tide in Ponchartrain, is from 27 to 30 feet.

channel, to the Gulf, is only 132 miles, and that which the Mississippi traverses, from the point of separation to the Gulf, is 318 miles, it is evident that a given column of water may be passed off in much less time through the channel of the latter stream. From this topographical description of that portion of the plain south of the 31st degree of latitude, it is evident, that, independent of the general and gradual declination of this plain, descending with the Mississippi, it also has a more rapid declination towards the Lakes Maurepas and Ponchartrain on the east, and towards the valley of the great Lake of Attakapas on the west; and it may, as to its form and configuration, be compared to the convex surface of a flattened scollop shell, having one of its sides very much curved, and the surface of the other somewhat indented: there is, therefore, good reason to believe that by conforming to the unerring indications of nature, and aiding her in those operations which she has commenced, this plain may be reclaimed from inundation.

The quantity of water which has been drawn off from the Mississippi, through the Iberville, the bayou Lafourche and the Chafalaya, has so reduced the volume of water which passes off through the Mississippi proper, that individual enterprise has been enabled to throw up embankments along the whole course of that river, from a point a little below that where the Chafalaya leaves the Mississippi nearly to its mouth, and for forty or fifty miles on each side of the Lafourche; the lands thus reclaimed will not, however, average forty acres in depth fit for cultivation, and may be estimated at four hundred thousand acres. This is certainly the most productive body of land in the United States, and will be in a very short period, if it is not at the present, as productive as any other known tract of country of equal extent.

If the waters drawn off in any given time from the Mississippi, through the natural channels now formed, were delivered into the Gulf through those channels in the same given time, then they would not overflow their natural banks, and the adjacent lands would be reclaimed; but this is not the fact; and the object can only be accomplished by increasing the capacity and numbers of outlets of the natural channels, by which the water is now disembogued, and by forming other artificial ones, if necessary, by which the volume of water that enters into the lower plain of Louisiana in any given time may be discharged into the Gulf of Mexico within the same time. If that volume were ascertained with any tolerable degree of accuracy, then the number and capacity of the channels necessary for taking it off into the Gulf might be calculated with sufficient certainty. A reference to the map of that country will show that the rivers which discharge themselves into the lower plain of Louisiana, and whose waters are carried to the Gulf in common with those of the Mississippi, drain but a small tract of upland country: for Pearl river, and, if necessary, at a very moderate expense, the Teche, may be thrown into the ocean by separate and distinct channels.

At the thirty-first degree of north latitude, and near to the point where Red river flows into, and the Chafalaya is discharged from, the Mississippi, the waters of that river are compressed into a narrower space than at any other point below the thirty-third degree of north latitude: this may be considered as the apex of the lower plain. The contraction of the waters of the Mississippi at this point is occasioned by the Avoyelles, which, during high water, is an island, and is alluvial land, but of ancient origin:

from this island a tongue of land projects towards the Mississippi, which, though covered at high water, is of considerable elevation. It is probable, therefore, that, at the point thus designated, a series of experiments and admeasurements could be made, by which the volume of water discharged, in any given time, on the lower plain, by the Mississippi, at its different stages of elevation, might be ascertained with sufficient accuracy to calculate the number and capacity of the channels necessary to discharge that volume of water into the Gulf of Mexico in the same time. With this data, the practicability and the expense of enlarging the natural, and excavating a sufficient number of new channels to effect this object, might readily be ascertained. If that work could be accomplished by the Government, every thing else in respect to the lower plain should be left to individual exertion, and the lands would be reclaimed as the increase of the population and wealth of the country might create a demand for them.

The contraction of the plain of the Mississippi by the elevated lands of the Avoyelles, and the manner in which Red river passes through the whole width of the upper plain, in a distance of nearly thirty miles, has a strong tendency to back up all the waters of the upper plain; therefore it is, that, immediately above this point, there is a greater extent of alluvial lands, more deeply covered with water, than at any other point perhaps on the whole surface of the plain of Louisiana; and at some distance below this point, the embankments of the Mississippi terminate. To enable individuals to progress with these embankments, and to facilitate the erection of others along the water courses, and to reclaim with facility the lands of the upper plain, it will probably be found to be indispensably necessary to draw off a considerable portion of this water by artificial channels. The Red river, arrested in its direct progress by the elevated lands of the Avoyelles, is deflected in a direction contrary to the general course of the Mississippi, and traverses the whole width of the upper plain in a circuitous course of upwards of thirty miles before it reaches that river. There is good reason to believe that the waters of the Red river, or a very large portion of them, in times past, found their way through bayou Bœuf and the lake of the Attakapas to the ocean; and during high floods, a small portion of the waters of that river are now discharged into the bayou Bœuf, at different points between the Avoyelles and Rapide. A deep cut from the Red river, through the tongue of elevated alluvial land east of the Avoyelles, to the Chafalaya, and opening the natural channels by which it now occasionally flows into the bayou Bœuf, would probably take off the waters which accumulate at the lower termination of the upper plain with such rapidity, and reduce their elevation so much, as to enable individual enterprise and capital to continue the embankments, which now terminate below this point, not only along the whole course of the Mississippi, but along all those extensive water courses running through the upper plain.

