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AIKEN AND THOMASVILLE

AS TYPES OF THE INLAND HEALTH-RESORTS OF SOUTH CAROLINA AND GEORGIA.*

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During the winter of 1885–'86 I was requested by a committee of the American Climatological Association to prepare a paper on the inland health-resorts of South Carolina and Georgia, to be read at the annual meeting in May. On investigating the matter, I found that Aiken and Thomasville were the only places for which I could obtain the requisite meteorological data. This, and the fact that the other localities considered to be health-resorts were comparatively unimportant, induced me to devote my whole attention to the above-mentioned resorts, one of which has been known to the profession for over thirty years, while the other has sprung into existence as a health-resort only within the past six or eight years. As regards temperature, there is but little difference between the resorts in the interior of the South Atlantic States and those on the coast, the interior being about two degrees colder. Thus, the mean annual temperature on the coast of South Carolina and

* Read before the American Climatological Association at its third annual meeting.

Georgia is 67°, while that of the inland stations is 65°. But with this similarity of temperature all resemblance ceases, the coast, as one would naturally expect, being moist and sedative, while the interior is more or less dry and bracing. Hence the former is indicated in bronchitis when the cough is dry and tight and attended with little or no expectoration, and in all diseases where there is great irritability of the nervous system. The interior resorts, on the other hand, are better suited for the treatment of diseases of an asthenic type, and are especially beneficial in pulmonary phthisis; but to all of this I shall again refer in another portion of this paper.

Topography, etc.—Aiken is located on the southern border of what is known as the Sand-Hill region. It is about 565 feet above sea-level, and is the highest point within a radius of a hundred miles. It is 120 miles west of Charleston and 17 east of Augusta. Thomasville is about 100 miles farther south, a little north of the Florida line, in what is designated on the agricultural maps of the "Tenth United States Census" as the region of the long-leaf pines. Its altitude is 330 feet, and is therefore 235 feet lower than Aiken, but, like the latter place, it is much higher than the surrounding country. It is about 150 miles from the Atlantic Ocean and 60 miles north of the Gulf of Mexico.

The Sand-Hill region in which Aiken is situated is a tract of sandy soil of moderate elevation and about twenty miles in breadth, extending through the middle portions of South Carolina and Georgia. Commencing in Chesterfield County in the northern border of the former State, it extends in a southwesterly direction until it reaches the Savannah River at Augusta. Reappearing on the other side of that river, it crosses the State of Georgia in the form of a narrow strip which terminates on the western border

of the State. Consisting, as its name implies, chiefly of fine loose sand, this region in its natural state is so utterly worthless for agricultural purposes that it well deserves to be called the "pine barrens," the name applied to it by many of the natives. But, although naturally so unproductive, the soil of this region contains a certain proportion of clay which makes it very retentive, so that, by the addition of fertilizers, it may be made to produce valuable crops of cotton and other products. The subsoil of this region is very porous, and water is rarely found at a depth of less than 80 feet, and often it is necessary to dig 150 feet before it is reached. Owing to the porosity of the soil, water disappears rapidly from the surface, so that even the heaviest rains interfere but little with the out-door life of the invalid.

The inhabitants of Charleston and the planters of the counties along the coast were long ago familiar with the extreme salubrity of this favored region, and, as soon as the South Carolina Railroad was completed, hastened to avail themselves of Aiken, not only as a sanitarium for consumptives, but also as a place of refuge from the deadly malaria (bilious remittent or country fever) which rendered their estates uninhabitable during the warmer months of the year. As a proof of the healthfulness of the Sand-Hill region, it is stated in the "United States Census for 1880"* that at Platt Springs, a little hamlet in the adjoining county of Lexington, there were in 1879 but two deaths out of a population of 853, and in 1880 only four, and that of these, three of the decedents were over eighty years of age. The sandy soil of this section, as well as that around Thomasville, is covered with forests of the long-leafed pine (*Pinus australis*) and black-jack oak. The former is remarkable for the large amount of resin it contains, and it is the "lightwood" of this tree which affords the bright, cheerful fires

* "Tenth Census of the United States," vol. vi, p. 90.

which are so attractive to the Northern invalid. Whether these trees, by generating ozone or peroxide of hydrogen, really add to the purity of the atmosphere, is still an open question, but it is quite certain that the terebinthinate exhalations from the pine forests around Aiken and Thomasville are exceedingly grateful to pulmonary invalids. Although we may not be able to offer any satisfactory explanation of their physiological action, there can be no doubt that the presence of large tracts of pine forests add materially to the therapeutic value of a health-resort. In common with all forests, they afford protection against the wind, but in addition to this, for some hitherto unexplained reason, the air of the pine woods is apparently warmer than that of forests of oak and other trees. This is so marked that, on driving through the country on a cold winter day, the entrance into even a comparatively small thicket of pines gives rise to a sensation of warmth similar to that which is experienced on going from the cold outside air into a comfortably heated apartment. Hermann Weber* states that he has often known tender exotics growing in a forest of firs to remain uninjured by the severe cold of winter when those in more open situations in the same neighborhood were destroyed.

