GARNETT. (A.Y.P.)

OBSERVATIONS

ON THE

SANITARY ADVANTAGES

OF

TIDE-WATER VIRGINIA,

EMBRACING

VIRGINIA BEACH, AS A WINTER HEALTH RESORT.

BY

ALEXANDER Y. P. GARNETT, M.D.,

EMERITUS PROFESSOR OF CLINICAL MEDICINE IN THE NATIONAL MEDICAL COLLEGE, WASHINGTON, D. C.

presented by the author,

REPRINTED FROM THE

TRANSACTIONS OF THE AMERICAN CLIMATOLOGICAL ASSOCIATION,

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OBSERVATIONS ON THE SANITARY ADVANTAGES OF TIDE-WATER VIRGINIA, EMBRACING VIRGINIA BEACH, AS A WINTER HEALTH RESORT.

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In selecting a subject worthy the attention and consideration of this Association, it might very naturally be expected that the author would confine himself within the domain of climatology, a field so ample in its proportions when contemplated from a scientific and medical standpoint as to challenge all the zeal, labor, and study that we can command for the elucidation of those hidden and unexplored capacities which relate directly to the conditions of human health.

Recognizing the appositeness of this proposition, I have chosen as the subject of this paper, observations upon the sanitary advantages of tide-water Virginia, embracing Virginia Beach, as a winter health resort.

The very fact that the selection has been made of a portion of our country included among the earliest settlements of this continent, demonstrates, at once, how little attention has yet been bestowed upon the subject of climatic influences upon health, in the vast domain of this country, emphasized by the fact that even at this late day with all the appliances and progress of science, added to the extraordinary facilities for obtaining knowledge, we have to rely in a large degree, upon tradition for facts that have a direct and important bearing upon practical sanitation in many populous and long settled regions of the older States.

In so brief a paper as I shall present, it is not my purpose to enter upon an extended analytical discussion of the several factors which may be embraced in the consideration of a health resort, but confine my remarks only to those which go to make up the sum of what is understood by the general term, climate; including topography, soil, humidity, wind, and temperature. For, at least, a century the tradi-

tional belief has prevailed among the inhabitants of tide-water Virginia, embracing the counties of Elizabeth City, York, James City, Warwick, west of the Chesapeake Bay, and the two counties of Accomac and Northampton on the eastern shore of the Bay, that pulmonary consumption was a rare disease—in many of them almost unknown.

It is deeply to be regretted that no systematized record of diseases has ever been kept in these localities down to the present time, thus compelling us to accept such fragmentary information as can be gathered through the uncertain channels of tradition; nevertheless, the observations of intelligent physicians residing within this region during later years go to confirm this popular belief. The whole of this region of country is composed chiefly of a light, sandy soil, at one time almost entirely overspread by extensive pine forest, and, although interspersed by rivers and creeks, whose shores are in many places lined by marshes, the cultivated lands and forests are remarkably dry and porous. These bodies of pine forests, besides affording protection from the cold winds of Winter and Spring, furnish a constant source of terebinthinate exhalations, which can be readily perceived at all seasons of the year, but especially so during the Summer and Spring. With the exception of intermittent fevers, which prevail to some extent along the borders of the streams, this whole region is remarkably exempt from disease. It has been a subject of common observation for many years, that persons affected with pulmonary consumption, when brought to the piney regions of this section and permitted to reside there for a long period, almost invariably improve in health and in many instances get apparently well. In view of the popular theory of the present day, one, indeed, almost universally accepted, that certain altitudes constitute one of the most important and efficient agents in the climatic treatment of this disease, these statements may seem somewhat startling and improbable.

In support, however, of their correctness I have been able to obtain a few statistical facts bearing directly upon this point. These facts show that in the following named counties and the city of Williamsburg, which embrace all territory between the James and York rivers, and from this point to the ocean, including the counties of Accomac and Northampton on the eastern shore of the Chesapeake Bay, the deaths for the years 1881, 1882, 1883, and 1884 were as follows (the list is given with the population of each, as reported in the United States census of 1880):

ACCOMAC.

