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LETTERS to the Editors must be post-paid.

REPORT of CHARLES B. SHAW, Esq. Engineer of the Literary Board, on the Drainage of the Swamp Lands of North Carolina.

To the President and Directors of the Board of Literature of North Carolina :

GENTLEMEN : - A period has arrived in he operations preparatory to the Drainage f the SWAMP LANDS, which makes it necessary to submit a memoir of the Surveys and Examinations, and to suggest for your consideration the plans and estimates which have been deduced from them.

On the reception of your instructions to hat effect, such instruments were purchased as were necessary for the commencement of the work, and as soon thereafter as practicable, a corps of assistants procured for the surveys.

Pending the organization of field parties, examination was made in the county archves at Hyde Court-house, for evidence of title, on the part of the State, to retroceded lands. The only deed of that descripto his Excellency Gov. Williams, for a large tract of 56,000 Acres, lying in the rear of the front patents on the east side of Pungo River, forming a part of a large tract of 200,000 Acres granted to John Hall, in 1795, known as the Hall Patent, and subsequently the property of John G. Blount, dec'd, to whose heirs & to Messrs. Small. wood and Donnet, the remainder of it now

A connected chain of title exists in the Hyde county records, from the State, thro John Hall, J. G Blount and Edward Harris, to William Orr, for whose taxes the aforesaid tract of 56,000 Acres was sold and duly conveyed to the Governor, for the benefit of the State, on 1st Sept. 1801; and the same is now on record in the Office of the Secretary of State.

Among the deeds transmitted to me by the Board, from Raleigh, are also sundry re-conveyances of large tracts in Tyrrel county-one in particular for 40,000 Acres, on the West side of Alligator River, and East of Alligator Lake, and a second for 22,000 Acres of reverted land, lying near Pungo Lake, known as Jones & Davie's Patent. This latter tract lies North of the 56,000 Acre tract in Hyde. There is also good reason to believe that 40,000 Acres of land, never granted to any individual or company, wift, upon examination, be found South of Alligator Lake, forming in part the North boundary of the Hall Pa-

It thus appears that no less than 158,000 Acres of land, belonging to the State, lie contiguous to, and are more or less injured by the redundant waters of Pungo and Al-Lakes. The drainage of these Lakes, or a reduction of their waters, appeared therefore to be an important preli minary to any attempt at reclaiming the State lands, and examinations for that pur-

head of the Canal, upon which the depth dant diseases. of water did not exceed a foot, made it e-

mine how it could best be accomplished. These examinations were the first untlertaken, and in obedience to your subse-

River. A small Canal, constructed at pri- ed to. very dense underwood of gall berry, fetter- feet. The survey was made upon the Ca distance of 7 miles, as ascertained by our cost about one half dollar. From 500 to 600 the survey before made to Alligator Lake,

require it, the information necessary to the lage, in good seasons, 8 or 10 barrels of completion of that work.

nicated in another place.

remarks will be offered, explanatory of the moving the earth. position of these Lakes and their effect upon the immense wastes which surround similar to those allready described—the dis- and the Bay. A proportion of the expense sand was absent. Sand would be more few places, less than 9 or 10 feet. At the ground, their sites having in all probability, and the fall 4.329 feet. Alligator River was of the land under the existing law, altho' growths of aquatic and other plants have and of a very variable depth and width, al- cube yard per second must be the increased by degrees still further elevated their mar- together unsuited to the rapid conveyance capacity of discharge for each additional ters are returned, the loose spungy charac- fast as it is descended. ter and great capacity for moisture of a waters to a distance that would be incredi-