A wooded country is much more equable than an open plain, a fact which applies to humidity as well as to temperature. Absence of dust, with its injurious effects upon the mucous membrane of the respiratory tract, is another advantage which the presence of pine forests confers upon a health-resort. Eliot and Storer remark in their work on organic chemistry that "the disinfecting power of ozone produced by the action of the atmosphere on turpentine is interesting in connection with the observed facts, that ozone

* H. Weber, "Klimatotherapie." Ziemssen, "Allgemeine Therapie," Leipzig, 1880, p. 62.

is abundant in the air of pine forests where turpentine abounds, and that pine forests are remarkably free from malaria." This protection against malaria afforded by pine forests has long been known to the rice planters of the coast of Georgia and South Carolina, who, during the summer, as night approaches, retire to their pine-land settlements, and find there a safe refuge from the deadly poison which pollutes the air of the surrounding country and makes it extremely dangerous for a white man to remain there after nightfall.

Some twenty miles from Charleston is the pine-land village Summerville, which, although located in the midst of the malarial belt, is so healthy that hundreds of families from the city utilize it as a summer resort, and so great is the faith of the inhabitants in the immunity afforded by pines that a heavy fine is imposed for cutting down one of these trees without the permission of the Municipal Council. From the above we arrive at the following conclusions in regard to the influence of pine forests upon the climate of a locality—viz.: That they render the temperature and humidity more equable; that they afford protection against high winds; that in winter they are warmer than the open country; that by generating ozone or peroxide of hydrogen they disinfect the air; and that to some extent their terebinthinate exhalations moderate the amount of secretion from the mucous membranes of the air-passages, and thus exercise a curative influence in bronchial catarrh.

I have dwelt at some length on the subject of pine forests, as I believe that their presence adds materially to the usefulness and attractiveness of a health-resort in this section of the country. They are said to be much more extensive at Thomasville than at Aiken, where, owing to the great demand for land for agricultural purposes and to the absence of all laws for their protection, they have been every year

most recklessly destroyed. They are, however, still quite numerous, and steps are being taken to prevent their wanton destruction and to encourage the planting of new trees.

METEOROLOGY.—As the limits of this paper preclude any detailed discussion of the various elements which, when taken together, constitute climate, I have prepared a series of tables, by referring to which the reader can compare at a glance the climate of Aiken with that of Thomasville, and thus be enabled to form his own opinion in regard to the merits of the two resorts, and determine which of the two places is best adapted for the class of cases he may conclude to subject to climatic treatment. With this view I have compiled two tables for each of the more important meteorological factors, such as temperature, humidity, etc., the first giving a general summary of a series of observations extending over a number of years, and the other a record of tri-daily observations made during March and April, 1886, at both places and at the same hours. For the later observations at Thomasville I am indebted to Dr. W. R. Birdsall, of New York, and Dr. W. S. Little, of Philadelphia. These gentlemen were prepared with a book of instructions issued by the U. S. Signal Service and a set of instruments from the same bureau, the latter being in every respect similar to those used at Aiken. These observations were taken with the most scrupulous care, and, although covering only a limited period, are of inestimable value.

Much to my regret, the Thomasville observations extend over only four years, while those of Aiken cover a period of eleven years. I applied to Dr. T. S. Hopkins for the more recent observations, but was refused on the ground that the unpublished meteorological data were the property of Dr. Huntington Richards, one of the collaborators of Wood's "Reference Hand-book of the Medical Sciences." So far as

temperature is concerned, the absence of the two additional years is a matter of but little importance, the difference between those given above and the more extended series amounting to but one degree. For those given I am indebted to Dr. Hopkins's pamphlet, "Thomasville as a Winter Home for Invalids."

The following table gives the mean temperature of Aiken and Thomasville during the six colder months, and the mean temperature of the months and seasons.

On examining the table, it will be seen that the mean temperature of the six colder months is about five degrees colder at Aiken than at Thomasville, the difference in winter being five and in spring four degrees.

TABLE No. 1.

Comparing the mean temperature of Aiken with that of Thomasville. Period of observation at Aiken, eleven years; period of observation at Thomasville, four years.

	Aiken.	Thomasville.	Aiken colder than Thomasville.
	Degrees.	Degrees.	Degrees.
November	54	59	5
December	47	53	6
January	48	54	6
February	50	56	6
March	56	62	6
April	66	67	1
Six colder months	53	58	5
Winter	50	55	5
Spring	57	61	4

The observations at 7 A. M., 2 P. M., and 9 P. M., although not as accurate as the readings of the maximum and minimum thermometers, afford a fair idea of the highest and lowest temperature of the different months, and are of more

importance in forming an estimate of the extremes of temperature to which the invalid is subjected. It would be obviously unfair to estimate the average winter at Thomasville and Aiken by the low temperature which prevailed during the early days of January of the present year, which, judging from its effects upon vegetation, is considered the coldest ever experienced during the last two hundred years.* The average range of temperature, as given in the third column, is very moderate for a dry climate like that of Aiken.

TABLE No. 2.

The mean temperature of Aiken at 7 a. m., 2 p. m., and 9 p. m., with the average daily range from 1873 to 1884.

