27th Congress, 2d Session. Rep. No. 891. Ho. of Reps.

ALBEMARLE SOUND AND ATLANTIC OCEAN.

[To accompany bill H. R. No. 514.]

June 24, 1842.

Mr. Rayner, from the Committee on Commerce, submitted the following

REPORT:

The Committee on Commerce, to whom was referred the following resolution, offered by Mr. Stanly: "Resolved, That the Committee on Commerce be directed to inquire into the expediency of connecting the waters of Albemarle sound with the Atlantic ocean, by cutting a canal, or otherwise," submit the following report:

This subject was referred to the Committee on Roads and Canals at the 1st session of the 26th Congress, from which Committee Mr. Rayner, who submits the following, then made a report favorable to the proposed object. The committee have examined that report, and hereby adopt and offer it as a part of this report. The committee, on examining the subject, consider it as one closely identified with the commerce of the country, and therefore believe that the recommendation of the proposed improvement comes much more properly from the Committee on Commerce than from that on Roads and Canals; for whilst the abandonment of a general system of internal improvement by the General Government might seem to prejudice such a recommendation, coming from the Committee on Roads and Canals, yet the committee consider the proposed work as one connected especially with the commerce of the whole country, both foreign and domestic, and as one which, owing to its peculiar character, must come within the scope, not only of the powers but the duty, of the General Government to effect.

That the proposed improvement would be of great benefit to the country in a national point of view, both in regard to our commerce in time of peace and our national safety in time of war, must be apparent from the facts and the reasoning set forth in the said report. The great importance attached to this work by the State of North Carolina, and the frequent resolutions that have been passed by the General Assembly of that State, calling the attention of Congress to the subject, would seem to require that it should receive the calm and deliberate consideration of the General Government. The General Assembly of the State of North Carolina, at the session of 1840–'41, adopted resolutions "urging and requesting" the Senators and Representatives from that State in Congress "to use their utmost exertions in procuring from the General Government an appropriation to effect the re-opening of Roanoke inlet." Copies of these resolutions were forwarded to the Senators and Representatives from that

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State accordingly, which we duly presented, and are now on file; which resolutions are hereunto appended.

At the session of 1838–'39, of the General Assembly of North Carolina, an act was passed directing the board of internal improvement for that State to procure the services of a skilful and competent engineer to survey the waters of Albemarle sound and the adjacent waters, and report to said board upon the practicability and importance of re-opening Roanoke inlet. In accordance with the provisions of said act, the said board employed Major Walter Gwynn, late of the United States army, to make said survey. Major Gwynn, having completed the survey, submitted the result of his labors, and his views of the feasibility and importance of the proposed work, to the president and directors of the board of internal improvements, the greater portion of which report from him is herewith submitted, and made a part of this report. From the well-known character aud reputation of Major Gwynn as a civil engineer, the committee consider his views as entitled to high consideration, and beg leave to call the earnest attention of the House to them, as set forth in his report.

The committee, after considering all the facts of the case, feel convinced of the importance of the proposed improvement as a great national work, and recommend an appropriation for the same. They report a bill accordingly.

JULY 10, 1840.

Mr. RAYNER, from the Committee on Roads and Canals, to whom was referred the following resolution, offered by Mr. Stanly: "*Resolved*, That the Committee on Roads and Canals be directed to inquire into the expediency of connecting the waters of Albemarle sound with the Atlantic ocean, by cutting a canal, or otherwise," made the following report:

The great importance of a direct communication between the Albemarle sound and the ocean cannot fail to strike the attention of the observer, at the first glance, on viewing the map of that region. All the waters of the Roanoke, the Chowan, and their many tributaries, the Perquimans, Pasquotank, Little, and other rivers, are poured into Albemarle sound; the embodied waters of which flow on, in one vast volume, in an eastwardly direction, to the ocean. This great body of water, when within less than a mile of the Atlantic, is arrested in its course by an embankment of sand, which extends in one continued chain along the whole seacoast of the State, indented formerly by occasional inlets, all of which, to the north of Ocracocke, are now filled up. The waters, thus arrested in their course to the ocean, assume a southern direction, and, about the point where they take this latter course, are split or intersected by Roanoke island, a strip of land about fifteen miles in length, and about three in breadth. The eastern portion of the waters thus divided, lying between Roanoke island and the ocean, is known by the name of Roanoke sound, being from one and a quarter to one and a half mile in width; and the western portion, lying between Roanoke island and the main land, is known by the name of Croatan sound. At the south end of Roanoke island, the waters thus divided are again united, and, after a few miles, become mingled with those of Pamplico sound, whence they flow on in a

wide and extended sheet of water, in a southern direction, for about sixty miles, when they find an issue through Ocracocke inlet. The navigation of Albemarle sound is good, with water deep enough for vessels of any draught. There is only one narrow channel in the waters connecting the two sounds, through which all the commerce of the extensive and productive country above is carried on. This is unsuited to navigation, except for vessels of light draught. The inconvenience, delay, and expense, thus attending the commerce of that section, can be readily seen. There is the expense of pilotage through this narrow and intricate channel, the cost and delay of lighterage for vessels drawing more than seven or seven and a half feet water, and the detention by contrary winds, which baffle nautical skill in threading this dubious passage. And vessels, after being thus detained for weeks by these various causes, are often detained for weeks longer at Ocracocke, and, owing to the difficulties of the navigation about that point, are frequently lost before they are fairly embarked on their outward voyages. After overcoming these many obstacles, when they get to sea, all vessels bound northward (and most of the commerce of that region takes that direction) have again to encounter the dangers and difficulties of Cape Hatteras; the bare name of which is a terror to mariners, and which is the scene of more shipwrecks than any other point on the coast of America. If, however, fortunate enough to avoid shipwreck, they have to pass (after a detention of many weeks, perhaps months, after a heavy expense, and after sailing one hundred and twenty miles) within sight of the very point in the Albemarle where their course to the ocean was arrested by the embankment of sand before mentioned. Mr. Fulton, civil engineer for the State of North Carolina, in a report on this subject, dated September 15, 1820, says, when speaking of the advantages of a communication between Albemarle sound and the ocean, "that vessels to and from the northward would certainly effect their passages in half the time they do at present, as those winds which are most favorable for their passages to the northward lock them up for weeks together at the marshes." And of the dangers of the navigation along the coast around Cape Hatteras, he says further: "I believe it is also an incontrovertible fact, that more losses are sustained between Nag's Head (a point near the proposed inlet) and Ocracocke than on any other part of the passage from Albemarle sound to New York."

Such are the heavy burdens to which all the commerce of that extensive section of country, watered by the tributaries of Albemarle sound, is subjected; and such, also, is the drawback upon the profits of all those who are interested in the commerce and trade of that region, no matter in what part of the Union they may reside. There is, perhaps, no portion of the eastern section of the United States more rich in resources, more productive of the articles of commerce, than that whose trade is thus crippled and destroyed by the difficulties in its navigation just mentioned. There are about twenty counties in North Carolina, and about the same number in Virginia, which are watered by the tributaries of Albemarle sound, constituting one of the most productive and fertile sections of either State, whose produce would find a natural outlet to the ocean at the foot of Albemarle sound; but, owing to the obstructions before mentioned, it takes an unnatural direction—partly by land carriage to Petersburg, Virginia, partly through the Dismal Swamp canal to Norfolk, and partly over Ocracocke bar, subject to the difficulties and detentions before spoken of.

The immense quantity of grain, cotton, lumber, fish, naval stores, &c., produced by this section, amounts to several millions annually, which, with the facilities of navigation, would not only confer incalculable advantages upon the country immediately concerned and the State at large, but would tend to swell the commerce and wealth of the whole country, and to diffuse its benefits throughout every portion of the Union engaged in that branch of industry. All the section of country just mentioned, containing about seventeen thousand square miles, and a population of near half a million, so conveniently situated for commerce, with a most fertile soil, and watered by streams navigable for hundreds of miles above their mouths, would, with the benefits of commerce, soon become one of the most flourishing and desirable portions of the Union; yet, owing to its being almost entirely cut off from all communication with the ocean, it is languishing every day, and sending off its enterprising population to the distant West. Some idea may be formed of the resources of this section, and of that portion of its products which, under all the disadvantages before mentioned, find their way to the ocean over Ocracocke bar, from the following extracts from a report made to this House, on this same subject, by the Hon. William B. Shepard, chairman of a select committee to whom this matter was referred in 1830, which is hereby referred to, and made a part of this report.

"The commerce of this section of North Carolina being principally carried on coastwise, it is impossible to state, accurately, its amount: the custom-houses furnishing but little information, resort must be had to the business of each individual merchant. In a memorial presented to the Legislature of North Carolina in 1827, by a number of merchants, the annual value of the exports over Ocracocke bar was estimated at $5,000-000." Again: "Taking the amount of the shipping employed in the Albemarle at what it has been estimated, (viz: 100,000 tons,) we may arrive at some knowledge of the losses annually sustained at Ocracocke bar and the intermediate navigation. The charge on vessels for lighterage and detention at the Swash averages $1 per ton, amounting to $100,000; the additional rate of insurance, because of the risk, averages ¾ of 1 per cent., and amounts, on the exports and imports, (taking the same at $3,,000,000,) to $45,000, and on the vessels to $30,000 per annum. This annual tax of $175,000 upon the navigation of this section of the country, independently of the other evils, cannot but enhance the rate of freight and the cost of conveyance to market; which suggestion is proved by the fact that the price of freight from Norfolk and Wilmington (the latter but 120 miles south of Ocracocke) is from 20 to 25 per cent. less than from the towns of the Albemarle. Estimating this enhanced freight as a tax upon produce of 6 per cent. only, we can fairly charge to the defects of this navigation an annually positive loss to the country of $355,-000. From the causes heretofore alluded to, this estimate is rather under than over the fact. When, therefore, we take into consideration that the farmer ultimately pays all these charges in the diminished value of his products, we easily account for the fact that the same articles of produce on the waters of the Albemarle are, from 15 to 30 per cent., of less value than upon the Chesapeake." Again: "North Carolina has more shipping employed in the coasting trade than any State south of Maryland, except Virginia; and when we reflect that the commerce of Albemarle alone employs five times as much shipping as belongs to the whole

State, it is correct to suppose that, were the resources of this country developed, the quantity would be greatly increased. The whole enrolled and licensed tonnage of the Union amounts to 881,000 tons, nearly one-eighth of which finds employment in the northern counties of North Carolina."

