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CONSTITUENTS OF CLIMATE,

WITH

SPECIAL REFERENCE

TO THE

CLIMATE OF FLORIDA.

BY

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PALATKA, FLORIDA.

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THE CONSTITUENTS OF CLIMATE.

In a paper which I had the honor of reading before the American Public Health Association two years ago, in Boston, I made the attempt to enlighten the public, and especially the medical public, on the subject of the climate of Florida, its adaptability as a health resort, and especially to remove certain unfounded ideas and prejudices which have become wide-spread and deeply-rooted in northern communities. It is somewhat surprising that this should be the case with medical men, since positive information on the subject has always been accessible to them in the volumes of the "Medical Statistics of the U. S. Army," the "Army Medical Reports" and the "Reports of the Adjutant-General's Office," embracing statistics covering a space of more than forty years, which are, of course, thoroughly unprejudiced. They are particularly full of information regarding the meteorology and endemic influences of Florida. For some years past, however, a number of northern physicians have spent winters or portions of a winter in Florida, and the number is yearly increasing. The verdict of these has been uniformly favorable, as also that of the various surgeons of the army who have been stationed there, some of them for several years, during the Seminole war. The earliest visitors and the various adventurers who landed on the shores of Florida, and who left us any written evidence of their experience and sentiments, have spoken in the most enthusiastic terms of her climate. The numerous writers on the subject in the present century have expressed themselves in a similar manner, and indeed it seems almost impossible to one who has lived several winters in Florida, in describing the beauties or the advantages of her climate, not to drift into the same strain. Something of it will be noticed even in the formal reports of some of the older army surgeons. But I propose to avoid this, and to deal with plain facts as far as possible, and leave my medical brethren to draw their own conclusions.

I am disposed to think that there is a desire for further information on this subject, from the fact that my first paper was copied entire or by large extracts in various journals, and that frequent inquiries are now made for the reprints, which were long ago exhausted; while a longer residence in Florida, and a more extensive acquaintance with those who have tested the winter climate for several years, will enable me to speak with more confidence on certain topics than I was able to do at the date of my first publication.

The question of climate is confessedly a difficult one to manage, and the amount of definite, practical knowledge which one is able to gather on the subject from the numerous publications, some of them quite voluminous, is very small. In truth, the more one reads and the more facts he gathers from various sources, the more difficult the task of collation and inference becomes, since these observations are so conflicting and the various theories so confusing that it seems well nigh impossible to deduce any valuable therapeutical conclusions from them. I have addressed myself to this task for the past few years; have studied all the works on Florida from that of Le Moyne, who visited it in 1564 as artist to the expedition of Laudonnière to the latest accessible publications, including all the records bearing upon the subject in possession of the War Department, the library of the Surgeon-General and other depositories at Washington; have conversed with the Surgeon-General, the Assistant Surgeon-General, and other medical and line officers who have been stationed in Florida, and who have had experience of both her summer and winter climate; with many of the scientific and medical residents in the State; with some of her representatives in Congress; and have had the opportunity, during the past three winters, of seeing and conversing with a large number of intelligent visitors and invalids who had, many of them, sought health in various quarters of the globe, and whose evidence regarding the comparative value of climates I consider more valuable than that from any other source; since they have no interest in any particular locality, except so far as it has been conducive to the object in view. Among these, when they have remained in Florida a sufficient length of time

to form anything like an accurate judgment, there has been a remarkable unanimity of opinion in favor of her climate. The opinion of the hundreds who are scattered over the country, who have spent a month, or a few weeks, or one winter even in the State, going generally to only one point, is not worth taking into consideration; yet we have an abundance of contributions from this source in the Press of the country, and many form their judgment from these effusions. Florida has been poetically described as the "Italy of America." But those who have fully tested the climate of the various Italian resorts will consider it anything but flattering to Florida. If space will permit, this comparison will be further alluded to.

There are indications at present that our ideas on the intricate subject of climate are assuming a more definite shape, are becoming crystallized, as it were, around one central point, which, if true, will save us a good deal of perplexity and responsibility when we are asked by our patients the important question: "What climate will suit my case?" Is there any special property of climate which we may seize upon as the test of superior fitness for our purpose as therapeutists? I have reference now to one disease—Pulmonary Consumption in its various forms. These indications are that the public and the profession are arriving at the conclusion that the climate which will offer the greatest inducements to invalids to be out in the open air, or which will enable them to breathe it constantly and without danger of chilling the surface, or, in other words, that which furnishes the greatest *amount* of pure air, is, to speak in general terms, the one to be preferred, paying due regard, however, to the various constituents of climate which may influence the quality of the air. Let me briefly refer to several publications in the journals of three different countries, all falling within the last few months, for these straws show which way the wind blows. In an article in the November number of the "Popular Science Monthly," by Dr. Felix L. Osgood, entitled "Modern Troglodites," the author quotes the following from the report of the celebrated German surgeon, Langenbeck, on Small-Pox: "I have cut up more human bodies than the 'Old Man of the Mountain' with all his

accomplices; and, speaking only of my primary object, I must confess I am no wiser than before. But, though the mystery of small-pox has eluded my search, my labors have not been in vain. They have revealed to me something else, the origin of consumption. I am sure now of what I suspected long ago, viz., that pulmonary diseases have very little to do with intemperance, or erotic escapes, and much less with cold weather, but are nearly exclusively (if we except tuberculous tendencies inherited from *both* parents, I say *quite* exclusively) produced by the breathing of foul air. The lungs of all persons who had worked in close workshops and dusty factories showed the germs of the fatal disease, while confirmed inebriates who had passed their days in the open air, had preserved their respiratory organs intact, whatever inroads their excesses had made on the rest of their system. If I should go into practice and undertake to cure a consumptive, I should begin by driving him out into the *Deister* (a densely wooded mountain range of Hanover) and prevent him from entering a house for a year or two."

The drift of the whole article is to prove, as he does by arguments and interesting anecdotes, many of them familiar perhaps to most of my readers, that dwelling as far as possible in the open air, whether cold or warm, and breathing it day and night, regardless of the bug-bear of "taking cold," is the only preventive or cure of consumption. In the same journal for December is an article by Dr. Paul Niemeyer, entitled "Open Air and Health." In this he speaks of certain "throat and lung complaints which we physicians are daily more and more clearly tracing to inhalation of impure, vitiated air." The burthen of his argument is fresh air and plenty of it. "The patient must keep the window of his bed-room open. Night air is fresh air without daylight; he who fears night air is like a child who dreads darkness. In a city, night air is always wholesomer than day air, being both purer and stiller." In a late number of the "London Lancet," Dr. Handfield Jones, an eminent English physician, gives remarkable clinical evidence from hospital experience of the great value of what he terms *hyper-ventilation;* that is ventilation of sick rooms carried far beyond what the

great majority of us physicians, as well as non-professional persons, would consider judicious. The change in the aspect of cases, which were considered hopeless, from throwing open the windows of the wards, even in cold weather, was truly astonishing. Dr. J. Schreiber, of the Vienna Faculty, in a recent address before the Austrian Meteorological Society, translated by Dr. Geddings, of Aiken, for the "Richmond and Louisville Medical Journal," also calls attention to the same subject, and concludes by saying that "the term climatic," which has hitherto been employed to denote a vague, indefinite specific, of which no rational account could be given, appears now as something infinitely clear and very simple, being in fact nothing more than pure air uncontaminated by miasma, with no organic or inorganic substances, and one in which meteoric precipitation (rain) is not unduly deficient. He shows that it is neither warm air necessarily, nor cold air, nor dry air, nor moist air that is wanted, but *air* in abundant quantity.