Population, white	11,841
" colored	12,567
Total	24,408
Deaths in 1881	287
" 1882	256
" 1883	186
" 1884	389
Total	1118

NORTHAMPTON.

Population, white	3389
" colored	5763
Total	9152
Deaths in 1881	117
" 1882	117
" 1883	48
" 1884	45
Total	327

ELIZABETH CITY.

Population, white	4158
" colored	6531
Total	10,689
Deaths in 1881	95
" 1882	122
" 1883	134
" 1884	105
Total	456

YORK.

Population, white	2837
" colored	4512
Total	7349
Deaths in 1881	58
" 1882	83
" 1883	80
" 1884	13
Total	234

JAMES CITY.	
Population, white	2227
" colored	3197
Total	5424
Deaths in 1881	41
" 1882	41
" 1883	50
" 1884	51
Total	183
WILLIAMSBURG.	
Population, white	740
" colored	740
Total	1480
Deaths in 1881	19
" 1882	19
" 1883	17
" 1884	14
Total	69

Thus, we see in these five counties and one small town, aggregating in 1880 a population of 59,300, the average death-rate for the four years above given was, for each, as follows; fractions omitted:

Accomac	274, or 11 to 1000
Northampton	81, or 9 to 1000
Elizabeth City	114, or 11 to 1000
York	88, or 12 to 1000
James City	45, or 9 to 1000
Williamsburg	19, or 12 to 1000

We have an average of deaths in the above counties and towns, from all causes, of about 10.68 to 1000 of population.

The colored population in these counties exceeds the white by 9.818. In the United States Census of 1880, Virginia is divided into three grand groups (See vol. xi., Part 1, *Vital Statistics*), so as to show the percentage of deaths to the 1000 each. These groups are designated Nos. 1, 2, and 3. The first embraces twenty-seven counties on the "Middle Atlantic Coast" with a white population of 136,715, and a colored population of 166,077; total, 302,792.

The second, thirty-seven counties, called "Interior Plateaus and Table Lands," with a white population of 323,541, and a colored population of 340,709; total, 664,250.

The third, called "South Central Mountainous," contains a white population of 420,693; colored, 124,830. Total, 545,523.

The death-rate in these groups is as follows, per 1000:

	White.	Colored.
First group	18.12.	17.47.
Second group	15.27.	20.80.
Third group	11.71.	18.77.

In the eastern, or first of the groups, the colored population exceeds the white by 29,362; in the second, the colored exceeds the white by 17,168; in the third, the white exceeds the colored by 395,863. The average death-rate in the State is for whites 15.05, for colored 19.12.

Now on the Peninsula, and including Accomac and Northampton counties, the death-rate for *both races* is but 10.66 per 1000.

If we take the ratio of deaths among whites and colored in the first group of the State (of which these counties form a part), we find the death-rate per 1000 to be for whites 18.12, for colored 17.47. But the death-rate for *both races*, in the counties above named, is but 10.66, or 7.46 per 1000 less than the average death-rate of the whites in the group No. 1, and 4.39 less than the average of the death-rate of whites in the State as a whole.

We have no means of estimating the actual ratio of deaths between the whites and colored on the Peninsula, but may fairly estimate it on the basis it occurs in the first group of the State, of which they form a part. Thus, we see the favorable showing for this section.

That consumption is a rare disease in this region is clearly indicated by the small death-rate from all causes. An intelligent physician, Dr. R. A. Wise, who has resided at Williamsburg for the last seventeen years, writes thus, when speaking of pulmonary consumption:

"I know of many instances in which the disease has been arrested, or rather a strong predisposition to it has been overcome in this section. The College of William and Mary has had an average attendance of students, counting all the time it has been closed, of over thirty pupils for the last 193 years, a total of at least 5790, and not a single death from consumption has occurred among these while at the college. Only eight deaths have taken place among students at the college, from all causes, in the whole period above named, and three of these were from accidental causes. This information is furnished me by Col. Benjamin S. Ewell, the venerable President of the college.