Owing to the difficulty of ascertaining the entire amount of the commerce of this region, (which, in the absence of any law on the subject, can only be found out by individual calculation and labor,) it is reasonable to suppose that the foregoing estimates, instead of exceeding, fall far short of the truth.

But the advantages of the proposed work would not enure to the country immediately adjacent, and the State of North Carolina, alone: the whole commercial and shipping interest of the Union is directly concerned in it. The greater portion of the shipping employed on the waters of the Albemarle is owned in distant quarters of the Union, and the proposed improvement would not only afford to that interest additional security against the disasters and difficulties that now attend it, but it would open a field for the employment of additional shipping, and invite the industry and enterprise of that portion of the North whose capital is invested in commercial pursuits to a safe and profitable employment. Not only would the vast amount of property annually lost by shipwreck be saved to the enterprising owners, but an increased amount of shipping would find employment; thus adding to the commercial marine of the whole country, as the dangers attending it are diminished.

Besides, the great seaports on all the Atlantic coast are, to a considerable extent, dependent on the products of the fields and forests of the section of country watered by the tributaries of the Albemarle for supplies, which cannot be readily drawn from other sources: any improvement, therefore, in the means of intercommunication between the producers and consumers must be a matter of interest common to both; and, when the enterprising spirit of our people is considered, their constant and intimate intercourse between points the most distant, it will readily be seen that every commercial and trading portion of the Union is interested in this work. Yes; not only is North Carolina deeply concerned in the measure, but the owner of every vessel and cargo, every commander and crew, that has to pass this sand-bound coast in the ordinary course of trade between the Northern and Southern Atlantic States, has a vital interest in it. And when we reflect on the many millions invested in commerce, and the dangers and obstacles which here beset it, we may form some idea of the incalculable benefits likely to result from the proposed improvement; which benefits would not be local or sectional in their character, but would extend their blessings over the whole Atlantic section of the Union: for, as additional security is afforded to its shipping, and the dangers of navigation decreased, its commerce must be enlarged, its resources developed, and its wealth increased.

The saving the proposed work would afford to the mercantile interest, and ultimately, in part, to the people who are the consumers, in the price of insurance upon all vessels and cargoes that have to double Cape Hatteras, in the course of the extensive and increasing trade between the North and the South, is also a matter which should engage the attention of that body to which the Constitution has intrusted the regulation of commerce. The enhanced rate of insurance on Southern coasting is chiefly

attributable to the dangers of navigation around Cape Hatteras; and there is but little doubt that the annual saving of property which might be effected by a safe inlet upon the coast, near the site of old Roanoke inlet, together with the saving it would cause in the price of insurance, would be nearly or quite equal to the cost of the work.

The means of computing, with any thing like accuracy, the annual number of wrecks, or the value of cargoes lost in whole or in part, are not within the reach of the committee; but the reduction upon insurance alone, supposing it should be lessened only one-fourth of one per cent., would, in one year, amount to a sum that would go far towards paying for the work. The annual exports of the South to foreign countries amount to about $70,000,000, one half of which, at least, is sent coastwise to Northern ports, and thence reshipped to foreign markets. The value of these, returned in foreign goods imported into the Northern cities, and reshipped to the South, added to the native productions shipped from South to North and from North to South, (the value of the vessels included,) must amount to at least $70,000,000 more; which, added to $35,000,000, the amount of that half of the Southern exports that takes a coastwise direction through the Northern cities, amounts to $105,000,000. The one-fourth of one per cent. on that amount is $250,000 and upwards—a sum which, the committee believe, would go very far towards accomplishing the work.

There is another consideration, of far greater moment than any of those mentioned, which should engage the special attention of the National Legislature; and that is the saving of human life that would result from the execution of the proposed improvement. This cannot be estimated in dollars and cents—it is of far greater value than can be computed by any standard of pecuniary calculation. It appeals to the feelings of humanity more than to the calculations of interest, the desire for gain, or the public spirit and enterprise of the country. The shoals of Hatteras are often the scene of many a tragedy more awful in reality than ever was portrayed in fiction. Many a hardy mariner, who has weathered the storms of every sea, has found a watery grave on this iron-bound coast. Many a widowed heart has been wrung with anguish by the appalling disasters of which this point has been the constant theatre. Many an unprotected orphan has been left to mourn the untimely fate of a father, here left at the mercy of the winds and the waves. Many a gallant bark, which has weathered the tempests of every clime, has here been compelled to yield to the fury of the elements. This point on our coast is literally shingled over with shipwrecks. The shore of the ocean is here covered with the evidences of disaster, which lie scattered around in every direction. Not only does the weather-beaten mariner often fall a victim to the difficulties of this dangerous coast, but, in the course of travel by sea, which is daily increasing, persons of every age, sex, and condition, have met a premature fate, amid the storms and shoals which here abound, and which are far more dangerous, and not less dreaded, than the Scylla and Charybdis of classic story.

The dreadful fate of the William Gibbons and the Home attests the truth of the foregoing statements, and commends to judgment and humanity the propriety of attempting something to prevent such disasters in future.

The committee believe that these circumstances, which appeal so loudly to the feelings of the human heart, are strong incidental inducements

to the accomplishment of an object which reason and judgment must approve, as presenting strong claims on account of its connexion with a great leading interest which the Constitution has placed under the sole regulation of Congress. And when we reflect on the sea-travel by packets and steamers, which is daily increasing, and must continue to increase as the population of our country is enlarged, its wealth and resources developed, and its intercommunication between North and South extended, we see the absolute necessity of providing some means for avoiding such catastrophes in future. The expenditure of some thousands may save from shipwreck many a bark, the loss of which would deprive a suffering wife and children of bread. It may save the life of many a seaman to foster our commerce in peace, and to man our navies in war. It may preserve the life of many an enterprising and useful citizen to serve his country, and to advance the happiness of humankind.

It may be asked how can the opening an inlet on the coast, in the neighborhood of the scene of these many disasters, afford protection to the commerce and travel that is compelled to pass this point? Because it would afford a safe harbor for vessels to enter when in distress, or during the prevalence of storms. And, what adds to the dangers of navigation on this part of the coast, it not only abounds with the most dangerous and deceptive shoals, but, from some cause, (perhaps its contiguity to the Gulf stream,) it is more subject to storms than any other portion of the Atlantic coast. The site of the proposed inlet is nearly central upon our Eastern coast, and is so situated, with reference to Cape Hatteras shoals, as to be the precise point where a harbor is most wanted in times of distress. At present, vessels driven on the coast of North Carolina, to the north of these shoals, by northerly storms—so prevalent and so disastrous—are almost always lost, if they are not able to enter the capes of Virginia, especially if they are unacquainted with the navigation in those latitudes. For vessels thus pressed, there is no place of refuge from Cape Henry to Ocracocke inlet, a distance of one hundred and fifty miles; and the latter place is beset with shoals, and difficult of approach in bad weather. If Roanoke inlet were improved, it would afford a place of safety and protection for all vessels thus circumstanced; and the least acquaintance with the nature and situation of the waters in that neighborhood will show that a vessel thus entering would be entirely free from danger, even in the most stormy and violent weather. By opening the proposed inlet, a harbor would be obtained which would be perfectly land-locked, where either vessels engaged in commerce, or steamers and packets in travel, might ride out the most violent storm in perfect safety; while now, when overtaken by the storms which prevail in that quarter, they are compelled either to attempt to weather the shoals, or, for the purpose of avoiding them, in seeking shelter elsewhere, they are forced to fly from the land; and, for the purpose of doubling the shoals, they must stretch their course oceanward, and rush into the very bosom of the tempest—encountering the combined fury of wind and wave, rather than risk the shoals and breakers more adjacent to land.

