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DESTRUCTION  
OF  
BOSTON HARBOR.

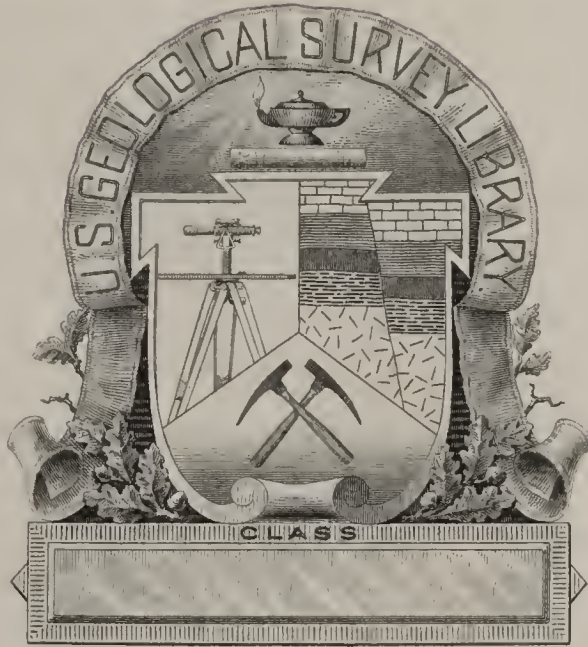






Class \_\_\_\_\_

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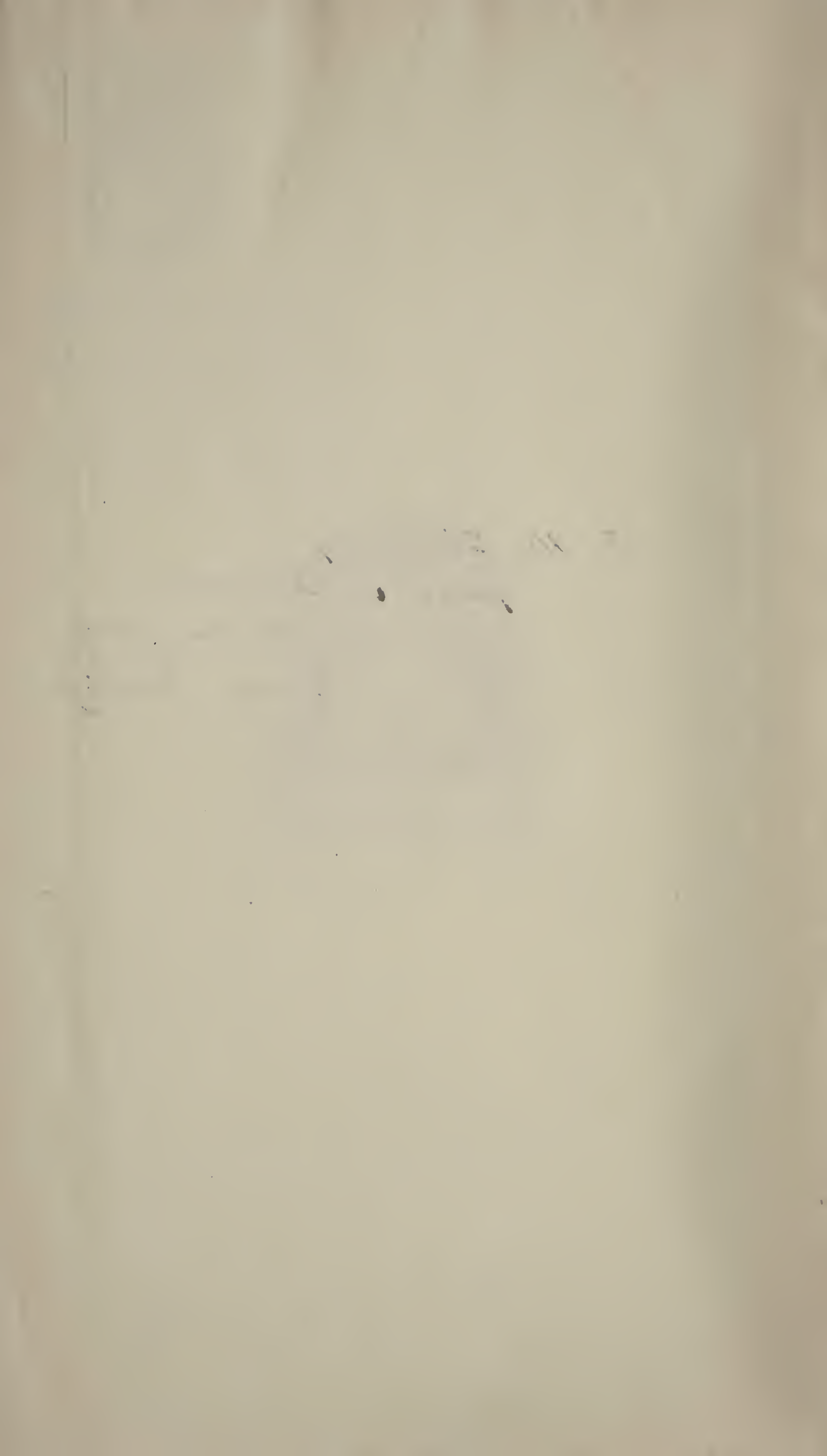


Ma His Excellency.

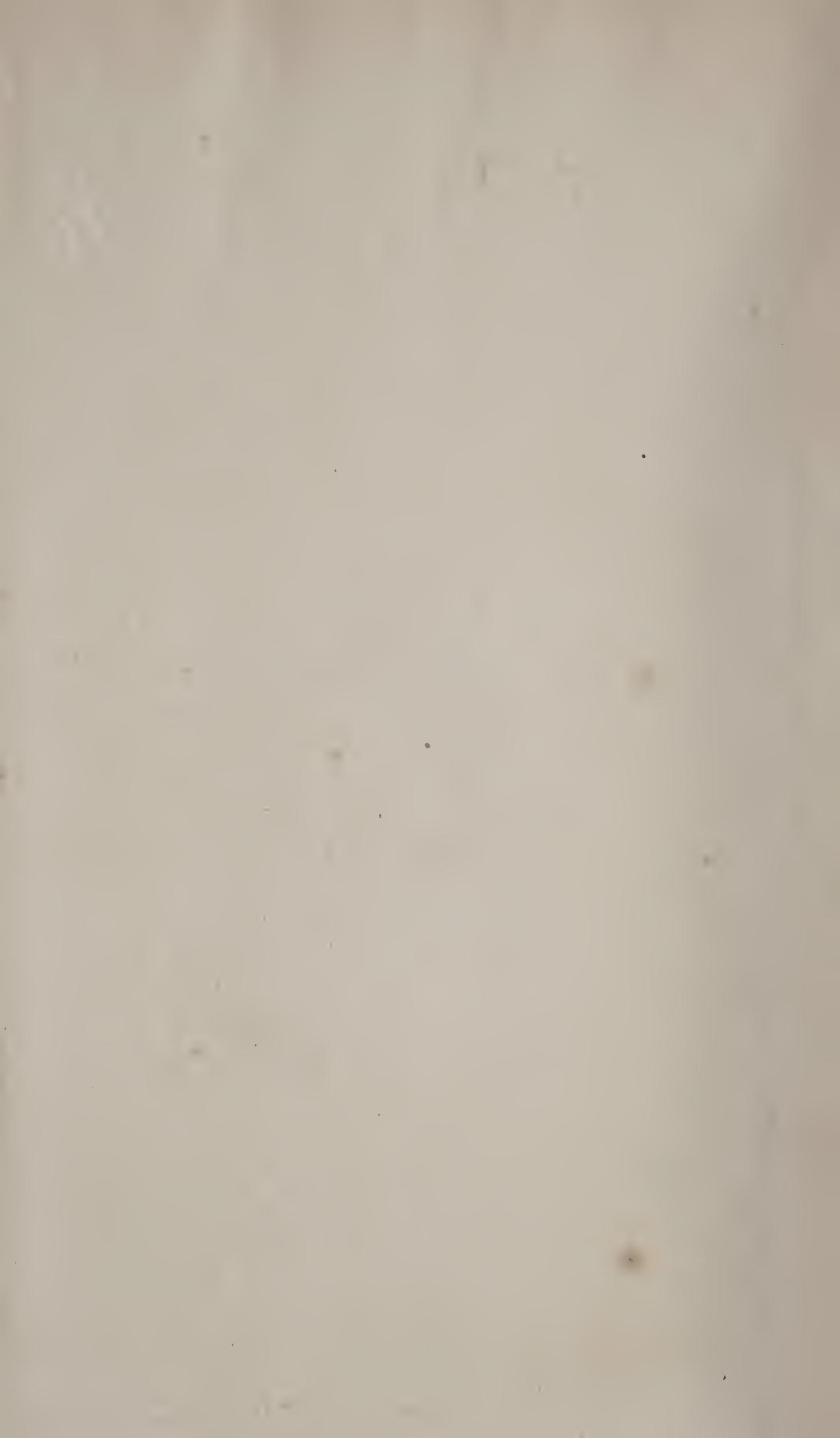
George S. Boutwell.

with the respects of

William Whiting











# BOSTON HARBOR.

COPIED FROM AN OLD MAP AT THE STATE HOUSE,

ENTITLED

## CHARTS OF THE COAST AND HARBOURS OF NEW ENGLAND.

COMPOSED AND ENGRAVED BY

JOSEPH FREDERICK WALDO DES BAIRES, Esq.

In consequence of an application of the Rt. Hon. Vis. Howe, Commander in Chief of  
his Majesty's ships in North America.

FROM THE SURVEYS TAKEN UNDER THE DIRECTION OF THE LORDS OF TRADE,

BY SAMUEL HOLLAND, Esq.,

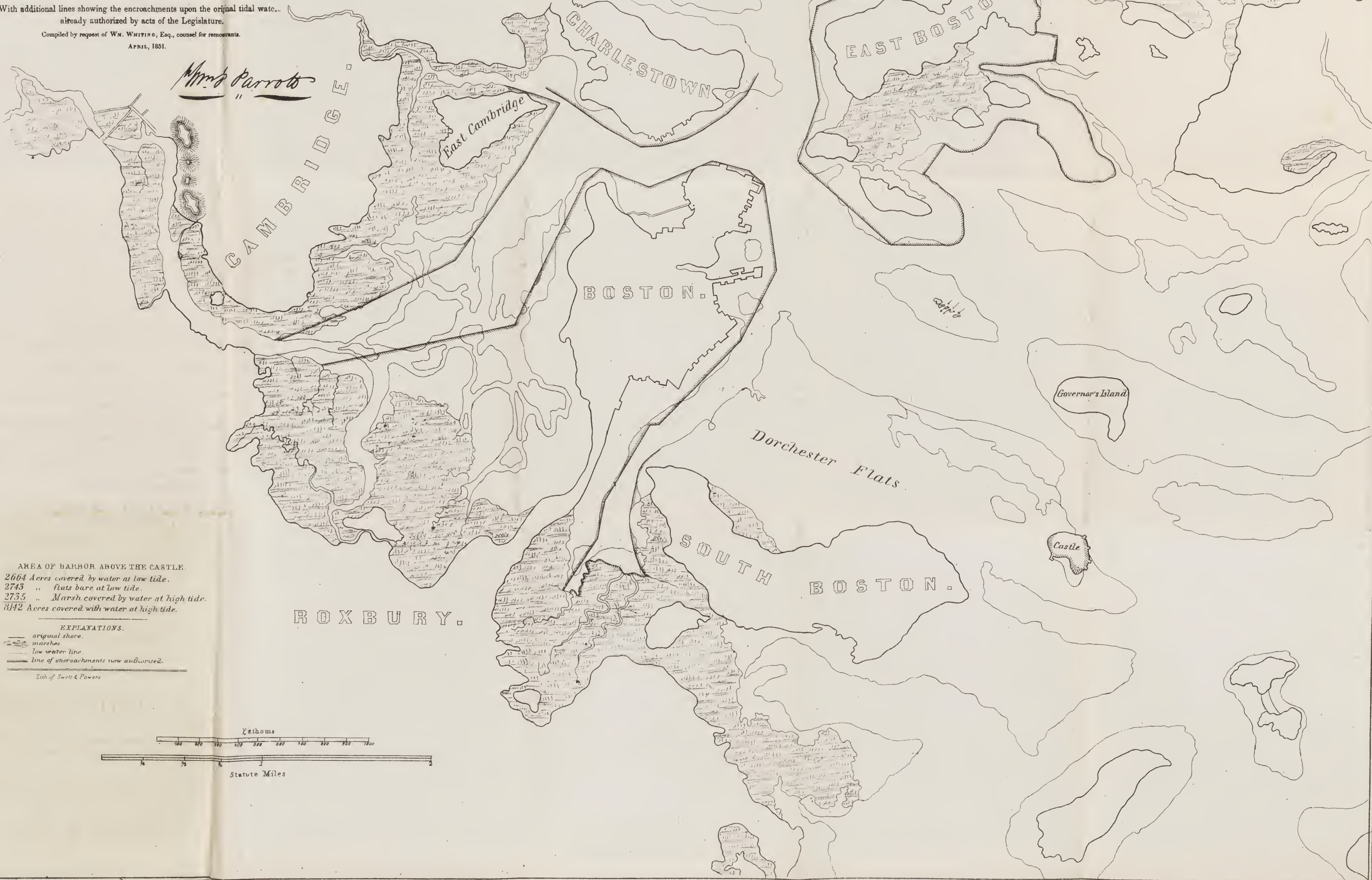
Surveyor General of Lands, and his Assistants, who have been employed on that service since  
the year 1764.

Published according to act of Parliament, by J. F. W. DES BAIRES Aug. 5, 1775.

With additional lines showing the encroachments upon the original tidal water,  
already authorized by acts of the Legislature.

Compiled by request of Wm. Whiting, Esq., counsel for remonstrants.

APRIL, 1851.



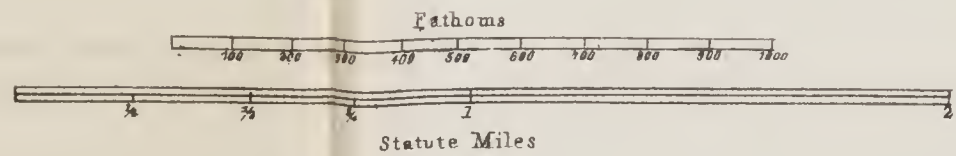
AREA OF HARBOR ABOVE THE CASTLE.

- 2664 Acres covered by water as low tide.
- 2743 " flats bare at low tide.
- 2755 " Marsh covered by water at high tide.
- 3172 Acres covered with water at high tide.

EXPLANATIONS.

- original shore.
- marshes.
- low water line.
- line of encroachments now authorized.

Lith. of Swift & Powers





APPLICATION  
OF  
JOHN C. TUCKER AND OTHERS

FOR A  
Charter for the Mystic River Rail Road,  
TO RUN FROM THE BOSTON AND MAINE RAIL ROAD  
ACROSS  
CHELSEA BRIDGE OVER THE FLATS TO DEEP WATER.