"Williamsburg is particularly exempt from tubercular disease."

The above statistics supplemented by the experience and statement of an intelligent and capable medical gentleman, necessarily command

a thoughtful consideration by the student of climatology as it relates to disease, and challenges speculation and inquiry into the inherent causes or instrumentalities which exercise these sanitary influences claimed for this region of the State of Virginia.

In considering this subject it has occurred to me that, apart from the local and indigenous conditions of temperature, soil, topography, and forests of this section, the proximity of that vast region of pine, cypress, and fir known as the Great Dismal Swamp, should not be overlooked as playing a possibly important part in the solution of these questions.

Lying immediately south of the city of Williamsburg and about fifteen miles distant, the winds, for the greater part of the year, prevailing from that direction, it is more than probable that they come loaded with the exhalations perpetually going on from this immense forest tract, embracing as it does an area of thirty by ten miles.

Accepting the theory which has been latterly advanced that the important atmospheric principle of ozone is in some way associated with, if not a direct product of pine forests, we may reasonably include this agent as a probable factor in estimating the sanitary influences of the Great Dismal Swamp, but as yet our researches in determining the exact origin and nature of this subtile principle have proved too vague and uncertain in their results to justify us in speaking ex cathedra upon this subject.

Notwithstanding the close intelligent study bestowed upon the subject of ozone of late years, questions of doubt are continually arising on the action and influence of this subject in nature, and whether our ozonoscopic and ozonometric observations are sufficiently exact to be of value. The reactions by which we can detect the presence of ozone are sufficiently delicate and distinctive for that purpose, but the means for determining the amount of ozone and of readily estimating the changes of quantity present in the air at one moment, and that present after an interval, are anything but fixed and satisfactory.

We know that the further we remove from the seashore and its influence, the less the amount and presence of ozone is recognizable. If electricity be really the principal cause of the production of ozone, as Décharmes was convinced of, stating that the curves of atmospheric ozone and of progress of atmospheric electricity were nearly parallel, it might then be possible to get observations more exact.

Variations of atmospheric ozone taken near Versailles, show the following results in many localities:

"1. Dividing the day into two periods of twelve hours each—*i. e.*, from 9 P. M. to 9 A. M., and from 9 A. M. to 9 P. M.—the paper exposed during night is most deeply colored.

"2. Dividing the day into four periods of six hours each of exposure, the result has been shown that papers exposed from 9 A. M. to 3 P. M. display more ozonic influence than is apparent on paper exposed between 3 P. M. and 9 P. M., and this difference is more evident as the months are warmer.

"3. Dividing the day into four periods of three hours each, in cold and temperate months, the strongest ozone tint is produced by papers exposed from noon to 3 P. M., in the hotter months by papers exposed from A. M. to noon.

"4. In winter the greatest variation is between 3 A. M. and 3 P. M.

"5. The augmentation of temperature does not increase the production of ozone as does the amount of aqueous vapor to which the ozone appears attached.

"6. Barometric oscillations have no influence on the direct production of ozone, unless the condition of watery vapor be taken into account."

"Ozone may be produced naturally or artificially. Natural modes (three):

"*a*. Electrization of air or of water in storms.

"*b*. By influence of solar light.

"*c*. By decomposition of carbonic acid by growing vegetation."