The committee are of opinion that these vast and incalculable benefits, resulting to the commerce of the whole country, constitute a sufficient and weighty reason why this work should be executed by Congress; for, as has been before stated, not only is North Carolina, but the whole Union, deeply interested in some improvement on this part of our coast. But

there are other reasons, equally pressing, and perhaps more so, which recommend this work to the favorable consideration of Congress—reasons not only affecting and connected with one great leading interest in our country, but which are identified with our national security and independence. These appeal to the patriotism as well as to the enterprise and interest of our citizens. They are the benefits resulting to the country from this work in time of war. It is reasonable to suppose that, in the vicissitudes of human affairs, we shall not always enjoy the calm and sunshine of peace, but that, as with all other nations, we shall in future time be visited with the dangers and horrors of war; and the probabilities of our difficulties with other nations increase as we grow in prosperity and numbers: for, as the resources, the wealth, the enterprise, and the commerce of our country are enlarged, we shall be the more likely to come in conflict with the ambitious designs and interested projects of other nations. As we grow in power we may expect to arouse their jealousy; as we extend the blessings of our free institutions, to incur their hatred. Owing to our relative situation to the great Powers of Europe, (from whom alone we have any thing to dread,) should we ever become involved in a war with any of them, it is reasonable to suppose that it must be a maritime war mainly. And suppose any of the immense fleets of the first European powers were poured upon our coast, what protection would be afforded to any of the commerce between the North and the South on this part of the navigation? And, in time of war, the protection of commerce becomes a matter, not only of national, but of individual interest. It is then that our people feel the want, not only of the luxuries, but the necessaries of life, that are the products both of native and foreign growth; and, in the course of trade and intercourse between the various and distant portions of the country, this want is felt, as well in the forests of the West, as in the tide-water countries of the East. Merchantmen, privateers, and vessels of war, when chased by the enemy's cruisers, would, in the present condition of the coast, either be compelled to yield to superior power, or to decoy their pursuers amid sands and shoals, with a certainty of their own destruction, as well as that of their enemies. But, by the opening of Roanoke inlet, they would find a place of retreat and protection, much safer and more certain than the harbors of the Chesapeake, which would usually be blockaded; because, on account of the vicinity of the inlet to Cape Hatteras, the enemy would soon find it so dangerous for rude cruisers to encounter these perilous shoals, that they would the sooner give up the pursuit. For the same reason, it could not be blockaded; and thus an ingress and egress would be afforded to our commerce and vessels of war, free from these harassing difficulties. It is a matter of history that, during the last war with England, owing to the numerous harbors afforded by the Chesapeake, its waters were hardly ever free from a blockading squadron, and that the trade of lower Virginia was, to a great extent, carried on through the waters of North Carolina, for the reason that no blockading vessel dared lie in the neighborhood of the shoals of Hatteras; and should the proposed improvement be effected, the inlet will be of such limited extent, and the harbor of such convenient situation, that it will be an easy task to defend them against the entrance of an enemy's cruiser, or other armed vessel. The enemy could neither enter it nor come near it; and the proposed work

being immediately at the sea-beach, a safer place of retreat, or a more convenient one of departure, for our shipping, cannot be well imagined.

The completion of the proposed work, then, will not only foster our prosperity in peace, but it will strengthen our power in war. Whilst it will, by its stimulus to commerce, assist in filling our coffers with the means of paying the defenders of our country in war, it will afford them a place of refuge in danger, and a retreat from which they may unexpectedly assail our foes.

The opinions of the most experienced engineers, whose attention has been directed to this object, concur in the great importance and vast benefits resulting from the accomplishment of the proposed work, not only to the State of North Carolina, but to the whole Union. In a report made by Gen. Bernard, Lieut. Col. Gratiot, and Major Totten, Board of Engineers in the service of the United States, in 1820, they use the following language: "We shall merely remark that, if the plan be carried into successful operation, whether we consider the profits of commerce, the dangers of shipwreck, pursuit by an enemy, or convenience as a point of departure and refreshment for our own privateers and vessels of war, a harbor will be formed precisely in that part of the coast where it is most needed." Again, in a report made by Capt. Bache, of the Topographical Engineers, dated February 12, 1829, on this same subject, the author says, in reference to the re-opening of Roanoke inlet, that "it is an object of more extensive usefulness than any other work of a similar character in our country." These are high authorities, coming from scientific men, and which are worthy the serious consideration of Congress.

There are other benefits of a national character which would result from the execution of this work. There is no section of country on the Atlantic coast so much abounding in forests of the finest timber for ship-building as that watered by the tributaries of Albemarle sound. Its low lands abound in the finest oak, and its barrens in those lofty pines which furnish the spars and masts for our ships of war, which, on account of their great length and weight, are transported, at a vast expense and trouble, from one point to another. Even under all the difficulties existing at present, this region, in a great measure, supplies the navy yard at Norfolk with these materials for ship-building. But the expenses of conveyance are so great, that, while the Government has to pay a greatly enhanced price for them, the contractor is but poorly compensated for his labor. Let the General Government improve the navigation of the Albemarle as proposed; let it open the channels of communication, by which it can more easily obtain the indispensable materials for "providing and maintaining a navy;" and, in a very few years, the diminished expense resulting from this source alone will pay for the cost of the work. The same reasons will apply to the naval stores which this section of country produces in abundance, and which are equally indispensable for ship-building, whether naval or commercial. Let the General Government remove the difficulties of navigation, and it has the means of obtaining any amount of this article at any given time, and that at a reduced price, while the labor and industry of the producer are more amply rewarded; and when we take into consideration that the pressing emergency in time of war would not admit of opening this communication, and that the demand for the materials of refitting and increasing our navy would then be greatly enhanced, we see that the proposed work is connected with our national

safety. It will tend to the protection and encouragement of that branch of our national defence which is our pride and boast, viz: our navy. It will be a means of "in peace preparing for war."

There is a more pressing consideration than any yet mentioned which should urge this matter upon the attention, as it places it under the control and jurisdiction, of Congress. The "laying and collecting taxes, duties, imposts, and excises," is a power which the States have surrendered to the Federal Government. The States, as well as corporations, are thus cut off from all chance of pecuniary remuneration for executing works of this character. All the revenue arising from this work, on the importation of foreign goods, would enure to the benefit of the General Government. The duties arising on importations would all go into the coffers of the national Treasury. Then, if the benefits of this improvement would enure to the whole Union, ought not the legislative power of the Union to adopt means for its accomplishment? When we consider the contiguity of the proposed improvement to the West India islands, the vast and growing commerce which our country must continue to carry on with that portion of the world, and the plentiful production, by the Albemarle country, of those articles which find a ready market there, the value of which is almost always brought back in the products of those islands, it must be evident, from the facilities thereby afforded to commerce, that, in a very short time, the increase of duties on foreign importations would compensate the Government for the expense it may incur in effecting the work.

If North Carolina were to effect this work, she must do it at her own expense; while, as has been shown, the benefits would accrue to the Union, in common with herself: because it would be done with a view to the commerce of the whole United States, both foreign and domestic; and the States have parted with the right to tax such commerce in any way whatever.

The committee are of opinion that this work is not of such a character as to come within the scope of that general system of local internal improvement which has (no doubt properly) been abandoned by the General Government, and been taken up by the respective States. It is inseparably connected with, and intended to cherish, an object which the States have no control over, but which they have surrendered to the Federal Government, viz: the regulation of commerce. And the leading motive to all local improvements by States or corporations—that of seeking a profitable return from the investment of capital—is taken away, owing to the constitutional restriction above alluded to. Owing to this difficulty, the interests of the commerce of the whole Union, both foreign and domestic, must continue to suffer forever, unless this work meet with the approbation of Congress.

The most rigid constructionist, in regard to the power of the General Government over internal improvements, must admit that there are some works so intimately connected with the welfare of the whole country, so inseparably identified with some great national interest, the protection of which the Constitution has intrusted to Congress exclusively, and so far beyond the power of the States to bear the expense of executing, when the means of compensation are taken away, as to place them undoubtedly under the control and management of Congress, and to require appropriations by Congress to carry them on. Neither the States themselves, nor the most rigid advocates of their reserved rights, have ever denied to

Congress the power to erect light-houses, marine hospitals, beacons, buoys, &c., within their limits, or to make surveys and charts of their coasts: all which have been done, and undisputedly, from the origin of the Government. Where is the difference in principle between the construction of works for designating and marking out obstructions to navigation, and works for removing such obstructions altogether? The object is the same; so are the means. The object of both is facility to commerce; the means of accomplishing both are appropriations from the public Treasury.

But those who deny that the power to "regulate commerce" confers upon Congress any further control over *domestic* commerce than the establishment of uniform rules for carrying it on, cannot deny that the work proposed has an intimate connexion with, and relation to, the *foreign* commerce of the country.

It is well known that one of the principal causes which brought about the adoption of the Federal Constitution was the necessity of placing the foreign concerns of the country in the hands of an authority which could wield them with singleness of purpose, and with a united and (because united) more efficient action; and, in conformity with this leading object, the framers of that instrument contemplated the free and liberal action of the Government in all matters connected with our external commerce. Foreign nations expect, and the interests of the people of the States and of the Union require, from the General Government such improvements and facilities to commerce as the advancement in civilization and science points out to be necessary; and as the respective States are not, and cannot be, constitutionally known to foreign nations in matters so comprehensive, and as they are inefficient for carrying out measures other than of a local character, it appears to the committee that the propriety and absolute necessity of the improvement, by Congress, of those channels of communication which are so much connected with the vital interests of the Union, and which are not only common to all the States, but to every nation on earth with whom we are at peace, cannot be denied.

While it is admitted that the General Government should interfere as little as possible with the domestic and local interests of the States, it is also insisted that it is bound to make improvements in all cases connected with the extensive foreign relations of the country, and with the regulation of that foreign commerce which the Constitution has intrusted to it. That the improvement under consideration is so connected, in a very great degree, the committee have attempted to show, and, as they think, cannot be denied.

The committee, having attempted to show the great importance of re-opening Roanoke inlet, in a national as well as local point of view, and having further attempted to show that, from its peculiar character, it claims the especial attention and consideration of the Federal Government, now deem it proper to inquire somewhat into the practicability of its execution.