PETITION  
OF  
FREDERIC J. WILLIAMS AND OTHERS

FOR A  
Grant of and leave to fill up 117 Acres of the Commonwealth's Flats  
IN  
MYSTIC RIVER ABOVE AND BELOW CHELSEA BRIDGE.

S P E E C H

OF

44933  
WILLIAM WHITING

BEFORE THE

*Mass,*  
Joint Legislative Committee on Mercantile Affairs and Insurance,  
MONDAY, APRIL 17, 1851.

Phonographic Report by Dr. James W. Stone.

BOSTON:

J. M. HEWES & CO., 81 CORNHILL.  
1851.

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HON. BENJAMIN SEAVER, Chairman of Committee.



WILLIAM DEHON, *for the Mystic River Railroad Petitioners.*

RICHARD H. DANA, JR., *for the Petitioners for Flats.*

WILLIAM WHITING, } *for the Remonstrants.*  
THOMAS RUSSELL, }

BY TRANSFER

JUN 13 1867

A 15-1867



# S P E E C H .

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GENTLEMEN,

THE pressure of your engagements will require us to proceed at once, notwithstanding the absence of some members of this Committee. You will be glad to learn that the evidence is closed, although we have not produced certain witnesses whose names have been stated, because you are already so familiar with the subject under consideration.

There are two distinct questions to be answered ; one relating to the Railroad Bill,—the other, to the petition for leave to fill up a portion of the flats of Mystic River, lying above and below Chelsea Bridge.

As to the former, you are to inquire *whether the Bill as reported by the Committee on Railroads ought to pass ?* Should you be of the opinion that the Bill *as reported* ought not to pass, the question may still be open, whether any project similar to this ought to be favored. In regard to filling the flats, the great question is, *whether those flats can be filled without injury to the harbor, or the wharf property surrounding it ?*

These being the questions, permit us to inquire, *Who are the petitioners* who come here to ask not only for a charter but a donation of land from the Commonwealth? Are they merchants desiring additional accommodations for the commerce of Boston? Are they persons engaged in manufactures? Are they persons engaged in any operations which require changes or enlargements in the business facilities, or requiring better access to bold water? If they are, then the petition they have brought before you may be favorably considered, and, if no damage be done, may be granted. But if, on the other hand, they are not persons concerned in the commerce of this place, or in what may be called the business of Boston and Charlestown, if it should turn out that they are merely an association of land speculators, I think their claims would stand on different grounds. And we do not feel much hesitation in saying to what class we suppose the petitioners belong.

We will ask your attention to the fact that there are *two separate sets* of persons who are petitioners. The one petition for a *Railroad*, the other petition for *land*. They appear before you in a double character; though we suppose that the same general design is at the bottom of this scheme. They have come before you separately, and as though they had separate objects, for a reason which is believed to be not obvious. They wish to have two chances before the Legislature;—one before this Committee, and the other before the Railroad Committee. And if they fail in getting the grant of the petition from the one, they think they may succeed with the other;



or, as we will show presently, if they succeed in getting both schemes sanctioned by the Legislature, they may drop one scheme and carry out the other. I will ask the Committee to consider that the petition before this Committee is in its character vague and indefinite. It requests the Legislature to give away as much as they will. They do not ask any thing definite, giving the metes and bounds, in order that the public may know precisely what the plan is ; but the supplicants come with soft tone and under breath and say, “ Gentlemen, give us about a hundred acres ; and if you cannot give us a hundred, pray favor us with eighty ; and if our petition for eighty acres is too large, then pray grant us fifty ; let us have all you can spare, without robbing yourself ! ” If they can have what they wish, they will obtain the whole. But the smallest favors will be gratefully received. They protest they do not wish to do any harm. But they wish to have the Legislature manufacture a scheme for them *here*, and that this Committee should sanction this scheme. That is the plan. Now they begin by making two assertions that we wish you to consider,—assertions which we do not consider to be well founded. These statements, though perhaps not intended to be incorrect, yet are not in fact true. They tell you that none but themselves are interested in this subject. That is their statement. Now when there is a petition presented to the Legislature relating to any public work, an order of notice is usually issued to those interested against the project, because the Government wishes, before putting its hands into the pockets of any

of its citizens, to give them a chance to be heard. The petitioners make that first statement perhaps for the purpose of not waking up any opposition, in order that they may go slyly into some Committee room and get a report in their favor and then slide along as smoothly before the Legislature, and without opposition obtain the grant of their petition.

The petitioners state that they are the *owners* of a tract of land which is liable to be filled up ; and would make it appear before you, as the basis of their claim, that they have already a right to fill up down to the present channel. This statement has been insisted upon. We begin by saying to you that that assumption is not correct. The petitioners are not legal owners of all the flats which lie in front of their lands. Only a small portion of those flats, viz., those situated between their lands and the ancient channel, down to low water mark, belong to them. They are the owners of flats only to the line of the original channel, which was distant but comparatively a few feet from the ends of their wharves. That erroneous claim, Gentlemen, is stated by them in substance as one of the elements which you are to take for granted and which we say is not true. The effect of that error is to mislead. It did mislead certain persons who supposed, when these petitioners were asking the privilege of making a Railroad over flats of their own, that they were really flats of their own, and not a part of the flats of the Commonwealth in Mystic River. The plan of proposed filling, now brought forward,—and which was prepared for them by Lieut. Davis, if it had been known, would



have raised 500 or 5,000 remonstrants. What the petitioners asked in public is not what they ask here. They asked in public the privilege of certain flats, and alleged that no other persons but the petitioners were interested. Now they ask for a hundred acres of flats, most of which is the property of the Commonwealth.

These applicants for the flats come before you with no better reason, in reality, than a desire that they may be permitted, by the Legislature, to make a grand speculation out of the property of the Commonwealth, and that you should report in favor of their project.

Now it may be said that there are petitioners in aid of this project. We will tell you how it is that they are interested. Some of them who reside in distant towns on the line of the Boston and Maine Railroad are interested. They are told that it will benefit them by giving them additional access to deep water; little knowing that the project will not give them a single *wharf* on the harbor.

The city authorities of Charlestown have come forward and petitioned; and we are not surprised at that. They are looking to their own interests. If they can get you to fill up any portion of this harbor within the precincts of that city, they will extend their lands and their business to some extent. They will put up new buildings and have new sources of income. Of course, therefore, Charlestown is in favor of this plan.

Then there are some, like Mr. Barker, who are in favor of this project. He says he shall thereby get a job of engineering. There are others who are in favor of it;

and the reason is that they expect that they will have something to do, some lucrative employment growing out of the enterprise.

But, Gentlemen, there are other petitioners. Some are from Chelsea, remonstrants as well as petitioners. But those from Chelsea in favor of this proposition could not have known what was to be the project at last, because the petitioners did not and could not tell them what the project was finally to be. But suppose they were in favor of it because they thought it would be the means of causing Chelsea Bridge to become free from tolls, by making a portion of the adjoining flats into solid land. But the object may be accomplished better by appropriating the proceeds of these flats to the freeing of that bridge, without injuring the harbor by excluding the tide water.

We must ask you to look at a Bill which you did not sanction, but which was reported by the second Committee on Railroads, and then ask you what is the real object of the petitioners for that Road. See what they propose to have you do. This Bill reported, is entitled “An Act to incorporate the Mystic River Railroad ;” and enacts that “J. C. Tucker, David Hamblin, P. J. Stone, and their associates, successors and assigns,” shall be incorporated with all the powers and privileges, &c., to “construct and maintain a Railroad, with one or more tracts, commencing at some convenient point on the Boston and Maine Railroad in Somerville, easterly of the Middlesex Canal and westerly of the point where the Grand Junction Railroad unites with the Boston and Maine ;” that



is, between the Grand Junction Road and the Mill Pond ; and thence shall come down along the margin of the river, crossing “ the flats between the main and south channels in Mystic River to Chelsea Bridge ; ” and then crossing the bridge on an even grade ; that they shall have the privilege of filling up a circle of land which shall extend 600 feet below the bridge ; and that they shall have the privilege of extending out their wharves in fan shape about 600 feet more, which will give an extent of 1200 feet from the bridge towards East Boston.

That is their plan. And, Gentlemen, if you believe it after all the testimony that has been offered to you, that is the act which that Railroad Committee reported just as it is, although the plan is now by the petitioner’s counsel in part abandoned. That bill, as we are informed, was reported in the absence of the Chairman of the Committee on Railroads ; and we know, for I have it from one of the Committee, that it was reported without any investigation of the great question of injury to the harbor.

Mr. DEHON. Do you intend to say that the Chairman does not approve of the bill ?

Mr. WHITING. No ! I only mean what I said, that it was reported in his absence, without any investigation of the question of injury to the harbor.

Next I will say that that bill was reported without one single provision for the protection of the harbor of Boston ; without one single provision by which we might be saved from that ruin which would necessarily follow the blight of our commercial prospects. There was sim-

ply the Railroad project without the least regard to our harbor, knowing that that subject was to be disposed of by the present Committee. That bill does not provide for one foot of excavation. They have by it a right to fill up the flats as high as they please. They are by it under no obligations, express or implied, to excavate a single foot. There was the project of 20 acres of land given away without the slightest compensation to the harbor or to the Commonwealth.

We would ask you to consider that in no part of this project do the petitioners propose (whatever may be said by our friends on the other side) to enter into any security, or to give any obligation to Massachusetts, that they will perform any thing on their part, except take the ground which you have to give them.

No such grant as this has been yet made by the Legislature of Massachusetts. We have granted charters. But we have never been yet so kind as to give a company of speculators a charter and at the same time to give them the capital stock to speculate upon.

Such, then, Gentlemen, are the petitioners. Such is a general idea, as far as I can gain it, of the objects and designs of the petitioners. And now let me ask you, before I proceed to the merits of the question, who are the parties on the other side?

Who, Mr. Chairman and Gentlemen, are the remonstrants? I hold before me a list of a portion of them. And without taking your time in reading even a list of the names of these remonstrants, let me say to you that Mr. Robert G. Shaw and various others, the East Boston



Company, the Boston Marine Society, whose sole interest is to protect the harbor of Boston, the Winnissimmet Company, the English Steamship Company, wharf owners at East Boston, wharf proprietors at the South end, inhabitants of East Boston, of Chelsea, and of Boston proper, various other private gentlemen, the selectmen of Chelsea, and in fact nineteen different classes of remonstrants, being men of various interests, appear before you, by their counsel, and request that you should do them the justice to hear their views, their evidence, and their arguments.

My friend on the other side (I know not which of two so very old gentlemen is the eldest, but we trust Mr. Dana will pardon this somewhat unparliamentary allusion to him by name) took the liberty to sneer in advance at some of our remonstrances as being *got up* ; and as being the subjects of wire-pulling, intimating that any quantity of remonstrants could be obtained by such means. Now I am ready to concede that any quantity of remonstrants can be obtained in any case where they are interested. But we cannot tolerate any such remark in regard to the honorable men whose remonstrances I have presented. We should be forgetful of the dignity of those whom we represent were we to entertain other feelings than *regret* that such an insinuation should have been uttered.

I would ask my brother, (if I must call names,) Does he mean to say that my client, Mr. Robert G. Shaw, Mr. Thos. Lamb, and others like them, are men who are to be procured to come before a Committee of the Legislature and state what they do not believe ? They are men

whose interests are at stake, or who believe their interests are at stake. Are they to be made to come up here and say that they believe that the ruin of Boston harbor is to be the consequence of the grant of this petition, when they believe no such thing? Is not such a charge equal to branding these men with an unseemly epithet? I will ask if either of the gentlemen on the other side suppose that Mr. Lamb, who represents the Boston Marine Society as president, would come up here and take his oath before you of the sincerity of the apprehensions expressed by his remonstrance unless he believes what he said? Is it not going too far to suppose that these large numbers of proprietors of wharves, of steamboats, and of ferries, and the numerous presidents of corporations could be made to say what they thought was incorrect? I will not take time in arguing such a question, or in supposing that it could have weight with you. The remonstrants are *interested* men. I do not believe you will find a man among them who is not interested. Each is interested in the preservation of his property. They are interested in this as much as the petitioners are to get the property of the Commonwealth into their pockets. They are men who entertain a well grounded fear. They are men who have knowledge on this subject—men who have experience and as qualified to guide you as any of the individuals who are called “men of science.” My clients are interested to the amount of millions of dollars in the preservation of the water courses of Boston harbor.

Such, Gentlemen, is the position of the persons who appear before you as petitioners and remonstrants, and



who ask a hearing, a patient hearing of the evidence and arguments.

I begin by stating, as matter of law, that by usage founded upon the colony ordinance of 1641, which in Massachusetts has the force of common law, the owners of land bounded on sea or salt water shall hold to low water mark, so that any one does not hold more than one hundred rods below high water mark ; saving the rights of others to convenient ways.\*

The ebb of tide, when from natural causes it ebbs the lowest, and not the average or common ebb, is to be taken as low water mark.†

“A creek in which the sea ebbs and flows and from which the tide does not ebb entirely, is the boundary of the ownership of the flats by the riparian proprietor ; and his ownership is absolute as far as it extends.

“The rights of the riparian proprietors to flats *below* low water mark are not enlarged by reason of the filling up of channels in front of them.”

The conclusion, therefore, Gentlemen, which would be deduced in regard to the law is this ; that if the Committee are satisfied that the *ancient channel* of the Mystic River, (according to the statement of the last witness and Des Barres' map,) existed as late as 1775, where it is proved by these witnesses to have run, then the peti-

\* See *Storer v. Freeman*, 6 Mass., 435 ; *Barker v. Bates*, 13 Pick. 255 ; *Austin v. Carter*, 1 Mass., 231 ; *Commonwealth v. Charlestown*, 1 P. 180, 183-4.

† *Sparhawk v. Bullard*, 1 Mitch. 95.

tioners are not the owners of the flats one inch below low water mark of the ancient channel. So that Massachusetts is still the owner, and always will be so, (till she alienates them,) of all the flats running up near the shore, covering a large portion of land which is claimed as belonging to the riparian proprietors. It is important that you should know the extent of the land that you may estimate its value, and that you may not be blinded in giving this away by any unfounded claim to it by the riparian abutters. Whatever you do, it is important that you do it advisedly.

By examining the ancient map of Des Barres, published in 1775, you will observe that the main channel of the Mystic River is represented as flowing near the Charlestown side of the flats, while a narrow creek or thread of water alone is shown upon the opposite side of these flats.

Whether the course of the main channel has thus shifted over on to the Chelsea side, from the action of artificial causes, or otherwise, may be uncertain. But from the legal principles before alluded to, it would appear that a large body of flats claimed by the petitioners, was below low water mark in relation to the riparian proprietors on both sides of the river; and therefore belongs to the Commonwealth, notwithstanding the recent filling up of *one* of these main channels.