	7 A. M.	2 P. M.	9 P. M.	Range.†
	Degrees.	Degrees.	Degrees.	Degrees.
November	49	61	53	12
December	42	54	47	12
January	42	54	48	12
February	43	57	50	14
March	49	64	56	15
April	57	71	63	14
Six colder months	47	60	53	13
Winter	44	56	49	12
Spring	49	64	56	15

The following table requires no comment, but is exceedingly useful as a supplement to Tables Nos. 1 and 2. It shows that the means of the month of February, 1886, at both places correspond with the average given in Table No. 1. During the ensuing month (March) the temperature was seven tenths of a degree lower at Aiken, and three and a

* The cold at the time referred to was so intense that it killed palm-trees which had been growing on Sullivan's Island, near Charleston, for upward of two hundred years.

† The difference between the lowest and highest tri-daily means.

half degrees lower at Thomasville. During the two months Aiken was, on the average, only three degrees colder than Thomasville. The average range during February was thirteen degrees and five tenths at Aiken and fourteen degrees and seven tenths at Thomasville. During March it was fourteen degrees and three tenths at Aiken, and nine degrees and four tenths at Thomasville. To enable the reader to compare the temperature of Aiken and Thomasville with

TABLE No. 3.

Temperature observed at Aiken and Thomasville from February 8 to March 31, 1886, at 7 a. m., 2 p. m., and 9 p. m.

1886.	7 A. M.		2 P. M.		9 P. M.		MEANS. ⅓(7+2+9+9)		Difference between Aiken and Thomasville.
	Aiken.	Thomasville.	Aiken.	Thomasville.	Aiken.	Thomasville.	Aiken.	Thomasville.	
	Deg.	Deg.	Deg.	Deg.	Deg	Deg.	Deg.	Deg.	Deg.
Feb. 8..	42	48	61	66	53	51	52·2	54·0	Aiken 1·8 colder.
" 9..	43	45	63	63	58	53	55·5	53·5	" 2·0 w'rmer
" 10..	55	58	68	72	62	62	61·7	63·5	" 1·8 colder.
" 11..	51	55	54	74	53	62	52·7	63·2	" 10·5 "
" 12..	52	57	56	61	46	48	50·0	53·5	" 3·5 "
" 13..	36	40	52	60	44	48	44·0	49·0	" 5·0 "
" 14..	47	48	63	70	58	57	56·5	58·0	" 1·5 "
" 15..	50	56	68	73	51	60	55·0	62·2	" 7·2 "
" 16..	32	42	48	60	42	46	41·7	48·5	" 6·8 "
" 17..	34	41	46	59	40	48	40·0	49·0	" 9·0 "
" 18..	38	46	54	50	42	50	44·0	49·0	" 5·0 "
" 19..	45	52	58	70	52	56	51·7	58·5	" 7·2 "
" 20..	31	45	40	52	35	38	35·2	43·2	" 8·0 "
" 21..	27	31	52	60	48	53	43·7	49·2	" 5·5 "
" 22..	42	52	62	70	53	54	52·5	57·5	" 5·0 "
" 23..	48	49	66	72	59	54	58·0	57·2	" 0·8 w'rmer
" 24..	45	53	64	73	58	58	58·7	60·5	" 1·8 colder.
" 25..	60	62	62	70	57	63	56·5	64·5	" 8·0 "
" 26..	40	51	53	59	45	50	44·2	52·5	" 8·3 "
" 27..	35	47	45	50	35	50	38·7	49·2	" 10·5 "
" 28..	33	45	36	49	37	47	35·7	47·0	" 11·3 "
Mean of 28 days.	42·1	48·7	55·6	63·4	48·5	52·8	48·9	54·4	Aiken 5·4 colder.

TABLE No. 3.—(*Continued.*)