There is a tradition among the older inhabitants of Roanoke island and the banks bordering on the ocean, that, at the first discovery of the country, there was from 12 to 15 feet water over the bar at Roanoke inlet; and that Sir Walter Raleigh's fleet, and those that were successively fitted out under his direction, sailed through Roanoke inlet, and anchored immediately under the heights of Roanoke island. They point to the place where his ships rode at anchor, as well as to the ruins of the fort, on the northern

part of the island, that was built by the adventurers in those early expeditions. The first authentic account which we have of this subject is in Lawson's History of North Carolina, published in 1718. In that work, (page 64, Library edition,) we find the following passage: "Roanoke inlet has ten foot water; the course over the bar is almost W., which leads you through the best of the channel." It appears from Wimble's map of the same State, published in 1738, that there were then 9 feet water over the bar. There was, until within the last few years, another inlet, through which a portion of the waters of Albemarle sound found their way to the ocean. This was Currituck inlet, about 35 miles north of Roanoke inlet, but which is now also filled up; and the whole of the pent-up waters of the sound, having cut their way through what was then a marshy ground, extending from Roanoke island to the main land on the west, take a southwardly direction to Pamplico sound, and through Ocracocke inlet, where they escape.

It is within the recollection of persons now living in the neighborhood when there was a body of marsh occupying the present site of Croatan sound, extending from Roanoke island westward to the main land—a distance of from 3 to 3½ miles. A narrow passage existed through this marsh, connecting Albemarle and Pamplico sounds, not more than a hundred feet wide, and so inconsiderable as to be entirely unsuited to the purposes of navigation. With the gradual closing of the inlet, this narrow passage through the marshes continued to increase in dimensions; and at, and ever since, the final closing of the inlet in 1810, the waters of the Albemarle sound, that formerly escaped at this and the other inlets on the coast, (which are also now filled up,) discharge through the place that was once an extensive marsh, and thence through Pamplico at Ocracocke inlet. In consequence of the passage of such a body of water, this marsh between Roanoke island and the main land has nearly disappeared; and what was once marsh is now a wide sheet of water, dotted with a few very small islands, which are constantly decreasing in size, and which will, no doubt, in the course of time, entirely disappear. The inlet closed up gradually as the passage through the marshes gradually increased in size. It is therefore not only probable, but almost absolutely certain, that the opening of the passage through the marshes was the cause of the filling up of the inlet. The action of the water through the marshes was, no doubt, accelerated by the power of the winds and waves washing the sands into the shoal and narrow waters of Roanoke sound, through which the waters of Albemarle sound, sweeping around Roanoke island, had their only access to the inlet. The waters of the Albemarle, being thus impeded in their exit to the ocean, in passing through Roanoke sound to the inlet, would inevitably cause an increased current in the channel through the marshes; which increase of current would, of course, wear or wash a wider passage, and give, in that direction, a larger vent to the waters.

It is therefore apparent that, if the course of the waters, in their present passage through the marshes, were arrested, they would force an outlet at some point contiguous to the old inlet. The vast volume of water poured down Albemarle sound has a perceptible current when confined in the passage through the marshes, but of what velocity the committee are unable to state: the daily washing away of the small islands in this channel proves that it is considerable. This water, according to the laws of nature, must have an outlet to the ocean, in order to find its proper

level. Before the closing of the inlet, it found an outlet there; since then, its only passage has been through the marshes to Ocracocke inlet. It is therefore evident, and in strict accordance with the economy of nature, that, to restore the inlet, it is only necessary to excavate a passage through the banks that separate Roanoke sound from the ocean, near where the inlet formerly was; throw an obstruction across Roanoke sound, from the lower end of Roanoke island to the banks; and another obstruction across Croatan, from the other side of the island to the main land on the west, so as to prevent the waters from passing off in either direction, and the work is done.

In a report of "the commissioners, appointed by the General Assembly of North Carolina, to have sundry surveys made," &c., submitted to the Legislature of the State by the late Judge Murphy, chairman of the board, in 1819, we find the following suggestions, which, on account of their official character, as well as the learning and practical knowledge of the author, are entitled to consideration. They are corroborative of the opinions hereinbefore expressed by the committee: "If the closing of Roanoke inlet has been caused by the opening of the channels through the marshes, it is probable that closing those channels would open the inlet, and that there would be greater depth of water in the inlet than in the time of Sir Walter Raleigh; for it is certain that some of those channels were open in his time. The closing of Croatan sound would further improve the inlet, by directing the whole current from the Albemarle directly out to sea. This would probably be the strongest current from the interior to be found on our coast; and, if the inlet could be prevented from widening, it would have a depth of water equal to that at Cape Fear."

Perhaps it may be asked, Will not the same cause which filled up the inlet before succeed in filling it up again? The answer is: the cause which must have operated before will cease to exist, viz: the escape of the waters in a different direction. And when it is borne in mind that the pent-up waters of the Albemarle sound are two and a half feet higher than the level of the ocean, which is in sight, it must be seen that, as soon as there is a slight passage of the water from sound to sea, the rush of the waters, together with the current which must necessarily follow from the confinement of such a volume of running water into so narrow a channel, must be strong enough to counteract any opposing cause which would perhaps succeed in filling up the inlet again, if the waters passed off through the marshes, as they now do.

The waters of the sound *must* have an outlet to the ocean; and, as nature always performs her operations in the most direct and convenient manner, the natural issue of these waters must be in a direct line with the current of the sound, or nearly so, and at some point most convenient for their finding their common level: so that the proposed work is not in violation to the laws of nature, but rather intended to aid nature in those operations which have been temporarily obstructed by some countervailing cause. It frequently happens now, during the prevalence of violent winds, which tend to obstruct the escape of the waters through the marshes, that the waters of the sound become so dammed up that they force passages of several feet in depth through the sand beach that obstructs their exit to the ocean. After the return of calm, these passages are again filled up with sand, owing to the fact that the passage of the waters south, through Croatan, prevents that current through the beach, which

would otherwise be strong enough to overcome any opposing influence, and thereby keep the inlet open and clear.

According to the suggestion of the North Carolina board of commissioners, before quoted, it is reasonable to suppose that the proposed improvement will afford a better inlet on that part of the coast than ever has existed since the settlement of the country; for it is within the memory of man when there were three different places of issue for the waters of Albemarle sound, viz: the passage through the marshes, Currituck inlet, and Roanoke inlet. By the execution of this work, the united waters of the sound will be forced out at one point; the volume and current of which must be sufficiently powerful to keep the inlet clear of all obstructions, and to afford sufficient depth of water for all the purposes of navigation.

There is another plan for the improvement of this work, to which the committee beg leave to refer, as worthy the consideration of those under whose direction and superintendence this work must be executed, if done at all. This plan has been submitted by Cadwallader Jones, Esq., a member of the board of internal improvement for the State of North Carolina at the present time—a gentleman whose high character and scientific attainments entitle his views to respectful attention, and whose suggestions have afforded much aid to the committee in the preparation of this report.

This plan is to cut a passage or canal through the banks separating Roanoke sound from the ocean, to be defended by stone walls, if necessary; effect a channel or basin across Roanoke sound, from Roanoke island to the banks, from 300 to 600 yards wide, and from 10 to 14 feet deep, by means of dredging-machines, &c.; defend this channel or basin by two parallel embankments on either side, to be constructed of the sand scooped out of this channel; cut a canal through Roanoke island, connecting with this channel in a right line across the island to Croatan sound. About the middle of the island construct a lock of sufficient strength and dimensions to resist the force of the waters either within or without; and thus a direct communication from Croatan sound to the ocean will be effected, through which vessels, either outward or inward bound, may pass with safety and despatch.

If this latter plan should be considered practicable, it will have the recommendation of being much cheaper, while it will be much easier and quicker of execution.

Between the respective merits of the two plans the committee will not pretend to decide; and, as this is a matter for the consideration of those who may have charge of the survey and execution of the work, the committee mention them mainly for their information, and as entitled to their attention.

In case the first-mentioned plan of an embankment across Croatan sound should meet with the most favorable consideration, the committee beg leave to refer to a slight additional improvement, which has been suggested from another quarter, and which certainly merits attention: that is, the cutting a short canal, of not more than a mile in length, to be provided with a lock of sufficient power, around the western end of the embankment across Croatan, when it adjoins the main land. The object of this is to preserve a channel of communication between the two sounds, Albemarle and Pamplico. A considerable inland trade is now carried

on between the two sounds and the countries bordering on their respective tributaries, which is increasing, and which must be suspended if Croatan is entirely shut up. By the proposed canal, this inland trade will be better provided for than at present; while, at the same time, the benefits of the proposed inlet will equally enure to the outward-bound trade of all the county on Pamplico sound, and its tributaries, the Tar, Neuse, and other rivers: for the commerce of this latter region would of course prefer a safe inlet and a direct route to a dangerous and circuitous one through Ocracocke, and around the shoals of Hatteras. The cost of this short canal would be very inconsiderable, compared to the benefits resulting from it.

The committee, deeming it advisable that there should be a survey, by able and experienced engineers, preparatory to the commencement of this work, have herewith reported a bill, making an appropriation of $10,000 for the survey of this work, and the further sum of $100,000 for the immediate commencement of the work as soon thereafter as convenient.

Resolutions of the General Assembly of the State of North Carolina in relation to the re-opening of Roanoke inlet, adopted at the session of 1840-'41.