This estate is of great value for various purposes. It may be made useful for excavations, supplying the material for filling up neighboring wharves. But it is of far more importance for other uses. The property of the



State in these flats differs in no respect from its other property, although equity may require that it shall be appropriated to different uses. As the State is owner of the public buildings, or the wild lands in Maine, so is she owner of the land under Mystic River below low water mark.

One species of property is not to be *given away* any more than the other;—not certainly to be gratuitously bestowed upon a set of speculators. Neither is to be used, unless the public exigency requires it.

This is, like all other property, held in trust by the Commonwealth. Berkshire owns it as much as Middlesex or Suffolk. It is not the property of Boston, East Boston, Chelsea, or South Boston. It is the property of Massachusetts and should be used as such.

We have a word to say of the market value of this 100 acres of flats. We have shown you one man, and have no doubt there are in Boston one hundred men, who would give you \$200,000 for that property. There are men who would give a large amount for the mere privilege of excavating it, and using the mud in other places. What the value of it is, may easily be ascertained by showing the value of land in similar situations. Last evening, Mr. Lewis testified of a purchase made by himself. There might have been testimony of other purchases introduced, but the Committee said they did not desire it. Mr. Lewis purchased flats on the rear of East Boston upon the creek as far up as *the bridge*. He says, that he paid for it a little over a shilling per foot. He bought this for the Grand Junction Railroad, with an

agreement that he would take it on his own account if the Grand Junction Corporation did not take it. And you know enough of Mr. Lewis to be aware that he is not a person to purchase land in that way without being sure that it was of value equal to the price he was to pay.

Now there are twenty acres below the bridge, which it is proposed to take for this Railroad, which, at a shilling a foot, amounts to \$145,200. This is at a rate or trifle less than Mr. Lewis paid. Would any of you doubt that this land, which it is proposed to take for this Railroad, is worth as much as land further from Boston? If this land was taken at a shilling a foot, and filled up at eight or ten cents a foot, would it not be a speculation, a magnificent speculation? The *land* costing a shilling a foot, with eight or nine cents per foot for filling up, the whole would amount to about twenty-five cents a foot; while being below the bridge, it would be made to extend to deep water, because they could excavate the flats in front, down to the channel, and use the mud in filling up.

Take the eighty acres here asked for above the bridge, and at the same rate, they would amount to \$580,800. Putting both of these sums together, they would amount to \$726,000; and if you grant as much as is embraced in this plan, which is about 117 acres in all, at the same price of a shilling a foot, it would amount to nearly \$1,000,000. Will you, then, hesitate to say that Mr. Lewis would be justified in giving for this land less than *the third part* as much as he has already paid for land



further off, which is to be filled up before it can be used ?

It is true that one of the learned counsel undertook to put questions to Mr. Lewis, apparently designed to embarrass him. We think the result was that the counsel himself was embarrassed, when he asked him how he could reconcile his statement that there was no great *emergency* for wharf accommodations in the harbor of Boston, with his offer of \$200,000 for this property. The counsel asked what he would do with it ? Mr. Lewis did not tell all that he would do with it. But there were many things very obvious. \$200,000 for 117 acres would amount to about five cents per square foot. I will ask you, Gentlemen, if there be any of you who would not be glad to obtain those flats at five cents per foot ?

You could fill them up at eight or ten cents per foot, so that when filled up they would cost little more than ninepence a foot. Would any one hesitate to pay this sum when the poorest wharf property in that neighborhood sells for from twenty-five to eighty-seven and a half cents per foot, including the flats ? This value, too, is independent of the other uses, besides wharfage, to which it might be put.

We have no doubt that either of the learned counsel would be willing to purchase these flats at this price, provided they would do so unprofessional a thing as to make \$300,000 or \$400,000 by an operation beyond the purlieus of the Court House.

Usually the riparian proprietors ask leave to extend their wharves. Here they solicit an absolute grant of

the fee simple, as we think, for the purpose of making city lots, and not for the purposes connected with navigation.

The State should not sell at any price ; but should hold this estate, (according to the views expressed in the report of the Committee on Mercantile Affairs and Insurance,) as a sacred trust for the improvement of the harbor in which it lies. If the State should make any movement about this species of property, it should be to increase and not to diminish its interest in the flats of the harbors.

If Massachusetts means to trade away Boston Harbor, and let it go to destruction, certainly there is value enough in the flats to pay the State debt. I do not believe there is a man of information upon the subject, who will not tell you that flats are of such value, that by selling all those in Boston Harbor, the proceeds could pay the entire *debt* of the State. The consequences of such a sale might be, however, the ruin of the State commercially.

You have, this evening, to deal with a matter involving many hundred thousand dollars, which is to be decided by the Legislature under your advice. But the value of these flats is not worth a moment's consideration in comparison with the consequences which would ensue from their sale. I beg you to consider that while various Committees of the Legislature have reported in favor of one or another project, they have generally not made that comprehensive examination of the subject which its importance demands ; but rather they have looked as in-



dividuals examining projects in their local bearings only. They have not taken those large views, and entertained those general considerations of the consequences of this course of operations, which we hope that this Committee will take in the report they are to make to the Legislature.

We have been met by the remark, that one former Committee has reported in favor of this project. And if the action of other Committees is to have weight with *this*, I beg that the objections of the remonstrants may be treated with so much the greater consideration. We know that this project has never been made known to the public. We speak for those whom we represent. We have never been aware of the nature and extent of this plan. If we had been, the respectable remonstrants, for whom we appear, would have earlier hastened to this Senate chamber, earnestly remonstrating against this project, and we think no Committee would have reported in favor of doing the damage which the granting of this petition will accomplish.

What are the grounds on which the petitioners rest their claim, to have a charter and a grant of public land bestowed upon them ? They come here claiming that there is *some good* which they may expect to accomplish. It is not sufficient that they are to be made rich. That is not enough for you or the Legislature to act on. They propose some plausible reasons for their request. And what are they ? We suppose the great want of the people they urge upon you to supply, is the want of wharf accommodations for the inhabitants of Charlestown. It

has been so put forth by their able counsel. Now I wish to ask you if that be correct. Charlestown has no more claim to be accommodated than any other town. Charlestown has a Navy Yard, which has built her up, which she struggled hard to get, and which enables her to enjoy the benefit of that Government expenditure which is usually considered so desirable. She secures the residence of a number of officers, the construction of a large amount of machinery and vessels, and the distribution of a large amount of the money of the United States. And in consideration of the great benefit that that navy establishment was to be to the place, she volunteered to allow the United States a place to put their ships in after they are built. She ought not to complain that a large portion of her wharfage is given up for public purposes.

Charlestown has no more reason to receive your bounty than Roxbury or any other town on the harbor. They each can ask to do what may not injure their neighbors. None can ask more. Charlestown has no better right to ask you to give her a portion of the public domain than Worcester has. But the petitioners' claim rests entirely upon the question, whether such an exigency exists as will justify you in giving away the public domain, and inflicting a fatal injury on Boston Harbor ; not whether land speculators want more land, but whether the commercial interests require these wharves. May not Charlestown have sufficient wharf accommodation in the harbor without filling up any portion of it ? May or may not the Boston and Maine Railroad have access to suffi-



cient depot accommodation upon bold water without the grant of this petition ?

We answer that there is no such public exigency. There is not a great demand for wharfage in Charlestown. It does not and never did exist. It is an exigency of speculators. The men of business do not ask this charter. They are not the men who state that there is an exigency. It is only the men who fill up the flats, the engineer who wants a job, who come forward to swear to the exigency. They do not produce a man here out of this interested circle, who undertakes to tell you that there is any exigency, or any great stress for wharf accommodations in that town. If they did so, we should answer to them that facts speak much louder than words.

When a man tells you there is a great demand for wharfage accommodation, the first question you ask is, What is the value of your wharves per square foot ? The Chairman of this Committee knows the value of some wharf property,—that which he has himself recently owned. In that neighborhood, land is worth about twenty-five cents a foot ; and the best wharf there, the Tudor wharf, used for the exportation of ice, was bought not long since for fifty cents a foot.

Now, in Boston, we should like to know how much wharf property is worth. For it is here that there is a real demand for wharf accommodation. Let any one try to purchase, and he will find that an enormous price will be asked, and so large, that this species of property, taking the average of the whole together, will produce only about five per cent. on the investment. He will find

that it is many dollars instead of a few coppers per square foot.

What are the uses of Charlestown wharves? They are only occupied for the wood and lumber business, and for the exportation of ice. No! Do not believe that any such exigency is made out, as entitles any set of men to receive half a million of dollars worth of public property without compensation.

Now, Gentlemen, if Charlestown people want to get at bold water, if that is the exigency they choose to state, if the Boston and Maine Railroad want twenty acres of land on bold water, she can have them by switching off from her own road to the Grand Junction Road, and placing depots all along the Chelsea shore to East Boston. And then she can have as much deep water accommodation as there is in Boston and Charlestown combined. She may get at as many acres of bold-water as she pleases, without filling up any flats or touching any public property. If you have already granted charters for bringing this Boston and Maine Railroad to bolder water, why should you grant another charter for the same purpose, entailing upon us so many formidable disadvantages?

Not only the Boston and Maine but all the other roads that centre in the city are, or may be, connected together by the Grand Junction Road. You have just granted a charter for that project, and it has been accomplished. You have permitted your fellow-citizens to invest some millions of dollars in carrying that enterprise into effect. This spring that road will be in working order. They



are making wharves where vessels can come and receive goods from the cars. And we ask why you would not rather foster that which you have already created than organize another machine for the same purpose? It is in vain to say that it would be further for the Boston and Maine Railroad to go up to the Northern shore. This argument you will hear directly from the other side. We would answer that, if it is the sole object to deliver the goods on board vessels, it makes no difference whether the cars go further to reach the vessel, or whether the vessel goes further to reach the cars. We all see that at a glance.

We believe that the policy which this Commonwealth has generally followed in making public grants is, not to grant two charters for the same purpose, one of which might tend to injure the other. Now I do not imagine that the Grand Junction Railroad fear competition from the Maine Railroad. The Grand Junction Road does not manifest any interest in opposing this scheme.

But you should *take care*, because you are the custodiers of all these enterprises. You will not grant the prayer of this petition, if it is designed really to attain nothing more than what is already accomplished.

Gentlemen, as to this *Charlestown exigency*, they have not felt enough of it to make them use the shore property they already possess. They have not had exigency enough to enhance the value of wharves already in existence. They have not had exigency enough to keep that channel clear; we mean the Charlestown portion of that channel. They have allowed many rods of it to fill

up. A great exigency that must have been, when they might have taken the mud from the channel and with it filled up the wharves, and yet have neglected both !

Therefore it is an opinion not founded in fact, that there is an exigency of Charlestown people for wharves. And what is more than that, it *is proposed* that this property should be used by the Maine Railroad and not by the Charlestown people. So that the idea that the citizens of Charlestown want this for the benefit of the Railroad is preposterous, when in another moment they say they want it to extend their own wharf accommodation and to benefit themselves. It seems to us that this is saying two inconsistent things in the same breath.

We would now call your attention to some statistics which will show, whatever it may be pretended that Charlestown may want, whether the exigency really exists. The frontage for wharves in Boston on all sides, above and below the bridges, amounts to 24,975 feet only ; while Charlestown has 13,170 feet, of which the Navy Yard occupies only 2,880 feet, leaving 10,290 feet to be occupied by her own citizens. The population of Charlestown is about 16,000. Boston contains at least 140,000 inhabitants. 16,000 will go in 140,000 nearly *nine* times. Now Charlestown has more than one-third as much frontage as Boston, while it has less than one-eighth of the population. You can judge by that fact of the exigency for an increase of the harbor accommodations in Charlestown.

Chelsea has frontage from Chelsea Bridge to Chelsea Creek 6,000 feet. East Boston contains, from Chelsea



Creek Bridge round to Dr. Jeffries' point, a frontage of 17,000 feet. So that there is in Chelsea and East Boston alone about as much wharf frontage as there is in the entire extent of Boston proper. Why should we not use the bold water that we can use without encroaching upon the harbor before we undertake to create that which may be attended with the most disastrous results to all. The amount of frontage actually used in 1835 in Boston and Charlestown both did not exceed 15,000 feet. Now Charlestown has the ability to use 10,290 feet for her private purposes. She can appropriate two-thirds as much frontage by making the proper excavations as was used by both these cities in 1835, and one-third as much as Boston now has. You can bring into use double the frontage now used about Boston, without filling up any of the public property beyond the Commissioners' lines. But supposing there were a want of wharfage in the south side of the Mystic, may not that want be supplied by excavation? Have they not the water course? May they not excavate that? If they can obtain reasonable accommodations by clearing their own channels, it seems to me not fair to say that there is any exigency which it does not belong to them to remedy.

But independent of this question whether Charlestown does or does not want wharfage, we say that the *present commerce of Boston requires for its convenient accommodation every foot of water area between Chelsea Bridge and the Commissioners' line at East Boston*; and that we think we have shown you. The distance from the East end of Chelsea Bridge to the Commissioner's line at East

Boston is about 1,300 feet by rough measurement upon the map. The greatest distance from the centre of Chelsea Bridge to the Commissioners' line is only 1,680 feet. The width of channel at the end of the flats to the Commissioners' line at East Boston is about 870 feet. The width of the proposed channel would be only 480 feet from the ends of the proposed wharves. But independently of those wharves, imagine them to be removed, and imagine the filling to extend only 600 feet from the bridge, and I will thank my friends to state how far they expect to extend the filling up.

Mr. DEHON. I should think about 700 feet.

Mr. WHITING. I will assume this to be the true extent. Take it just as they put it, with 700 instead of 600 feet of these flats filled up, and navigation will be rendered extremely unsafe to the present commerce of Boston. It will be endangered in many ways. I will ask those of you who are accustomed to shipping so as to know the length of the lower yard arms of large vessels, who can tell how far they will extend into the stream when lying at the ends of wharves, and who know whether we make a fair estimate, whether each vessel would not occupy about 60 feet of channel? Twice that will be 120 feet. That is on the supposition there is one vessel on each side of the channel. Take out of your 1,680 feet of present width the 700 feet which it is proposed to fill up.

Mr. DEHON. I wish to state that we think that that channel is 2,100 feet wide.

Mr. WHITING. We understood that it was proved to be 1,680 feet, I suppose your plan is to measure at



right angles with the direction of the bridge. But I am speaking of the shortest straight line from the centre of the bridge to the Commissioner's line. In order that there may be no mistake, we shall leave with the Committee the harbor-master's plan, and then by simple measurement according to the scale there laid down, you will find it as we have said. We are, of course, liable to mistakes as others are. But 1,680 feet is what we make it.

Now we have taken this project as one which leaves a channel less than a thousand feet wide. Supposing it to be a thousand feet wide, it has been stated to you by various witnesses that channels thus limited by fixed, solid structures will have a far too small area of water to accommodate present navigation. One fact alone will show you that this is true. The harbor-master, Mr. Tewksbury, testified to you that he was obliged to allow 1,000 feet in width for the track of the East Boston Ferry boats.

Mr. DANA. That was in the length of the stream.