I do not mean to say that there is anything particularly novel in the above ideas. Individual efforts in this direction have been made for many years. Several years ago a physician in California would not allow his consumptive patients to sleep even in a tent, but put them to sleep under the trees in the dry, pure air of the locality where he resided. Dr. MacCormac, an English physician of note, insisted, many years ago, that if people would sleep with open doors and windows, there would be no consumption; the hyper-ventilation of Handfield Jones. This, then, is the key-note of the climatic cure of consumption, scrofula, and allied diseases. It is not wonderful that *air* should be so essential to the proper treatment of these affections, since a deprivation of pure air has long been recognized as the principal factor in their generation. It is hardly necessary to argue this point, but a few illustrative examples may not be out of place. In the report of the health of the Royal Navy for 1860, "accounts are given," says M. Simons ("American Journal Medical Sciences," January, 1872,) "of a form of congestive pneumonia of the apex of the lung, which had much the character of incipient phthisis, which was attributed to the overcrowding of the men in berths between decks, the hammock

hooks being only fourteen inches apart. A great number of those who were invalided rapidly improved, when they were removed from the cause, and were able to rejoin the service." "In one instance, in the Dublin House of Industry, where scrofula was so common as to be thought contagious, there were in one ward, sixty feet long and sixteen feet broad (height not given), thirty-eight beds, each containing four children. The atmosphere was so bad that in the morning the air was unendurable." In some of the schools examined by Carmichael, the food was excellent, and the only causes for the excessive prevalence of phthisis were the foul air and want of exercise. This was the case also in the house and school examined by Neill Arnott in 1832. "Two Austrian prisons, in which the diet and mode of life were, it is believed, essentially the same, offer the following contrast:

"In the prison of Leopoldstadt, at Vienna, which was very badly ventilated, there died in the years 1834–1847 378 prisoners out of 4,280, or 86 per 1,000; and of these no less than 220 or 51.4 per 1,000 died from phthisis. There were no less than 42 cases of acute miliary tuberculosis."

"In the well-ventilated House of Correction in the same city there were in five years (1850–1854) 3,037 prisoners, of whom 43 died, or 14 per 1,000, and of these 24 or 7.9 per 1,000 died of phthisis."* It would be useless to take up space in multiplying these instances. But perhaps some of my medical friends who follow Niemeyer will say the majority of cases of phthisis are not tubercular, but inflammatory, and are therefore not due to this cause. But few cases of consumption, I think it is safe to say, result from cold, or the inflammatory chest affections commonly ascribed to exposure, in *otherwise healthy subjects*. There is predisposition, which is the result doubtless almost invariably of faulty habits of life, resulting among other things in imperfect nutrition, debility, deficient æration of blood, etc.; and the deprivation of a due amount of pure air, especially while sleeping, and during the most of the twenty-four hours in winter, is no doubt the most important factor in the production of this lowering of vitality; the first step towards the

* Manual of Hygiene. Parkes.

production of tubercle and scrofula. The medical profession is becoming fully alive to the importance of thorough ventilation in the *treatment* of disease, as the almost perfection, in this respect, of many of our recently-constructed hospitals fully attests.

Closely connected with the *amount* of out-door air which an invalid will get at a winter resort is the *temperature*. Let us, therefore, first turn our attention to the *winter and spring temperature* of Florida, and compare it, as well as its *equability*, with that of other places. I have abridged the following table, by Dr. A. S. Baldwin, published in the Proceedings of the Florida Medical Association, 1874–75:

	Spring.	Summer.	Autumn.	Winter.	Year.
Jacksonville	70.06	81.82	70.35	56.33	69.38
St. Augustine	68.54	80.27	71.73	58.08	69.61
Palatka	70.62	83.57	70.20	57.18	69.64
New Smyrna, Indian River	71.80	79.14	62.43	63.22	69.17
Florida	71.62	80.51	71.66	60.04	70.95

Referring to the winter and spring months, the temperature of Florida may, in general terms, be compared to that of a typical May and September in the Northern States, with some quite warm and some quite cool variations, which will again be referred to. There is a very erroneous idea prevalent with regard to the temperature of the month of April, and the first warm weather of March is apt to drive invalids off to seek a cooler climate, under the impression that the heat must necessarily be oppressive. Though the temperature of April, as indicated by the thermometer, may be considerably higher, it is not infrequently a more agreeable month than February or March, as was the case this year. The following table was furnished me from the signal office at Jacksonville, for which I am indebted to the kindness of Mr. F. Z. Gosewisch, the signal officer:

MEAN TEMPERATURES.

	1873.	1874.	1875.	1876.	1877.	1878.
March	58.9	66.0	60.1	60.9	60.8	65.4
April	69.1	70.0	62.8	68.8	68.2	71.3

The heat *in the sun* is, except during the morning and late in the afternoon, often somewhat oppressive, but there is almost always a sufficient sea breeze, commencing at 9 or 10 o'clock A. M., and lasting until sundown, to render it very pleasant in the shade. This, indeed, is the case even in the summer months, and the testimony of Northern people who reside in Florida the whole year, is that the early morning, the late afternoon, and the evenings are not unpleasantly warm, as a general rule; that is, when one has free access to the easterly wind which generally prevails as a sea-breeze at pretty regular hours. The army records show that the thermometer in Florida rarely rises as high as in most of the Northern States and Canada, but of course the heat is more continuous. A temperature, however, which would be felt as very oppressive in the Northern States, except on the seacoast, is in Florida quite endurable, owing, no doubt, to the peculiar configuration of the State, jutting out, as it does, in a narrow strip into the ocean, and with rivers or other considerable bodies of water scattered liberally over its surface. The isothermal of 70°, the April temperature of Palatka, passes through that place, through Galveston, New Orleans, Teneriffe, Alexandria and Canton.

Equability of Temperature.—Writers on medical climatology were at one time disposed to regard this as the most important quality; but, as in the case of dryness, moisture, rain-fall, and other characteristics, it is now thought advisable to define the *degree* of equability. Many travellers who have spent but a short time in Florida, and who have been led to look for perpetual spring, have been surprised at the not infrequent changes in certain months, and have disseminated erroneous ideas as regards their frequency and severity. The *diurnal range* for Florida is 13° to 14°, and for Palatka still less; while those variations, which occur at longer or shorter intervals, are within moderate limits, so as not only not to produce unpleasant effects on the most delicate invalids, but are decidedly beneficial, especially to the worst cases of pulmonary disease, acting as a tonic and tending to vary the monotony, which, in tropical climes, is so injurious. Nothing acts so unfavorably on all forms of invalidism as monotony of any kind. In tropical countries,

where these changes are so rare that no provision against cold is made, except to bring a small brazier of coal in the invalid's room, they are to be deprecated. But in Florida they are pretty uniform, and the wood-fires in the open fire-places, with which the hotels and boarding-houses are well furnished, are greatly enjoyed by all persons, sick and well. The evenings and nights are so cool throughout most of the winter, and even early spring, that a wood-fire is commonly seen in the sitting-rooms.

