

THE WEATHER:

Partly cloudy tonight and Thursday. Light N. E. Winds.

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Present City Water Supply Condemned Report of Expert J. L. Ludlow Recommends Point Near Brick House on Pasquotank River as New Source.

Water Company Promises to Conform With Requirements Named in Report to Furnish Good, Portable Water as Soon as Possible.

The board of aldermen held a special meeting last evening in the municipal building to accept the report of Mr. J. L. Ludlow relative to the water supply of this city.

The report of the committee and that of Mr. Ludlow, which appear below were read and discussed at length by the committee and the board, and they were finally adopted.

Following are the reports:

Elizabeth City, N. C., July 25. To the Honorable, the Board of Aldermen of Elizabeth City:

The undersigned committee, appointed by your Honorable Board on June 5, 1905, to investigate the trouble and failure of the Elizabeth City Water and Power Company to supply water to the city as per its contract of June 1, 1903, and report to the Board such action as we deemed advisable looking to a rescission of said contract or the proper method to compel said Water and Power Company to fulfill its part of said contract, respectfully submit the following report:

Your committee secured the services of J. L. Ludlow, C. E., M. S., consulting municipal, sanitary and hydraulic engineer, of Winston-Salem, N. C., to make a trip to Elizabeth City and examine the water plant of said company and the surrounding situation and report to your committee such defects, if any, in the water plant and water supply to the city as he might find upon such investigation committee fully in the matter as to whether the water company was complying with its contract and, if not, to make such suggestions as would enable him to do so.

Said Ludlow had made his report to your committee, a copy of which we herewith submit with this report. We also submit an extra copy of his report which we would suggest that the board have served upon the officers of said Elizabeth City Water & Power Company.

Upon considering the report aforesaid your committee have reached the conclusion that the said Water & Power Company has not complied and is not complying with their contract to provide and furnish to the corporation of Elizabeth City an adequate supply of good, wholesome, potable water, suitable for all domestic purposes.

We further conclude and recommend from the report aforesaid that the best place for the Water & Power Company to get its supply of water would be from the neighborhood of what is known as Brick House on Pasquotank river, distant about five miles from the city up the river and that the company can furnish water according to its contract by mechanical filtration, adding lime to the water in order to increase its alkalinity and subjecting the water to both the lime and alum or iron treatment as recommended by said Ludlow in his report to your committee.

It is evident from the report of Mr. Ludlow supported by the report of Mr. Geo. C. Whipple, whose chemical and bacteriological analysis of the water company this report, that the present point of intake on Knobb's Creek is totally undesirable for the reasons shown in said report as all features of contamination are higher there than at any other point from which samples of water were taken, while at Brick House on Pasquotank river the analysis show the same to be decidedly lower or totally absent. We take into consideration in recommending this point the future growth of the city and the fact that the existing contaminating features in the water would be eliminated by going higher up the river and the brick house.

We would further submit to your Honorable Board that according to the contract we were to pay said J. L.

Ludlow \$250 for his services in this matter and in addition the fees of the said Geo. C. Whipple amounting to \$60 for his chemical and bacteriological analysis of the water and \$3.70 expressage on samples of water shipped him; also that your committee employed the services of a boat to take Mr. Ludlow and committee up the river and creek to investigate conditions and get samples of water for which they agreed to pay the sum of \$5.00; all of which bills are hereto attached and made a part hereof and we recommend that you approve, allow and pay same.

Respectfully submitted, H. T. GREENLEAF, Chairman. H. D. WALKER M. D., I. FEARING M. D., J. HEYWOOD SAWYER, C. E. THOMPSON, Committee.

Winston-Salem, N. C., July 19, 1905. Messrs. H. T. Greenleaf, Chairman, Dr. H. D. Walker, Dr. I. Fearing, C. E. Thompson and J. H. Sawyer, committee, appointed by the Board of Aldermen of Elizabeth City, N. C., to investigate the character of the public water supply, Elizabeth City, N. C. Gentlemen:—In compliance with your instructions to make an inspection and examination and report on your water supply, I have the honor to report as follows:

I spent June 26th, 27th and 28th in your city, and carefully looked into the water supply situation in all its phases from a sanitary and health standpoint. At a conference with the full committee on the 26th, the general situation was discussed and an examination of the contract was made wherein I find the following provisions:

"The said water company shall erect and complete a first-class, up to date water plant, to be supplied with good, wholesome, potable water, suitable for all domestic purposes."