Mr. WHITING. I say that the harbor-master keeps clear 1,000 feet in width for those boats to run across a distance of only 1,400 feet. This wide passage is left because the force of the tide drifts the boat 500 feet each side of a right line between the slips. Now you have the force of the wind over five or six times as long a distance to bear upon the boat. It is obvious that the channel of 1,000 feet in width will not accommodate the long route of the Chelsea Ferry boats, to say nothing of the others. But when you consider that the Chelsea Ferry

boats carry upon an average as many as 3,500 passengers per day, amounting to more than *a million* a year, as Mr. Fenno, the ferry agent, stated, you will at once see the importance of keeping *that channel clear*.

The population of Chelsea is 7,000. Its increase on the Winnisimmet Company's lands alone is 500 a year. They swear to you that two boats running in connection will soon be necessary. Can you doubt the importance of accommodating this population with punctual and safe conveyances? They are your friends and neighbors. They are men who dwell there, and spend their days here in mercantile and other pursuits. How vastly important it is that nothing should be done to interfere with the constant transmission of those passengers as punctually as Railroad cars would carry them in any other direction.

East Boston also is not stationary. It is filling up with ship yards and with iron works, and a variety of manufactories, all along the Northern and Eastern shores. Bold water is brought into requisition there for various purposes, and wharf frontage is selling for high prices, and of course selling thus in consequence of the various enterprises which are there in progress.

Now it is to be considered that if you are asked to do anything which will impede the daily business, and which will diminish the comfort and convenience of a large number of your own citizens in those towns, it ought not to be done. We say, without the least hesitation, in behalf of one set of our clients, that if you carry out this project you will greatly injure the Chelsea Ferry. We



believe that it will be impossible safely to run those ferry boats, especially when they are obliged to put on double boats. You know that the United States vessels are lying at anchor close by their line. That is one of the public inconveniences which the public good requires the ferry to suffer. But every vessel stationed on the line of their route, in windy or in thick weather especially, causes trouble, expense and inconvenience, and may cause fatal accidents. If you put on two boats, the public will still require punctuality. Both boats must start at the same time. If one is detained the other must be. You know that when a steamer is stopped by any obstruction she cannot be commanded by her rudder, as she makes no headway; and if she has no sea room to allow her to drift a considerable distance, you cannot navigate her in safety. The petitioners propose to put up a smooth stone wall. And then, instead of leaving the flats, against which the steamer may be liable to drift without any danger, there will be only this stone wall to be run against, thus endangering the boats. The risk of collision, especially in the night time, will be increased by reason of the very alteration proposed. It will be necessary for the vessels to anchor in the channel, which here will be so narrow, that they will often be unable to get round the sharp *elbow* which it is proposed to project into the stream.

Then there is the difficulty about ice. We have not brought many men to testify on that subject, because we thought that a few experienced pilots, who were familiar with its action in this place, would answer as well as

many. Ice forms on flats below as well as above ; in short, on flats every where, on East Boston and South Boston, and all around the harbor. It comes in with great force when the tide enters, and, unless it clogs and piles up, goes out with force when the tide flows out. It must find its passage way, and will substantially follow the current. The narrower the channel, the harder the ice is jammed in, and the more difficult is it for vessels to escape. Although it is undoubtedly true, as has been said, that a rapid channel will carry the ice out quicker, that is one of the difficulties. The bow of the boat will be smashing against the ice ; whereas if there was a sufficient space, the boat could make its way through the ice far better than in a narrow channel, where, as in a canal, there is no chance for the ice to be pushed off towards one shore or the other.

Such we think to be the injurious consequences of this project to this ferry. And the Winnisimmet Company have, among the earliest of the remonstrants, retained us to represent their views before this Committee. They have invested a large amount in their undertaking. They are enterprising men. They have built up Chelsea, and they have helped to build up Boston. They are entitled to have nothing done unnecessarily which would materially injure their property or their prospects.

Then, Gentlemen, in regard to the Navy Yard, Commodore Downes has written a letter in which he requests that this Committee should postpone any action till he can receive instructions from the Government. Now we



do not doubt but that they will conclude that the filling up of all these flats will injure the Navy Yard.

But what will be the effect on the wharf property at East Boston? That I think is a much more important matter, because there is a vastly larger amount of property to be affected. There are of wharf frontage 32,200 feet to be injured, if not destroyed. It is admitted that it will change the current. It will send mud and silt, that formerly stopped in the Mystic River, all about their wharves. No doubt but that it will be a great injury, by putting the proprietors to constant expense in dredging out. It will be in the nature of a tax placed upon the people of East Boston to an amount equivalent to what they will have to pay in dredging, and all this burden will be imposed simply to put money into the pockets of Messrs. Tucker and others. The Commonwealth will lose infinitely more than she will gain. You can judge of the evil of that tax by the amount Mr. Lewis said he had paid, and was about paying, for dredging a few wharves within the last ten years.

The mud will fill up what little channel there is left in the Charlestown side of the Mystic River.

The effect on Boston wharf property you will also easily see. More mud will be thrown around the wharves. It will require an immense increase of dredging. It will require the citizens of Boston to pay *a new annual tax* to an *enormous amount*. And there is no remedy; but they will be obliged to take money out of their pockets every year to undo the mischief which the petitioners seek to do. Considering the effect on wharf property alone, it

will *destroy ten times as much as it will create*. It will injure and destroy, Gentlemen, far more than ten times what it will create, when you consider that they do not propose now to have wharves, but only frontage not capable of being made into wharves. It will injure and destroy a vast amount of other property ; for I think that is substantially admitted by Mr. Davis. He tells you that in order to make the proposed narrowing of the channel feasible, they must make a *smooth wall* of stone, or some other material, on the Chelsea side. And, if so, the same consequences will follow from the projection of wharves from one side as the other. Therefore they want you to prevent the whole Chelsea and Malden shore from being used as wharf property.

Mr. DANA. Building up the marshes would answer the purpose of preventing them from being carried away.

Mr. WHITING. What would they build on them ?

Mr. DANA. Wharves !

Mr. WHITING. If you build wharves you have yourself proved that they will ruin the harbor of Boston. Mr. Davis says that this plan will render your scheme disastrous.

Another consequence will be that the mud will be thrown across the Chelsea channel behind East Boston, and this will be ultimately filled up ; and thus fifteen times as much frontage will be destroyed as that which will be created. Now you know if any thing happens by which a bar is created and maintained across the mouth of that creek, all navigation above will be impracticable. The creek now contains the deepest water in



Boston Harbor. A seventy-four gun ship can go up. But if this bar be made, you will see what a consequence will result. There will be thousands of feet of frontage destroyed. As I have said, there are the Glendon Iron Works, various factories, ship-yards, and the northern depot of the Grand Junction Railroad. So that you will thwart the purpose for which this Railroad depot was located there, for the sake of giving another Railroad access to bold water somewhere else.

When lands are filled up in the creek to the Commissioners' line, you will see that the amount of water in the creek being diminished, the difficulty will be increased; because the force of that current being less, and the force of the Mystic River being greater, the latter will have a tendency to turn the former against the opposite shore and rapidly increase the bar across the mouth of the creek, by creating eddies, checking the current, and causing mud to be deposited. The Chelsea ship-yards then cannot be used for navigation.

The U. S. ordnance depot is about one hundred yards above Chelsea Bridge. Resolutions have passed requesting the U. S. Government to fix upon this as a place for manufacturing steam frigates. If the project of these petitioners is carried into effect, that will put an end to this improvement. Another effect is, that the narrowing of the channel will tend to wear away the shore on the *northern side* of the river. And I think Mr. Davis himself admits that, in his testimony this afternoon.

Mr. DANA. He said he did not apprehend any thing of the kind.

Mr. WHITING. I do not think he did *apprehend* it, because he said he had *no doubt* it would be so. When those who live on the spot and have watched the ice and the water with their mutual action on those flats, testify that they will be carried away unless they are protected, there ought certainly to be some protection guaranteed by these projectors.

Go round on the East Boston *shore*. I have spoken of the channel. Can they launch vessels there with a channel of six or eight hundred feet only, and a stone wall on each side? How will they get along with the mud clogging and filling up the wharves? Will they like to bear the expense which Mr. Lewis has incurred in dredging, and that even doubled and trebled? Mr. Lewis has spent in nine years \$40,000 in dredging. He has already expended for the Grand Junction Railroad \$21,000 in dredging, and has \$19,000 more to pay. Will this tax be a very just thing to add to the expenses of the citizens of East Boston? We think not, and we think that you will not so consider it. What benefit will follow from this plan, when they will destroy more than ten times as much as they will produce? What obligations do they propose to enter into to do any thing beyond what their interests demand? If you grant the Railroad Bill, what obligation is there that they will touch the flats above the bridge? If they get the flats this year, will they not force you to give them wharves next year, without which their plan is abortive? They came here with plans on which wharves were sticking out in all directions. That *was* their design. That is their design



now. And if you grant the leave to fill up the solid land, they will ask you next year to give them that which will make this land useful. They *will* hereafter insist on such provisions, as, if granted, will be ruinous to the harbor.

But what is the value of their proposed plan of deepening the channel of Mystic River? Deepening the channel! Is there any necessity of doing it? Is not the channel now deep enough in Mystic River? Is there any complaint that the channel of Mystic River is not sufficiently capacious for the uses to which it is put at present, provided you allow the flats to be covered at *high tide*?

Has any merchant, any ship-master come here and said he wanted the channel of Mystic River enlarged? Has any body said that it was important for the commerce of the harbor that it should now be done? What pilot has come in and testified to this? Why should you begin to doctor the patient before any one has told you he is sick?

They talk of widening the river. We say that that will not improve that channel at present, because the flats are now of use in case of emergencies for boats passing occasionally, and for light craft at high tide; because they are useful as mud catchers, for the very reason that the width of the mouth of that river allows the mud to be deposited without bringing it into the harbor; because the channel proposed by the petitioners is to be lined with stone walls, which will be an injury; because a part of the space left is to be lined with vessels fastened to these walls, and therefore the available part of the chan-

nel will be narrowed ; because it will render it impossible, if you grant this change, ever to excavate what these men now fill up, as it will be beyond your power. Why, Mr. Davis himself admitted that it takes 16 or 1700 feet of channel to work a vessel in.

Mr. DEHON. What sort of a vessel, and for what purpose ?

Mr. WHITING. I do not care what sort of a vessel, or for what purpose, we want to save the power to navigate all sorts.

Mr. DEHON. In London it is done in the space of 300 feet.

Mr. WHITING. I have no doubt but that a pilot of great skill may navigate in a space as wide only as the yard-arms of his craft. But that is not what we want. If the space which I have mentioned, say 1,600 or 1,700 feet, is necessary for the convenience of the shipping, you will have to excavate what they fill up. Widening the channel to a small extent, especially taking out the edge of the flats, will be no compensation for the injury resulting from the fact that you must thereby forever surrender all possibility of enlarging the channel, whatever the emergency may be.

Again, narrowing the channel, and thereby accelerating the current, would cause the Chelsea shore to wear away, unless it be protected by a wall. So that this would be a great evil. With wharves built into the channel on the south side, the project would be ruinous to the harbor, as witnesses on both sides agree. They admit that with wharves only on *this side* of the channel,



their scheme would be ruinous ; and there is no reason to suppose it would not be so if wharves are projected on the north side. Therefore they bring you a chimera which promises you no useful result. You get no slips, you would destroy the possibility of making any on the opposite shore. If you want to *improve the river, excavate the flats* and there leave it.

Then again, the proposed improvement of the river as a receiving basin to allow more water to be received and discharged at each tide would prove a failure, in consequence of a familiar principle of hydraulics. And I would beg the attention of the learned witness [Lieut. Davis] from whom, I understand, we are to hear again, that sudden contractions and expansions of water courses diminish the quantity of water that would flow through them if uniform. And does he not propose first to diminish, then to expand, and finally to contract it again ? What principle of hydraulics will authorize the assertion that narrowing a stream at *one part* only, will increase the quantity of water ? It is proposed theoretically to have one of the sides of the channel smooth and the other rough and ragged, as nature left it. It is not proposed to carry on any improvement up to Malden Bridge, for that would cross wharves which do not belong to the petitioners. Mr. Davis appears to have misunderstood the project. It cannot be their project, for the bill which they have had reported proposed to fill up a quantity of land, leaving the river of its *present width at Mr. Johnson's wharf*, and then it is to be contracted again at the bridge. It cannot increase the quantity of water, but must diminish

it, thus to place an obstruction at the mouth of the river, there producing contraction, leaving it of its usual width at Johnson's wharf, there allowing expansion, then reaching Malden Bridge, there causing contraction, again passing the bridge, and once more allowing expansion.

Again when the current flows two ways in consequence of the natural flow of the river *and the tide*, a tunnel shaped estuary with a wide mouth will receive and discharge more water than it will by placing any incumbrance across part of the mouth, even though you deepen the rest.

Therefore we say, that the theory of improvement, such as Mr. Davis would advocate, is not what these petitioners would carry into execution. They cannot have a *uniform channel*; or if they did, the Mystic being an estuary and the filling diminishing the area of the water section, would prevent the water from running in or out as freely as before. At the same time I admit, as Mr. Davis has said, that the channel of Mystic River, though not improved, will be unnecessarily deepened. And that will be one of the injuries which will be done.

But there are other considerations of infinite importance to a just judgment upon this question, whether it is *safe to diminish the capacity* of Boston Harbor.

We should legislate for the *future* as well as the present. If the water area between Chelsea Bridge and East Boston were not wanted at present, will it not be *wanted in future*? Will not the expanding commerce of this port require all the accommodation for shipping that the utmost capacity of the harbor will afford? Who can



doubt that in less than *thirty years* the foreign commerce of Boston will be increased *four fold*? If so, Boston Harbor will scarcely be able to hold the necessary shipping.

That I may not be thought to exaggerate, let me quote from the able and admirable report of the Harbor Commissioner of 1850.

“ In settling the great question before us, we believe that the *growing commerce* of the city, has not been sufficiently considered. We have obtained official statements of the imports and exports of the port of Boston, and also of the arrivals and clearances from 1830 to 1849, inclusive,—making a period of twenty years,—which we append to this report. By these statements it will be seen, that our commerce, viewed in all its bearings, has at least tripled within that period. Taking the consecutive years of 1830, 1831, and 1832, our imports averaged \$ 12,761,767, while in the three consecutive years, ending with 1849, the average imports were \$ 28,593,100. Here is an increase of \$ 15,831,333 within the medium period of eighteen years. And if we take the extreme period of twenty years, we shall see that the imports, which in 1830 amounted to only \$ 8,348,653, have, in 1849, arisen to \$ 24,117,175.