Whereas the re-opening of Roanoke inlet, upon the coast of North Carolina, at or near Nag's Head, so as to afford a safe and convenient retreat for the commerce of the country, as well from the pursuit of foreign enemies, in time of war, as from storms and tempests, is, by this General Assembly, deemed a work of great importance to the commercial prosperity of the people of these United States, because of the great destruction of vessels at that place, with the consequent loss of life and of individual property, and because of the high rates of insurance imposed upon vessels and their cargoes for the want of a sufficient inlet through which to seek a harbor there: and whereas, to remove all doubts of the practicability and permanency of such a work, (the great and general utility of which was little questioned,) a resolution was passed by our last General Assembly directing a survey of the adjacent waters of Albemarle, Croatan, and Roanoke sounds, to be made by some practical engineer of high distinction, with the view of having the inlet re-opened at that place: and whereas such survey has been made as directed, and, from the report thereof, we are satisfied that the re-opening of Roanoke inlet can and ought to be effected: and whereas we believe that the General Government, from its supervisory powers over the commerce of the country, has authority, under the Constitution of the United States, to undertake and accomplish this work: therefore,

1. *Be it resolved by the General Assembly of the State of North Carolina*, That our Senators and Representatives in Congress be, and they are hereby, urged and requested to use their utmost exertions in procuring from the General Government an appropriation to effect the re-opening of Roanoke inlet.

2. *Be it further resolved*, That the report of the survey of said work, directed to be made by the last General Assembly of this State, be herewith printed, and that his excellency the Governor of this State be re-

quested to transmit a copy of these resolutions to each of our Senators and Representatives in Congress.

Read three times, and ratified, in General Assembly this the 11th day of January, 1841.

ROB. B. GILLIAM, *S. H. C.*
A. JOYNER, *S. S.*

A true copy: WM. HILL, *Secretary of State.*

STATE OF NORTH CAROLINA, *Secretary of State's office:*

I, William Hill, Secretary of State in and for the State of North Carolina, do hereby certify that the above is a true copy of a resolution of the General Assembly of this State.

Given under my hand this 18th day of January, A. D. 1841.

WM. HILL.

Report of Major Gwynn, civil engineer, to the Legislature of North Carolina, December, 1840, upon the practicability and probable cost of opening an inlet at Nag's Head.

To the President and Directors of the Board of Internal Improvements:

GENTLEMEN: Having been appointed by your honorable body to carry into effect the act of the last session of the General Assembly, requiring a report upon the practicability and probable cost of opening a communication between Albemarle sound and the ocean, at Nag's Head, and in conformity to your directions to commence the survey in April or May, which I reported, in my communication of the 27th February, as indispensable to an inquiry so difficult and important, I repaired, on the 25th April, to the town of Newbern, with a competent party of assistants. On the 27th I embarked in the Government steamboat Newbern for Roanoke island, where I arrived safely, after a stormy passage, on the 29th, and immediately commenced the survey and examinations, upon which, and the information I have been able to collect, I base the following report and conclusions:

The belt of land which now stretches across the mouth of Albemarle sound and separates it from the sea was formerly broken by several inlets. The two best known, and which were long used for purposes of navigation, were the Roanoke and Currituck inlets, through which the waters of the sound were discharged into the ocean. Roanoke inlet was situated just south of a sand hill called Nag's Head, between Collinton and Roanoke islands.

Deriving my information from the best authenticated history and from living testimony, I feel fully justified in stating that there was, prior to the opening of the channel through the marshes between Roanoke island and the main, a depth of ten feet of water in this inlet, which gradually shoalled and finally filled up about thirty years ago.

Let us inquire into the causes which have led to its closing up, and into the means of re-opening it.

It is well known that the constant tendency of every harbor is to silt

or fill up more or less, according to situation; and, as the quantity of fresh water and the impurity of the land and sea waters differ in one place from another, the sea is incessantly bringing in sand and other substances—the streams, soil, and mud—and, unless the current of the land waters is mainly confined to one channel, and is equal in velocity, volume, and quantity, to the influx waters from the sea, they are invariably conveyed through marshes into the ocean, and the mouths of some of the longest rivers in the world are in this way shut up, at least for all purposes of commerce.

Such has been the effect here. The waters of the Albemarle being divided among the several inlets, and the discharge through the marshes constantly increasing, the refluent tide became weaker and weaker, until its efforts, thus enfeebled, rendered it incapable of returning to the sea the sands brought in by the waves. Meeting with more and more resistance every day, (the bars of the inlets gradually accumulating,) its action, conjoined with the unceasing efforts of the winds and waves, which sweep over the broad expanse of the exposed waters of Albemarle and Pamlico sounds, has been spent on the soft yielding banks of the marshes. Thus have these united forces gradually opened and given vent to all the waters of Albemarle sound, and the necessary consequence has been the filling up or swerving of all the inlets north of the marshes. That this has been the process there can be no doubt; it is apparent from the testimony of many persons of great respectability, veracity, and intelligence, from the nature and consistency of such of the marshes as are left, which are of a soft alluvial character, with steep borders and irregular intermediate soundings, (in some places fifty feet deep,) and from the numerous channels around the tufts of the remaining scattered islands. These indications show a violent action of the waters, in passing to and fro through the marshes, striking, irresistible, and conclusive, at first sight, that they have been cut through recently, and are now wearing away; and all along above the marshes we have evidence of the continuing encroachment of the waters of the sound. Stumps are found as high up as Man's point, both on the shores of Roanoke island and the main land, stretching out from a hundred yards to a mile into the sound, and in some places reaching nearly across it; and the recent abrasion of the banks is shown by the bare roots of hundreds of trees, some recently fallen, others in a tottering condition.

In assigning the causes of the washing away of the marshes, and of the encroachments upon the banks of Croatan sound, we must not overlook the effect of the tendency of the waters of Albemarle to unite with those of Pamlico, by reason of their being favored by a descent in that direction, which is apparent from the formation of the shoals at the mouths of the small creeks that empty into Pamlico sound, being always found on the north side; and Mr. Price, who was remarkable for his accuracy, ascertained, by a survey made by him in 1818, that the water at the mouth of Smithwick's creek, which empties into the Roanoke a little below Williamston, was five feet five inches higher than the water of Pamlico at Washington; and by a line of levels I have caused to be run from the mouth of Kendrick's creek, on Albemarle sound, thirty miles below Williamston, to Woodstock, eight miles above the mouth of Pungo river, which empties into Pamlico thirty miles below Washington, the fall is —— feet —— inches; from which I infer a descent from Albemarle to Pamlico of —— feet —— inches, suf-

ficient to create a current in Croatan sound: a fact which a calm, while I was engaged in the survey, afforded me an opportunity of testing.

This current, however, opposes but a feeble resistance to the winds, which entirely influence the tides in Croatan, Albemarle, and Roanoke sounds, control the currents, and drive the waters to and fro between the marshes, swelling them sometimes to a height of five feet above ordinary water.

The foregoing, with such additional facts as I shall now adduce, incline me to the opinion that, at no very distant period back, there was no communication whatever between Albemarle and Pamlico sounds.

In the memory of the last generation, there was a mere gut between the marshes through the eastern channel, narrow enough to be crossed on a fence-rail; and Sir Francis Drake, who, on his return from the conquest of St. Domingo, Carthagena, and St. Augustine, in 1586, visited the colony planted by Sir Richard Grenville in 1585, says "the people he left behind settled on Roanoke island. I gave them a bark, of which they were in the greatest need imaginable: for though Sir Richard Grenville, when he left Captain Amydas among them, had given him the title of admiral, *he had not left them a vessel of any kind.*" Now, had there been a channel of any considerable extent between Roanoke and the main, through the marshes, Sir Richard would certainly have left them a *vessel of some kind*—one that would have enabled them to cross it. The bark which Sir Francis Drake gave them, and of which he says they stood so much in need, was a vessel of considerable size, and in which a portion of the colony was conveyed to England: it cannot, therefore, be understood that the bark was wanted to enable them to cross to the main land, but to facilitate their explorations. And from the account which Governor Lane gives of the relief afforded by Sir Francis Drake on this occasion, in a letter to Sir Richard Hacklevyt, I should infer that Sir Francis's fleet, which consisted of twenty-three sail, entered Roanoke inlet.

Governor Lane says "the colony was reduced to a desperate state for the want of provisions, and the hostility of the Indians constantly lessening our numbers, and the famine grew so extreme among us, our means failing us in fish, that I was enforced to send Captain Stafford with twenty men to Croatan, My Lord Admiral's island, to serve two turns—one to feed himself and company, and the other to watch for shipping, and give warning if any appeared."

"8th June, 1586, came advertisement to me from Captain Stafford, at My Lord Admiral's island, that he had discovered a great fleet of twenty-three sails. The 9th of said month he himself came to me, having travelled by land twenty miles: he brought me a letter from General Sir Francis Drake, with offers of supplies of vessels, men, ammunition, and supplies of all sorts. The 10th he arrived *in the road of our bad harbor, and came to anchor.* On the 11th I visited him, and he renewed his offers of assistance. 19th June, 1586, the fleet, having been previously injured by a storm, set sail with the whole colony for England."

I quote these facts because they have been considered of sufficient importance to be called to the view of one of the engineers who has preceded me in inquiring into the practicability of re-opening Roanoke inlet; and my researches into the early history of this portion of the coast, which have been very elaborate, enable me to satisfy doubts which have

been entertained on the subject, stating that Sir Walter Raleigh never visited the coast of North America. Nearly all his writings, relative to the countries discovered by expeditions fitted out by him, have been lost, as also his geography of these countries.

I have been favored with a perusal of Doctor Hariot's journal, which, it was thought, would throw much light on this important subject, and aid in the inquiries in which I am engaged; but it is wholly taken up in speaking of "merchantable commodities, commodities for food, roots, fruits, wild berries, beasts, fowl, fish, timber, and the manners and customs of the natives." He says not one word about the coast, islands, or rivers. It is sufficiently clear, therefore, without extending our views further, that in some former age there was no channel through the marshes; that, at high water only, when the marshes were overflowed, was there any communication between Albemarle and Pamlico sounds; that Roanoke island, at the time of its discovery and settlement, in 1584-'86, was cut off from the main land by a very inconsiderable channel through the marshes; and that the opening of this channel has been the cause of closing Roanoke inlet, and every inlet north of it.