Turning to the evidence of army officers, Dr. Southgate remarks, in his report: "Rarely is the change so great as to impress the individual in fair health uncomfortably, and the invalid has invariably sufficient warning to guard against it." Surgeon-General Lawson, speaking from an extended personal experience, says: "The climate of Florida is remarkably equable and proverbially agreeable, being subject to fewer atmospheric variations, and its atmospheric ranges are much less than n any other part of the United States, except a portion of the coast of California."

Sir James Clark, in his well-known work on Climate, remarks: "A long residence in a very equable climate is not favorable to health, even with all the advantages of exercise in the open air. A moderate range of temperature and of atmospheric variation seems to be necessary for the preservation of health." Turning to a more recent authority, 1877, and one of the best, Dr. Charles Th. Williams,* referring to the invalid's dread of cold changes, says: "And herein lies their mistake; for if our invalids could indeed find a lotus-eater's land

> In which it seemed always afternoon,
> All around the coast the languid air did swoon,

I would predict that the results on their health would be rather pernicious than otherwise, and loss of appetite and diarrhœa would probably be induced." This constitutes one of the prominent distinctions between a tropical and a semi-tropical clime; between the West Indies or Nassau, for instance, and Florida.

A good deal of attention has lately been devoted to *high altitudes* for consumptives, and various theories have been advanced

* Influence of Climate in Pulmonary Consumption.

to explain the effect of elevation. Thus, Mühry thinks the effect is due mainly to the necessity for greater expansion of the chest in consequence of the *rarefaction* of the air; while Weber ascribes it to a cause, among others, just the reverse—the superior oxydizing power of the air from the presence of much ozone, thus lessening the amount of air necessary, and thus requiring less expansion, placing the crippled organ in a comparative state of rest, as it were. But all the theories have been disproved by further observations. "It was soon demonstrated," says Schreiber (op. cit.), "that the altitude at which this immunity commenced varied with latitude, being higher the nearer we approach the equator, which could not be the case if the above theory were correct, the law of diminished pressure being everywhere the same." "An inquiry instituted in Saxony, at the expense of that government, proved that elevation had nothing to do with immunity, very high localities in the Erz and Riesengeberge exhibiting a large percentage of phthisis as soon as the inhabitants turned their attention to the industrial arts, such as mining and the manufacture of china; while, on the other hand, the percentage in the lowlands was diminished when the people were engaged in agriculture and cattle-raising." In other words, that it was the abundance of good air and not any peculiar property of it which effected the good results. Nor are the assertions of writers as to the complete immunity of the natives of high altitudes in other parts of the world, in the Jauja mountains of Peru, for instance, confirmed by later observers, although all agree that consumption is rare;* but so it is in Florida among the white race; the disease in the exceptional cases being, as a general rule, induced by bad food and bad habits. In fact, it is now sufficiently well demonstrated that it is to be found everywhere. Richard Payne Cotton, M. D., Senior Physician to the celebrated Brompton Hospital, England, says:† "And here I would make a passing remark on the now rapidly dying-out question, that there is

* "Lombard's Statistics," says Williams, "give us a phthisis mortality of 5 per cent. up to nearly 4,000 feet." Dr. Ludwig found a case of consumption in the Engadin, which boasts of entire immunity, who had never lived at a lower level than 4,000 feet.

† British Medical Journal, 1877.

anything in any one climate, wherever it may be, which is opposed to the development or even the increase of tubercular disease—consumption exists everywhere. There is no favored spot where it is not. There is no 'promised land' for our consumptive sufferers where they will fail to meet consumptive sympathizers." The valuable statistics which we get from the Army Medical Reports of England demonstrate this conclusively. It has been long thought that intensely cold countries, near the poles, for instance, were absolutely free from phthisis. But, notwithstanding the positive assertion to the contrary, the Army Reports tell us that, "with the exception of epidemics, diseases of the chest furnish the largest quota of mortality," and mention that "*consumption is common.*" So is it in Shetland and Iceland, according to the excellent authorities quoted by C. T. Williams (op. cit.). "The Army Medical Reports," says Parkes (Practical Hygiene), "show how little reliance can be placed on the cold-immunity theory, for it appears that the mortality in Bengal from phthisis is almost precisely the same as in Canada (1.70 and 1.71 per 1,000, respectively). "In the Presidency of Madras, which is an exceedingly hot region, our Army Reports," says Williams, "assign one of the lowest phthisis mortalities of all the countries where the British army is stationed; while among the Sepoys, the mortality from this cause is even less."* "But,"

* In 1870 the deaths from consumption in the United States amounted to nearly 70,000, more than double the number from any other cause. In the different States the mortality from consumption, taken from Dr. Bizzell's report (Medical Association of Alabama), is as follows: In Maine, 1 to every 3.9 deaths from *all causes*, or 1 to every 315 of population; New Hampshire, 1 in 4.5, 1 death to 334 of population; District of Columbia, 1 to 4.6, or 1 to 298 of population. The mortality from phthisis in the States of Vermont, Rhode Island, Connecticut, Delaware, New York, New Jersey, Ohio, Pennsylvania, *in fact*, every State and Territory of the Union north of the 38th parallel, ranges from 1 in 3.9 in Maine to 1 in 11.9 in Kansas; and in no State north of this does the mortality fall so low as 1 in 12, save in the Territory of Wyoming, where the statistics are too scant to be worth much. In Minnesota it is 1 in 7.6 deaths from all causes; in California, 1 in 7.2; in Arizona it is only 1 in 250 from all causes; in New Mexico, it is 1 to 26.2; Nevada, 1 to 20.5; Florida, 1 in 17.3; Texas, 1 in 16; Louisiana, 1 in 10.3; Georgia, 1 in 15.6; Alabama and Arkansas, each, 1 in 14.2; Mississippi, 1 in 13.2; South Carolina, 1 in 11.2; North Carolina, 1 in 8.6; Virginia, 1 in 7.2.

We see from this table that in all the States east of the Mississippi, Florida has the smallest mortality from phthisis; and a considerable share of this mortality should be attributed to persons coming into the State from other States and dying there, many of them in a hopeless condition on their arrival Allowing for this, the rate is probably as low as in New Mexico or Nevada.

he says, "the crowning objection" (alluding to the diminished pressure theory) "appears to come from Asia, from the Kirghis land. According to M. Maydell, this vagrant population of over a million in number are quite exempt from phthisis, although they live, not in Himalayas or Andes, or on Alps, but on a steppe one hundred feet below the sea level." The foregoing facts will give some idea of the difficulties which environ this subject of the effect of climate on consumption. Take the famous health resorts of the south of Europe, for instance. "In Nice," says Dr. Meryon ("London Lancet," July, 1850), "more *natives* die of phthisis than in any town in England of the same population." In no country, says Dr. Pollock, is consumption so rapidly fatal as in Genoa, Florence, and Naples ("Medical Gazette," volume xlvi). In Madeira, consumption is frequent among the natives. In Australia, to which many of the English resort for the relief of consumption, it is quite common. But, of course, in all these places we must make due allowance for the condition and habits of the people as a factor in the development of phthisis.