“ But the values of our imports are not a test of the increase of business, so far as harbor accommodations are concerned. The great reduction in the prices of almost every article, will show that the quantity has increased in a greater ratio than the value; and it is manifest that it is the quantity, rather than the value, which shows the amount of accommodation which our shipping and navigating interest requires. Our arrivals and clearances, perhaps, furnish the surest test of the increase of our commerce. Our foreign arrivals in 1830 were only 642, while in 1849 they were 3,111;—being 484 per cent. more in 1849 than in 1830. And our coasting arrivals, which in 1830 were 2,938, have gone up, in 1849, to 6,156. The whole number of arrivals in 1830, both foreign and domestic, were 3,680;—while in 1849 they amounted to 9,267. But though these statements are official, they do not show the whole amount of the shipping in our harbor. A *vast number of our coasting* vessels neither enter nor clear at the Custom House. These may safely be estimated at 4,000 a year, which number is fast increasing. If this number be added to the number of vessels that enter or

clear at the port, it will make an *aggregate of nearly 14,000*, which came into our harbor the past year.

“ These facts will fully sustain the position that our commerce *has tripled in the space of twenty years*. And if the commerce of Boston is to go on increasing in this ratio, the day is not far distant when the flats will be wanted for dockage and anchorage of the vessels, which our growing trade will call into this port. And even now these flats are used by vessels of light draft of water. The eastern coasters, with wood and lumber, frequently pass across the flats at high water. And it was in evidence before the Commissioners, that during periods of easterly winds, when it is difficult to go to sea, there are frequently several hundreds of these small vessels, mostly from Maine and the British Provinces, lying in the harbor; and, owing to the *crowded state of the channel, large numbers of them resort to the soft mud on the flats for anchorage*;—a fact that shows most conclusively, that fifty, or *even twenty years hence, the very space which it is now proposed to fill up, will become absolutely necessary to accommodate the vessels in the harbor*. The extreme line which has been recommended, which, for the sake of distinction, we will call Mr. Carey’s line, not only allows all the South Boston flats to be filled, with the exception of a small point opposite Rowe’s wharf, but actually cuts off nearly two hundred acres below low water mark;—the greater portion of which, as shown by the soundings, has a depth, at extreme low water, of from three to four feet,—while some portions of the harbor, thus proposed to be cut off, have a depth of from four to seven feet; and to these soundings we may add two feet, to show the depth at mean low water. *Here there are nearly two hundred acres, well adapted to the anchorage of these small coasters, which it has been proposed to fill up; but which, we are satisfied, will, in a few years, become almost indispensably necessary for this class of vessels*. We, therefore, should regard it as a departure from the dictates of true wisdom, to suffer any *embankment or structure to be erected upon any of the harbor belonging to the State, which can be used as a roadstead, or converted into wet docks*.

“ The great argument in favor of filling up the flats, is, that more land is wanted for warehouses and dwellings. We admit that the circumscribed condition of the city is such as to create a good demand for land. But the harbor is as circumscribed as the town; and the demand, prospective at least, is as great for water as for land. In prospect, there is a great demand for both. But we consider the demand for water to be paramount. The demand for land is, in a great degree, an individual demand,—the demand of companies engaged in speculations; while the demand *for water is*



*a demand of the public,—a demand of commerce,—*in which the *State and nation* have a deep and vital interest. When such claims come in competition, that of the public should prevail.

“ It may be some inconvenience to the merchant to reside out of the city,—but it would be a greater one to have his vessel compelled to anchor out of the harbor. The numerous and increasing trains upon our Railroads, and the hourly and half hourly coaches which are constantly passing and repassing, between the city and the neighboring towns, render it no great inconvenience to reside five, or even ten miles from State Street. Whether his residence is ten minutes’ or thirty minutes’ ride from his place of business, is of but little consequence to the merchant ; but it is a matter of great moment to him whether his vessel can anchor in the upper harbor or in Nantasket roads. So of the Railroad Corporations, whose claims are urged with great force. They had better stop one or two hundred rods short of navigable water, than to run so far into tide water as to destroy the channels of the harbor, and so render their Railroads unproductive. We say again, that we regard the demand for water as greater than that for land ;—the former being the demand of public, the latter, that of private interest.

“ It has been represented to the Commissioners, by a number of merchants, that there is a great demand for wharf accommodations in the city, especially for lumber, molasses, and other bulky articles. We have no doubt but that it would be somewhat convenient for persons engaged in those branches of trade, to have wharves where they could land such articles, and have them remain upon the wharf until they were disposed of. But it must be obvious that they could not afford to pay for such accommodations situated in any central part of the city. They must, under any circumstances, occupy for such purposes, wharves somewhat removed from the centre of business ; and we apprehend that there is but little difficulty in obtaining such accommodations now in the outparts of the city. We could name wharves, where we think that such accommodations could be had, and bulky articles could remain on the wharves without being liable to be disturbed by the press of business. It was in evidence before the Commissioners *that wharf accommodations in the city of Boston, were greater than in any of the great commercial cities ;—*and taking the *amount* of accommodation into the account, the *rates of wharfage* were less here than in the other great marts of trade. This evidence was given by some of the very gentlemen who ask for more wharf accommodation. But if there is a great demand for wharf room, that demand *can be supplied by the erection of*

*wharves at East Boston, and other parts of the city, without encroaching upon the harbor.*

“The gentlemen who advocate the filling of the flats, give us glowing pictures of the prospective growth of the city, and the great increase of our trade, when our present Railroads have fully developed their capabilities for business, and when those now in the progress of construction shall have been completed. We accede to all these representations. We believe that the picture has not been overwrought. We anticipate a great increase of the trade of Boston;—and for that very reason we think the capacity of the harbor should be enlarged, rather than diminished. For that reason, we would arrest a policy, which, if encouraged, would prove ruinous to the harbor, and be subversive of the end which it professes to secure. We have already shown that our commerce has tripled in twenty years, and we see no reason why it may not continue to increase in the same ratio. The Western Railroad has already contributed greatly to the trade of Boston, by connecting our city with Troy and Albany; and when the several lines of Railroad through New Hampshire and Vermont, which are now nearly completed, shall connect us with Lake Champlain, and so with Montreal,—and by the Ogdensburgh Railroad with the great lakes of the West, we believe that our trade will receive a new impulse.

“The importance of this northern and western trade can hardly be overestimated. It is a fact well sustained, that for several years past, one half of the vast productions of the valley of the Mississippi, sent to the Atlantic, finds its way to market through the great lakes; and the rapid increase of population in the upper part of this valley, together with the increased facilities of transportation by canals and railroads, which are now being furnished, will turn a larger per centage of this trade into the northern channel; so that the day is not remote when the amount of western productions which reaches the ocean through this northern outlet, will be far greater than that which passes down the Mississippi. In an able report, submitted to Congress in 1847, by Col. Abert, of the United States Topographical Engineers, the commerce of the lakes, meaning the trade only in one direction, is set down at \$62,000,000 in 1846, and the products which arrived at New Orleans from the valley above, at the same sum. It also appears, by the same report, that while the trade down the Mississippi had increased, for the last few years, at the annual average rate of 5½ per cent., that of the lakes had increased at the rate of 17½ per ct. At this rate, the commerce of the lakes in 1856, will amount to \$170,500,000. This estimate, Col. Abert thinks perfectly safe. He says: ‘I see no reason to doubt the



correctness of this estimate, and I feel under no apprehension of being reproached for exaggerating, after the ten years shall have passed away.'

“ But in addition to the American commerce mentioned above, there is the trade with Canada, which ought to be taken into the account. The whole section of country, from Montreal to Lake Superior, is one capable of great productiveness, and as wheat land, is not inferior to the corresponding section on the American side of the line. The navigation of the St. Lawrence, always objectionable on account of the distance and the danger, is closed about half of the year. The merchants in Canada are becoming satisfied that they can obtain their supplies more readily, and at a cheaper rate, through the United States than by the way of the St. Lawrence; and when our railroads are completed, we shall be brought into immediate commercial intercourse with our Canadian neighbors. We have already alluded to the productiveness of Canada West. Its exports, in 1848, were about \$10,000,000. Not only the soil, but the facilities of transportation, are such as may justify the belief that their trade with us will increase. The importance of this trade has not been sufficiently considered by the great mass of our people. Montreal, the point at which our railroads are to terminate, is immediately connected with the whole country above. The St. Lawrence, with the canals upon its margin, is navigable at all stages of the water to Lake Ontario; that lake is connected by the Welland Canal with Lake Erie; so that steamers of four or five hundred tons burthen can pass from Montreal into the upper lakes. There is also a more northerly line of communication between Montreal and Lake Ontario, by the way of the Ottawa River and the Rideau Canal, terminating at Kingston. And it is in contemplation to extend a railroad from Kingston, or some place on Lake Ontario, through one of the most productive sections of Upper Canada, to Lake Manitouline;—thus connecting Lake Ontario with Lake Superior, and thereby bringing the copper regions, to all practical purposes, several hundred miles nearer to us than they are at present. All these improvements in Canada, the Ogdensburgh Railroad, the canal from the Sorel River, near St. John, to the St. Lawrence, and the railroad connecting St. Johns and Montreal,—must open a direct trade between Boston and the far West.

“ The policy adopted by the national government, allowing a drawback upon merchandize sent inland to Canada, enables the Canadian merchant to obtain his goods from Europe, through the United States, free of duty;—and the growing dissatisfaction towards the mother country, and the increasing sympathy for us and our free institutions, felt by the people in

these Provinces, all tend to bind us together, and to increase our commercial intercourse. From this view of the subject, together with the increase of our population and manufacturing industry, we may fairly anticipate a regular increase of our commerce, and a growing demand for harbor accommodations.

“ There is another view of this subject, which ought not to be overlooked. By our present warehousing system, a large quantity of merchandize is kept constantly on hand, at Boston, and the merchant at Montreal or Kingston, may, at any time when the St. Lawrence is closed, obtain his supply of merchandize from our city, and this trade, once commenced, will be likely to continue.

“ For this Canadian and western trade, Boston has no rival but New York. Between these cities there will be a brisk competition for this trade ; and it becomes us to adopt such a policy as will enable our commercial capital to compete on the most advantageous terms. Experience has shown that the Western Railroad, intersecting the trade of the west at Albany, a point some thirty or forty miles nearer to New York than to Boston, has been able to divert a portion of that trade from New York ; and if we are able to compete, in any degree, with the great commercial emporium under these circumstances, we have full confidence in our success when our lines of communication are open to Montreal, where the difference in distance is greatly in our favor.

“ The geographical position of Boston gives her a decided advantage over her great rival, in a competition for the Canada trade. Samuel S. Lewis, Esq., agent of the English line of steamers, and who, from his position, is supposed to possess reliable information on the subject, testified that we were nearer Europe, by three or four days' sail, than New York, —and by the steamers, were nearer by a day and a half. He estimates the distance from Liverpool to Boston, by way of Halifax, at 2,876 miles, and from Liverpool to New York, by way of Halifax, at 3,093 miles ; and from Liverpool to Boston direct, 2,856 miles, and from Liverpool to New York direct, at 3,073 miles ;—making a difference in favor of Boston of 217 miles. The distance from Montreal to Boston, he sets down at 344 miles,—and from Montreal to New York, at 398 miles ;—being 54 miles in favor of Boston ; so that the distance from Liverpool to Montreal, by way of Boston, is 271 miles less than by way of New York. Though Boston has the advantage in distance, and our railroads will be open when Lake Champlain and the Northern Canal are closed with ice, we must not forget that in New York we shall always find a powerful rival ; and hence, it be-



comes us to afford every facility to this trade, by giving the greatest harbor accommodations in our power.

“ We believe that the growing commerce of the city will, within fifty years, require *the utmost capacity of the harbor*; and that nothing should be filled which is capable, *by excavation, of being converted, at a reasonable expense, into wet docks or roadsteads.*”

Who then can doubt that the EXIGENCY of commerce is for *water* accommodation, rather than wharf accommodation; that the former can be abundantly supplied by using what we now have lying upon bold water; while the latter can be *preserved* only by resisting all encroachments not now authorized, and can be *increased* only by buying out the interest of riparian owners.

Will you now consider the effect which will be produced on the channels of Boston Harbor? Boston Harbor consists of large channels which receive vast quantities of water from the ocean into estuaries or receiving basins above the city, and discharge it at each ebb of the tide, in addition to the water which accumulates in the rivers and flows down the streams. The quantity of water depends upon keeping these reservoirs open. Estuaries or harbors composed of rivers and tides, where the main body of the water is received from and returned to the ocean, involve many considerations quite different from mere river harbors. Scientific theorists who imagined that the formation of channels in these cases depended solely upon the same laws as that of tidal estuaries; or that the same laws of hydraulics are applicable to each, have fallen into the grossest practical errors. In truth, there is a broad difference. The river tends to carry mud and silt and deposite in one direction, but the

tide has a tendency to carry it both ways ; the flood tide tends to neutralise the flow of the river ; the ebb adds ten fold force to its action upon the bottom and sides.

The distinction has been admitted by *Mr. John Scott Russell*, and what he says is, that the principles which he has laid down as applicable to the river harbors of England, are not at all applicable to estuaries. I will bring you the book if it is denied.—[See Report on Tidal Harbors. Parliamentary Reports, 1845, p. 223.]

This subject must not be looked at *in detail*, otherwise what might be locally beneficial, may as a whole prove injurious.

Now we propose to show you that filling up 100 or 120 acres of flats will inevitably tend to cause the harbor to fill, producing shoals, where none exist, raising those which now are, and filling the channels themselves ; thus *destroying the harbor for all commercial purposes*. And this conclusion I propose to prove to you in the following manner : first, by the application to this case of certain physical laws derived from the observation and experience of men of the highest claims to our respect, and which may be considered as established laws of hydraulics applicable to estuaries ; second, by the testimony and opinions of men of science and practical skill and experience, who are personally acquainted with our harbor ; third, by the admissions of the petitioners' own witnesses and men of science ; fourth, by the unanimous opinion of five successive Boards of Commissioners of this State ; next, by the examination of the effects already produced upon the harbor by partially excluding the tide water



thereof ; and lastly, by the history of several harbors in England, Scotland and Wales, which were formed originally in a manner similar to ours ; that is, with estuaries or harbors at the mouth of rivers.

Gentlemen, I shall not at any length detain you by going at large into this subject at this late hour of the evening, because I feel that your almost exhausted attention can hardly endure much addition to the fatiguing and protracted labors of the session. But let me state what no man will deny ; no man, I mean, who makes any claims to be a man of science on the subject of hydraulics. No man will deny that diminishing the area of the water section will increase the rapidity of the current. Narrow your channel and the water will run faster. No man will deny that if the area remains the same and the water be deepened, the scouring force will be increased. What will be the result ? It is admitted that if there be mud and silt that would otherwise remain stationary, this increase of the current may bring it down and lodge it somewhere below. Some people tell you where, and some do not. No man will deny this ; that the channels which feed the receiving basin and discharge the waters, will grow larger or smaller in proportion to the amount of water which is daily passing through them ; that you must preserve the greatest capacity of your receiving basin in order to preserve the capacity of the harbor, which consists of the channels that receive and discharge the tidal waters.