Also, "That the said water company covenants and agrees to provide and furnish to the said corporation (Elizabeth City) an adequate supply of good, wholesome, potable water, suitable for domestic purposes as aforesaid."

On the 27th inst., I was taken up the Pasquotank river to what is known as the Brick House to see the character of the drainage area of the river and to collect samples for chemical and bacteriological analysis. I secured one from the river at a point near the site of the Brick House and another of the river water near a point known as Lamb's ferry. I was then taken up Knobb's creek to inspect the water shed and the exposures and to collect samples of the creek water at the water works intake and at a point about a mile or more above the water works intake and about half a mile above the county bridge. I also collected a sample of the tap water from a faucet in Sammons & Wood's bakery. Of these five samples I had chemical and bacteriological analysis made by Mr. Geo. C. Whipple of New York, and the results of the chemical analysis and the bacteriological and microscopic examinations are herewith attached.

The primary purposes for which I was called there was to investigate the character of the water supply to determine whether or not it was pure and wholesome and of such quality as required by the contract with the Elizabeth City Water Works Company, but after approaching the matter and considering the great importance of your city of having a pure and wholesome public water supply it seemed proper that I should go further than this and investigate not only the character of the water at present being supplied but the possible methods of remedying the conditions and furnishing a pure and wholesome supply in the event that the water being furnished

Water Company at this time should be found to be unsatisfactory.

The available sources of water supply for your city appears to be two, viz: Pasquotank river and Knobb's creek. So far as general contamination of surface streams is concerned, both of these streams are favorably situated, having their origin in the swampy or so-called "desert" country and passing through the swampy lands nearly their entire length, rendering it impracticable for more than a very sparse population ever to dwell on the water shed so that an excess of pollution due to animal organic matter on the water shed of either of these streams is very remote. There will naturally, of course, be an organic pollution of the vegetable origin due to the swamp growth on the water shed, but this is not nearly so objectionable as would be organic pollution due to a more thickly populated water shed. Both these streams, however, are subjected to the condition so common to streams in the eastern portion of the state, where the cypress and juniper abound, in being heavily stained and colored, rendering the water very objectionable in appearance and to the taste and sight, though not necessarily and probably not directly injurious to health.

In examining these streams, it did not appear to me that there should be any great difference in the character and quality of the waters of the two in the extent of organic pollution, and the difference would probably only be one of degree of color in the water, but the analysis that have been made force me to a different conclusion, viz: that there is quite a natural difference in the character of the two waters.

As stated above, while the color and stain in these eastern waters are probably not wholesome per se, yet they are objectionable in public water supplies and must be removed to such an extent as to appear clear to the ordinary observer, and while this can be done, it is rather a difficult and expensive undertaking.

The analysis of the Pasquotank river water show a very high stain and color, with a large quantity of organic matter, as indicated in the amount of free and albuminoid ammonia, and a reasonably small content of chlorine. It contains very few bacteria, only 90 per cubic centimeter. It is a soft water, and the alkalinity is so low that the difficulty of decolorizing the water is increased.

The water of Knobb's Creek at the water works intake, while not so highly colored as the water of Pasquotank river, still presents a higher degree of pollution from organic matter, with less satisfactory ratio between the free and albuminoid ammonia as well as having abnormally high chlorine content and a larger number of bacteria, viz: 900 per cubic centimeter, including the bacteria coli communis, which is one of the common bacteria usually found in streams exposed to sewage contamination, though it must not be considered as a sure indication of sewage contamination in all cases. The immediate exposure of this stream at the water works intake is very bad, owing to the close proximity of a large lumber mill with its great quantities of bark and sawdust refuse, which is thrown into the stream to decay, as well as the other sources of pollution incident to the workmen around the plant, and is altogether very ill adapted as a site for a water works intake.

The sample of water taken from Knobb's Creek at a point further up stream than the water works intake from the analysis is shown to contain a little less organic matter and chlorine as well as a considerably smaller number of bacteria, but the bacteria in this sample likewise contain the B. coli communis. This sample was taken at a point about half a mile above the county bridge, and altogether shows a considerably better quality of water than that from the present water works intake.