The Tensa, a continuation of Black river, is, for fifty miles above its junction with Red river, a deep water course, and in breadth but little inferior to the Mississippi. It draws a very small portion of its waters from the high lands, but communicates with the Mississippi by a number of lakes and bayous, at different points, from near its mouth to its source, which is near the thirty-third degree of latitude, and through these channels aids in drawing off the surplus water of the Mississippi, while it continues to rise: when the Mississippi, however, retires within its banks, the waters in these bayous take a different direction, and are returned through

the same channels into the Mississippi. Particular local causes will produce this effect at particular points; but the general cause, so far as these bayous connect with the Tensa, will be found in the fact that there is not a sufficient vent for the waters of the upper plain at the point of connection with the lower plain of Louisiana. The Tensa is also connected, in times of high water, at several points, with the Washita and its branches. When the Mississippi has risen to a point a few feet below its natural banks, the whole of the upper plain of Louisiana is divided by the natural channels which connect the Mississippi with the Tensa, and the Tensa with the Washita, into a number of distinct islands of various extent. The banks of the rivers, and the natural channels which connect them, are very generally the most elevated lands; and each and all these islands might be reclaimed from inundations by embankments, thrown entirely round them, of from six to twelve feet high; provision being made to take off the rain water, and that occasioned by leakage and accidental crevasses in the banks, by machinery. While the Mississippi is rising, the waters are carried off through these natural channels, and their outlets into the lakes, and the lowest and most depressed parts of the plain. During this process, there are currents and counter currents in every possible direction; but when the floods have attained their greatest known height, then this whole plain becomes covered with water, from a few inches to twelve feet deep, as its surface may be more or less depressed: and if it could be exposed to view, would exhibit the appearance of an immense lake, with a few insulated spots dispersed throughout it, such as the island of Sicily, the banks of the lakes Concordia, Providence and Washington, and some very narrow strips partially distributed along the banks of the Mississippi and the other water courses. If the whole of the upper plain were reclaimed in the manner above mentioned, then the waters, being contracted into much narrower channels, would, necessarily, be very considerably elevated above the point to which they now rise; and passing off on the lower plain with greater elevation and greater rapidity, and having only the present natural channels of outlet to the Gulf, the inevitable consequence would be, that the whole of the lower plain would be inundated, and probably parts of Attakapas and Opelousas would again be subject to inundation.

The reclamation of both of the plains of Louisiana will depend, under any possible plan that may be proposed, upon the practicability of tapping the Mississippi and Red rivers at one or more points, and to an extent that may draw off rapidly such a quantity of water as will prevent the reflux waters now collected just above the 31st degree of latitude from rising to the heights to which they now do, and the practicability of delivering the waters into the ocean within periods equal to those in which they were drawn off. We have seen that the natural channels of the Lafourche, Plaquemine, Iberville, and the Chafalaya, have so reduced the mass of water in the Mississippi below their points of efflux, as to enable individuals, by very moderate embankments, to confine that part of the Mississippi within its banks. The Lafourche is the only one of these natural channels that takes off the waters to the ocean so rapidly and directly as to enable individuals to erect levees or embankments along its whole course. The passes at the Rigoletts and at Berwick's bay not being sufficient to take off the waters, which flow through them, as fast as they are discharged into their reservoirs, it is evident that no beneficial effect could be derived from tapping the Mississippi at any point on its eastern bank, or at any point on

its western bank above the Lafourche, unless the capacity of the outlets at Berwick's bay and the Rigoletts be greatly enlarged. The passes at the Rigoletts are well known; and it is probable that, by enlarging them, and cutting off that portion of the waters of Pearl river which now flows through them, they might be made adequate to take off, in a sufficiently short period, the waters of Iberville, and those of the short rivers of Feliciana, so as to prevent that portion of the plain between the Iberville and the city of New Orleans from being inundated, except so far as the waters of Ponchartrain, elevated by high winds and tides, may produce that effect. It is only, therefore, on the west bank of that river, or the south bank of Red river, that the proposed tapplings can be made with the prospect of a successful issue.