The consequence of this is perfectly obvious ; that whereas the reservoirs of Boston Harbor, in 1775, re-

ceived, (as the evidence shows,) 70 millions of tons of water at each average tide, and 90 millions of tons at every spring tide, by filling up to the line of riparian ownership, you have reduced the capacity of the reservoir, and thereby the amount of water to 42 million tons; that this diminution of the flow of water will gradually show its effects in the size and width of your channels, and that they will be somewhat in the proportion of 42 to 70. Not that the same mathematical proportion will always follow. For the channel will diminish in more than arithmetical proportion to the water flowing through it.

The petitioners wish to fill up a reservoir which will contain *two millions of tons of water* at each tide, which performs or helps to perform the scouring process. They ask you to cut off *one-twentieth part of all the receiving basin that will be left when the rivers are filled up according to the lines of riparian ownership*. You have heard testimony concerning the process which nature follows in filling up channels. Some have told you that no effect would be produced. Some have told you that much effect would follow.

What is the mode in which the channels fill up? Look at the sections of the map, and you see the process. But look at any channel, and I think you will find that it usually fills *not in the deepest part first*, but that it fills first *on the sides*. And while the channel is being destroyed, the sides are approaching each other, while the depth is remaining nearly the same. That will account for the fact that the channels are filling up at a



rapid rate, while the depth in certain places may be preserved.

Again, it is a fact that channels shoal in certain places, while they retain or increase their depth in others. The current may send the sand out and shoal it where it would least bear the injury; that is, where there is already a shoal. It is no matter how deep the harbor is made in spots. It is no matter how much you go on in making the harbor deeper where it is not wanted to be deeper, if at the same time you allow it to shoal where it is wanted to be deeper. Injury to the harbor necessarily occurs by such changes.

Two tides brought in opposition tend to neutralize each other. Then there is a tendency to drop the sediment which would otherwise sweep onward. So that, when you bring the current of Chelsea Creek, weakened as it will be inevitably by reducing the amount of water in consequence of filling up new wharves, to the current of Mystic River, strengthened as it will be by narrowing the channel, you bring a weaker against a stronger current, and the mud and sediment which formerly swept down into the harbor below, will now be deposited at the mouth of the creek, and form a BAR.

Again, a tunnel-shaped estuary will not take in so much tide water, with an obstruction placed in its mouth, as without it; especially when the water is required to go further, and then to turn a more acute angle than otherwise would be necessary. And you are, by this filling, diminishing the capacity of the receiving basin itself.

Lastly, whenever mud or other material which is specifically heavier than water is taken up by the force of the current, it must be deposited again when the velocity decreases to a point below that which caused it to be taken up, and not till then. The result is, that mud which is now allowed to deposit at the mouth of the Mystic River, because the velocity of the water diminishes at that point in consequence of the expansion of the stream, will be deposited there no longer, but will be deposited elsewhere. I know my friends are too well acquainted with the subject of hydraulics to deny this. But one thing is sure, that the increased current will carry the mud and silt down stream. We can tell you where it will stop. It is where the decreased velocity of the current will allow it to deposit. And if it be not deposited in Mystic channel, will it not be deposited *in the Harbor of Boston*, where the channel is broadest and the water is stillest ?

Then as to the testimony of the men of practical science and skill ! My learned friends may state in argument that certain of the Commissioners of 1850 favor their project. I have to present a conclusive answer to that. They say that perhaps this project might be tolerated. They say they do not advocate it, but that if the Legislature allow it at all, it should be done under restrictions.

I have to say of that report of the Commissioners, which is one of the most able ever written, that the filling up of these flats is in violation of every one of the principles which are thereby established. No specific pro-



ject is recommended in that report, as I understand it. They state that if the Legislature shall see fit to allow any of those flats to be filled up, it must be done under limitations and conditions. And they are such limitations and conditions as it is impossible to enforce on these parties. But they admit that though the channel of the Mystic River might be improved, they were apprehensive that it would throw the mud down into Boston Harbor. *That is precisely our reason why that project should not be tolerated for a moment.*

Then Mr. Davis is brought forward as advocating the project. By the way, let me put to you one thing about this report. The Commissioners say, if the Legislature grant leave to fill up the flats, it should be on condition that the Company should be made to excavate as much land as they fill up, and that they shall be compelled *to maintain that excavation.* That they cannot do. And Mr. Davis himself says that that would be chimerical.

MR. DEHON. No!

MR. WHITING. "Romantic" was his language, and not chimerical.

MR. DEHON. He was asked about excavating all the flats.

MR. WHITING. No! This was the question. The Commissioners of 1850 said, that under no circumstances should those flats be allowed to be filled up, without the compensation of requiring those who filled, perpetually to keep their excavation from filling up. Then, if they can do that and will do that, the injury by diminishing the

receiving basin is compensated for, but not that resulting from the scouring of Mystic River into Boston Harbor.

I have a word to say of Mr. Davis. The intercourse that I have had the pleasure of enjoying with that gentleman has been of the most agreeable character. But because I say that, and because I acknowledge that he is acquainted with the principles of hydraulics, it is not for me to blind my eyes to the facts. I say that I believe that Mr. Davis has not yet made himself master of this subject. He has examined it in certain attitudes. He has taken a partial view of this particular case, without considering its bearings in relation to the entire scheme of filling up other parts of the harbor. Boston Harbor, with its wharves, its flats and its channels, he has not examined thoroughly with reference to these inquiries. He could not tell you how many feet the flats in question were above average low water mark. After he produced his formulary for determining the amount of land to be excavated, which would contain a body of water having the same scouring power as that excluded by the filling one hundred acres of these flats; he then told us that an excavation of about *fifty acres* would accomplish that result. I then inquired of him whether the excavation must not be between high and low water mark. He said it must. I asked if the excavation must not be permanently *maintained*, in order permanently to obviate the objection of reducing the receiving basin? He said it must; but that the excavation proposed would never fill up, because it was in the channel itself, and that the petitioners proposed to excavate *eighty*, instead of fifty



acres ; and this would be a permanent excavation of a larger number of acres than he had shown by his formulary was a just equivalent for the filling. I then asked for the cubic feet of water excluded by the filling. He replied he could not tell. I inquired for the cubic contents of the flats above low water mark. He referred me to others for an answer. He had, in fact, made no actual application of the principles of science he had stated, to this specific case, and substantially admitted a practical want of acquaintance with the locality. He professes to state *principles*,—there he is *at home* ; and when he shall bring forward a plan for the improvement of our harbor, which I am told will ere long appear ; after he shall have had opportunity to become acquainted with all its details, we shall then know how he views *this* proposed improvement in connection with the whole subject. I shall give great consideration to every thing that emanates from so distinguished a gentleman.

But it is admitted by Mr. Davis that he cannot tell where this mud and silt, once scoured out, will go to ; and he does admit that Boston Harbor is now going to ruin.

Mr. DAVIS. Deteriorating.

Mr. WHITING. And deteriorating means going to ruin. He admits that we are on the wrong track. I am going to ask you, what we have done that should fill up Boston Harbor to such an extent within the last few years ?

Mr. Davis states another fact,—that the Mystic River flats are growing ; that they have grown out 200 feet within a few years. And he proposes to doctor Mystic

River. Mr. Davis admits that you cannot tell what will be the ultimate result of any one change you may make. You can tell what it will begin to do ; but where it will end, and what will become of it, probably no man will say. Now I will leave Mr. Davis with this statement,—that we think him perfectly sincere ; that we think him very well informed ; a very good hydrographist ; that he is a well-educated gentleman in all respects ; and that his opinions are as much entitled to consideration as those of any other person would be in his situation ; but that he is interested on one side of this question ; that every thing he says he thinks is true ; but that when he is examined about the mode of curing the flats in Boston Harbor, it is like attempting, at a venture, to give medicine to heal a local disease ; and although there be a possibility that a cough may be cured, there is an equal possibility that a consumption will be caused.

We show you, on our side, among scientific witnesses, *Mr. Parrot*, who has known the harbor of Boston as long as Mr. Davis has ; a gentleman employed by the Harbor Commissioners in making the same hydrographic surveys that Mr. Davis has been making ; a person well read on all these subjects, and having deeply at heart the preservation of Boston Harbor ; differing from Mr. Davis in his results ; agreeing with him in the laws he maintains, but disagreeing in the practical application of them. Mr. Davis takes it as no disparagement that he and others agree in principles of science, but disagree in their application to specific cases. It is in that, that I, myself,



disagree from Mr. Davis, although I do not assume to be an hydrographer.

We then, show you Mr. Low, who has been a County Commissioner, who has made soundings, observed the tides where he resides, on the other side of the river; who enjoys a high reputation as an engineer and surveyor; who has noticed the effect of the ice, the silt, the growth of the flats, and the whole course of this channel; who has watched Chelsea Creek and the formation of these bars; who, though agreeing in the principles which Mr. Davis presents, disagrees in the practical results.

We next produce Mr. Tewksbury, appointed as the Harbor Master, who ought to know, if any one ought to know, the changes of the currents, the shoals, and the causes of them. For that is his daily business.

We have brought you Capt. Read, who has run daily over the very ground of which we are talking, for eighteen years.

We presented to you Mr. Fenno, a gentleman of great intelligence and great respectability, the agent of the Winnisimmet Ferry Company.

We also bring to you Mr. Thomas Lamb, a distinguished citizen, and President of an Insurance Office. I do not know whom I could bring before you, as a man of sound practical judgment, better than him.

Then we have brought Mr. Samuel S. Lewis. If my friend by my side [Mr. Dehon] will recal some of his earlier professional achievements in connection with questions before Legislative Committees, he will recollect

how many Committees he has addressed, and how many opponents he has routed, horse, foot and dragoon, by means of the testimony of Mr. Lewis, and of those who sustained his views, and one of the most recent ones, which now occurs to me, is the Forbes case.

Mr. DEHON. Beaten, out and out!

Mr. WHITING. Surely not!

Mr. DEHON. Beaten in the Committee!

Mr. WHITING. But successful in the House by means of this very testimony!

Mr. DEHON. Mr. Webster conducted the case.

Mr. WHITING. Then we all know very well *who made his thunder*. Here is the artificer, and you were successful.

I am informed that the letter which is contained in the Commissioners' Report of 1850, and was written by Mr. Samuel S. Lewis, was submitted by my learned friend, on the other side, as testimony. I refer to the statement of Mr. Lewis. We all know the position of that gentleman. If there be a man who has taken watchful care of Boston Harbor, it is Mr. Lewis. If there is an individual known as a far-sighted, sagacious man, looking into the future, it is that same Mr. Lewis. He has been the father of many of the wisest and most long-headed projects which have given reputation to our city. He has taken care of Boston Harbor, by constantly watching to prevent every attempt to injure it. And although a reflection was cast at his disinterestedness, I think it will be gladly withdrawn by those who made it, when it is remembered that he was the means, originally, of



inducing the Commissioners to draw in their lines around East Boston to their present limits. In these gentlemen, Messrs. Parrot, Low, Fenno, Lamb, Lewis, and others, we have a weight of experience, judgment and science, I think, that no person can hesitate to pronounce as respectable as that produced on the other side.

But I ask you to look at something else ; and that is the unanimous opinion of all the Commissioners who have been appointed on this subject. Every Board of Commissioners, five of them in all, have reiterated the principles which are to govern our conduct in reference to this subject.

Mr. DEHON. You do not mean to say that they have reported against this project ?

Mr. WHITING. I mean only what I said, that they have reported upon the principles which are to govern us in such cases.

The report of 1835 was by Messrs. Baldwin, Thayer and Heywood.

“ The harbor of Boston,” they say, “ is not an open, broad bay, surrounded on all sides by the sea shore, where the tide simply ebbs and flows with a gentle and almost imperceptible current, but it is wholly made and continued as channels, through which the tides ascend into immense basins and rivers, some of which reach many miles into the country, and from which the tides descend again into the ocean, and in their progress, scour out the channels according to the quantity and velocity of the current produced by the ebb. That part on the southeast, called Fore Point Channel, is thus made by the tide passing into South Bay—and the harbor on the north side is only the channel through which the tide flows into the Charles and Mystic Rivers to the head of tide water, to Watertown on the first, and Mystic Pond on the latter. During spring tides, the current acts more sensibly in all these channels, as there is a greater quantity passing in the

same time than in ordinary neap tides. In the latter, the usual range between high and low water is about seven feet, and during the former, the range is fourteen feet from high water to low. It is the channel produced by these alternate currents in opposite directions, in the South Bay, or the great reservoir of the two rivers, that constitutes all the advantages of Boston harbor for commercial purposes:

“Boston harbor being only a channel for the tide to flow in and out of the great reservoir before mentioned, it may not be irrelevant to show *how it may be suddenly or gradually destroyed*, and become only a safe anchorage for lighter coasting craft, where the largest merchant vessels, and even ships of the line, now ride in deep water in perfect safety. It is obvious to every reflecting man, that if a dam were to be built upon the site where South Boston Free Bridge or South Boston Bridge now stands, and the tide be prevented from flowing above, Fore Point Channel would soon be filled with sediment, and not be distinguished from the surface of the flats on the southeast side. Similar effects would also result from the erection of dams in the places of Chelsea and Charles River Bridges. These would stop the tides, and as there would be no current either way, silt and sediment would in a short time fill this beautiful part of the harbor, and render it only accessible for fishing boats.

“The commissioners are aware that this is putting a strong case, as no such dam can ever be erected without the sanction of the Legislature. But, what would evidently be the consequence in the course of a few years by the supposed dams, will as certainly be effected more gradually, and the ruin of the harbor be as complete at a more distant period, by cutting off large portions of the Charles and Mystic Rivers above the two bridges, either to stop the tides altogether or partially, from flowing and filling the extensive basins of either.”

This board, after citing the ordinance of 1641, granting the right to the shore owners to extend one hundred rods, or to the channel, declare that “they believe, and feel it to be their duty to state the reasons, that the full and equal enjoyment of the right given by this ancient law, is inconsistent with the existence of the harbor. An instance is presented in South Bay. The proprietors of the shores surrounding the flats of this basin, have a right to build their wharves, or solid filling, extending one hundred rods into or over tide water, if not interrupted by channels within that distance. As we do not know any legal objection to their exercising or selling this right, and one hundred rods in width around this basin will make a considerable part of its area, Fore Point Channel may be affected, and as the



South Cove Company have already filled nearly all the surface of the flats between the two bridges, the absolute ruin of that channel hangs upon the contingency, whether the ancient law is in force relative to the tide water in South Bay, and whether the owners will exercise their rights. The same effect may be produced in numerous places on the Charles and Mystic Rivers, by a different mode, but quite as fatal to that part of the harbor."

In 1839 another commission was created, consisting of H. A. S. Dearborn, James F. Baldwin, and Caleb Eddy, Esquires, to mark on the plan of the former commissioners such lines as they might think expedient to establish, "beyond which no wharves shall be extended." This authority related only to such parts of the line as had not been adopted by the Legislature. Their powers being limited, they did not go extensively into the question of affecting the channels in the harbor by filling up the flats. They however admit the importance of preserving the harbor; they allow that certain portions of the channels have been filling up, and that it is impossible to determine in advance what effects would be produced by any obstructions being placed where the tide now flows. They say, however, "It may be assumed as an important and well established element in the inquiry, that whatever is done that shall reduce the quantity of water that passes into the large estuaries and bays north, west and south of the city, and now covers the vast extent of shoals in other parts of the harbor, will have a direct tendency to create obstructions at some points in the various channels, while at others, the depths may be deepened."