In the foregoing remarks it will be observed that I have made no reference to the city of Norfolk and the region of country lying east of that city, extending as far as the Atlantic Ocean. Nothwithstanding the presence of numerous small bodies of water scattered throughout this section, the similarity to that already described in topography, climate, soil, and forests renders it equally desirable in a sanitary point for those affected with, or predisposed to, pulmonary consumption. In support of this statement, I here introduce an interesting and elaborate communication addressed to me by Dr. S. J. Jackson, of the city of Norfolk. Dr. Jackson, as you are probably aware, is a close and intelligent observer, and has contributed much scientific and valuable information on kindred subjects to medical literature, which entitles his views to our consideration and respect. He writes:

"For some years before the region around about Norfolk, in Virginia, seems to have been thought of as a place for winter resort for invalids suffering from pulmonary affections, it had been discovered that its climate was mild enough for the raising of early vegetables, and until increased facilities for transportation brought the more southerly district of South Carolina, Georgia, and Florida in competition with it, it furnished the northern market with its chief supply of early spring vegetables. The 'trucking business,' as it is called, has increased tenfold in the last thirty years, viz., from about $200,000 in 1856, to about $2,000,000 in 1886. Besides this evidence of the mildness of the climate, another had been furnished long before by yearly immigration to this region of water-fowl, such as geese, ducks, and swan,

from the cold northern latitude where they spend their summers in hatching and rearing their young. On the beginning of winter, flocks composed of countless myriads of them, pour into the waters of this region, there to remain until the opening of spring. The genus Homo might have learned a lesson long before from the instinct of these birds, but it was not until the war had revealed its charms to soldiers from the North, who had never known such a climate, that this region was ever thought of as a place for winter residence, or as a winter resort for invalids."

"Indeed, up to that period Norfolk had very unfortunately and unreasonably acquired the reputation of being an unhealthy 'place.'

"The disastrous importation of yellow fever in 1855, by which she lost some two thousand of her population, would have ruined her prospects as a place of residence, but for the fact that the disease was known to have been imported, and not to have been generated here; and, further, it was proven that the subsequent winter was cold enough to destroy every vestige of the infection so completely, that it never revived or reappeared, and probably never will, unless through some carelessness or inadvertence of the health authorities, it should be allowed to enter again.

"But the question will naturally occur: Why should Norfolk in a latitude above the northern line of North Carolina and Tennessee have a milder climate than those States, and how is it possible for it to compete with the more southerly States mentioned in the production of spring vegetables, or in furnishing a mild winter habitation for those whose health will not allow them to remain in the northerly latitudes? The explanation is to be found in our proximity, to the *gulf stream*, that great river in the ocean, which, heated in the torrid zone, carries and distributes its warmth along its track, even to that far off northern island 'The Emerald Isle,' which, but for this, would be more like Labrador than the beautiful green spot that it is. Before the gulf stream reaches the coast of Ireland it has traversed thousands of miles of ocean, wasting its heat may be upon icebergs, or at any rate, by encountering the cold currents from the north, until it might be supposed not to have a sufficient amount reserved for its beneficent purpose. But it passes our shore before it has had time to lose its heat, coming direct from the Carribean Sea it has encountered no cold winds or waves before it reaches us. Besides warming the winds, which, sweeping over it, bear to us its balmy sweetness, its eddies actually lave our shore.

"A glance at the map will show how far off from the coast of Georgia and the Carolinas the gulf stream is forced to clear Cape Hatteras; but from that point northwardly it runs more nearly parallel with the shore until, when opposite us, it is only thirty miles distant.

"From the Virginia Capes northward the coast line and gulf stream diverge, the latter tending rapidly to the northeast. But for this divergence the whole Atlantic-American coast would share its general warmth.