With regard to the *elevated regions*, about which so much is written now, and which are becoming so fashionable, for the sway of fashion is omnipotent and omnipresent, it is worthy of note that in almost all, if not all of them, diseases of the respiratory organs are very prevalent. Speaking of the Peruvian mountains, where it has been asserted the natives are almost entirely free from disease, Williams writes: "The diseases most prevalent are those of the respiratory organs, such as catarrh, pharyngitis, pleurisy, pneumonia, pleuro-pneumonia, and are all marked by an adynamic type.* Diseases of the brain

* "It has been long observed that the inhabitants of elevated mountain districts appear to be peculiarly exempt from consumption, and an attempt has been made of late to turn this observation to practical account by recommending such localities as health resorts for the phthisical. It is, however, more than doubtful if the fact that the hardy mountaineers who inhabit Alpine districts, and whose lives are passed under the most favorable hygienic conditions as regards pure air and exercise—the natural prophylactics against tubercular disease—are rarely attacked by consumption, can be regarded as a proof that these localities are therefore suitable winter resorts for patients already phthisical, and whose state of health would, in such elevated and oftentimes intensely cold and variable climates, probably confine them to the house in the new sanitariums of the Engadine, or other Alpine resorts, during the greater part of the winter." Madden (op. cit).

and spinal cord are common." Similar reports, except the frequency of pneumonia, come to us in the American Army Medical Reports from all the posts situated on these high elevations (5,000 to 7,000 feet). *Neuralgia* and *rheumatism* are very common in those altitudes, and *nervous diseases* are aggravated. Dr. Dubois, of San Rafael, says ("Medical Record," March, 1872,) the same of that region, although it is highly commended for other affections. Another peculiarity of these elevated regions, of all very dry regions generally, is the extraordinary *range* of temperature. Thus, Assistant Surgeon J. H. Patzki, writing from Fort Fred. Steele, Wyoming Territory, says "a daily range of 40° is frequently observed, of 50° not rarely, and of 60° occasionally" (e. g., Aug. 9, 1874, max. 86° min. 26°).* In these regions there is also a peculiar *fever* prevalent, which is serious, and not infrequently fatal. It is known all over the United States, in the mountains, even at moderate elevations, and is called by the people and by the medical men "mountain fever." It has usually been described as a *typhoid* fever, but the medical officers of the army have established the fact that it is a remittent and of malarious origin.

Before dismissing the subject of the effect of high altitudes, which, by the by, have very different effects as to respiration, etc., on different individuals, it may interest those who send their patients to these places to know the effect elevation produced on a medical man and how he treated it. Assistant Surgeon W. H. Gardner, U. S. A., stationed at Fort Union, New Mexico, thus relates his own case:

"Shortly after arriving at the post, I was attacked with a fullness in the head, ringing in the ears, mental hebetude, and confusion of ideas, dizziness and headache. Thinking these symptoms might be caused by constipation, dyspepsia, or torpidity of the liver, I took a mercurial purgative, and followed it by a dose of Rochelle salts, which relieved the fullness of oppression for a day or two, but it at once returned, the dizziness and confusion of ideas increased, and a feeling of numbness and tingling commenced in the fingers of the left hand, and gradually spread until it involved the whole left side, even the muscles of the tongue being involved in the paralysis, so that I could not

* Dr. Gehring, of Denver City, graphically describes the risk of sending patients to these elevated regions (Territorial Medical Society, 1873). He says if he has vigor and *digestive force*, and "if his disease is *not too far advanced*, let the patient be sent to Colorado; without it let him be advised to remain at home. Our Territory is like a wild steed. If you can tackle him he will carry you out of your difficulties; if you can not, he will break your neck."

articulate. There was also oppression of breathing, throbbing of the carotids, and slight dilation of the pupils. The only medicine handy at the time of my first attack was a bottle of chloroform; and thinking the symptoms might be due to spasm of the cerebral or pulmonary veins, I poured a drachm or two on my handkerchief and inhaled it, when the disagreeable symptoms promptly subsided. The next day, on my visit to Dr. Moffat, of our corps, I told him of my troubles, and he thought they were due to malarial poisoning, and advised me to commence a course of quinine and arsenic, which I at once did, taking twelve grains of quinine and one tenth of a grain of arsenic each day. But, in the course of five or six days, while under the full influence of these remedies, I had another attack in all respects similar to the first, coming on after a hearty dinner, which was relieved by a prompt emetic. Shortly after this second attack, I was sent for to attend a case at Mora (fifteen miles northwest of the post, about four hundred feet higher in altitude), and while there alone, I had another attack, more severe and prolonged than the other two, and upon this occasion I certainly thought there would be another vacancy in the medical corps to fill, for I took emetics, bromide of potassium, and chloroform *ad nauseam*, without the least effect. The symptoms went off before morning; but when I got back to the post, I brought the Darwinian theory to bear on the case. *Ita:* If the environment of an animal be suddenly changed, and the animal does not change his habits to suit his environment, it will be speedily eliminated. The only radical change in environment which I could detect here was decreased atmospheric pressure from increased altitude, and consequently deficient oxygenation of the blood. The indication, therefore, was either to supply the deficiency of oxygen to the blood, or to reduce the volume of blood to the decreased amount of oxygen. The latter alternative seemed the easiest and most certain. I therefore decreased the amount of my nitrogenous food, and made up the quantity by laxative vegetables and fruits, and have been in good health ever since. I have seen two cases since, in every respect similar to mine, and they have promptly succumbed to the treatment indicated; that is, decreasing the amount of blood to the decreased amount of oxygen by cathartics and decreased animal food."

Dr. Charteris, in a clinical lecture at the Glasgow Royal Infirmary, lately remarked: "The benefits of warm climates and of well-known health resorts for phthisis simply consist in this, that out-door exercise can be indulged in those with greater impunity and with less chance of in any way lowering the vitality."* This is the gist of the whole matter of climate. Though patients with pulmonary troubles *can* bear cold if they *will*, and do improve and recover in the coldest climates; though they even do better, as a general rule, in a rather large class of cases, in a moderately cool climate, if not moist; though they recover in mountain ranges from six to ten thousand feet above the sea level; yet I am confident that, in the end, it will be found that the majority of consumptive invalids will do better

* "Preference should always be given to those winter resorts," says Madden, "Health Resorts of Europe and Africa," 1876, "which present the greatest inducements and opportunities for open-air exercise; and no small part of the benefit derivable from removal to a southern health resort results from the opportunies afforded in the latter of being much in the open air."

in a moderately warm and moist climate like that of Florida than in any other variety, because nearly all such invalids shrink from moderate degrees of cold, and even if they have sufficient vitality, have not enough energy, will, or perseverance to brave any considerable degree of cold day and night, as they must do to get the benefit of the climate. A climate must not only be such as to render it *safe* for them to be out at all suitable hours, but to entice them out, to make them ashamed to stay in-doors. A mean winter temperature of about 48°, and spring temperature of 55°, which is that of the winter resorts immediately north of Florida (of course it is far colder at Asheville and similar stations) is too low to *entice* many of the feeble invalids out of doors, except on calm, sun-shiny days. But in some of them, as at Aiken, this degree of cold is much enhanced, as far as the sensations of the invalid are concerned, by the winds which frequently prevail.* At such times most invalids will, therefore, be found hovering over the comfortable wood fires, just as they do here when one of our cold transitions occur, and will be pretty sure to keep all the apertures of their chambers closed at night, thus depriving themselves, during by far the greater part of the twenty-four hours, of the principal means of cure.