1886.	7 A. M.		2 P. M.		9 P. M.		MEANS. ¼7+2+9+9		Difference between Aiken and Thomasville.
	Aiken.	Thomasville.	Aiken.	Thomasville.	Aiken.	Thomasville.	Aiken.	Thomasville.	
	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.
March 1.	36	46	59	57	49	54	48·2	52·7	Aiken 4·5 colder.
" 2.	38	51	55	61	51	60	48·7	58·0	" 9·3 "
" 3.	37	44	52	57	48	60	46·2	55·2	" 9·0 "
" 4.	39	48	48	48	44	46	43·7	47·0	" 3·3 "
" 5.	41	48	60	55	54	53	52·2	52·2	" 0·0 "
" 6.	46	52	60	66	54	58	55·5	56·0	" 2·5 "
" 7.	41	48	54	55	47	50	47·2	50·7	" 3·5 "
" 8.	47	56	63	64	49	56	52·0	58·0	" 6·0 "
" 9.	45	54	57	60	46	56	48·5	56·5	" 8·0 "
" 10.	37	45	42	48	38	40	38·5	43·2	" 4·7 "
" 11.	37	35	49	59	45	50	51·5	48·5	" 3·0 w'rmer
" 12.	45	51	57	60	55	62	53·0	58·7	" 5·7 colder.
" 13.	51	55	54	47	48	45	50·2	48·0	" 2·2 w'rmer
" 14.	41	40	63	60	59	52	55·5	51·0	" 4·5 "
" 15.	46	50	67	73	60	61	58·2	61·2	" 3·0 colder.
" 16.	57	61	65	64	57	61	59·0	61·7	" 2·7 "
" 17.	52	62	69	72	64	68	62·2	67·5	" 5·3 "
" 18.	52	65	68	72	64	63	62·0	65·7	" 3·7 "
" 19.	60	62	73	70	67	68	66·7	67·0	" 0·3 "
" 20.	66	69	68	70	64	68	65·5	68·7	" 3·2 "
" 21.	52	56	64	67	53	55	55·5	58·2	" 2·7 "
" 22.	48	51	59	63	53	54	53·2	55·5	" 2·3 "
" 23.	46	54	56	68	49	54	50·0	57·5	" 7·5 "
" 24.	43	52	64	69	58	57	55·7	58·7	" 3·0 "
" 25.	55	56	75	73	64	60	64·5	62·2	" 2·3 w'rmer
" 26.	60	59	75	74	67	60	67·2	63·2	" 4·0 "
" 27.	60	64	72	70	67	66	66·5	66·5	" 0·0 "
" 28.	64	65	68	71	61	68	63·5	68·0	" 4·5 colder.
" 29.	47	66	49	75	52	70	50·0	70·2	" 20·2 "
" 30.	65	74	80	78	72	69	72·2	72·5	" 0·3 "
" 31.	58	58	61	61	48	48	53·7	53·7	" 0·0 "
Mean of 31 days.	48·8	54·7	63·1	64·1	55·7	57·8	55·3	58·5	Aiken 3·2 colder.

The Thomasville observations from February 8 to March 7 were made by Dr. W. R. Birdsall, of New York, and from that date to March 31 by Dr. W. S. Little, of Philadelphia.

that of other places I have compiled the following tables, giving the mean temperature during the six colder months at some of our principal cities, and at the most generally known health-resorts in this country and abroad:

TABLE No. 4.

Comparing the mean temperature of Aiken with Thomasville during the six colder months (November to April, inclusive) with that of some of the larger cities of the United States.

	Deg.									
Aiken.....	53									
Thomasville	59	Deg.					Deg.			
Boston.....	33	20	colder	than	Aiken	and	26	colder	than	Thomasville
New York..	36	17	"	"	"	"	23	"	"	"
Chicago....	34	19	"	"	"	"	25	"	"	"
Cincinnati.	34	19	"	"	"	"	25	"	"	"
Baltimore..	41	12	"	"	"	"	18	"	"	"
Jacksonville	61	8	w'rmer	"	"	"	2	warmer	"	"

TABLE No. 5.

Comparing the mean temperature of Aiken and Thomasville during the six colder months (November to April, inclusive) with that of several well-known health-resorts.

	Deg.									
Aiken.....	53									
Thomasville...	59	Deg.					Deg.			
Davos.....	30	83	colder	than	Aiken,		89	colder	than	Thomasville
Colorado Sp'gs.	32	21	"	"	"		27	"	"	"
Denver.....	36	17	"	"	"		23	"	"	"
Pau.....	45	14	"	"	"		20	"	"	"
Meran.....	44	9	"	"	"		15	"	"	"
Ashville.....	43	8	"	"	"		14	"	"	"
Mentone.....	55	2	warmer	"	"		4	"	"	"
Catania.....	56	3	"	"	"		3	"	"	"
Cannes.....	56	3	"	"	"		3	"	"	"
Santa Barbara.	57	4	"	"	"		2	"	"	"
Nice.....	57	4	"	"	"		2	"	"	"
Algiers.....	59	6	"	"	"		0	"	"	"
Cairo.....	63	10	"	"	"		4	warmer	"	"
St. Augustine.	63	10	"	"	"		4	"	"	"
Madeira.....	72	19	"	"	"		13	"	"	"

Humidity.—In forming an estimate of the climate of a health-resort, the humidity of the atmosphere ranks next in

importance to its temperature. Judged by popular signs—such as the rare occurrence of heavy dews, infrequency of fogs, absence of condensation of moisture on the walls of houses, the rarity of rust on guns and steel instruments, and of mold on boots and shoes—both Thomasville and Aiken would be regarded as exceptionally dry. At Aiken this is further proved by the absence of the gray tree-moss (*Tillandsia*), which abounds in the Atlantic States wherever there is sufficient moisture to promote its growth.* The presence of this moss is not only a sign of moisture, but is popularly regarded as a test of the healthfulness of a locality, and it is a well-known fact that it abounds in those sections where bilious remittent fever is most prevalent.

Scientifically, the amount of aqueous vapor in the atmosphere is expressed by its absolute and relative humidity. The former is synonymous with the tension of vapor, or, more intelligibly, by the weight of water in a given quantity of air. This method of designating the humidity is seldom employed in works on medical climatology. The term relative humidity, expressing as it does the percentage of saturation, is much more satisfactory. The amount of water that the atmosphere is capable of containing in the form of vapor varies with its temperature. When it has all the vapor it is capable of holding it is said to be saturated, and this condition of saturation is expressed as 100 per cent.—that is, its relative humidity is 100 per cent. If it has only one half its complement of water, its relative humidity is said to be 50 per cent., and so on from 1 to 100 per cent. The amount of aqueous vapor that the atmosphere is capable of holding varies with its temperature, being greater when the air is warm, greater in summer than in winter, and greater in a warm than a cold climate. The relative hu-

* Whether this moss grows at Thomasville I am unable to say, and at the moment of writing have no means of ascertaining the fact.

midity exercises a powerful influence upon animal and vegetable life. It is a well-known fact that the inhabitants of a dry climate are, as a rule, thin and sallow, while those living in a moist insular country have well-developed figures and fresh, ruddy complexions. It is to the greater dryness of this country that we owe the peculiar physique of our people, which is so different from that of our English ancestors.