"But besides our proximity to this heat-bearing current, there is another most important and valuable circumstance which causes a more general

distribution of its warm water on our shore than would be produced by ordinary eddies. The space between the Virginia Capes (Henry and Charles), only about ten miles, is the waste-gate for an immense body of water borne down to the Chesapeake Bay by the rivers of Maryland, Pennsylvania and Virginia. The Susquehanna, the Patapsco, the Severn, the Rappahannock, Potomac, James and Elizabeth, and their tributaries, which drain the immense water-shed of these great States east of the Appalachian range of mountains, can only empty their torrents through this narrow gate-way. So vast a body of water poured into the ocean through so narrow a vent must be forced very far out into the sea, so far, indeed, as to form no inconsiderable impediment to the outward northern flow of the gulf stream, and thereby causing more of an eddy than would otherwise be produced. This backing of the warm water of the great ocean-river at a point nearly, if not quite, opposite our Capes, is, I believe, the true explanation of the mildness of our climate. That it is not due to latitude, is evident from the fact that it becomes colder the farther you recede from the seacoast. The winter isotherm of Norfolk, instead of following the line of latitude across the continent, rapidly dips toward the south and enters the northern part of Louisiana. A glance at any of the weather maps issued by the Signal Service, will convince us of this and will show that we have in Norfolk, during winter, the same temperature and climate as Shreveport, La., but in addition to this we have the invigorating salt air from the ocean.

"I do not know of any observations by which the proportion of oxygen or its allotrope, ozone, in the air has been determined, but there is a popular belief (which may be an inference from the exhilaration experienced when first breathing it after coming from an interior locality) that they are in excess.

"If the oxygen be in excess, which is more than probable, it must afford some compensation to the deficient respiration in pulmonary cases.

"Whether or not the excess of oxygen be attributable to the sea air, we have another most important factor in the production of it or its allotropic form in the extensive pine-forests of this region.

"It seems to have been but a recent discovery that the terebenes are generators of ozone; and it may be that this has given the pine forests of Georgia their reputation for benefiting pulmonary diseases. Long before this property of turpentine was known to me, I had been in the habit of employing it by inhalation in cases of phthisis, and with most marked benefit, which I had attributed to some antiseptic power, which it is more than probable it also possesses."

"We have then the very valuable conditions favorable to the treatment of this class of diseases, viz., an equable and mild climate free from the extremes of heat or cold; winds loaded with the exhalations from the ocean, moderated in temperature by having passed, when blowing from any quarter east of the meridian, over the broad expanse of the gulf stream, and when blowing from any quarter west of this line, moderated in force, and becom-

ing charged with ozone by the extensive forests over and through which it must pass.

"Nearly every condition which is here claimed for this region as a health resort is also claimed by different places of resort to the north of us, which have already become popular for the sojourn of invalids. A very little reflection, however, will assure one of their existing to a much more influential extent in this locality.

"Comparing it, for instance, with Atlantic City, N. J., we are considerably further south. The gulf stream, which is the acknowledged factor in moderating the temperature, is only thirty miles from our shore, whereas it is one hundred and fifty miles from the New Jersey coast. There is no growth of wood for many miles from this latter shore, whereas with us the forests almost reach to the ocean's edge. And what is of more value than all these, is the prevalence here of southerly winds, really the extension of the southeast trade-wind; while they blow here a portion of every day, to the north of the Virginia Capes they are not regular, and cannot be relied on. At Norfolk they generally begin to blow about 10 A.M., increase in strength as the day advances, and decline about sun-down, to rise again about 8 or 9 P.M. On the coast they are a couple of hours earlier, and are much stronger. It is this southerly wind that makes this locality tolerable as a place of habitation in the summer. During the daytime it serves to moderate the intense heat, of which we are only conscious at the rare time of calm; or when the sky is overcast with clouds which prevent radiation from the earth or our heated bodies. But if this is sometimes the case during the day, it is seldom or never the case at night, for the delightful southern breeze generally lasts us until morning, so that a warm night is a rare occurrence.

"I am now writing on the 29th day of July, the night preceding which, is the first, this summer, in which I have slept without a blanket.

"Our winters are so mild that fig-trees need no protection; nor do the most tender varieties of magnolia. The grape-myrtle which all summer furnishes such a gorgeous floral display, needs no care, and many of the tender varieties of grape, which, in the northern part of this State, need the warmth and protection of the vinery, flourish here in the open air.