Free evaporation from the general sur face of these vast solitudes, is almost impossible from their umbrageous character; it is probably not more than half that which occurs in cultivated districts. The excess of moisture must consequently either be taken up to supply vegetable growth, or escape by slow filtration to the nearest stream whose dull meanderings are at variance with all the purposes of artificial drainage. After long continued rains, or under the influence of high winds, the Lakes overflow, and their contents are suddealy poured upon the already half submerged swamps; a continued motion, or press as it is termed, of the water, then takes place in the direction of the greatest de clivity, until it reaches the vicinity of cul tivation, where, the soil being of a less permeable nature, and sometimes more depressed, water accumulates to the depth of several feet, notwithstanding the greater la cilities there afforded for its discharge and evaporation. The duration of this evil is increased, though its intensity is no doubt abated, by the slow arrival of these redun-The special appropriations by the Legis- the shape of natural streams, are compelled Canal is about 20 feet wide and very shal- hours, and could the same head be maintain- The dismal between the River and Lake fall. In ordinary rains, the velocity with ing Lake Mattamuskeet, had been expend- may find exit. From these two causes, lapsed. The water is very shoal at its head, the time would be nearly doubled, however, after the reduction of the waters of Alligator of swampy districts must be many times ed, just previous to my arrival in that dis- slow evaporation, and almost imperceptible and for a variety of other reasons, not ne- in consequence of the continued reduction and Mattamuskeet Lake, the piney savan- less than in a country under cultivation, trict, in the enlarging of a Canal before drainage, result an autumnal and winter cessary to enumerate, I consider this the of the head, unless a more rapid discharge nas near Alligator River may be cultivated both from the retarding causes above menexisting from Lake Landing to Ysocking climate of uncommon humidity with the least eligible of the several proposed loca- be afforded by an increased width at the in Rice, there being no doubt that the head tioned, and the general inequality of the Creek. The Canal had already been open- concomitants of rheumatism and pleurisy. tions. ed, and the water of the Lake was slowly in summer, the conjoint effects of heat and subsiding; but an extensive shoal at the moisture are felt in malaria and the atten-

vident that, below that depth, the Canal removal entirely, or in part, of the contents of it was necessary to purchase the right of could have no effect, except by its exten- of these great elevated basins, by Canals way and the previously existing smaller sion through the shoat to the deep water of or artificial rivers, which shall at the same | Canal. As regards the actual labor perforthe Lake. The undoubted property of the time receive the surface water of the coun- med there, I should suppose, from a very Literary Board in the Lake flats when re try. Their greater inclination, resulting rough estimate, that it could not be less than claimed, the probability of their re-imburs- from their directness, their regular form 76,000 cube feet yards of excavation, of ing any expense incurred in their improve- and the secondary Canals, to be construct- which the cost was something less than ment, and the certainty that the Ysicking ed as the sales of public lands progress. \$5,000. No complaint can be made on the Canal could not effect that purpose, occa- will reduce the lands contiguous to a suffi- score of economy, but it is much to be resioned the institution of surveys, to deter | cient dryness for all the purposes of agri- gretted that the appropriation had not been culture. The clearing and cultivation of the lands will remove in part, if not entirely, the sources of disease; and their unquent instructions, were made with much exampled fertility, when reclaimed, will afford ample means of subsistence at home, Among several modes which suggested to those who are now compelled to seek it hemselves for drawing off the Lake wa- in new and remote territories. I have no and their exhausted means, they cannot acters, was that by a Canal from the North purpose to occupy your time with descripside to a remarkable bend of Alligator Ri- tions of the swarip region, already well ver, where an enlargement and an increas. known from the Memoir of Judge Murphy, reception of the diluvial matter deposited taking for granted that what has been so as it is called, in Ysocking Creek, and exby the Canal without interruption, at least often described is now well understood. I tending that Canal to the deep waters of the greater fall from the Lake when the lower this line would strike the Lake, the genes New Jersey, Ohio, Tenn., and Kentucky, for many years, of its discharge, and with- will proceed at once to a brief detail of the Lake; but I consider it too devious, even sections of the Canal were not filled. If

vate expense, extended nearly the whole Spencer's Canal was constructed for the the Lake. distance, and afforded great facilities in the improvement of private property, and comexecution of a survey which must otherwise mences half a mile from the north margin Lake Landing, is the boldest part of the have progressed very slowly, from the ne of the Lake; its width is 10 feet, its length Lake shore. The depth of 5 feet may be annum, and one-fifth be added for contract.