Schlagintweit, a German, who traveled extensively in this country, notes this peculiarity, asserting that we are very proud of the leanness of our women: "According to Pettenkofer and Voit, the human body exhales from the lungs and skin twenty-eight ounces in twenty-four hours, and of this a little over seventeen ounces is from the skin alone, and, as the amount exhaled depends in a great measure upon the hygrometric condition of the atmosphere, it becomes apparent that even a slight change of only one per cent. in the relative humidity exercises a marked influence upon the cutaneous exhalations, and any diminution in the cutaneous and respiratory exhalations produces a corresponding increase in the urinary secretions, and not infrequently in that of the intestinal canal." "Dry climates, by diminishing the water in the blood, act as a powerful stimulant to the nervous system, increasing its functional activity, causing excitement and sleeplessness." Hence such climates, although admirably adapted to the treatment of pulmonary diseases, are contra-indicated in many nervous affections. "This effect is observed even in healthy persons on their removal to a dry climate, or to one of considerable elevation, and exhibits itself in a certain degree of restlessness." Sudden changes in the percentage of relative humidity operate very sensitively in a diseased organism, their first effects being a sudden increase or diminution in the blood-pressure. Hence high altitudes,

owing to diminished atmospheric pressure, even when combined with a high percentage of relative humidity, is similar in its effects to a dry climate with lower elevation.*

TABLE No. 6.

Monthly mean relative humidity at Aiken for seven seasons, and at Thomasville for four seasons.

	Aiken.	Thomasville.	Aiken drier than Thomasville.		Aiken.	Thomasville.	Aiken drier than Thomasville.
	Per ct.	Per ct.	Per ct.		Per ct.	Per ct.	Per ct.
January .	62·20	65·00	2·80	November.	61·70	67·00	5·30
February.	56·10	62·00	4·90	December.	58·80	64·00	5·20
March . . .	52·10	61·00	8·90				
April	56·20	60·00	3·80	Mean . .	57·85	63·16	5·15

According to the condensed observations in Table No. 6, the mean relative humidity of the season is 57·85 per cent. at Aiken and 63·16 per cent. at Thomasville, a difference of a little over 5 per cent. in favor of the former place. The winter mean at Thomasville is 65·33 per cent., while that of Aiken is 60·90 per cent., a difference of 4·43 per cent. In the spring the relative humidity is 61·00 per cent. at Thomasville and 54·80 per cent. at Aiken, a difference of 6·20 per cent. in favor of the latter place. The detailed observations taken by Dr. Birdsall and Dr. Little during the months of February and March give Thomasville a much larger percentage of humidity than that recorded in Table No. 6, while the Aiken observations for the same period exhibit a variation of only one half per cent. from the annual mean. According to these observations, the relative humidity for the months of February and March was 73·09 per cent. at Thomasville and 53·56 per cent. at Aiken, a difference of nearly 20 per cent. It should be remembered,

* Hann, "Klimatologie," Stuttgart, 1883, p. 35.

TABLE NO. 7.

Tri-daily observations of relative humidity at Aiken and Thomasville, from February 8 to March 31, 1886. The latter by Dr. W. R. Birdsall of New York, and Dr. W. S. Little, of Philadelphia.