The sample of water taken from the tap in Sammons & Wood's bakery shows about half as much stain or color as the Knobb's creek water, and a large reduction in organic matter and the number of bacteria, but the chlorine still remains abnormally and the B. coli is found among the bacteria. The difference thus shown in this water, however, cannot be altogether due to the use of the filter bed, as it has recently been provided by the Water Works Company in their effort to secure clear water. Such a filter cannot be ex-

pected to fully clarify such a highly colored water, and in fact does not in this case. An important cause of the difference in the appearance of the water taken from the tap and that from the creek is that the tap water does not come entirely from the creek and filter, but is such water mixed with the natural ground water in filtering through the sand soil into the filter gallery. My conviction that this is the case has been conclusively confirmed by samples of water sent me by Dr. Walker of your committee taken on the 11th inst., one from the collecting chamber in the filter bed and one from the filter gallery, which shows about the same difference in color that the analysis show between the raw creek water and the tap water. It should be remembered that the collecting chamber of the filter discharges directly into the filter gallery distant therefrom about 60 or 75 feet, and the water in which would be identical except for the infiltration into the filter gallery.

The problem of providing a good wholesome and potable water supply for your city is by no means an easy undertaking and to be accomplished, the task must be approached with much care and skill, and careful attention to details or purification. The original plan of the Elizabeth City Water Co., viz: to secure the water by direct infiltration through the sandy stretch of soil some distance from the city, would have been a fairly good one had it succeeded, but it appears to have been early determined that the quantity of water available at the site of the filter gallery was very small, and by no means sufficient for an adequate public supply. It also appears that the creek water, though distant only about 150 feet does not find its way to the filter gallery in any great quantity owing to the very fine sand in that vicinity; even if it had, while the water may have been purified from a standpoint of organic matter, yet it is hardly to be hoped that the stain would have been removed. However, it has been demonstrated that a supply from such a source cannot be had, neither does there appear any good reason to hope that a supply might be developed from deep wells, and the logical conclusion to which we must yield is that the available supplies for the city must be the purified waters of either Pasquotank river or Knobb's creek.

At the time of my visit there it was pointed out to me that under certain conditions of wind, a strong wind tide is formed, which backs the water of the river up Knobb's creeks and causes a reverse current in the creek to a point at east to the water works intake and perhaps for some distance beyond, carrying with it the natural pollution due to the emptying of the city's sewers into the river on the margin of the city and natural washings from the city. I must confess that this suggestion did not appeal to me as being very reasonable, at least that any material pollution could obtain at the water works intake from such a cause seemed improbable, but the results of the analysis compel me to modify this view and acknowledge a strong indication that such pollution may come from this cause. As stated above, it would appear that the water from the two sources should be nearly the same, unless there is some immediate contamination in the one that is not in the other, and from the higher bacteria count in the creek water than in the river water and the character of the bacteria and the higher chlorine content and increased organic matter, all of which must be taken as evidence of possible sewage contamination, shows this water to be exposed to some immediate pollution, and the most probable cause of this pollution would appear to be due to the backing up of the waters of Knobb's creek and the reverse current being formed. It is very difficult, however, to conceive of any pollution sufficient to account for the chlorine found in the water, and it is my opinion that this is due to brackish water backing up the creek.

Whether the river or the creek water is to be used, they must be purified before they become a pure and wholesome potable supply, and the natural purification will give the best results as a supply. As indicated above, the analysis of the water from the creek even if it were filtered or so treated, would not make be-

tween the two will have reference to the creek at this point, the present site of the water works intake being considered entirely improper and unsuited for a source of public water supply and should be abandoned. That waters with much worse contamination than the creek water can be and are purified in many cases must be admitted, but this must be kept in the creek is due to the wind tide above mentioned, there is no way of determining at present how much more polluted this water may become when such a wind exists. At the time when I took the samples, this condition did not obtain, and the analysis must be taken to indicate the constant condition of the creek water when it is not directly exposed to this wind tide and clearly representing it in its best condition. While it is true that this creek water may be purified by proper means to a satisfactory degree and rendered good, wholesome and potable supply, yet it is considered wise and good practice to secure a water that is nearest pure before the process of purification is begun.