bushes, and brambles, mixed occasionally nal bank. At the point of commencement | survey, there are two Bays of Pamlico cube feet per day is the ordinary work of to determine what the true direction of the with reeds. This route is known as that soundings were extended in a straight line Sound, one of which, East Bluff Bay, was ditchers in this country, according to the South boundary of the tract should be. The of Spencer's Ditch. A second line which into the Lake. Five feet water was found sounded and exhibited a depth of 5 feet with- character of the ground. Taking the mean line was afterwards, in that way, found to solicited examination and presented simi- at the distance of 300 yards, and that depth in a few yards of the marsh—the harbor of the two, the mere excavation of each bear N. 37° 23 E. which is the most lar exemption from the difficulties which is not increased more than one foot at the capacious and secure, and having a general cube yard would be nearly three cents .- Northerly line that would at all touch the usually attend swamp surveys, was that of distance of a mile from the shore. Within depth of 6, 7 and 8 feet. West Bluff Bay Supposing the two banks to be 20 feet wide Lake, and consequently gives the natural Blount's Ditch, extending also from the a few yards of the Lake the land rises about North margin of the Lake to Alligator Ri- a foot and a half. An alternation of very ver, and distant from Spencer's Ditch as gentle ridges and depressions succeeds for Point. It is also reported to be shoal and upper end will be about 42 feet, and 51 at posed line. The State tract was originally bout 3 miles at each end. The third line nearly 21 miles, the variation either above less secure as a harbor. surveyed was that of the large Ditch at the or below the Lake level seldom exceeding side of the Rosebay Turnpike, extending a few inches—the greatest depression being from the West end of the Lake to Rosebay fifteen inches. The declivity towards Alligator River, is afterwards more rapid. -The line of the Ysocking Canal was also The first half mile is chiefly cultivated. surveyed and levelled, and soundings were and if thoroughly reclaimed from water, taken of its depth, with the purpose of af- would be unsurpassed in fertility, producfording to the Commissioners, should they ing at present with the most careless til-Corn to the Acre. The two miles succeed-A random survey was also made from a ling are heavily timbered, as is generally deep part of Lake Mattamuskeet, opposite the unimproved belt of land around the James McCloud's house, to East Bluff Bay. Lake for the same width-the growth by and triangles were thrown across East and ing cypress, black and sweet gum, and ma-West Bluff Bays, whereby the direction ple, with a luxuriant undergrowth of vines and length of Canals between them and the and flowering shrubs-Laurel & bay trees, Lake might be determined with all suffici | with an undergrowth of gall-berry and fetent exactness-avoiding thus the difficul- ter-bushes succeeded followed by an extenhave rendered it impossible to complete the ter-bushes, and interspersed with dwarf perimeter of the bottom and sides would be expended between the construction of the by the waters of Pungo Lake. A line of ties of penetrating the dismals, which would | sive savanna overgrown with reeds and fetsurvey before the re-opening of spring, and pines. These savannas are frequently demight pestpone the work, should it be found vastated by fire; at other times they afford expedient to undertake it, to the next year. a valuable range to cattle and droves of Surveys and Levels were subsequently hogs. The total fall from the surface wataken between Pungo River and Pungo ter of the Lake to the ordinary water of inclination and mean depth, would be about was first made of the Lake margin; after supplied with water from the Swamps in Lake, and a line of exploration run into Alligator River, is 4.818 feet. The reeds two and a fifth feet per second, which mul- which, soundings were taken at the depth that direction. From the head of the race, the State tract of \$6,000 Acres, to ascer- on the margin of the River indicate an oc- tiplied into the area 2121, and afterwards of 31 feet which were surveyed by trian- the levels were continued until they reached tain its character and capability of being casional rise of 2 feet above this point, the' divided by 27, to reduce it to cubic yards, gulation; and the quantity included be- ed the flood waters of Pungo Lake, which, drained, and the proper plans for that pur- during the flood of August last, the rise was gives 174 as the quantity per second drawn tween the present and lower margin, deter- at that time, covered the country for two pose; the results of which will be commu- probably 4 feet. The soil is easy of exca- from the Lake. This Canal would pass mined by the difference of the two areas. miles from its margin, being 17 222-1000ths vation, but difficulties exist in regard to through the lands of Blount, Donnel, and Before describing in their proper order the removal of the timber, and the inter- Smallwood and others, now quite unim- land auger to the depth of several feet at be but little fall to Pamlico Sound. the details of these several operations, a few ruption of water during the process of re- proved, and its capacity would require in- every sounding station. In some instances The Southern end of the tract is, in fact,

be considered the termination of Albemarle dimensions would give a discharge of 293 Sound. It will be seen hereafter, that Pam- cube yards. lico Sound is about 51 feet below Mattamus- An enquiry will now arise, whether some

ted for draining the Lake. The fund appropriated was evidently insufficient to ac-The evident remedy of the evils is, the complish a work of that magnitude; a part larger, thus affording more latitude to the Commissioners in the selection of a suitaable line. It does not become me to anticipate their report, but I believe it is now conceded by them, that with an extensive shoal existing, at either end of this Canal, complish their object.