But while they admit that the filling up of any portion of the flats in any part of the harbor may affect it injuriously, they appear to think that the demand for land is more pressing than for water accommodations. They say, "But such is the imperiously increasing demand for greater accommodation by all the branches of the infinitely varied industry in which the accumulating population of the metropolis is employed, that it is impossible to meet it without yielding much of mere theory, to the practical advantages which will be gained from the increased facilities which such encroachments are intended to afford." But notwithstanding their desire to accommodate business by encroachments upon tide water, they say "that the proprietors of land on the northern shore of South Boston, should not be allowed to extend wharves or other structures over the flats situated between that shore and the main channel which separates those flats from those of East Boston, Bird and Governor's Islands, beyond the distance of one hundred rods, as prescribed in the Old Colony law of 1641."

In 1845 another commission, consisting of James Hayward and Ezra Lin-

coln, Jr., Esquires, was created. In their report, which was submitted to the Legislature the year following, several important facts were stated which have a direct bearing upon the subject before us. It appears by their report that the South Bay, above the old South Boston Bridge, contained, in 1846, 345 acres, and of this area, 250 or 300 acres were liable to be filled up by the shore owners; and that contracts had then been made to fill certain portions of these flats; and we know that the work is now progressing—so that the day is not distant when the whole of that basin will be completely filled, except the small portion which may be situated below the one hundred rod line.

We also learn from this report, that by actual measurement it was found that the area of Mystic River above Chelsea Bridge, within its banks at low water, was 878 acres, and that the area of the flats and marshes covered at high water was 1533 acres, making 74 per cent. more of the flats and marshes than of the river itself; and that the area of Charles River above Charles River Bridge, including Miller's River (the estuary back of East Cambridge) and the bay back of the State Prison, was 1340 acres—and that the marsh land connected with it, which was overflowed at high tide, was 915 acres; showing the excess of the river over the marshes and flats of some 35 per cent. It appears, then, from the report, that the aggregate area of the flats and marshes overflowed by the tides on the Mystic and Charles Rivers, is 2448 acres; while the rivers themselves, above the bridges, contain 2218 acres; *being 230 acres less of the rivers than of the marshes.*

The importance of this river and bay, (Charles River, and the bay above West Boston Bridge,) and that of the Mystic, to the preservation of the main channel down to the islands, is altogether incalculable. They are the two main arteries which literally supply the life current of Boston harbor. And the commissioners would respectfully recommend to the Legislature the preservation of these estuaries to the greatest extent that may be consistent with the rights of individual proprietors of bordering estates. If the modern construction of the colonial law of 1641, that the riparian proprietor has a right to exclude the tide water from the flats in front of his estate, to the distance of one hundred rods, if there be no intervening channel, must prevail, then Boston harbor is in danger of serious injury. The subject is one which commends itself to the careful consideration of the Legislature. The whole State has an interest in it. The preservation of Boston as a place of trade, of commerce, of ships, is every year increasing in importance to the whole northern section of the country. Every part of



New England has its railroads running to this city. These have been built for the purposes or business of trade. They connect the interior of the country with the commerce of the world. But annihilate the harbor of Boston, and these expensive facilities for intercommunication will become of but little value, either to the city or the country.

“ The building of new wharves, the extension of old ones, the filling up of flats to the exclusion of the tide, and consequent diversion of the currents, to a greater or less degree, are producing changes in the state of the harbor, some of them innocent, some of them more or less detrimental to the channels, and some of them tending to serious consequences. Changes of this kind have been observed since the survey made in 1835. Some of these are traceable to particular causes, and tend to throw light on the general subject of causes and effects in relation to these changes. They all show the importance of having the harbor *taken care of*.”

The commission of 1846 consisted of T. G. Cary, Simeon Borden, and Ezra Lincoln, Jr., Esquires.

They say : “ If the whole area of flats opposite South Boston were *above* the city, receiving the tide through any channels by which vessels must pass to reach their places of discharge, there can be no question that it would be *extremely dangerous* to the commerce of the port to enclose them. To exclude from such a basin a volume of water that aids to scour the channel in the upper harbor, as it passes to and from the sea, four times a day, might produce changes of the most injurious character. The enclosure of the Back Bay, as it is called, by the Western Avenue, is an instance of this kind, which it would be hazardous to repeat. But the flats in question are below the city. The water that covers them aids in no such scouring process. That process is in fact diminished in its effects, by suffering a portion of the water that daily ascends as a supply for the upper basin, to flow over so wide a surface, instead of confining its passage to the channels.”

The Commissioners of 1850, John M. Williams, David Cummings, Thos. Hopkinson, Geo. S. Boutwell and Chs. Hudson, Esqs., say as follows.

When the subject is stripped of all its disguises, and is presented in its naked form, we are inclined to hesitate before we pronounce in favor of filling up the flats over which the State has control. When the safety of the harbor is placed in competition with any magnificent scheme of land

speculation, we must decide in favor of what we believe to be the safety of the harbor. When we consider that a volume of water, of an average depth of at least seven feet, covering an area larger than the whole city of Boston proper, is now liable to be excluded from the harbor, we want something more than a mere speculative theory of tides and channels, to justify us in adding to this quantity. When we consider that flats once filled can never be restored to harbor accommodations ; but that flats kept open, can, at any future period, be filled, when it shall have been demonstrated by experience that previous fillings have wrought no injury to the harbor—we believe it to be the dictate of wisdom to pause before we make any further grants, except they be accompanied with an obligation to make corresponding excavations, or other improvements in the harbor.

The Commissioners of 1851 do not discuss that subject ;—that is, the preserving of the water basin *above* the bridges.

We did intend (supposing there would be sufficient time,) to go more thoroughly into this branch of the testimony. As has been shown, the Commissioners of 1850, and those who preceded them, all say in substance that you must not fill up above Charles River and Mystic River ; and if you do, you cause *irreparable injury to Boston Harbor*.

How do the petitioners get over this difficulty, which (they do not deny) is sure to follow ? They ask you to grant them this privilege of filling up the flats *upon condition of excavating as much as they fill up*. And I wish simply to say to you on that subject, that excavation is admitted, on all hands, to be but a *temporary* remedy for an eternal evil. They do not *intend to maintain any such excavation*. The number of cubic feet which they would take out, is relatively nothing when compared to what would be filled up. Where would this excavation be ? It would be somewhere up country. In order



to make that excavation a permanent remedy, it must be *maintained*.

What must we conclude as to the value of it? We believe the excavation will never be made. They will build their wharves. The excavation will never go further than their interest dictates. They must purchase hundreds of acres of land to remove; and it must be an area of land near the water. They must excavate such as they can find,—that is to say, flats and marshes which lie but little above low water mark; and if they take this, they must excavate an *enormous area* in order to remove as many cubic feet, between high and low water mark, as they are to fill up. Such an excavation would be of an enormous cost. It is not practicable for that reason.

What do they intend to do, and when do they propose to excavate? They have designated no time or place. Do they own the land which is to be devoted to enlarging the basin, and what is the estimated cost? The public and the Legislature have a right to know. If a Railroad were asked for, and nobody knew what it would cost, the Legislature would have nothing to do with granting a charter. What are these excavations to cost? Whose land is it to take? The excavation will not be of permanent use, because it is admitted, on all hands, that it will fill up again. In five years you will be as badly off as if no excavation had been made. Ought not the Commonwealth to consider that the evil is long and the remedy short? Do they offer any security that it will be done at all, or done any further than the private pecu-

niary interests of the petitioners demand? I apprehend that if the actual expense were honestly estimated, the stock of the Company, unless wharves are projected into the channel, would not be very attractive. As Mr. Lewis said, “This project of excavation is worthless.” It is a mere blind to the eye.

I pass to the next topic;—that the effects produced by what has been already done towards keeping out the tide from Boston Harbor, will lead you to the same conclusion; namely, that the ruin of the harbor will follow, if the same course is much longer continued.

The history of the successive encroachments upon the tidal waters of Boston Harbor is not generally familiar to the members of the Legislature. The extent to which the natural reservoirs of the port have already been authorized, directly or indirectly, to be filled up, is startling. In order to bring these facts into a more tangible shape, we have caused a new map of Boston Harbor, and its tributary waters, to be carefully prepared. It is founded upon the ancient map of Des Barres, published in 1775, the original of which is now in the State House Library,—and upon that of Bonner, made in 1720.

The different lines drawn upon our map, show,

1. The *original* extent of Boston proper in 1720, and also that of Charlestown, East and South Boston, &c.
2. The extent of present filling up.
3. The Commissioners’ lines, and lines of grants of the Legislature to different persons and Corporations.
4. The extent and position of channels.



5. The area and position of all the marshes and flats covered at high water.

From these elements we cannot resist certain conclusions of the most *alarming character*. The result of careful measurement by our engineer shows that in 1776 the area covered by water, at low tide, was 2,664 acres.

The area of flats left bare at low tide was,	2,743	“
“ “ marshes “ “ “	2,735	“

Making the total amount of water area, at	
high tide, . . . . .	8,142 “

If the riparian proprietors fill up as far as the Commissioners' lines, and the various acts of the Legislature authorize them to go, there will be left only 2,500 acres to be the water area of our entire harbor inside of Governor's and Castle Islands at high tide !

If the Legislature act upon the recommendation of the Harbor Commissioners of 1851, and authorize the filling up of 500 acres more, at South Boston, there will remain less than 2,000 ACRES of *water area* at high tide. THREE quarters of our harbor thus being *filled up*, and leaving ONE QUARTER part only ! and yet you remember that flats and marshes are just as *important* to the scouring of the harbor, as the channels,—in proportion to the water they maintain at high tide.

The consequence of this, it is impossible not to foresee. Why, then, should you grant to private individuals *that land* which will soon be so absolutely essential for the future preservation of our harbor ?

Let us call your attention to another aspect of these facts. The aggregate area of flats and marshes above the Charles River, Chelsea and South Boston Bridges, is . . . . . 2,448 acres.

The channels themselves contain only	2,218	“
Total,	4,666	“

The riparian proprietors may generally fill up to low water mark, if within 100 rods, and thereby diminish the capacity of these receiving basins from 4,666 acres down to 2,218 acres, being 230 acres more than half its entire capacity! And this enormous filling up will certainly be done as fast as the pecuniary interests of the land owners will require it.

Again, Boston proper in 1722 contained only 592 acres, as appears by measuring the area upon the map of Bonner, published in that year.

The quantity actually filled up at this date	
is about . . . . .	532 “
The quantity now being filled is about . . .	626 “

Making the present size of Boston, after	
completing these fillings,	1,750 “

Thus this little peninsula, planted in a land-locked basin, like a diamond in its setting, has grown to be three fold its original size. *You* will see to it that no selfish enterprise shall be allowed to dim its lustre.

Now, Gentlemen, pause a moment to consider the consequences which *have* followed from these encroachments upon the tide.



Every witness has admitted, what you know full well, that Boston Harbor is now *going to ruin!*—by that I mean that the flats are shoaling, and *that the channels are fast filling up.*

Des Barres' map shows that the depth of water in the channel off Fort Hill in 1760 was thirteen feet. It was in 1835 but ten feet. Opposite the end of India Wharf, in 1761, the water was then thirty feet deep. It is now reduced in depth to thirteen feet. I heard yesterday an interesting circumstance in connection with Long Wharf. When they had to rebuild it, some twenty or thirty years ago, in excavating, they found soldiers' uniforms, and other clothing, which had probably been thrown into the dock in the time of the Revolution. Some of the jackets, one of which contained a guinea, was found *thirteen feet* below the surface.

Take the admission of Mr. Davis himself. He tells you that in eleven years Boston Harbor has been shoaling to such an astonishing degree, that by taking a section across from Cunard's Wharf to Rowe's Wharf, the whole water section *has diminished 1,200 feet in eleven years!!* And that is *one seventy-second part, per annum, of the entire water way receiving all that passes through to Charles and Mystic Rivers.* If this be shoaling at that rate, I ask you, What is to become of the Harbor of Boston in sixty or seventy years? Truly something is going wrong. There has been an immense acceleration of this destructive process since 1835!

They tell you that from the earliest periods, beyond the memory of man, the Harbor of Boston did not shoal

materially, and that it has not done so *till within the last thirty years*. Then the same facts are shown by the plans of the water sections, which we have taken the pains to have prepared. The red lines show the water as it now is, and the black lines, as it was fifteen years ago.

The testimony of these men of science, who have made accurate observations ; the testimony of the Commissioners in these reports ; the testimony of those who are brought here as pilots, all tend to show you precisely the same thing. Mr. Lewis tells you a fact in regard to the grounding of heavy vessels. He says that heavy vessels cannot go in and out of the harbor readily at low tide. I received a few days since a letter, which I have misplaced, from Capt. Harrison, about the grounding of the British steam ship *Canada*.\* He stated the same thing, in substance, to which Mr. Lewis testified ; that he waited until about half tide, and then set out from the dock. He struck twice with his vessel, drawing but nineteen feet of water, and remained aground at one of the times thirty-five minutes.

There is another fact stated in the Commissioners' report of 1851. It states that the main channel, leading in and out of Boston Harbor, has narrowed 500 feet within the last thirty years ; not by shoaling, but absolutely narrowing. Now I pray you to consider, *Have we not reached, in this course of destruction, a point at which it is prudent to stop ?* Mr. Lewis has stated to you that

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\* See Appendix, Note A.



there was no dredging machine used here till the year 1835 ; and, of course, you will see that if there had, before that time, been a *shoaling* of the water, it had been so gradual as not greatly to attract the attention of the people. But now there are four steam dredging machines in constant operation. And when this dredging creates such an expense, that one man has to pay \$40,000 out of his pocket for this purpose, you will see that it is by no means a slight evil. The effect of the deposition of mud and silt, is, therefore, very destructive to the commercial interests of Boston.

Let me say to my distinguished adversary, [Lieut. Davis,] as I must call him for his earnestness in behalf of these petitioners, that the deposition of silt and mud has not yet ceased. Is it not prudent to stop in this process of filling up the harbor until you have seen what is to be the consequence of what has already been done ? It seems to me that a cessation in this course is indicative of prudence and wisdom. The largest class vessel is the one which is most important, in connection with the future development of our commerce. If your harbor will not admit vessels drawing nineteen or twenty feet, you cannot have those magnificent ships which are building in New York enter your harbor. The merchants there will say, "We will send our small boats to the village of Boston. Our larger vessels cannot enter their harbor." We have already had a little of that talk. In former years the largest vessels have been able to come up our harbor at any time of tide, and have found themselves safe in so doing. I ask, Mr. Chairman, Would

not you be ashamed to be obliged to admit that the largest class vessels could not enter Boston Harbor, and that those largest class vessels, drawing 24 or 25 feet of water, could not come in or go out at any time of tide? It needs only a little more shoaling to reduce us to that situation.