The method of treating such water as you have to consider has been thoroughly tried and demonstrated in several cases notably at Norfolk, Va. where the water is of about the same natural purity but has less stain and color than has either the water of Pasquotank river or Knobb's creek. The difference between the sand bed or English system of filtration and the mechanical or American type need not be dwelt on at length here, except for the results that experience has shown can be accomplished with such waters. There is no doubt whatever that purification, so far as pertains to removing the organic matter from these waters can be accomplished by either of the systems of filtration, but it may be stated as a positive fact that the color and stain in the water cannot be removed by the most perfect system of English or sand bed filtration, but it must have some chemical treatment such as is in common use with mechanical filtration. In order that by means of some chemical coagulant the dissolved coloring matter, as contained in the water can be gathered together and precipitated and in addition be intercepted and stained out of the water in its passage through the sand bed of the filter. Either of these waters, however, present some difficulties for mechanical filtration by reason of the waters being very soft and of very low alkalinity, not being sufficiently alkaline to absorb the quantity of alum or other coagulant that would be required to clarify the waters. This condition, however, can be remedied by the addition of lime to the water in order to increase the alkalinity, and the water must be subjected to both lime and alum or iron treatment. The plant that would be required to render either of these waters pure and wholesome and suitable for domestic consumption, as called for by consideration of the healthfulness of your community and under the terms of your contract with the Elizabeth City Water Co., must be of the modern and most perfect type of mechanical filtration with a suitable coagulating basin for preliminary coagulation, and have a capacity to give sufficient period of coagulation before the water reaches the filter and must be provided with proper appliance for treating the water with both lime or alum or iron, though more lime will be required in the

Continued on 4th page.

Married Amidst Floral Splendor

Miss Cornie White Became Mrs. John Abbitt Today at 2:30.

One of the most beautiful and elaborate marriage ceremonies ever witnessed in this city was celebrated this afternoon at 2:30 o'clock at the First Baptist church, when Miss Cornie White, one of Betsy's most graceful and accomplished daughters, became the happy bride of Mr. John Luther Abbitt, a well-known young business man of Norfolk, with a most promising future. To make the appearance of the church correspond fittingly with the

gladsome event, all the consummate skill and taste of a large number of young ladies had been employed during the whole day in arranging floral designs around the altar, and the crowds of witnesses who filled the entire seating capacity of the edifice feasted their eyes on an exceedingly handsome scene. There were rare potted plants, the choicest out flowers of the season and large and small ferns, all of which united in one magnificent blending of delicate colors. A massive fern placed on either side of the altar formed a natural arch and under this the ceremony was performed. While the auditorium of the church was filling with people, Mrs. I. M. Meekins rendered in finished style a selection on the organ and Mrs. Mae Guirkin sang "Could'st Thou But Know."

Promptly at the appointed hour the wedding party arrived and after forming in the prearranged manner, the inner doors were swung back, the organ pealed forth and a chorus of fifty voices sang the chorus of Lohengrin's beautiful wedding march, as the procession marched with measured tread to the altar. The bride-elect, looking happy and beautiful, attired in a blue silk traveling suit carrying bride's roses and asparagus fern, leaning on the arm of her uncle, Mr. M. H. White, of Hertford, who gave her away, was preceded by little Miss Dorothy Gregory who carried the ring which nestled in a magnificent floral wreath and was followed by the maid of honor, Miss Willie White, her sister, who was handsomely costumed, and by the bride's maids, who were Misses Cora White and Charlotte Cartwright, attired in white chiffon, and carrying splendid bouquets. The groom entered the church by the side door in company with his best man, Mr. Hunter Abbitt, of West Virginia, and the whole proceeding at the altar, the bride was carried out to perfect the ceremony. C. W. Duke, of the First Baptist church, was the celebrant and performed the ceremony with great impressiveness.

When the mystic words uniting them as man and wife had been pronounced, the party marched out to the strains of the wedding march played by Mrs. Meekins. They were at once driven to the Norfolk and Southern depot where, amidst showers of rice, they boarded the north bound train for Baltimore, Washington and other points of interest to spend their honeymoon. They will spend sometime at the home of the groom at A pamatox, Va., and from there will go to Norfolk, where they will reside at 110 Mariner street.

The happy pair were the recipients of many costly and useful presents, also the congratulations and well-wishes of their hosts of friends.

Appointed Chief Operator.

Miss Mattie Hobson has been appointed chief operator in the telephone exchange in this city and has already resumed the attendant duties. The telephone company thus acknowledged the thorough competency attained by her long service in swiftly and accurately "connecting" any two 'phones in the city. The other operators are Misses Emma Carter and Georgia Pratt and Mr. William Hyatt, Jr.

SALE OF FURNITURE

Notice has been served that on Saturday, July 29, there will be sold all the remaining stock, pictures, etc., of the firm of Sammons & Overton, consisting among other things, of horses, vehicles, etc. The sale will be held at 11 o'clock a. m., at the corner of Road and Fearing streets. At 4 o'clock the same day all the other remaining stock, pictures, etc., of every description, including the horse and wagon of the firm of Sammons & Wood, will be sold in the same way.