The course of the Mississippi from Donaldsonville to New Orleans being nearly parallel to the Gulf, and the distance to the Gulf across that part of the plain being much shorter than that by its natural channel to tide water, that portion of the river presents eligible points for tapping, particularly near to New Orleans; the commerce of which, in time, not perhaps distant, may require a deep cut to be made to the Gulf. The width of the river at Donaldsonville being about seven hundred yards, the rise above its natural banks about one yard, and its velocity two and a half miles an hour; if then, by one or more tapplings below this point, a volume of water of the above dimensions could be carried off to the ocean with equal velocity, then would the highest elevation of the river be reduced very considerably every where below such tapping, and for some distance above. Such a reduction of the elevation of this part of the river, aided by the clearing out of the rafts from the Chafalaya, would possibly produce so great a reduction of the reflux waters at the junction of the Red and Mississippi rivers, as to enable individuals to proceed gradually to the reclamation of the whole of the upper plain by common embankments. It would then require only an increased capacity to be given to the outlets of the lake of Attakapas to ensure the reclamation of both plains. But if this effect cannot be produced by the tapplings below the Lafourche, then they must be made at points higher up, either between Laquemine and the Chafalaya, or at a point about the mouth of the bayou Lamourie, or Du Lac, on Red river. A reference to the map will show that the waters of Red river can be taken to the Gulf from this point in almost a direct course, through channels that it is more than probable they formerly occupied, and in a distance of less than one-half of that by which they reach the ocean through the channel of the Mississippi, and by forty or fifty miles less than that through the channel of the Chafalaya. A deep cut at this point, of ten miles, through an alluvial soil, would discharge the waters of Red river into bayou Bœuf; and as these waters would pass through an alluvial plain, having probably a fall of not less than sixty feet in seventy miles from the point of tapping, there is reason to believe that they would work for themselves, without much artificial aid, a channel of great capacity.

The question then arises, how are these waters, in addition to the superabundant waters of the Chafalaya, which already overflow all the valley of the lake of Attakapas, to be taken off to the Gulf? To solve this question satisfactorily, it will be necessary to take a view of the outlets of the lake of Attakapas. The Teche is a natural canal, almost without feeders or outlet, except at its mouth; and having no doubt been a channel for a

much larger mass of water in time past, its adjacent lands have been formed precisely as those of the Mississippi have been, and its banks of course occupy the highest elevation of the country through which it runs. For forty miles above its mouth it is contracted by the waters of the Attakapas lake on the one side, and by those of the Gulf on the other, so as to exhibit almost literally a mere tongue of land just above high water mark. It enters Berwick's bay about eighteen miles from the Gulf. Nearly opposite to the mouth of the Teche, is the mouth of bayou Black, or bayou Bœuf. This bayou, like the Teche, is also a natural canal, occupying the highest elevation of a narrow tract of land extending eastwardly nearly to the bayou Lafourche, that is seldom inundated, and which would seem to be a prolongation of the Attakapas country; inducing a belief that the Teche formerly discharged its waters, at a point farther east, into a bay that occupied the whole of the present plain, from the Attakapas lake to bayou Lafourche and the Mississippi. It is this elevated ridge that causes the indentation in the lower plain to be deluged by the waters of the Mississippi; which, forcing a passage for themselves across the Teche, have formed an outlet called Berwick's bay. This pass is narrow, and is about seven or eight feet deep, passing, in part of its course, through lands not of recent alluvion, and disembogues into the bay of Achafolia, through the lake of that name, and two or three other outlets.

Following up then, this indication of nature, by cutting artificial outlets from the lake to Attakapas across the Teche, at different points, for a distance of fifteen to twenty miles above its mouth, at such places as the drains emptying into the ocean may approach nearest to Attakapas lake, giving to such cuts any width that may be required, and a depth that may be on a level with low water mark, and embanking the lake of Attakapas so as to raise it three feet above its present surface, it is believed that a capacity may be obtained for taking off any volume of water that it may be necessary to throw into the lake of Attakapas, and at an expense very trifling in comparison to the object to be obtained. All the waters of the Atchafalaya being thrown into lake Attakapas, and that late embanked, the whole of the plain between it and the Mississippi would be exempt from inundation. The rain water, and that from the weepings and crevasses in the embankments, would find a reservoir in the deeper lakes and beds of Grand river, the surplus being taken off by machinery, or by tide locks in some of the bayous, which now connect with these lakes in the highest floods.