The mean temperature of these six months in Florida is, by our tables, about 63°; and, during about five-sixths of the days, the sun shines so brightly, the air is so balmy, the song of the birds so enlivening, and the orange trees, in their delicious bloom or laden with their golden fruit, lend such a charm to the outlook from the windows, that the most indolent or the most cold-blooded invalid feels little inclined to stay in-doors. Contrast such a winter with that of the boasted and time-honored resorts of Southern France and Italy, even in their most protected cities. I will say nothing of their spring, for no one who has ever tried it, or has inquired of any reliable authority about it, would trust himself there after the first of March. Even in the most sheltered localities, as at Cannes and Mentone, a change, on one of the most pleasant days, from the sunny to

* Dr. Kane estimated that it made a difference of 40° in the polar regions when he turned his face instead of his back to the wind.

the shady side of the street, often produces a shiver, and renders necessary for an invalid an extra covering;* while in all the resorts of the Eastern Riviera this is always the case. At sunset one must rush home and in-doors for his life; nor does any prudent man dare to ride out in the afternoon without the wraps he would require in his northern home. Such is the case even in Algiers, which is a superior climate to that of the north shore of the Mediterranean. My friend, Dr. W. F. Jenks, informs me that, while walking into the city, in an uncomfortably hot sun, he always carried a thick overcoat on his arm, for the moment he struck the shady side of one of the narrow streets, a shiver passed through his body; and, while riding, he always provided himself and family with thick woollen wraps for the change which was sure to take place near sunset. "Though the temperature of Hyères in winter, *as marked by thermometer*, is not low, the air is sharp and often cold. The misral is not infrequently painfully experienced, especially in January, February, and March. In spring, the sun acquires great power, and its influence, alternating with the occasional cold winds, produces frequent and rapid changes of temperature very trying to those in health." Speaking of Nice, the same author says:† "In winter there is a difference of 12° to 24° between the temperature of places exposed to the south and the north, between those in the shade and the sun." In Florida, during most of the warm and pleasant days, one may not only be out at sunset on land, but with equal comfort on the water. I have frequently called the attention of persons to this contrast with the European climates when we were returning from a row at sunset; some of us in midwinter, in our shirt-sleeves. Had there been any considerable degree of dampness in the air, this would not have been prudent or comfortable. But one seldom

* There is a saying in Rome that "only dogs and strangers go on the shady side." Dr. Dubois, of San Rafael, says of the much-vaunted Mentone: "I remember a number of chilly, windy days, which, without the ordinary conveniences for making fires, were spent wrapped up in overcoats, and in endeavoring to make a fire, that should remind us of home, with several baskets of olive-wood." Such is the opinion of those who winter at similar European resorts, most of which are more exposed than Mentone, unless they happen to be on the sunny side of the house.

† Edwin Lee, Prize Essay, London.

feels any dampness on sunshiny days. Those who have never been south, and who are shivering in a winter temperature of 10° to 30°, may think that 48° or 55° would be abundantly warm to insure ability and inclination to exercise in the open air; but while a winter temperature of that degree in New York or Boston would seem like summer, it is considered in Florida, even by sound persons, as entirely too cool for comfort. A person requires much warmer clothing in the South than at the North, at the same temperature. The air here during the greater part of the winter, with the exception of a brief series of days now and then, when an almost summer temperature is reached, is, in connection with the pleasant surroundings, exhilarating, not debilitating. It is a great mistake to suppose that warmth, *per se*, is inimical to health or strength; heat is, not warmth; such a temperature is only such as nature requires to keep all the organs in a healthy state of action. The warm weather of the spring and autumn at the North, and even the comparatively hot weather of summer are the healthiest seasons. Persons make themselves uncomfortable by fuming over the thermometer, but they don't get sick, or not sufficiently to send for a doctor. But unusual summer heat or winter cold, long continued, equally tends to swell the bills of the doctors and the undertakers.

There is a remarkable unanimity, within the last few years, in the opinions of the medical reporters from all sections of our country, from the Atlantic to the Pacific, from the level plains and the highest altitudes, from very cold and moderately cold regions, on this point, that only cases of incipient phthisis, that is, *tubercular* phthisis, are likely to be permanently benefited, and almost all of them warn against sending cases of advanced disease, even when not much enfeebled. Dr. Gleitzmann, of the Sanitarium at Asheville, N. C., seems to be of a different opinion. He says (Trans. of the Med. and Chir. Faculty of Md., 1875, p. 204): "The patient, after returning home" (from southern climates), "has not acquired that power of resistance which alone can prevent a new bronchial catarrh or fresh catarrhal inflammation attacking the alveolæ of the lungs. As much as ever, he is exposed to the same danger of a

relapse from the same causes, or is perhaps inclined to it in a still higher degree, as the warm, humid atmosphere has served more to enervate than to invigorate the system." He quotes Madeira as the type of such southern climates. On the contrary, the reporters from the cold regions, as in Minnesota, and the less severe regions further south (see Transactions of State Medical Societies and Army Reports) say that invalids, even after a residence of several years, and a subsidence of all the symptoms, are very apt to relapse on returning home, and frequently regain their health on repairing again to the colder regions; and they strongly urge invalids to remain permanently, or for a long time, at least, after the subsidence of all bad symptoms. Sometimes these climates fail for a year or more, or a series of years, to fulfill the expectations of the physicians there and their patients, and from causes not always fully explicable. Thus, in Minnesota, for instance, this was found to be the case. And the Committee on Climatology, Epidemics, and Hygiene proposed a question as to the cause to the physicians of the State. "The question," says the committee, "originated in the belief that the climate of this State, from some cause or other, operated less favorably on consumptive patients than formerly." The answers were all, except from one who had no phthisical patients, in the affirmative, that the climate had lost its usual effect. "Dr. J. E. Finch had several consumptive patients under notice, all of whom failed with unexpected rapidity on the approach of spring. Some of these had come to Minnesota with the disease in its early stages, and had been so much benefited by a residence here as to believe themselves quite recovered." Some inscrutable agency was at work, which may influence any climate at times, whether hot or cold. This question, that is, as to the failure of all climates to relieve a very large majority of cases in the later stages of consumption, may be considered settled. But when confidence in the "hyperventilation" system becomes general among the public and the profession, we may reasonably expect a far better showing from climatic treatment. In the meantime, the warmer and pleasanter climates will naturally succeed better than the colder, notwithstanding the alleged superior qualifications of the latter in other respects.