about \$2,500 in removing the Mud Shoal, rapidity which would result from the more have required. It was considered doubtful an opinion in favor of this bill. The States out impediment to the navigation of the results of the several surveys before allud- after those improvements, and of too irre- these Canals be executed, they will probably too much to the North. It was neverthen their members to vote against it. Mary-

cessity of penetrating an all-pervasive and 5 miles, and its depth varies from 11 to 2 had 200 yards from the margin. At the ors' profit, the daily labor of a slave will muskeet Lake, connecting thereby with majority of 66.

is divided from East Bluff Bay by Pungo at top, with a slope of one and a half to one, boundary required, with the least possible Bluff, and is more remote from Cypress the mean distance of transportation at the invasion of the Hall tract East of the sup-

to deciding on the location, I would recom- yard becomes 91 cents. the water surface, with 5 feet depth, would lue cannot but exceed the expenditures, even The North Western corner, and thence comprise an area of 2124 square feet, the after deduction of interest upon the capital nearly to the centre of this tract, is flooded 55 feet, and the division of the former quan- | Canal and the sale of the land. tity by the latter, would give its mean depth, To ascertain how much good land would on Pungo River, to Pungo Lake, using for or what hydrodynamists term the radius of be laid dry by the operation of draining its great convenience the banks of Mr. its section. The velocity generated by that down 31ft. below the present level, a survey Clark's head-race, by which his Mill is Upon Blount's Ditch, appearances were lated quantity of water between the Lake a deep vegetable soil, but in most instances points 13 feet above tide, probably, in a They invariably occupy the highest tance from the Lake to the river but 8 miles, would have to be defrayed by the owners | generally found at the surface of the soil, | greatest elevation, a forest of Canes 12 or once been firm ground, and their basins ex- surveyed between the mouths of these two the land reclaimed by the operation from the cavated by the action of fire; successive ditches, and found to be extremely crooked, Lake would alone authorise it. About one gins, and made them the receptacles of of water. Spencer's Canal is the most sui- square mile of improved land; and to pro- detract from the value of the soil. Some of redundant vegetation. The North end of pluvial water from the adjoining swamps table location on the North side; the River vide for improvement on each side of the clay and red ashes are also found at the the tract between Pungo Lake and the front in rainy seasons. To these swamps, in the at its termination being 15 feet deep, and Canal to a distance of 2 miles, that the mardry weather which may succeed, their wa. 15 feet wide, its width augmenting very ginal lands might be drained without diminishing the flow of water from the Lake, The tides as they are called, are mere the discharge at the mouth of the Canal purely vegetable soil, attracting the Lake accumulations of water under the effects of must be 314 cube yards per second. This Northerly winds; in calm weather the River would be nearly accomplished, by making ble to those unacquainted with such locali- has probably very little fall before Spen- the Canal 60 feet wide at bottom and 75 at cer's Canal, the termination of which may the water surface, at its embouchure. Such completion.