1886.	Aiken, 7 A. M.	Thomasville, 7 A. M.	Difference between Thomasville and Aiken.	Aiken, 2 P. M.	Thomasville, 2 P. M.	Difference between Thomasville and Aiken.	Aiken, 9 P. M.	Thomasville, 9 P. M.	Difference between Thomasville and Aiken.	Aiken, mean.	Thomasville, mean.	Difference between Thomasville and Aiken.
FEBRUARY.	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.
8	65	96	Aiken 31 drier.	50	45	Aiken 5 moister.	66	80	Aiken 14 drier.	60·3	73·6	Aiken 13·3 drier.
9	67	83	" 16 "	41	56	" 15 drier.	47	72	" 25 "	51·6	70·3	" 18·7 "
10	44	86	" 42 "	36	53	" 17 "	56	72	" 16 "	45·3	70·3	" 25·0 "
11	86	93	" 7 "	86	64	" 22 moister.	93	87	" 6 moister.	88·0	81·3	" 6·7 m'ster
12	86	86	" 0 "	80	56	" 14 "	68	71	" 3 drier.	78·0	71·0	" 7·0 "
13	61	82	" 19 "	11	44	" 33 drier.	45	86	" 41 "	39·0	70·6	" 31·6 drier.
14	77	93	" 16 "	63	53	" 10 moister.	17	93	" 76 "	52·3	79·6	" 27·3 "
15	77	86	" 9 "	47	55	" 8 drier.	66	60	" 6 moister.	63·3	67·0	" 3·7 "
16	53	65	" 12 "	12	39	" 27 "	26	68	" 42 drier.	30·3	57·3	" 27·0 "
17	43	64	" 21 "	27	42	" 15 "	30	56	" 26 "	33·3	54·0	" 10·7 "
18	46	53	" 7 "	34	71	" 37 "	43	77	" 34 "	41·0	67·0	" 26·0 "
19	60	86	" 26 "	40	39	" 1 moister.	40	57	" 17 "	46·6	60·6	" 14·0 "
20	29	31	" 2 "	21	16	" 5 "	44	61	" 17 "	31·3	36·0	" 4·7 "
21	41	88	" 47 "	16	44	" 28 drier.	27	55	" 28 "	28·0	62·3	" 34·3 "
22	50	66	" 16 "	42	36	" 6 moister.	40	62	" 22 "	44·0	54·6	" 10·6 "
23	42	77	" 25 "	22	37	" 15 drier.	34	80	" 46 "	32·6	64·6	" 32·0 "
24	45	66	" 21 "	30	27	" 3 moister.	58	74	" 16 "	44·3	55·6	" 11·3 "
25	75	84	" 9 "	73	70	" 3 "	86	90	" 4 "	78·0	81·3	" 3·3 "
26	57	47	" 10 moister.	19	30	" 11 drier.	31	58	" 27 "	35·6	45·0	" 9·4 "
27	44	56	" 12 drier.	25	86	" 61 "	69	93	" 24 "	46·0	78·3	" 32·3 "
28	88	93	" 5 "	89	86	" 3 moister.	82	86	" 4 "	86·3	88·3	" 2·3 "
Mean of 21 days.	58·85	75·28	Aiken 16·43 drier.	41·14	49·95	Aiken 8·81 drier.	50·85	73·23	Aiken 22·38 drier.	50·24	66·12	Aiken 15·88 drier.
MARCH.												
1	61	83	Aiken 22 drier.	48	74	Aiken 26 drier.	50	74	Aiken 24 drier.	53·2	77·0	Aiken 23·8 drier.
2	44	72	" 28 "	34	60	" 26 "	59	60	" 1 "	45·6	64·0	" 18·4 "
3	51	93	" 42 "	33	69	" 36 "	42	93	" 51 "	42·0	85·0	" 43·0 "
4	54	93	" 39 "	42	86	" 44 "	51	93	" 42 "	49·0	90·6	" 41·6 "
5	73	93	" 20 "	30	86	" 56 "	66	93	" 27 "	56·3	90·6	" 34·3 "
6	68	86	" 18 "	35	45	" 10 "	43	57	" 14 "	51·0	62·6	" 11·6 "
7	57	93	" 36 "	33	55	" 22 "	56	77	" 21 "	48·6	75·0	" 26·4 "
8	63	80	" 17 "	26	68	" 42 "	50	69	" 19 "	46·3	72·3	" 26·0 "
9	53	86	" 33 "	42	93	" 51 "	68	74	" 6 "	54·3	84·3	" 30·0 "
10	61	53	" 7 moister.	51	50	" 1 moister.	44	65	" 21 "	52·0	56·0	" 4·0 "
11	51	89	" 38 drier.	37	47	" 10 drier.	60	77	" 17 "	49·3	71·1	" 21·8 "
12	76	93	" 17 "	80	100	" 20 "	93	93	" 0 "	83·0	95·3	" 12·3 "
13	80	100	" 20 "	74	100	" 26 "	56	100	" 44 "	70·0	100·0	" 30·0 "
14	57	100	" 43 "	26	60	" 34 "	29	100	" 71 "	38·0	86·6	" 48·6 "
15	68	93	" 25 "	63	66	" 3 "	65	100	" 35 "	66·0	86·3	" 20·3 "
16	86	100	" 14 "	73	100	" 27 "	86	100	" 14 "	81·6	100·0	" 18·4 "
17	86	93	" 7 "	36	66	" 30 "	48	84	" 36 "	56·6	81·0	" 24·4 "
18	72	84	" 12 "	61	71	" 10 "	78	100	" 22 "	70·3	85·0	" 14·7 "
19	70	100	" 30 "	64	93	" 29 "	78	93	" 15 "	70·6	95·0	" 24·4 "
20	90	100	" 10 "	90	100	" 10 "	90	100	" 10 "	90·0	100·0	" 10·0 "
21	47	86	" 39 "	35	50	" 15 "	41	93	" 52 "	41·0	76·3	" 35·3 "
22	42	66	" 24 "	25	36	" 11 "	33	48	" 15 "	33·3	50·0	" 16·7 "
23	47	43	" 4 moister	14	26	" 12 "	37	86	" 49 "	32·6	51·6	" 19·0 "
24	36	86	" 50 drier.	22	47	" 25 "	42	86	" 44 "	33·3	73·0	" 39·7 "
25	55	86	" 31 "	24	46	" 22 "	48	75	" 27 "	42·3	69·0	" 26·7 "
26	70	81	" 11 "	37	51	" 14 "	51	93	" 42 "	52·6	75·0	" 22·4 "
27	70	84	" 14 "	50	100	" 50 "	59	100	" 41 "	59·6	94·6	" 35·0 "
28	73	100	" 27 "	61	90	" 29 "	72	100	" 28 "	68·6	96·6	" 38·0 "
29	93	93	" 0 "	93	82	" 11 moister.	93	100	" 7 "	93·0	91·6	" 1·4 m'ster
30	100	82	" 18 moister	58	74	" 16 drier.	76	78	" 2 "	78·0	78·0	" 0 "
31	86	74	" 12 "	39	39	" 0 "	42	93	" 51 "	55·6	68·6	" 13·0 drier.
	65·80	85·96	Aiken 20·16 drier.	46·32	68·70	Aiken 22·38 drier.	58·25	85·61	Aiken 27·36 drier.	56·88	80·06	Aiken 23·18 dri'r