Malaria.—This is a topic which inevitably enters into the discussion of all southern climates. So much has been said about it both in and out of Florida, and there have been so many misrepresentations about it as to render necessary a more extended notice than it received in my first paper. A great injury has been done to Florida as a winter resort unwittingly, both by physicians and laymen, who have been accustomed to associate the idea of this State with that of swamps, alligators, and fevers, and wittingly by those who think it their *interest to* misrepresent facts.* It is a matter of the first importance that physicians at least should have correct ideas on this subject, otherwise patients are apt to be debarred from deriving benefit from the very best season of the year here, the *spring months.* In the first place, tourists travel almost always along the water courses, and seeing them, on either side, bounded apparently by interminable swamps, are apt to form an erroneous idea of the extent of the swamps of Florida. They usually form only a narrow belt along the river, and immediately behind are the pine lands, except when a strip of hammock intervenes, often the tops of the pines being visible over the swamp.† In many of these swamps the tide ebbs and flows, and they rarely give rise, even in summer, to any serious form of fever. In the second place, the sickly complexions and gaunt forms of many of the native Floridians, who are met with at the landings, are apt to suggest the continued inroads of malaria. But these appearances are due not so much to the climate as to their peculiar mode of life, their scanty clothing, sufficient for three-fourths of the year, but not for the winter months; their unsuitable habitations, but especially their food and drink. From

*It is the custom of many persons living at Florida resorts, off the St. John's river, to represent, for very obvious reasons, to tourists, that fever prevails there the year round, and that it is dangerous to visit it at any time. In this manner they have excited alarm in the minds of those proposing to come to Florida, and have diverted them to other southern resorts; thus, in the end, injuring themselves as well as others. Hotel runners and the agents of steamboat lines running to other localities all aid more or less in this fraudulent attempt to secure custom.

† A great advantage of the peculiar distribution of the different kinds of land in Florida is, that the hammock or richest lands and the pine are in such close proximity, that the farmer can work in the former by day and retire to his house in the latter at night, where he is comparatively secure from the danger of malaria or any dangerous form of it.

early childhood they live on sweet potatoes and the everlasting hominy and grease, the melted fat of pork stirred liberally in hominy, not always well boiled. This they become so fond of that they do not care for anything better, although game and fish surround them almost everywhere. This food, and their drink from the shallow wells, or the dark-colored water of the sluggish brooks, begets dyspepsia, or as they term it, "biliousness," and then come "Tutt's liver pills," or some powerful cathartic, which affords temporary relief. The people in the cities and villages, and the families of northern men along the water courses, who have brought up their children there, but who live differently, present an entirely different appearance. In this village they will compare favorably with those in any northern town. James Johnson ascribes the horrible aspect of the inhabitants of the fertile but malarious plains of Lombardy mainly to the same causes. Their food and drink are even worse than that of the Floridians in quality, as are also their houses. Sir James Clark, on investigating the cause of a considerable prevalence of consumption in the Island of Madeira, found that it was due almost entirely to the habits of life of the poorest peasantry, among whom almost all the cases occurred. They are "hard-worked and miserably nourished, badly clothed and worse lodged; their beds consist of pallets of straw raised a foot or so from the ground, damp during nine months of the year." So we infer that a location is not necessarily unsuitable for invalids because the appearance of the inhabitants is unfavorable, or because a considerable amount of disease prevails, even the very disease for the alleviation of which the invalid desires a change. I quote the following paragraph from my former paper:

As regards *liability to disease* in Florida, a careful examination of the "Medical Statistics of the Army," extending through a long series of years, personal observation and conversation with medical and line officers engaged in the Seminole war, indicate a remarkable exemption throughout the State from malignant or even very serious diseases.* "At all seasons,"

* Forry (Climate of the United States and its Endemic Influences) says, alluding to St. Augustine: "This is only the second time that yellow fever has prevailed in this city for twenty years." This refers to about 1840. Since

says Forry, "with the exception of the northern division, the mortality is lower in East Florida than in any other class of posts." He ascribes this, in a great measure, to "its being nearly in a state of nature." In the "Statistical Report of the Sickness and Mortality of the U. S. Army" from 1855 to 1860, is a table at page 163, which exhibits the mortality and sickness among the troops stationed at the interior gulf ports, and embracing, especially, as regards the former, the most unhealthy part of the peninsula. The number of *cases* for the year is 19,312; the *deaths* 119, or 0.61 per cent. There were but four cases of *congestive* fever, none of which died. They could hardly have been of the severe character of those met with in other Southern States. If we take into account the very unfavorable circumstances surrounding the small commands scattered over this area, the bad water, poor food at times, hard work, and continuous exposure, the small percentage of mortality is remarkable, and shows that although the cases reported for treatment are numerous,* the diseases of all kinds were very amenable to treatment and

1857 there has been no yellow fever in East Florida, except two or three cases brought to Gainsville a few years ago from Pensacola, where it is apt to be conveyed from Havana, until last summer, at which time all the conditions for its spread were more, perhaps more, rife than they had ever been. Both Fernandina and Jacksonville were in a most unsanitary condition, when a case, through a careless quarantine, was brought into the former place; so long a period of exemption having naturally caused a great relaxation in vigilance. The severe lesson which these cities have received will insure strict attention to quarantine regulations for some years to come. The authorities of Jacksonville have been prompt and liberal in voting a large appropriation, and have already made extensive sanitary improvements, and the work still goes on. It is hoped and expected that next winter will find these cities as free from fevers of all kinds as usual at this season. It is a remarkable fact, and indicates how little yellow fever is disposed to spread in Florida, that in the several months during which it prevailed in Jacksonville, with unrestricted intercourse (except during a brief period with Palatka), with all places along the river, steamers plying to and fro daily with freight and passengers, not a single case occurred at any point along the St. Johns south of Jacksonville, and only one case, as far as I am aware, on any boat. This occurred in the person of the pilot of the Volusia, while I was on board. He returned to his residence in Jacksonville, and died there. In 1857 a few cases were brought to this place, but, though no precautions were observed, it did not spread to any other person. The recent epidemic did not attack a very large number of persons at Jacksonville, and the expediency of declaring the disease epidemic at all was debated for some time by the authorities. At Fernandina, though the *number of cases* was large (about 1,200), the mortality was small; about 60, so far as I have been able to learn, indicating a comparatively mild form of the fever.

* Soldiers report for relief from duty for the most trivial affections.

rapid cure, as all the military operations went on successfully, notwithstanding this large amount of sickness. The very small percentage of deaths from diseases of the respiratory organs is especially noteworthy—only 13 cases among the 19,000 of all diseases treated. Notwithstanding the dampness, rains and exposure, there were only 33 cases of pleuritis and 25 of pneumonia. "I have served in Florida," says Surgeon-General Lawson (letter to the Hon. D. L. Yulee, U. S. Senate, 1855), "and have served also with an army on the northern frontier, and from my experience of the influence of climate and active operations of the army in the field on the health of soldiers, I have no hesitation in expressing the belief that, had the troops engaged in the Florida war been engaged for the same length of time in active operations, in winter and summer, on the frontiers of Canada, though the *cases of disease* might have been less numerous, the *mortality* would have been infinitely greater than was experienced in Florida."