In this opinion every engineer preceding me in these investigations concurs. Not the slightest doubt or qualification is expressed by any of them—or, as far as I am able to learn, by any professional man—or by any one who has made a personal examination and proper inquiry.

Having arrived at the cause of the closing of Roanoke inlet, in a manner entirely satisfactory to myself, and I hope to every unprejudiced mind, I might proceed at once with a plan for re-opening it; but the subject is one of much importance, and my object is not only to satisfy my own mind, but to endeavor to meet the many objections which have been raised, and to convince others.

Because Gun and Hatteras (former outlets of Pamlico sound) have closed, and New inlet and Ocracocke have not improved (as it is said) by the accession of the waters of Albemarle sound, it is doubted by some, for whose opinions I entertain the highest respect, whether the opening of the channel at the marshes has had the effect ascribed to it, viz: that of closing Currituck and Roanoke inlets.

Now, we cannot fix the precise period of the closing of Gun and Hatteras inlets; the memory of man reaches not back to the period when they were open: but, as we cannot say when they were closed, we will admit they were open when the waters of Albemarle broke through the marshes. These waters, meeting with no resistance, would of course flow on south, until checked by the combined action of the waters of the Neuse and Pamlico rivers. A glance at the map would designate this point, and fix it opposite Ocracocke, precisely where they do meet. The consequence of thus arresting the waters of the Neuse and Pamlico was to turn a portion of them into Core sound, which has had the effect greatly to improve Beaufort inlet; but by far the greatest bulk of the waters have passed through Ocracocke, it being in the direct line of deflection, thereby weakening the refluent waters of Hatteras and Gun, so that they were no longer able to carry back the sand and earthy matters brought in by the sea, and thus causing those inlets to fill up.

The closing of these inlets, then, may be fairly ascribed to the opening of the channel through the marshes, and the consequent union of the waters of the Albemarle and Pamlico sounds. New inlet, being further

up the sound, and more favorably situated in relation to the land, has not been so much affected by the arresting of the currents of the Neuse and Pamlico.

The reflux tides, occasioned by the back waters of the southeasterly winds opposed by the flow from Albemarle sound, have maintained its depth, as is evident from the channel being on the south side. It has not improved, for the obvious reason that the bulkheads and shoals, formed within the inlet before the opening of the marshes, oppose more resistance to the passage of the water than its tendency to run in that direction, even with a greater descent, is capable of overcoming. "For the natural tendency of water is to make its way in whatever direction it finds the greatest declivity, and, if this happens to be in the shortest direction, it has no natural tendency to gain a longer course, as that would lessen the declivity. If, therefore, water is found pursuing a direction which is not the shortest, we may conclude (and on examination we will always find) that the longer course is owing to the intervention of some obstacle, so placed that the waters cannot have, at that particular point, a more speedy descent in a direction different from that which would form the shortest line of the whole descent; and, from causes of this kind, a stream may have a course meandering in every possible direction, as we frequently observe in nature."

The shoalness of the water opposite the mouth of New inlet is the obstacle preventing any great increase of outflow through it, and accounts satisfactorily for its not being improved by the opening of the marshes; and the application of the above principle confirms my statement of a descent from Albemarle to Pamlico sound.

We come now to another doubt which has been raised as to the effect the diversion of the waters from Roanoke inlet, through the marshes, has had in closing it, viz: because the accession of water thereby given to Pamlico sound has not caused an improvement of Ocracocke inlet. From the best information I have been able to obtain, the depth of water on the bar has increased, notwithstanding the width of the inlet has become greater. But, as was to have been expected as a natural consequence, the bulkheads and shoals on the inner side, and opposite the mouth of the inlet, have accumulated; for it is there that the Albemarle waters meet those of the Neuse and Pamlico. In the conflict which takes place, there is a kind of stagnation or diminished velocity, during which the solid matter held in suspension is precipitated; so that, after the union of these waters, they flow on comparatively pure to the sea, leaving behind deposites which form the bulkheads and shoals that obstruct the entrance into Ocracocke inlet. For this reason, the accession of the waters of Albemarle sound has proved injurious to the inlet.

Upon the withdrawal of these waters, as is proposed in the opening of Roanoke inlet, when the waters of the Pamlico and Neuse shall be allowed to pursue their direct and undistributed course through Ocracocke, the deposites will not be so great, and a considerable improvement of the inlet may be expected, and will no doubt be the result. But a swash or middle ground, opposite the inlet, must always exist, owing to the great expanse of the waters; and the consequent independent and great rise of water at the bar, which is not felt in the sound, counteracts and destroys the scouring effects of the ebb tides. This evil can only be remedied by confining the waters, and directing their energies into one channel. Considering

and comparing the circumstances in relation to the two inlets, even the small depth of water at Ocracocke is favorable to the conclusion I shall presently draw of the successful result attending the project for re-opening the inlet at Nag's Head.

Shutting off the waters of the Albemarle sound from the Pamlico sound will have the effect to improve New inlet. The waters blown up the sound by the south winds, as before mentioned, meeting with resistance from the dams across Roanoke and Croatan sounds, will be banked up and forced through the inlet (only ten miles distant from the dams) with a velocity that will cut away a portion of the swash, and by taking advantage of low tides to stir up the sand, which can be done at a very moderate expense either with the hedge hog or harrow, the bulkheads may be entirely removed. The advantages to the commerce of the northern part of Pamlico sound, and the entire security the harbor would afford to vessels driven to leeward of Roanoke inlet, would more than compensate for any expense that might be incurred in keeping it open, and of a sufficient depth for the admittance of ordinary coasting vessels.

It has been suggested that Albemarle sound will not afford a supply of water adequate to keep Roanoke inlet free of obstructions; that sufficient allowance has not been made for evaporation; and that the quantity of water discharged by the rivers may have been over-estimated.

To investigate these matters fully would occupy more time and incur more expense than I consider them worthy of, unless, indeed, I entertained such doubts myself. I am willing to rely on the statements heretofore made relative to them; and upon such, together with my own estimate of the quantity flowing through Croatan sound into Pamlico, when uninfluenced by winds, I have no hesitation in saying there will be a sufficient quantity for all purposes, and that, too, without taking into the estimate the quantity thrown in by the influx tides.

Another ground upon which the failure of the improvement has been predicted is, that it has no cape to the windward to shelter it against the northeast winds, and that a good harbor cannot exist on a straight coast.

There are many striking instances abroad against this theory; but I prefer drawing conclusions from a similarity of circumstances in our own country. A glance of the map will show, without discussing the matter, that it will not admit of general application.

At the mouth of Cape Fear river, New inlet, which, next to Beaufort, is the best inlet on the coast of North Carolina, broke out some sixty years ago to the *windward* of the cape, and Old inlet, under its *lee*, is becoming more and more shoal every year. Further south, we find Charleston, Savannah, Brunswick, and Pensacola, all good inlets, with good harbors, on a *straight sandy coast*.

In support of the theory that Roanoke inlet was not filled up by the opening of the channel through the marshes, and the withdrawal thither of the waters of the Albemarle from the inlet, its filling up has been ascribed to the sinking of a vessel in the channel of the inlet, to the blowing in of the sand, and to the currents from the land not being as strong as those from the sea.

Fortunately my own observations, strengthened by the testimony of respectable persons, enable me also to refute these speculations. The hull of a vessel wrecked 16 years ago, within half a mile of the site of the old inlet, still shows itself above the sand, although it is nearly submerged

by every flood tide; and admitting a vessel was sunk, of which there is much doubt, it is hardly probable it would form a nucleus sufficient to cause the closing of the inlet. Such has not been the effect in the case of the steamer William Gibbon, sunk about five years ago in New inlet, where the gallous frame is now to be seen above the water at high tide, and the inlet still as good as it has been within the memory of man.

As to the blowing in of the sands, there is no accumulation of sand near the site of the old inlet. The beach at Nag's Head is flat for the distance of a mile and a half, on each side of the former course of the inlet; indeed, so small is the rise, that, at the distance of five miles, the lines of separation between the ocean and the sound are imperceptible; and a person unacquainted with the fact of the inlet being closed would not suspect that any land intervened, and it so happens that this part of the beach is composed principally of gravel. I cannot, therefore, believe that the filling up of the inlet has been in any way facilitated by a wreck in the channel, or by the blowing in of sand. The greater quantity of gravel which enters into the formation of the sea beach here than is found elsewhere attests the power with which the land currents have resisted the sea.

That they would have been sufficiently strong to have forced this gravel back into the sea, had not the waters of Albemarle broke through the marshes, I cannot entertain a doubt. From my own observation of their force, (governed exclusively by the winds,) and the violence with which they are driven on and along the inner edge of the beach, across which, in strong westerly winds, they have been known sometimes to break into the ocean, I am satisfied they were fully as strong as the currents from the sea before the union of the waters of Albemarle with those of Pamlico.