keet, whence the difference of level of the economy might not result from making the two Sounds is ascertained to be 7 tenths of process of draining the Lake more gradual, Acres supposed to be State property. a foot, and not 3 feet as heretofore suppos- thus giving the Canal only such dimensions ed. This result was to have been expect- as will drain off the Swampy waters, and ed, as a fall of two feet from Albemarle to preserve the reduced level of the lake, after and is elevated above it 8 281-1000ths ft .-Pamlico Sound would create a constant and it shall have been attained. Supposing the It is consequently 4 feet above Lake Mattaunstable current through Croatan Sound; Lake waters to be lowered nearly to the muskeet, and 91 feet above mid-tide of instead whereof, it is at all times scarcely Canal bottom, upon the occurrence of rain, Pamlico Sound. It was surveyed by trias soon as the Canal was filled, there would | angulation, and found to contain very The Rosebay Turnpike Canal was next be a heavy press of water back into the nearly 5,000 Acres, but little of which surveyed. This is at the West end of the Lake, which would continue until the Ca- would be reclaimed by a reduction of the consequently, for the complete discharge Lake, the distance nearly 4 miles, and the nal water subsided below the Lake level .- Lake waters 5 feet as is contemplated .fall 4.78 to a stake which is about 8 or 4 The quantity of water so discharged into the The benefits proposed to be attained from canals, both principal and secondary, must tenths above the ordinary water of Rosebay Lake, would but slightly affect the level, that operation would be general, however, have a capacity of discharge equal to 1 cube Creek; 5.20 may be assumed as the fall, and upon the discontinuance of rain, the in regard to the large tracts of public land yard per second, for every square mile the greater part of which occurs in the last flow from the Lake would recommence .- on the South, the North-East and South- which they are intended to drain. For a fall mile, for which reason the depth of cut The Lake has been found, by my recent West of the Lake. A belt of land from of 2 inches, their capacity must be doubled, would be greater on the average than on survey, to contain 36 square miles. One two to three miles in width, would also be for 3 inches tripled, &c. This calculation other lines of greater declivity. Between inch depth upon a square mile, requires a rendered susceptible of cultivation. But applies to lands under a complete system the Lake and Rosebay there has been an drain capable of venting one cube yard per the conclusive argument in favor of this of drainage, where, by means of secondary extensive juniper swamp, indicating a san | second, for 24 hours. A Canal which would | drainage is its being indispensible as re- drains and water furrows, and the removal dy bottom, and I have heard that quicksand drain 174 cube yards per second, would re- gards the valuable tract of 56,000 Acres on of roots; morasses and other obstacles, the was encountered in digging the Canal. The duce its waters one-fifth of an inch in 24 Pungo River, of which I shall next speak. water may be discharged as fast as it may to seek low and soft places whereby they low, its banks having in many places coled, would discharge 60 inches in 300 days: contains some valuable jumper timber, and, which water is discharged from the surface Ysocking Canal is that recently construct terrupted efflux may be afforded to the Lake | below the present level, when the press of to be filled up to the general level, before

If we suppose that by the expenditure of ceased. a small sum upon the Ysocking Canal, it

the lower end, averaging 46 feet, in which sold to Wm: Orr, and divided from the The examinations which have been made distance 3 men will easily transport what Hall Patent in the deed of conveyance by

Canal 35 feet at bottom, and 50 feet at the Lake, will be 10,000 Acres, and the va- ances on the State Map.

a few inches of sand were found overlying heavily timbered, and is elevated in some

of Alligator River to Alligator or New Lake, able fertility when reclaimed: it possesses to ascertain its level and position. This a vegetable soil some feet in depth, with a survey passed though the tract of 40,000 clay bottom. In regard to the present con-

River, near the mouth of Blount's Ditch,

The Southern boundary of the 56,000 can be made to discharge half the quantity | Acre tract, as defined in the Sheriff's deed of that to East Bluff Bay, their joint effect to Gov. Williams, is a line running N. 30° rains, but is even then very considerable. would accomplish the reduction of the Lake | E. 4 miles to Alligator Lake, which line 41 ft. in about 300 days; and supposing that commences at a stake which was, at that general explanation. In the extraordinary a warm summer should evaporate one foot time of the first survey, N. 30° E. 4 miles flood of August last, preceded, as may be more of water than fell in the same time up- from a certain gum tree at the head of Ruton the Lake, its waters might be reduced 41 man's Creek. This Gum was one of James ft. in eight months, and 31 ft. below their Wilkinson's corners, and easily pointed tained by careful measurement at the time, present level in less than two-thirds of that out by persons in the neighborhood. A time, or about 160 days; the precise period random survey from the deep water at the would vary according to that of the rapid confluence of the Creek and Pungo Rivers; evaporation, and whether it take place at was made to this tree, whence the required ted 2 inches by the influx of water from the commencement or latter part of the pe- line was run without deviation for 34 miles, riod of discharge. If the dimensions of the but was abandoned in consequence of un-Canal be restricted to a width of 60 feet, a favorable weather, and the great difficulty slight diminution of the discharge from the of progress, on account of the thickness of Lake would occur during the heavy rains, the undergrowth, which, for the purpose which would, however, be more than com- of levelling, was necessarily removed to a fact, that South Carolina is the only State I would recommend the expenditure of pensated at other times, by the increased greater extent than a mere land survey would that has, through its Legislature, expressed gular an inclination and section, to drain be undertaken by the slave owners in the less thought expedient to run the line a land, Indiana, Massachusetts, Vermont and neighborhood, where the yearly value of a portion of the way, with a view to examine Delaware, are beyond all question as firmly At Cypress Point, four miles West of slave's labor varies from 80 to 90 dollars. the general character and level of the tract, opposed to it. Add these to the instructing