however, that, owing to frequent rains, the relative humidity at Thomasville during the month of March was greatly in excess of the usual mean for that month. The chief object in inserting this table is to enable the reader to follow the daily course of the relative humidity.

The only attempt at a classification of climate, according to its relative humidity, is the rather unsatisfactory one of Vivenot, which is as follows:

1. Dry climates..	*a.* Excessively dry.....	1– 55	per cent.
	b. Moderately dry.....	56– 70	" "
2. Moist climates.	*a.* Moderately moist.....	71– 85	" "
	b. Excessively moist.....	86–100	" "

According to this standard, Aiken and Thomasville would both rank as moderately dry climates. The mean relative humidity of Aiken is, however, less than that of any station east of the Rocky Mountains where hygrometric observations have been taken, and during the first four months of the current year was even less than that of Denver, Colorado.* The spring is the driest season at both places, the relative humidity of March being lower than that of all the other months.

In the following tables will be found a comparison of the relative humidity of Aiken and Thomasville with that of some of the large American cities, and of the leading health-resorts in this and foreing countries.

This comparison, which is based upon the result of many years of observation, proves that Aiken is from 4 to 24 per cent. drier than all the other resorts mentioned in the table, and, as the list comprises all the well-known

*

	Aiken.	Denver.		Aiken.	Denver.
	Per cent.	Per cent.		er cent.	Per cent.
January.....	60·50	66·70	March.....	56·90	65·26
February.....	51·30	51·70	April.....	56·20	60·70

TABLE No. 8.

Comparing the mean relative humidity of Aiken and Thomasville during the six colder months with that of some of the larger cities in the United States.

	Per c									
Aiken.....	57·9									
Thomasville..	63·2	Per c.					Per c.			
San Francisco.	72·9	15	moister	than	Aiken	and	9·77	than	Thomasville.	
Charleston...	72·8	14·9	"	"	"	"	9·6	"	"	
Chicago.....	71·7	13·8	"	"	"	"	8·5	"	"	
San Diego....	71·2	13·3	"	"	"	"	8·0	"	"	
Jacksonville..	71·0	13·1	"	"	"	"	7·8	"	"	
Boston.....	69·8	11·9	"	"	"	"	6·6	"	"	
New York...	69·8	11·9	"	"	"	"	6·6	"	"	
Cincinnati....	67·7	9·8	"	"	"	"	4·5	"	"	
Baltimore....	66·3	8·4	"	"	"	"	3·1	"	"	

TABLE No. 9.

Comparing the mean relative humidity of Aiken and Thomasville during the six colder months with that of some of the principal health-resorts of the United States, Europe, and Africa.

	Per c									
Aiken.....	57·9									
Thomasville..	63·2	Per c.					Per c.			
Pau.....	82·5	24·6	moister	than	Aiken	and	19·3	than	Thomasville	
Davos.....	76·6	18·7	"	"	"	"	13·4	"	"	
Nice.....	71·0	13·1	"	"	"	"	7·8	"	"	
Meran.....	67·5	9·6	"	"	"	"	4·3	"	"	
Cairo.....	67·0	9.1	"	"	"	"	3·8	"	"	
Ashville.....	63·8	5·9	"	"	"	"	0·6	"	"	
Cannes *.....	62·0	4·1	"	"	"	"	1·2	"	"	

stations for which I have been able to obtain reliable data, Aiken may justly be ranked as *one of the driest health stations in the world*. I have been unable to obtain any information as to the relative humidity of Colorado Springs and Manitou, but, judging from the hygrometric conditions of other places west of the Rocky Mountains, these resorts are even drier than Aiken. Thomasville is drier by from 0·6 to 19·3 per cent. than the other health-resorts men-

* According to Hann (*op. cit.*, p. 444), the relative humidity of Meran, Cairo, and Cannes is much higher than the figures in the table.

tioned in the table, except Cannes on the Riviera, which is 1·2 per cent. drier.