A conviction of these imaginary difficulties in the way of opening Roanoke inlet has given origin to a project of an artificial harbor, based upon the theory of there being a necessity of a conformity and fixed proportion between the capacity of a harbor and its inlet; and under such circumstances that the influx and reflux of the tides are adequate to free the harbor and preserve it from alteration. But it is a well-established theory that tidal currents do not contribute so much to sand formations as has been supposed, and the effects which have been ascribed to them and to literal currents are now readily traced to the action of the *waves of the bottom.**

It is true that some of the best harbors on our coast are mere arms of the sea; but it is also true that harbors thus formed are either very good or they are good for nothing. If the water is shoal, the bottom will be affected by the *waves of the bottom*, and will soon fill up. Sometimes the mouths will close, and cause the formation of salt ponds or lagunes. A harbor, therefore, under such circumstances, with no land water running into it, ought to be deep, its bottom ought to be below the influence of the waves of the bottom, and its entrance wide enough to admit a quantity of tide water to flow in and out twice a day, sufficient to keep the mud and other matter in agitation, and from settling. A tendency to form a bar at the inlet, and to silting, can only be counteracted by contracting the entrance, and thereby increasing the strength of the ebb tide, or by damming up the waters at high tide, or by throwing in fresh water, to obtain an artificial scour. But to widen an outlet, (which would be in

* *Du mouvement des ondes par.* A. R. Emy.

accordance with the above theory,) with the view of deepening it, is a plan not yet tried, and is in direct opposition to the theory, or rather the axiom, that the depth of streams is in the inverse ratio of their widths. Surely this plan would not be practised in improving the entrance into rivers, and certainly would not succeed in restoring an entrance into a lagune. An artificial harbor, therefore, at Roanoke inlet should be very deep. Agreeably to my estimate of the force of the *bottom waves*, on this part of the coast, it should be at least 20 feet deep, and then it would be absolutely necessary to protect its entrance by stone walls, which, together with the excavation, and the expense of a canal through Roanoke island, and the walls between the banks and the island, would swell the cost to many millions.

Having considered the causes of the closing of the inlet, and the objections to its practicability, I will now take into consideration the plan and effect of the works for re-opening it.

The universal plan of improving harbors is, to contract their outlets by the erection of piers, sometimes projecting far into the sea, to turn the silt and shingle brought coastwise across the inlet; to pen up the tide-water in pools or basins, and let it out at the proper times—in some instances through pipes or tunnels, to act as a scour in conjunction with the ebb-tide; or, by damming and canalling, obtain and turn through the harbor an additional quantity of water from the land, with the view of obtaining an artificial scour, in imitation of the effects of a fresh-water river.

These plans are all derived from nature. The natural means by which an inlet is kept open is, the discharge of fresh water through it; which, opposing the influx tide, and adding to the power of the ebb, will always maintain a certain channel in proportion to the quantity of land water to be discharged. The tendency of nature is to contract the channel to such a size, that the natural power of the stream can just maintain it.

From these plain and obvious principles, the plans mentioned have been derived; they guided even the first attempts at the improvements of harbors; and, up to the present time, they govern, without a single exception worthy of notice, in the improvement of all the harbors on the coast of England and France. We but follow nature, therefore, and all past experience, in pursuing the plan I propose for re-opening the inlet at Nag's Head, to wit, to cut off all communication between Albemarle and Pamlico sounds by dams, and thus turn all the waters emptying into Albemarle sound through Roanoke inlet—the effect of which, I have no doubt, will be to preserve a channel at least fifteen feet deep.

Under circumstances not more favorable as to situation, winds, or tides, and with not one-fourth the volume of water, New inlet, at the mouth of Cape Fear, maintains a depth of 13 feet. Over the bar at Ocracocke there is 16 feet, and at New inlet, the northern outlet of the waters of Pamlico and Albemarle sounds, there is a depth of 12 feet. The obstructions being on the inside over the swashes, we may therefore confidently depend upon at least 15 feet on the bar at Roanoke inlet, and, as will presently appear, the situation is such that there will be no *inner* formations or obstructions.

The northeast wind, aided by a southerly current, to the effects of which the failure of the work, from the formation of swashes, has been apprehended, will no doubt make a higher tide and bring in more sand than any other wind. It will blow the waters up the sound, and, during its preva-

lence, weaken somewhat the reflux tides. Immediately on its lulling, the back water will reflow to the ocean with all the weight and force of the pent-up streams which empty into Albemarle sound. Guided by the islands of Roanoke and Collinton, which open like a funnel to receive and convey them directly to the ocean, with increasing velocity, force, and volume, they will return all that has been brought in by the sea. By their concentrated energies between Roanoke island on the south and Collinton and the main on the north, they will prevent the formation of shoals and swashes, such as obstruct the entrance into Ocracocke and New inlets, where the ebb tide reaches the inlets from an immense expanse, uncontrolled by banks, at least so far as any beneficial result can be derived from them, in increasing the velocity and scouring effects of the refluent waters.

As to the southerly current, which has been thought by some to exist, I have no hesitation in saying there is no such current. My own observations, but more particularly the opinions of a number of respectable, intelligent, and experienced sea captains, some of whom have been thirty years in the coasting trade, whom I have consulted, and on whom I can rely, give me confidence in stating that the currents on soundings on this part of the coast are entirely influenced and governed by the winds.

In my opinion there is no eddy current from the Gulf stream, nor is there any current setting southerly from the Chesapeake bay. The waters of the bay, unless affected by the wind, make of course down the greatest declivity into deep water: there is, therefore, no constant tendency from this cause to the formation of a shoal north of Roanoke inlet, nor indeed to any accumulation on this part of the coast; on the contrary, we have strong and striking evidences of encroachment. A few miles north of the old inlet stumps are to be seen within the reach of tide water, and in many places just at the site of the inlet; and wherever the marshes have become the substratum of the beach, and sustain the superincumbent sands which have been thrown up by the waves, every heavy blow disengages large portions of them, which are left by the retiring sea to become again, after having been submerged for years, an uncovered soil, inviting the labors of the husbandman.

Apprehensions have also been entertained that the waters of the sound dammed up, as we propose, might break through the Currituck inlet, or open a new channel into Pamlico sound. The shoal water in Currituck sound, and there being no prevalent wind to press the water in that direction, nor indeed towards Pamlico sound, and the height of the land between Albemarle and Pamlico sounds, leave no just ground for these fears.

Should there be any appearance of a re-opening of the inlet north of Roanoke inlet, a few piles driven in, projecting about five feet above the surface of the water in the sound, and interwoven with fascines, will effectually check it; though, for the reasons I assign, and as I have before observed, there is no danger of a re-opening of Currituck inlet.

There are, besides those already mentioned, other powerful natural causes constantly operating to free Roanoke inlet of obstructions brought in by the northeasterly winds. The fall of the sound is considerable, as has been shown, and the height of the water, as nearly as can be ascertained, two and a half feet above the level of low tide in the sea.

With this fall there will be a strong outward pressure of the land

waters, which will greatly strengthen the ebb tide. These running to the sea at low water, particularly at the low ebb of the spring tides, when the fall will be the greatest, and the sandy bottom most exposed to their action, they will act at a time when they can operate to the best advantage; and when the current thus created is strengthened by freshets, as will sometimes happen, both operating at low water, when the descent to the sea is the greatest, they will, in such cases, be capable of producing extraordinary effects—effects frequently strong enough to arrest, in the beginning, the march of the dreaded northeasterly winds, prevent the tendency of the inlet to fill up or swerve, and prevent the introduction of sand or silt into the harbor. Another powerful auxiliary, which will sometimes co-operate with the above forces, is the northwest wind, which frequently succeeds, has as long a duration, and blows with as much violence as a northeaster; and at the same time that it forces the waters down, and raises them in the lower part of the sound, it depresses the waters of the Atlantic, and, in the event of an inlet, will urge the egress of the sound waters with an irresistible scouring impetus.

The effect, therefore, of turning the whole of the waters of Albemarle sound through Roanoke inlet, by means of the proposed dams, combined with all these favorable concurrent and co-operating causes and circumstances, will be to keep a channel of 15 feet of water constantly open, though the *bottom waves* may come in loaded with sand in any possible degree.

And lastly, though not on this account the least important consideration, is, that the same causes which have led to my conclusions formerly existed, and produced precisely the same results as are now anticipated in restoring the same order of things. Such a fact is sufficient in itself to allay all apprehension and dissipate all fears of full and complete success, unless we apprehend, what we have no reason to apprehend, and what never yet has occurred, viz: that similar causes will not produce similar effects; that with the same head of land water, nay, with an increase of four times the volume, concentrated upon one particular point, with the tides, the coasts, the sands, the currents and the winds the same, what was true in 1584 will not remain true in 1840.

I beg it to be understood that the effects I anticipate are not conjectural; they are inferred from the operations of similar causes (as stated) both on the coast of North Carolina, and on the sea-coast of foreign countries. We know the inlet, when it shared the discharge of the waters of Albemarle sound, with Currituck, Caffee, and Pamlico, maintained a depth of 10 feet, and that, too, when exposed to the same strong gales and storms as we have now to contend with. With all the causes which formerly existed, increased by all the waters of the Albemarle sound, to doubt their effects to keep the inlet open would be to doubt that the whole application of a force will not produce as great an effect as the application of a part of it.

We have now to take into consideration the location and the plan of the dams by which it is proposed to effect a communication between Albemarle sound and the ocean at Nag's Head, by shutting off the waters of Albemarle from those of Pamlico, leading the former through a channel to be excavated near the site of the old inlet from Roanoke sound to the sea.

Across Croatan sound, the most eligible site for a dam is from Pork point, on Roanoke island, to Fleetwood's fishery, on the main land. The

distance is 3 miles; the average depth of water is 8¼ feet, the greatest not exceeding 13¾ feet.