Of course there are here, as in other States, healthy and unhealthy areas, and areas where the *summer* heat is found to be more intolerable than in others. It behooves the settler, therefore, or the invalid, if he proposes to make the State his *permanent* residence, to look well to this circumstance. Along the St. John's river and its vicinity, malarious diseases are, during the summer and autumn, more prevalent in some localities than in others, and especially where numbers of people locate at once, and commence clearing the hammocks and swamps on a large scale, in order to form a village or "settlement." Places which have been reputed healthy have become the reverse, from admitting the sun's rays suddenly and extensively to a surface previously shaded by the forest and undergrowth, and from turning it up with the plow. This is a well-known fact. A remarkable instance of this action over a large extent of country is the unusual prevalence of malaria during the past eight or nine years over a large portion of the Northern and Eastern States, and some of the Western States. It is not the forests which have been cut down, but during all this period, until within the past twelve months, when rains have been more frequent, an unexampled drought has prevailed winter and sum-

mer, only surface rains having occurred, but not sufficient to penetrate to the sources of springs and wells, so that these gradually dried up, and on several occasions farmers were compelled to take their cattle long distances to brooks to give them water. The snows have also been very deficient in winter, not sufficient to wet the subsoil. Large surfaces, therefore, which had always been kept cool and moist in summer by springs, became dry, and wherever there was an impervious subsoil or rock, there the malaria was generated. This has been, in my opinion, the most potent if not the only factor in the causation of the marked increase of fevers in all these areas.

But tourists and the great majority of invalids are only concerned with the *winter* climate of Florida; and while it can not be denied that persons may contract ague here in any season of the year, just as they are doing all over the country, especially of late, yet it is so rare among visitors that it need not, and should not, enter into the calculations of those whose condition calls for a winter residence in a mild climate. No climate on earth is perfect. Persons who have suffered for years from malaria at the North have recovered from its effects here; the escape from the injurious influence of a severe winter and a changeable spring having improved the tone of the nervous system. The writer affords an illustration of this. Having suffered for a long time from malarious fever among the picturesque and formerly salubrious highlands of the Hudson, he was strongly advised by his medical friends at the North not to remain longer on the St. John's than the first of April. He did, however, remain until near the middle of May, has continued to remain late in the spring for three years, and has entirely recovered from his malarious torments, though failing to get relief previously even in Saratoga. As another illustration of the immunity from fever here in the winter, enjoyed by Northern visitors, it may be worthy of mention that of the large number of employés of the hotel in which the writer boards, and the proprietor's family, scarcely a case of fever has occurred in three years, although they remain until May, and most of them are by no means very careful of their health.

It is well known among physicians that other causes than

miasm or the emanations from swamps, are capable of producing, and are actually producing every day, symptoms precisely analogous to those of intermittent fever, and which yield to the same treatment; and it is well that visitors to Southern resorts should understand and remember this: first, that they may, as far as possible, avoid these causes; and, secondly, that they may not be frightened away from a pleasant and suitable locality under the fear that their symptoms are caused by influences arising from its surroundings, instead of, perhaps, their own want of prudence.* Some experienced and thoughtful physicians, who have so constantly observed malarious attacks arising from causes which could not possibly be connected with marsh miasm, have gone to the extreme of denying that the latter ever has anything to do with these attacks. Dr. Black, of Ohio, has read two interesting papers on this subject before the American Medical Association; and facts, furnished by high authority, abound all through medical literature which tend to support his views. But, as usual in such discussions, the medium course is the safest. The fact, however, that so much doubt should have been engendered in the minds of medical men indicates that, at least, sometimes, and I think frequently, intermittent fevers, and malarious attacks allied to them, occur from causes having no necessary connection with marsh miasm; also, that when the effects of miasm have long disappeared from the system, these causes will re-develop the disease. Among these numerous agencies may be mentioned, in general terms, any cause which tends to lower vitality; want of proper food, nervous shocks, exposure to wet, or to severe cold, or long-continued cold, depressing emotions, excessive diurnal variations of temperature, etc. Dr. Black lays great stress on the latter. Some of these causes will develop malarious symptoms *de novo*, while some will only re-develop them when they are slumbering. A notable example of the latter, the effects of cold on a popula-

* Patients with pulmonary disease ought also to be informed by their physicians that chills and fever, which are precisely like the miasmatic as regards their phenomena, are apt to occur as an incident of their disease. But in such cases, medical advice should always be sought, as it is important to determine whether there is or is not a malarious complication.

tion, occurred in the practice of the writer a few years ago. There had been a great prevalence of malarious fever during the summer and autumn, but cooler weather and finally frosts caused their disappearance to a considerable extent. But in midwinter an unusually low temperature continued for a number of days, and immediately after there was a great increase in our fever cases. The effect was precisely what we have witnessed in summer after a prolonged hot and dry term. There is not space to multiply cases, which might be done to any extent. I will only mention one striking instance. The son of a distinguished practitioner of New York City, himself a physician, young and robust, never having suffered from any form of malaria, was called to Bloomingdale to assist in a surgical operation. On his way he was caught in a sudden cold shower, and his feet and legs got quite wet. It was necessary that he should wait with the patient two hours, but on his return home he changed his clothes. On the following day he was seized with a chill followed by fever, and for months he suffered from intermittent fever, and finally, after the failure of drugs to give permanent relief, he went to Europe, and recovered there. The converse of this proposition is also true; malarious fever will, after the failure of quinine and other supposed specifics against miasma, yield suddenly and permanently to nervous shock; for it is to this, I think, that we must attribute those recoveries which take place after swallowing some huge or some particularly disgusting dose, as a pint of vinegar, or live earth-worms taken in molasses, in the virtue of which the vulgar have such implicit belief, and perhaps also in part to the mental impression derived from this confidence. A medical friend of the writer, after having suffered more or less for years from malarious fever, and losing nearly all his hair, was cured by the advice of an old nurse, who told him to apply a wilted tobacco leaf over his abdomen. He had never used the weed in any form, and in a few hours he was more wilted than the leaf, but his old enemy was vanquished from that day. In fact, the disease commences in a morbific influence of one kind or another on the *nervous system*, and is cured by such remedies as act on this system, which have no specific influence on the blood and no *antidotal*

effect whatever. This morbific influence is often exerted on the cutaneous surface, and may be prevented, to a great extent, in a malarious region by wearing woollen next the skin, and by fires night and morning, especially when the diurnal range of temperature is unusually great, which preventives, the best we have, can not be said to exert any influence on marsh miasm. Quinine, when taken as a preventive, and it is a more or less reliable one, acts by fortifying the nervous system against depressing influences, and not through any supposed neutralizing effect on a specific poison circulating in the blood. So much for malaria, which has become an interesting topic in all parts of the country of late, in the parlor as well as in the doctor's office; and to which the writer regrets having felt himself obliged to devote so much space.