I had intended, but I will not trespass on the time of the Committee, to call your attention to the condition of various English harbors. I had investigated their history carefully. I had examined the writers referred to by Mr. Davis and some more recent authorities, as well as the opinions of Mr. John Scott Russell, who was a witness before several parliamentary committees.\* I find, however, that my want of time has left me without opportunity.

Yet I beg that you will look at the harbor of Portsmouth, in England, and you will find that it has shoaled to such an extent that vessels of war, for whose accommodation this particular harbor was selected, are obliged to take out their guns before they can cross the bar. In Liverpool the same thing has taken place. And I see also by Parliamentary Reports for 1845, p. 223, (on Tidal Harbors,) that the harbor of Glasgow has been injured the same way. The port of Dundee (Tay Harbor) is another. And may I mention our old namesake, Boston Harbor, in England, in which I have always taken some interest, and in whose history I have other reasons for being interested than those connected with this hearing. It has shoaled so much that the town is now, compara-

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\* See Appendix, Note B.



tively speaking, a mere village, while but a few centuries ago it was the third port, in point of commercial importance, in England. Yet its harbor was once utterly ruined. The handiest reference to its history is in Thompson's history of that town; and I remember, Mr. Chairman, that a neighbor of yours, Mr. Dean, has a copy of it. Chester Harbor is another instance of this decay and deterioration; and it is the last of which I intended to speak.

I will say nothing of all these harbors, except that they are illustrations of the fact, that *destroying a part of the receiving basins* has always resulted in the more or less complete destruction of the harbors themselves. They have been obliged to excavate what they had filled up, in order to reclaim their lost advantages. Then history establishes beyond question the principle, that when you destroy the equilibrium which nature established between the capacity of the receiving basin and the channels, you set in motion a train of evils that usually results in the shoaling of those harbors.

In concluding, I must ask your attention to some considerations of expediency. If you grant these bills in any shape, will you not make a precedent for every person that wants flats in Boston Harbor to come and ask for them? If you once begin, will you not find it difficult to resist the claims of men asking for acres here and there? Is it not better to settle the principle once for all; to say that the property of Massachusetts shall not be given away to any body, but that the Commonwealth shall keep these flats? Is it not better to wait until you

know what is to be the result of the injuries which are already inflicted upon our water courses? If you grant the land with restrictions this day; if you say you will give these petitioners a chance to fill up *without wharves*, do you not know that next year these gentlemen will come without their admirable witness, Lieut. Davis, who has admitted that wharves will ruin the petitioners' project, but bringing here somebody who will make a hue and cry about wharves, and will they not get you to say that *wharves* will then be necessary? They think they will take Bobadil's system of conquering their adversaries. They will take a little now, and a little then, and soon they will have all they want.

The petitioners wish that you will give them the right to fill these flats without any clause specifically *providing for excavations*. Or if you do make such provision, you will make it a "*condition subsequent,*" *to be performed after the title vests in the petitioners*. I appeal to you to know whether such a condition is ever practically enforced? You cannot induce the Legislature to enforce such conditions. If you give these flats, with a right to fill them up on condition that they excavate elsewhere, the title immediately vests in those parties. By and by you find they have not made their excavations.

The Commonwealth do not get their lands back unless they enter for a breach of condition. And though they have a legal right to do that, yet when the petitioners have sold that land, and the title has become distributed among three or four hundred, or even three or four thousand people, I would ask if you believe Massachusetts



would ever cause that land to be forfeited to the Commonwealth, and sell it out for the benefit of the State. Would such a course not raise a hue and cry that you would not hear the last of for many years? Thus will the petitioners gain the land and ruin the harbor, and WE must suffer the consequences.

The only condition by which you could secure us from injury, is one that would be perpetually nugatory. I will test the petitioners' sincerity. Propose to give them a lease for ninety-nine years, and that their estate in the premises shall end upon the non-performance of their contract. Say, Gentlemen, if you want these flats for this purpose, take a lease so that your estate shall last no longer than while you perform your conditions. Make the lease to end without the necessity of enforcing a forfeiture, and they would not fill up five inches of flats, nor thank you for the charter.

I will ask you to consider another point. If you grant away the flats, and thus injure the harbor, will the United States help you out of the difficulty? The improvement of this harbor, *in the channel*, depends upon the bounty of the Government of the United States. It is not likely to be done by public enterprise. It is the business of the Government. Will the Government come forward and save you from destruction, if you bring it upon yourselves by your own avarice or folly?

Government grants come slowly. Years of patience and suffering must be endured before the remedy can be applied. Your commercial rivals would rejoice at this project. For New England and Boston depend upon our

harbor. And I have no doubt that you could fill up flats enough to drive off the commerce of Boston ; that you could easily put commercial competition here at rest. But of one thing you may be sure. It is becoming continually more difficult to get grants of the United States Government, because we have now South against North, and because we have our magnificent rivals of New York, who are also against us. For what do our rival merchants in New York want Boston to prosper ? They cannot desire it. Hence we ought not to put it out of our power to help ourselves. Do not let Massachusetts part with the power to save herself from irreparable injury. Let us not depend upon grants from the General Government, to undo mischief which we may prevent being done.

Finally, I have endeavored to show you what was the design of these parties in filling up the flats of this harbor ; that it is against the judgment of a very large, respectable and honorable body of remonstrants ; that the claim is urged for the benefit of a few land speculators, whose success will add territory to Charlestown and money to their own pockets ; that they are seeking to get a grant, not under fair colors, because there is no public emergency for wharf accommodations or Railroad accommodations which cannot be supplied by those now in existence ; that the grant is inexpedient ; because, in the first place, it injures commerce as it now is, and leaves no adequate provision for the future commerce of Boston ; because it narrows the channel altogether too much ; because it will bring mud and silt around our



wharves, and tend to add to the difficulty by filling up the harbor ; and because it will destroy more than ten times as much as it will produce ; that the flats asked for are the property of the Commonwealth, and worth \$700,000 ; that they should not be given away to any one ; but that those persons who wish to buy, should have a chance, supposing the Commonwealth is determined to sell ; that the Bill proposed provides no guarantees, and cannot provide guarantees for the performance of conditions which are supposed to be necessary to accompany these grants ; that if the flats of Boston Harbor, of which we now speak, should be excavated, that it would be (as is admitted on all hands) an improvement ; and that it may and should be done, you have evidence from petitioners, and various other persons.

The conclusion, from all the considerations presented at this hearing, is irresistible,—that Massachusetts should refuse to alienate another foot of land over which she has any control, if, by so doing, she diminishes the receiving basin which is necessary to the preservation of Boston Harbor.





## APPENDIX.

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### NOTE A.

The following letter from the Captain of the British Steam Ship Canada, is the one alluded to in the argument.

*Boston, April 7th, 1851.*

TO WILLIAM WHITING, Esq.

Dear Sir—I have to acknowledge the receipt of your letter of the 4th inst. inquiring of me if the Steam Ship “Canada” grounded in leaving this port on her last voyage, &c. In reply, I have to say, that, according to the Almanac, the tide should have flowed at *twenty-six* minutes after *one*. The ship was detained in dock until *five* minutes after *four*, the Pilot not thinking it prudent to take her down the channel until that time; after leaving the dock the ship touched bottom twice, once *half* way between her dock and the Fort, and once off the Fort, where she remained about thirty-five minutes, drawing nineteen feet of water. In answer to your question whether in my opinion the channels in Boston harbor have shoaled since I first became acquainted with them, I do not hesitate to say in reply, I believe they have shoaled over one foot since I first came to the port in the year 1841.

Your obedient servant,

J. A. HARRISON.

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### NOTE B.

In confirmation of these views the following authorities are cited, to which reference is made.

1st. That harbors are destroyed by injudicious reclamation of land covered by tide waters, proof is found in the Reports of the Harbor Commission of the British Government. The long list embraced in that Report affords *ample* proof of the fact. Among others, the following are cited. The limits of the abstract preventing full extracts from these very interesting cases.

*Southwold.* Report of 1845, page 224. “Area formerly covered by spring tides, 2,000 acres. By embankments the area was reduced to 450 acres, less than one quarter the original area.” \* \* \* \*

The Commissioners say, "Southwold is entirely dependent upon tidal waters for its existence as a port, and since the value of the daily tidal scour in all our harbors does not seem to be sufficiently appreciated, we have entered into detail." \* \* \* \*

*Rye Harbor.* "Injured by filling in marshes, and finally excluding the tide water. The channel destroyed from shingle outside." (Boston harbor may be ruined in this manner. See Commissioner's Report for 1850. Mr. Hunt's testimony, page 12th.)

"The tide broke through the embankments in 1812, and one tide scoured the channel so that vessels came up drawing sixteen feet of water. £200,000 expended in vain attempts to form a new harbor between 1724 and 1787, 63 years. Time and money both wasted."

Vol XVI., same Reports, page 130. The testimony of Mr. John Scott Russell, conceded by the counsel for petitioners to be the best authority upon such matters in England. His theory of tides may be found at large in a report made to the British Association, 1844. See also Encyclopædia Metropolitana, Article 'Tides.' He states briefly the following principles, in relation to the tide waves which fill the harbors on the flood tide.

The ascent of the tide wave is not dependent upon the area but upon the depth of the water way. The tidal wave is propagated according to the same laws as a wave of the first order, which is, that the velocity is proportioned to the square root of the depth.

The relative velocities will be as follows:

Depth.	Velocity.
10	12
20	16
30	20
50	26
70	32
100	34

The greatest velocity will be gained when the channel is rectangular and deep.

Question 2697. Projections from the shore retard the current and diminish the quantity of water.

2715. Chester navigation at one time admitted vessels of considerable size up to the city. There can be no doubt that the entire ruin of that estuary has been owing to the injudicious reclaiming of land to an enormous extent by a large company formed by an act of Parliament in the year 1750. The company was not promoted by the inhabitants of Chester. Provision was made for keeping the channels open, but were ineffectual. Spring tides give but nine feet six inches at Chester. Tide rises thirty-three feet at the bar. There might be twenty-two feet at Chester at high water.

2730. From Ayr point upward, the largest ships formerly rode; it is now nearly dry.

2731-2. I have no doubt the change has been produced by enclosing tidal lands under sanction of Parliament. I think no permission under any



circumstances ought to be given TO DIMINISH THE VOLUME of water entering our tidal harbors. I think it should be most scrupulously maintained with a view of scouring the channels with *as large a body* of water as possible, and where channels are narrowed, it should be in conformity with this principle. I think it quite possible to obtain a good, deep, rectangular channel for the progress of the tidal wave, and still keep unimpaired *the whole lateral area* for the reception of the tidal water to produce the scour.

2737. The object aimed at in rivers which depend upon the tide, is, to prevent as much as possible any *diminution* of the tidal waters.

2740. Where I consider the river to be the effect of the tide, my object has been to prevent as far as possible any diminution of the tidal waters between high and low water. Deepening below low water has no effect in increasing the quantity of tidal water.

2742. The chief obstructions to the progress of the tide, are, *irregular widths* and *contracted channels*. Shoals, also, but if under low water not to the same extent.

2748. In all cases keep the banks as wide as possible where the tide flows, but to have them uniform if possible, particularly when the river depends upon land floods.

Vol. XVIII., page 10. Port of Chester is a notable instance of injury from reclaiming land. Original waste area, 12,000 acres. 8,000 were enclosed, and the harbor ruined.

Same, page 302. *Sir John Rennie*. The preservation of the sectional areas of all channels, depends upon the *quantity of water* passing through them. Same principle, page 329.

Page 447. *Mr. Hodkinson* upon Wells Harbor. The navigation was good until embankments were made. 660 acres were enclosed sixty years ago, other portions at times subsequent; in all, 846 acres; one-third of the whole area. And are in my opinion the sole cause of the obstructions formed in the harbor.

McCulloch's Geographical Dictionary, page 418. *Boston, England*. 6,300 acres of fens were cut off from the tide, and in *thirty years*, from 1721 to 1751, the consequence was as follows: In 1721, vessels of 250 tons discharged at the town. In 1751, vessels drawing six feet only could not come up except at Spring tides.

*Parliamentary Report*. Vol. XVIII., page 464. Great caution is necessary in the practice, so as to avoid any diminution of the area of these flats, which are the vital parts of such a harbor as this.

*Mr. Telford*. Page 472. Blakney harbor could once shelter 400 vessels, now not more than fifty, in consequence of reclaiming land.

Page 494. Many harbors have been ruined in consequence of the pernicious habit of embanking marshes from the sea.

Vol. XVIII., page 497. *John Rennie*. I have entered thus far into the nature of harbors similarly situated as that of Great Yarmouth, for the purpose of showing the advantages that arise from preserving to the *utmost extent the receptacles* into which the tide flows.

Vol. XVIII., page 632, same Reports. *H. T. de la Beche*. "The existing state of any estuary or tidal river, may be considered as an adjustment for the time, of certain conditions; changes in any of which conditions effect alterations in that state, productive of injury or benefit to the purposes for which we employ or may be desirous of employing such estuary, according to circumstances." \* \* \* \*

Page 633. Such are the variable conditions existing in estuaries. It becomes of the utmost importance well to study and reflect upon the value of each cause before we attempt changes in connection with an estuary, intended for our advantage, and the more especially when a great commercial port is situated on part of such estuary. \* \* \* \*

Viewing the *estuary as a whole*, and the effects produced by changes upon the two tides. That which may appear of very little importance should be considered as, to a certain extent, producing general results.

634. In all changes, care should be taken that the *total effective volume* remains the same.

A provision usually considered when improvements in estuaries are under investigation.

Sudden widening of channel lowered the surface of water one foot. *Parliamentary Reports*, Vol. XXII., p. 461.

*John Scott Russell*. Variable widths check the tide wave. Same, p. 461.

Increased width at mouth approved of. Same, p. 473.

Increase of the *volume of water* is an essential condition in making harbor improvements. Same, p. 464, 473.

Reference is also made to a late work, by *H. T. de la Beche*, upon Geology, stating generally the same principles here laid down. To the *Encyclopædia Britannica*, Article, Rivers and Harbors. To *Du Buat* and *D'Aubenon's Treatise upon Hydraulics*, in relation to the importance of regular channels for the preservation of the greatest flow of water, and the loss consequent upon contractions and expansions.

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¶ Some of the petitioners have been styled "speculators," in the foregoing remarks. This phrase is intended not in any *offensive* sense, but as a deserved compliment to their wealth, sagacity and enterprise.

The counsel for the remonstrants desire to express their obligations to *William P. Parrott, Esq.*, an eminent civil engineer of this city, for his valuable assistance in the preparation of this case, and in the scientific investigations of various questions relating to hydraulics.

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ERRATUM.—On the inside title page, "*Monday*" should read *Thursday*.









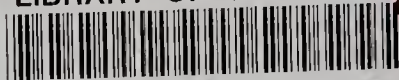








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