It is shoaler and better protected by the projecting points of Roanoke island and the main land than any other line; and between these points and the embankment there is an extensive cove, where the waters of the sound and sea, coming in conflict, will find a place of repose and deposite for the matters they will bring together, giving thereby strength to the work, and purity to the refluent waters. Across Roanoke sound, the selection for the situation of the dam may be referred to the causes above recited.

This embankment will cross Herring island far enough to the south to embrace any changes that may possibly take place in the direction of the inlet, and at a point where it will be best protected from the agitated water of the sound.

Between this island and Roanoke island, the water is in one place 10½ feet deep. The length of the water line is 6,935 feet; the average depth for 645 feet is 8½ feet. For the remainder of the distance (6,290 feet) the greatest depth does not exceed 6 feet, and the average is 2¼ feet. The length of the embankment across the island and the marshes on the margin of the sound will be about one mile.

I propose the following plan of construction for the dam across Croatan sound:

Cribs, 20 feet square, constructed of round logs not less than 1 foot in diameter, with a row of cross logs in the centre, and to be kept in position by 5 piles on each side. The cribs to be filled up with earth and capped with large flat stone 6 feet above ordinary water, which will place the top of the embankment beyond the reach of the greatest elevation of the waters in the sound. The earth of the embankment to have a slope of 2½ feet to 1 on the north side, and 2 to 1 on the south side, and to be protected on each shore by slope walls of stone.

The dam across Roanoke sound, in the channels between Roanoke and Herring islands, to consist of cribs 18 by 20 feet, made of round logs not less than a foot in diameter, and sustained in position by 5 piles on each side.

Across the channels, between the banks and Herring island, cribs 15 by 20 feet, kept in line by a pile on each side driven in every 5 feet—the whole capped, as above, with stone, and sustained on the sides by embankments of earth, with a slope of 1 to 1, 6 feet high, and 10 feet thick at top.

On Herring and Roanoke islands and the banks, the dam to be constructed of an embankment of earth 12 feet thick at the base, 4 feet at top, and 5 feet high; the slopes and top to be protected from abrasion and from washing by a covering of stone, of which no danger of sinking need be apprehended, as they will not be disturbed by the sea. We have evidence of this in the stones now to be seen, when the water is calm and clear at Ballast point, 3 miles above the site of the dam.

The bottom, as I have ascertained by borings in Croatan and Roanoke sounds, consists of a mixture of sand and soil, affording a foundation for the dams, and a good consistency in which to drive piles.

The timbers to be covered in earth; in which situation they will be entirely secure from the ravages of the worm.

It will be necessary to use a dredging machine, to remove the deposi-

tion which has taken place in the channel of Roanoke sound since the closing of the inlet.

I propose leaving the width of the inlet to the regulation of the refluent waters, with a full conviction, from what has been before stated, that a revetment of stone will not be necessary, and that it will not exceed a width due to a depth of 15 feet; and also, after designating the site of the inlet, by excavating the sand for a width of a mile, and a depth corresponding to the level (nearly) of low tide, to make use of the current for its removal—taking advantage of the greatest elevation within and depression without.

To bring the necessity and importance of this project more fully into view, I beg leave to avail myself of the following extracts from the report of a select committee to which this subject was referred in 1830:

"The place where the contemplated inlet is proposed to be made is at the southeastern extremity of Albemarle sound, a body of water nearly sixty miles in length, and averaging from ten to twenty in width. The sound is of a medium depth of water, from twenty to twenty-five feet, and receives into its bosom the tributary streams of Currituck sound, North river, Pasquotank, Perquimons, Chowan, Roanoke, and Alligator rivers. These rivers run through one of the most fertile sections of our country, and form the natural outlet of twenty-six counties in North Carolina and twenty-two in Virginia. In consequence of the closing of Roanoke inlet, the valuable productions of these numerous counties are compelled to seek a market, part in wagons across the country to Petersburg, Virginia, part through the Dismal Swamp canal to Norfolk, and part over Ocracocke bar to the ocean, through one of the most difficult and dangerous navigations in the world.

"The committee are fully impressed with the vital necessity of this inlet to a large and populous section of the country, and of its great national importance to the trade and commerce of this Union.

"The area of the country that would be immediately benefited by it contains seventeen thousand square miles, and a population of nearly half a million. The only outlet of any importance from Albemarle now is over Ocracocke bar—a distance of sixty miles from where Roanoke inlet formerly was: so that a vessel going to the north has to perform a voyage of 120 miles to get upon the same parallel, to pass through a difficult and narrow channel, and to encounter the dangers of Cape Hatteras, where, perhaps, there are annually more shipwrecks than upon any point of the coast of America. Taking the amount of the shipping employed in the Albemarle at what it has been estimated, (viz: 100,000 tons,) we may arrive at some knowledge of the losses annually sustained at Ocracocke bar and the intermediate navigation. The charge on vessels for lighterage and detention at the swash averages one dollar per ton, amounting to 100,000; the additional rate of insurance, because of the risk, averages $\frac{3}{4}$ of one per cent., and amounts, on the exports and imports, taking the same at $3,000,000, to $45,000, and on the vessels to $30,000 per annum. This annual tax of $175,000 upon the navigation of this section of the country, independently of the other evils, cannot but enhance the rate of freight, and the cost of conveyance to market: which suggestion is proved by the fact that the price of freight from Norfolk and Wilmington (the latter but one hundred and twenty miles south of Ocracocke) is from 20 to 25 per cent. less than from the towns of Albemarle. Estimating this enhanced

freight as a tax upon produce of 6 per cent. only, we can fairly charge to the defects of this navigation an annual positive loss to the country of $355,000. From the causes heretofore alluded to, this estimate is rather under than over the fact. When, therefore, we take into consideration that the farmer ultimately pays all these charges in the diminished value of his products, we easily account for the fact that the same articles of produce on the waters of the Albemarle are from 15 to 30 per cent. of less value than upon the Chesapeake. In estimating the utility of this undertaking, it is proper to take into consideration not only the loss now actually sustained, but also what would be the probable advantages of its accomplishment. The country bordering on Albemarle sound, from its general fertility and its numerous navigable streams, affords as great facilities for an extensive and profitable trade as any section of our country. It must be evident to all that, from the operation of various causes, the coasting trade, to which this section is particularly adapted, must, for the future, be the great nursery of seamen and the most important branch of our commerce.

"North Carolina has more shipping employed in the coasting trade than any State south of Maryland, except Virginia; and when we reflect that the commerce of Albemarle alone employs five times as much shipping as belongs to the whole State, it is correct to suppose that, were the resources of the country developed, the quantity would be greatly increased.

"The whole enrolled and licensed tonnage of the Union amounts to 831,000 tons, nearly one-eighth of which finds employment in the northern counties of North Carolina.

"It is impossible to place a limit to the advantages which might result from the clearing out of this inlet. It would be the opening of a new theatre to a branch of the navigation of our country as extensive as it would be nationally important."

The opening of Roanoke inlet is a subject which has long and anxiously engaged the attention of the authorities of the State. It has been frequently brought before Congress, and I believe no work presents stronger claims to the patronage of the General Government.

I am happy to have it in my power to corroborate the statistical statements of the committee. The register of Capt. Pew, keeper of the Roanoke marshes light-house, numbers 1,450 vessels, passing and repassing, during the year ending 31st December, 1839, making the shipping about 100,000 tons, the amount assumed by the committee; which, although remaining the same, shows, for that reason, a considerable increase when we consider the great tonnage withdrawn from this trade by the facilities afforded by the Petersburg and Portsmouth railroads—the former of which went into operation in 1833, the latter in 1836.

The amount of property and lives lost on the coast immediately adjoining the inlet, for a distance of 15 miles on each side of it, presents a frightful list, and a strong appeal to the protection and humanity of the Government.

Between the year 1824 and the present period, there have been (as nearly as I could ascertain) 112 vessels wrecked, which, averaging 50 tons each, would make, together with the cargoes, a loss not much short of $350,000; and with these vessels 224 souls have found a watery grave.

This list, fearful as it is, would be greatly swelled if we had the means

of adding to it the number of vessels wrecked on the remainder of the adjacent coast and off Cape Hatteras, in consequence of being compelled, by the closing of Roanoke inlet, to encounter the hazard of passing this dangerous promontory.

Throwing out of view the advantages to the commerce of the country, as a harbor of refuge from storms, in time of peace, the opening of this inlet is an object every way worthy of the nation; and, in time of war, there is no point on the whole coast where a harbor would be more useful, and where one is so much needed, not only for the refuge of coasters from the enemy, but, in bad weather, for privateers, and the smaller-sized armed vessels acting offensively.

In forming my opinion, and in framing this report, I have consulted some of the ablest engineers in England, and a variety of the best authorities extant, (with whose views I have made free use, when in accordance with my own,) and have availed myself of the reports of the engineers preceding me, in inquiries into the practicability of opening the inlet.

A plain statement of facts, with the obvious deductions therefrom, has been my aim, discarding all refined theories and abstract speculations, as unbecoming, and, indeed, derogating from a subject involving so many important, grave, and interesting considerations.

Accompanying this is a map of the survey I have recently made, and also some charts, drawn by the commanders of the expeditions fitted out by Sir Walter Raleigh, which I obtained from the admiralty office and the library attached to the museum in London, which will be found curious, interesting, and somewhat useful, and also some notes, having a bearing upon this subject, from the best authenticated history of the discovery of this portion of the coast, and the various colonies planted on Roanoke island.

I am, gentlemen, very respectfully, your obedient servant,

WALTER GWYNN, *Civil Engineer.*

NAG'S HEAD, *May* 27, 1840.