"It is seldom that the thermometer reaches as low as 16° (above zero), and when it does it is for too short a time to do much injury.

"We have snow occasionally, but it generally melts as it falls. I have known one or two sleighing frolics to last a couple of days.

"What cold we have, we value and need for the crippling of the malarial germs, and the destruction of some others, such as yellow fever, if it should ever be introduced among us."

This so fully covers the ground as regards Norfolk City and its immediate vicinity, that I shall not consume your time by the addition of any comments of my own, but pass directly on to a consideration and description of Virginia Beach as a winter health resort.

Stretching along the seacoast of Virginia, from Cape Henry in almost a straight line south for more than twenty miles in latitude 35° 26′, longitude 70° 6′, lies a low sandy beach washed by the Atlantic Ocean; no inlet or indentation mars its uniformity or interrupts its remarkable continuity. For many miles below the Cape this strip of sand beach embraces a width of two or three hundred yards, and is almost entirely bare of any vegetation whatever, save at long intervals may be seen spots of sea-grass or patches of stunted bushes.

Immediately bordering on the inland margin of this sandy beach there exists a dense forest of pine, cypress, and oak, which extends as far as the eye can reach, running parallel with the ocean line, and approaching within a few hundred yards of the sea, the broad, dry strip of sand alone intervening.

Just six miles south of Cape Henry on this beach stands the new bathing site of "Virginia Beach."

An intelligent physician who has resided in the immediate vicinity of this spot for more than forty years, writing of this as a suitable locality for a sanitarium, says:

"This shore line embraces, in my estimation, the most eligible locality known on the Atlantic coast for both a summer and winter resort. It is the only beach where the forest is in close proximity to the sea. In its entirety it is altogether free from all malarial infection. The seacoast extending for miles below this point, and as far north as Cape Henry, has not presented for the last forty years a single case of intermittent or remittent fever that originated among the fishermen, sailors, wreckers, and soldiers, while sojourning here in tents or huts."

Notwithstanding the apparent difficulty of establishing an efficient drainage upon a surface so flat and level, I am told by competent engineers that this can be easily overcome by proper sanitary engineering, and all sources of impurities incident to human habitation readily removed without resorting to the expensive though admirable plan in operation at Atlantic City.

The extensive forest above alluded to, immediately contiguous to the beach, at this point, composed principally of pine and other winter greens, affords an efficient protection during the winter from the northwest winds, whilst it aids in keeping the earth damp and cool during the summer months, and prevents the invasion of malarious influences which may arise at points further in the interior of the country. The temperature of woodland districts, it has been shown, averages about 3° F. lower than that of the open country during daylight, and an average humidity of 9.3 per day higher in the summer. It is not to

be denied that during the heated term embracing the months of July, August, and September, the temperature at this point, as well as all others along the Atlantic seacoast south of Newport, Rhode Island, is at times oppressive, but measurably tempered by the delightful sea breeze prevailing from 11 A. M. to past midnight. It is, however, as a winter resort for invalids that I desire especially to invite the attention of this Association to this locality. Compared with Atlantic City and Fortress Monroe, the two localities on our immediate seacoast most frequented as winter resorts, we cannot fail to recognize its superior natural advantages. Nature has endowed it with those supreme attributes of sanitary power beyond the capacity of man to give. It now only remains for science and art to avail themselves of this beneficent boon, and secure for deteriorated and suffering humanity a haven of repose and recuperation. At present the accommodations consist of a large open pavilion, capable of seating 3000 persons, to which is attached a small hotel. This building is situated about one hundred yards from the edge of the water, directly upon the dry sand. To the rear of it stand the pine forests, and about three hundred yards beyond a small lake of fresh water, into which the sewer-pipe from the building at present empties.