Rain and Snow.—The average amount of rain at Aiken during the six colder months is 23·18 inches. The rain-fall is greatest during the months of March and April, but even in these months it seldom interferes with the out-door exercise of the invalid. Of all the factors of climate, the rain-fall is the most misleading, the total amount varying greatly in different years and seasons. The quantity as measured in inches affords no criterion for judging of the dryness of a locality, as a large amount may fall in a few hours, while a much smaller amount may be distributed over several days. Hence, at health-resorts, the duration of the rain-fall is more important than the quantity which falls. One of the chief objects that an invalid has in view in going south is to be able to pass most of the time in the open air, and as this is curtailed by long-continued rain-storms, it is all-important to determine their duration. Unfortunately, I have been able to collect but little information on this point in regard to the places under consideration, the only record that has been made being the rather arbitrary one of the number of fair days.

TABLE No. 10.

Average rain-fall and number of fair days at Aiken for eleven years.

	Rain in inches.	Number of fair days.
January	3·64	19½
February	3·26	19½
March	4·86	21
April	4·71	23½
November	3·43	19½
December	3·28	20½
Months	23·18	123
Winter	10·35	19½
Spring	12·83	21½

In studying the rain-fall in connection with the out-door life of the invalid, it is also necessary to take into consideration the character of the soil. If the ground is retentive of moisture, especially if it be composed of admixture of clay, the walks become muddy after heavy rains, and hours, and perhaps days, may elapse before they become sufficiently dry to enable the invalid to walk out with safety and comfort. If, however, the soil is sandy and porous, the water disappears rapidly from the surface, and a few hours' sunshine suffices to dissipate all traces of moisture. This is particularly the case at Aiken, where, owing to the sandy nature of the soil and the absence of all moisture near the surface, the ground dries so rapidly, even after the heaviest showers, that all traces of water usually disappear from the surface within an hour or two, thus materially curtailing the time that the invalid is confined to the house.

At Aiken there is usually a slight fall of snow once during the season, but this is generally very light, and a little sunshine is sufficient to remove all traces of it. Thomasville, being a hundred miles farther south, may, for all practical purposes, be regarded as beyond the snow-line. Once only during the last fifteen years, according to Dr. T. S. Hopkins, has that place been visited by a snow-storm. At Aiken, owing to the extreme dryness of the atmosphere, there is little or no dew. Frosts, of course, occur from time to time, but are usually light, and generally confined to the months of January and February.*

Winds.—At Aiken the prevailing winds are from the southwest, and are remarkable for their extreme dryness. Owing to the northeasterly trend of the North American coast, the northeast wind has to travel over hundreds of miles of the dry pine forests of North and South Carolina,

* I have been unable to obtain any observations in regard to the rain-fall at Thomasville.

and is thus deprived of most of its moisture before reaching Aiken. Hence, during the first twenty-four or forty-eight hours of the prevalence of such a wind, the atmosphere usually remains clear and bright; indeed, during some of our most delightful days the wind is from that quarter. Strangers occupying houses in an exposed situation are liable to form an impression that Aiken is a windy place, but this is readily dissipated by a walk through the town proper. A year's observation with a Robinson self-recording anemometer shows that the average velocity of the winds is only three miles and a half an hour.

TABLE No. 11.

Giving the direction and velocity of the wind at Aiken during the six colder months.

	Direction.	Velocity—average number of miles per hour.		Direction.	Velocity—average number of miles per hour.
January...	S. W. & W.	3·77	April.....	S. W.	4·03
February..	S. W.	3·84	November..	S. W.	2·55
March.....	S. W.	3·79	December..	S. W. & W.	3·04

Summary.—On looking over the meteorological data as given above, we find that the climate of Aiken and Thomasville during the six colder months (November to April) is moderately cold and fairly equable, with sufficient elevation to insure good drainage and free circulation of air, that the days are fair during two thirds of the season, and that the prevailing winds are from a dry quarter and of moderate velocity. At both places the winter is short, commencing at Christmas and terminating early in March, the peach-trees in Aiken being usually in full bloom by the end of February. Compared with each other, Thomasville is by a few degrees the warmer of the two, but, as regards

humidity, Aiken is not only much drier than Thomasville, but the driest of all our health-resorts except those located in Colorado and New Mexico.

According to Thorrowgood,* the rule to be followed in the selection of a health-resort for consumptives "is to endeavor to have a residence on a dry soil and at a moderate elevation, where there will be free circulation of air, and to avoid places lying low where the air is damp, stagnant, and cold." Aiken comes up to these requirements, and the good results attained there in the treatment of pulmonary phthisis afford ample proof of the correctness of Dr. Thorrowgood's views. Several years ago I classified the results in over a hundred cases of phthisis treated at Aiken. Of these, fifteen per cent. were arrested, and most of them permanently, and, of the remainder, fifty per cent. were improved. I regret that I have been unable to obtain any statistics of results at Thomasville.

In preparing this paper I have endeavored to be correct and impartial, and, if I have written in greater detail about Aiken, it is because I am better acquainted with its climate and surroundings, having lived there for upward of seventeen years, while in regard to Thomasville I have labored under serious difficulties, owing to the inability of Dr. Hopkins to furnish me with the requisite data in regard to the winds, number of fair days, etc., Dr. Hopkins having turned over all the recent meteorological observations to Dr. Huntington Richards, for publication in Wood's "Reference Hand-book of the Medical Sciences."

* Thorrowgood, "Climatic Treatment of Consumption," p. 17.