It is believed that three brigades of the topographical corps, operating for a few seasons from the 1st of November to the 1st of July, would be able to obtain sufficient data to decide upon the practicability of devising, and the expense of accomplishing, a plan that would effect the reclamation of both plains; but if it should be found to be impracticable, or too expensive for the state of the population and wealth of the country, yet the minute knowledge which they would obtain of the topography of the entire plain would enable them to designate different portions of it in both plains which could be reclaimed from inundation at an expense commensurate with the present capital and population of the country.

The gradual elevation of the plain of the Mississippi\* by the annual

\* The gradual elevation of the plain is not perceptible, because the gradual elevation of the beds of the water courses, arising from the same cause, occasions as general an overflow of their banks as formerly; but that which is perceptible is the rapid filling up of the ponds and

deposites, and the accumulation of population and capital, will ultimately accomplish its entire reclamation from the inundations of the Mississippi; but the interposition of the Government, and the judicious expenditure of a few millions of dollars, would accomplish that object fifty or perhaps a hundred years sooner than it will be effected by individual capital, aided by the slow operations of nature.

I attach a small diagram of the country, as illustrative of some of the points referred to in this report.

With great respect,

Your obedient servant,

GEO. GRAHAM.

The Hon. RICHARD RUSH,

*Secretary of the Treasury.*

*An estimate of the expense of excavating outlets from the Lake of the Attakapas to the Gulf of Mexico.*

On the presumption that the waters of the Gulf of Mexico, at low tide, reach within six miles of the lake—and it is believed that they do, at several points between the bayou Cypress and Berwick's Bay—let positions at one or more of the most favorable of these points be selected, the aggregate width of which shall be two thousand yards: let such portions of these positions as may be inundated at high water be drained by common embankments so that oxen may be used in removing the earth; let excavations be made through them, of such numbers and of such widths as may be best adapted to the removal of the earth, leaving, however, the proportion of excavation to that of embankment as three to one. A number of canals will be then formed, with an embankment between each, the excavation of which, their beds being on a level with low water, would not average a depth of three feet. These proportions will give the amount of excavation as equal to 15,840,000 cubic yards, which, at 20 cents the cubic yard, gives \$3,168,000 as the expense of excavating outlets, which, at low tide would have the capacity of discharging from the lake, with great velocity, a column of water of fifteen hundred yards in width and one yard in depth, at the point where it left the lake.

No estimate, with any tolerable approximation to accuracy, can be made of the expense of excavating a deep cut from Red river to the bayou Bœuf; and of enlarging the bed of that bayou; of the embankments along

shallow lakes; and there can be no question that the great annual alluvion and vegetable deposit must produce similar effects through the whole plain.

The Mississippi river is among the muddiest in the world, and deposites its muddy particles with great rapidity: its waters hold in solution not less than one-sixteenth part of their bulk of alluvion matter, and some experiments are stated to give a greater proportion. If, then, within the embankments of the Mississippi, a piece of level ground be surrounded by a dyke sixteen inches high, and filled with the waters of the Mississippi when above its banks, and those waters drawn off when they have deposited all their muddy particles, nearly one inch in depth of alluvion matter will have been obtained: if this process be repeated as often as practicable during a season of high waters, a quantity of alluvion will have been accumulated of not less than six or eight inches in depth. This process is similar to that termed warping, in England, and is in use to some extent along the waters of the estuary of the Humber for manuring lands: and it is a process by which the lands of the plain of Louisiana will be rendered inexhaustible, so long as the Mississippi continues to bear its muddy waters to the ocean.

the lake of the Attakapas, necessary to give it the required elevation; or for tide-locks, machinery, &c. until an accurate survey on the ground be made. It is possible that the judicious expenditure of five millions of dollars by the Government would be sufficient to make the excavations, and erect embankments, tide-locks, and other machinery, that would be necessary to give such a control over the waters of the Mississippi and its outlets as to reduce them so nearly within their banks at high floods as to enable individual capital to progress with the entire embankment of them, and the reclamation of the whole plain.

The quantity of land belonging to the Government within the limits of the alluvial plain may be estimated at upwards of three millions of acres, which, at a minimum price of ten dollars per acre, would be upwards of thirty millions of dollars.

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 government has been unable to raise  
 the necessary funds to meet its  
 obligations. This is due to a  
 variety of causes, including the  
 high cost of the war and the  
 depreciation of the paper money  
 issued. The result is that the  
 government is unable to pay its  
 debts, and this has led to a  
 loss of confidence in the  
 government and a general  
 depression of the country.

The second of these is the fact that  
 the government has been unable to  
 reform the currency. This is due  
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