The most extraordinary feature of this spot is its remarkable dryness. Table-salt when exposed during the entire day has been found to remain perfectly free from moisture, differing in this particular from any other seacoast health resort which has come under my observation. The records kept by the United States Signal Bureau show an average difference in temperature between Virginia Beach and Atlantic City, during the winter months, of about nine degrees in favor of the former, and nearly the same between that of Fortress Monroe, notwithstanding the two latter are but twenty-five miles apart.

This is more clearly shown by the following table of average temperature and average humidity, prepared with great labor and much calculation for the months of January, February, and March, 1886, comparing the two points of Virginia Beach and Atlantic City:

THERMOMETER.

Average thermometer at Atlantic City for January, 1886. Taken by Government observers, five times a day.	30.8°
Virginia Beach, same month	34.6°
Average thermometer, Atlantic City, February, 1886 . .	29.7°
" " Virginia Beach, February, 1886 . .	39.1°
" " Atlantic City, March, 1886 . . .	38.2°
" " Virginia Beach, March, 1886 . .	45.2°

HUMIDITY.

Average humidity, Atlantic City, from Government observation, five times a day.

Average humidity,	Atlantic City, January, 1886 . . .	82.2
" "	Virginia Beach, January, 1886 . . .	78.4
" "	Atlantic City, February, 1886 . . .	78.8
" "	Virginia Beach, February, 1886 . . .	73.0
" "	Atlantic City, March, 1886	76.4
" "	Virginia Beach, March, 1886 . . .	72.8

Atlantic City,	highest average day thermometer, January, 1886,	40.3°
Virginia Beach,	" " " " " "	54.0°
Atlantic City,	" " " " February, "	41.3°
Virginia Beach,	" " " " " "	59.2°
Atlantic City,	" " " " March, "	50.1°
Virginia Beach,	" " " " " "	66.6°

Atlantic City,	lowest average day thermometer, January, 1886,	10.2°
Virginia Beach,	" " " " " "	17.6°
Atlantic City,	" " " " February, "	5.2°
Virginia Beach,	" " " " " "	12.2°
Atlantic City,	" " " " March "	20.1°
Virginia Beach,	" " " " " "	34.2°

In point, then, both of temperature and humidity, it is thus clearly demonstrated that Virginia Beach possesses a marked advantage.

The explanation of the discrepancy referred to, between Old Point and Virginia Beach, may be found in the fact that Old Point Comfort stands just twenty miles inland from the Capes, although located immediately on Hampton Roads. The sea air sweeping in through the two Capes has to traverse a space of twenty miles over this body of cold water before it reaches the Fort, and necessarily loses in its passage the thermal influence of the gulf stream, besides being deprived of some of the original saline constituents held in suspension.

The approaches to Virginia Beach, at present, consist in a narrow-gauge railroad running from the city of Norfolk directly to the sea-coast at this point, a distance of eighteen miles. There is also a shell road in good condition connecting Norfolk with the Beach.

In conclusion, I desire to add that whilst at present the limited and imperfect accommodations render this place ineligible as a winter residence, its superior and extraordinary inherent advantages cannot fail to attract the attention of the sanitarian, as well as capitalists, at no very distant day, and that we may confidently predict for it a successful and important future as a winter health resort.

Although not directly pertinent to the question being discussed, I may here mention, in connection with the geographical features of our Atlantic Coast, extending from this point as far south as Florida, a fact not generally known, but one of national importance as regards strategic advantage in a military point of view, and of economy in a commercial aspect. The fresh water lake already referred to, standing in the rear of Virginia Beach, is but one of a chain of lakes or bodies of water which extend from Hampton Roads to Florida. I am informed by an experienced engineer, who has personally inspected this region of country, that these areas of water lie so contiguous to each other that it would only require a series of short canals to connect the whole, capable of floating light draft steamers, and thus establish an inland navigation extending from the Chesapeake Bay to the State of Florida. The vast importance of such a connection between these two points in the event of a foreign war, as well as to commerce in times of peace, can scarcely be overestimated.