of Lake Mattamuskeet, have satisfied me 2 can excavate. The removal of 2 cube the aforesaid line, bearing N. 30° E. to the that it ought to be drained; and, from the yards would thus cost 15 cents, or 72 per Alligator Dake. The proprietorship at that information as yet obtained, a Canal from yard; but one-fourth must be added to this time was in Judge Edward Harris, and Cypress Point to East Bluff Bay, would estimate for idle days and loss of time from no reasonable doubt can be entertained of a best attain that end. Previously, however, bad weather, whence the price per cube right to draw a line which shall touch the Lake. Whether the quantity of land will mend an examination of the Harbors of The area of a section taken midway be exceed or fall short of that specified in the West Bluff and Mount Pleasant Bay. The tween the head and mouth of the Canal, deed, remains yet to be ascertained. The total fall from the Lake to Pamlico Sound, supposing the average cut to be 51 feet, original deed to John Hall calls for so as ascertained by the levelling of Ysocking | would be about 34 yards; which would give many natural boundaries; that a correct map Canal, is 51 feet to mid-tide; this fall. in a as the cost of one mile, at 91 cents per cannot be made from it: some new surveys distance of 7 miles, will give an inclination | yard, \$5,682 80-100ths, and for 7 miles the | must be resorted to. I should not, howto the bottom of the Canal, of 78 100ths of sum of \$39,776 60-100ths. The quantity ever, expect the quantity to vary much a foot, or decimally expressed 0.000156. of good land, which will be reclaimed from from that specified, judging from appear-

The Lake bottom was also bored with a feet above Pungo River, whence there can

that being more exposed to the attrition of 15 feet in height, give the best evidence the water, whereby the vegetable matter which could be desired of fertility. The would be removed, and the sand, from its | timber is of the description most indicative greater weight, be left behind. The quan of fertile soil, and the luxuriance of the tity of that matter must rather add to, than undergrowth unequalled even in this region Lake bottom, intermixed with vegetable patents, is one extensive bed of maiden matter. All the soundings are properly reeds, and its general elevation is from 12 registered, and, with the other field books, to 17 feet above tide; fire has repeatedly preserved for your inspection. A general swept over its forests, and the Lake waters Chart is in preparation, exhibiting all the have subsequently so often and constantly operations of the season; it will be trans- overflowed it, that reeds alone have sucmitted by the first opportunity after its ceeded them. Draining alone is necessary to make the land valuable; the whole of A survey was also made from the head this tract is thought to promise considerdition of this and other Swamp regions, it This Lake is 42 miles from Alligator may be remarked, that there is no want of a general declivity to carry off the rain water, but of channels into which it may flow; artificial rivers must be formed where nature has not provided them. Que inch of water falling upon a retentive soil, upon one square mile, is equal to 86,044 cubic yards; a day contains 86,400 seconds; of a rain 1 inch deep, upon a level, the lower end of the Canal, whereby an unin- of the River must be reduced some inches surface, all concavities having of necessity water from those two Lakes shall have a discharge of their waters can commence, except by slow filtration, through a spongy soil. The retardation of the effluent water is not so great in heavy as in moderate waters of Lake Mattamuskeet, as was ascerwithout intermission 36 hours; and after the cessation of rain, the rise was augment

(To be concluded next week.)

The Sub-Treasury .- It is a remarkable

Fausteville Observer