Rain-fall and other Hygrometric Conditions.—Very little space need be devoted to rain-fall, since it is now conceded that, in the first place, the mere *amount* of rain in the year, or in the winter, without a statement of its *distribution* over the months and even the days, is of no value; and, in the second place, that a certain amount of rain, if it falls rapidly, and does not recur at too short intervals, is beneficial in various ways, but especially as one of the best purifiers of the atmosphere, dissolving gases, and carrying down with it dust and animal and vegetable impurities. In some localities there is almost no precipitation of moisture (rain-fall), yet the air is constantly loaded with moisture almost to saturation.* With regard to the hygrometrical condition of the air of Florida, almost as erroneous ideas exist as

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* "At Cannes," says Madden (Health Reports of Europe and Africa), "the amount of rain-fall is about five inches more than in London; but notwithstanding this, Cannes has incomparably a dryer climate than London; the number of rainy days in the former being 52, while in the latter it amounts to 78."

Catania, a noted health resort of Sicily, has 78 inches in the year, and yet there are fewer rainy or cloudy days there than in almost any of the noted European resorts, from the fact that almost all the rain falls in a month or a month and a half.

The extremes of precipitation are the deserts, where there is none at all, and on the Khasya Hills, 200 miles from the city of Bengal, where 600 inches fall annually. Cameron, Manual of Hygiene.

in the case of malaria. Dr. Walton's charts* give us some curious information, and indicate how little value is to be attached to the amount of rain-fall as a climatological fact. Thus Aiken, whose reputation is based principally on the dryness of its climate, has nearly one-third more rain in the winter and spring months than Palatka; while Alexandria, noted for an excessively moist climate, situated as it is "on a low, sandy peninsula between the sea and the wet swamp known as Lake Mareotis," has less than one-third as much rain as Aiken, and slightly less than half as much as Palatka. Mentone also has more rain than Palatka, and double the amount of St. Augustine. The tables of Dr. Baldwin, a most careful observer, give for the five months from November to March, inclusive, 21.3 rainy days out of 121 days, one day in six; though it did not rain all day on many of these days, such an occurrence being not very common in a semi-tropical climate, even in summer. "Whilst on the northern lakes," says Forry (op. cit.), the annual ratio of fair days is only 117, on the coast of Florida it is 250, and at Fort King" (now Ocala), "in the interior, it is 309." From twenty-five years' observations, says Dr. Baldwin, January has had an average of 20.3 clear days; February, 29.5; March, 20.4; April, 25; May, 22.1. For the whole year, 235 clear days. This was in Jacksonville.

Relative Humidity.—A much more important constituent of climate than rain-fall is the amount of moisture suspended in the air. When the air is *saturated* with moisture, we say it contains 100 per cent.; when one-half or one-quarter saturated, 50 or 25 per cent. But as air at one temperature is capable of holding more or less moisture than at other temperatures, in order to compare the humidity of different climates, we must take into account the temperature also; and when the calculation is made with reference to this, we call it the *relative* humidity. But, like the rain-fall, the tables of relative humidity seem to fail in giving a very correct idea of climatic humidity; and, as we shall presently see, it is desirable to take into account a

* A Comparison of European and American Climatic Resorts, with original Charts in Colors. George E. Walton, M. D. 1877.

variety of other indications. Thus, Dr. Geddings* gives a table comparing the relative humidity of three prominent Southern health stations. Aiken, 64.04; Asheville, N. C. (reported a dry climate), 70.10; Jacksonville, Florida, 69.72; according to Dr. Baldwin, 69.90. For my own observations, I had used for two winters Saussure's hygrometer, until I found, by comparison with those of others and from other indications, that it was not reliable. During the months of February, March, and April, 1878, using a Mason's psychrometer (wet and dry bulb) and comparing my observations with those of the signal officer at Jacksonville, the relative humidity for three months in 1878, is for that city 66.2; according to Dr. Baldwin's observations for several years, 62.6; while for Palatka it is 61.3. Palatka is undoubtedly a dryer climate than the stations on the river further north, fogs less frequent and less persistent. Dr. Geddings also gives a table comparing the humidity of Aiken with that of eight prominent European health resorts; from which table it appears that the humidity of Florida for the year is less than in five out of eight (including Mentone), while Aiken has less than six out of the eight. Almost all of our American resorts appear to have the advantage over their European competitors both as regards *relative* humidity and rain-fall. Recognizing, however, the difficulty in forming any correct judgment as to the comparative dryness of climates from these scientific data, Dr. Geddings proposes certain other tests, the most of which, it must be conceded, are pretty reliable; for instance, he says, the mean relative humidity of Aiken being only 64.04, that place, according to Vivenot's classification, would rank only as "moderately dry," but tested by the more popular signs which he gives, "it would be considered *very* dry." These signs are, of a *moist* climate, heavy dews, frequent fogs, melting of salt, vapor condensing on walls, steel and iron quickly rusting, rapid formation of mould, mosses flourishing, perspiration remaining long on the skin. Dr. Madden (op. cit.) says also: "The extreme humidity of this climate (Madeira) is shown by the impossibility of keeping steel instruments free from rust, or of preserving any musical instruments in tune, or any article of

* "Aiken as a Health Station." Charleston Medical Journal, 1877.

clothing, however carefully packed, from being injured by the dampness of the air, as well as by the exuberant tropical vegetation," etc. Examining the effects of moisture during the winter and spring months in this village, *dews* are frequently heavy. During my first winter here, however, dew did not commence to deposit until near twelve o'clock at night. During the past two winters it commenced earlier. *Fogs* are infrequent, and when they occur, are almost invariably dissipated by the sun at an early hour, before invalids have had their breakfast. Nearer the mouth of the river, they last longer, and are more frequent. *Salt never melts*, and never causes any inconvenience from dampness. I have not seen *vapor condensing* on the walls or stair-rails but once in three winters. I take no precaution against the *rusting of my steel instruments* in winter or spring, and they are free from rust in the spring. *Mould* seldom forms here, so far as I have observed. We must plead guilty to *mosses*. The *Tillandsia Usneoides*, or Spanish moss, which, as Dr. G. remarks, "adds so much to the solemn grandeur of our Southern forests," is admired as much as any of the novelties which a new-comer sees here. Undoubtedly, this does not grow in a dry atmosphere. But there seems to be something more than moisture which is conducive to its growth, since a tree standing by itself on high and dry ground and unprotected from the sun, is frequently covered by a more dense growth than many of the same species standing in a wet swamp, to which the rays of the sun have but slight access. As regards the deficient evaporation from the skin, a few notice it occasionally, but the majority do not, probably because there is generally more or less breeze. Dr. Geddings then gives the popular characteristics of a *dry* climate; but, as these are mainly the opposites of those of a moist climate, it is only necessary to allude to three—the "desiccation of meats and their slower decomposition"; "the certainty with which matches take fire even in unheated rooms"; and "the frisure of women's hair, the crimps and curls retaining their form for days." As regards the first test, it is a fact which I confess astonished me, that beef, when hung up in a current of air, will keep longer than in a like temperature at the North, and that venison will desiccate

on the surface, and keep much longer than beef. As regards the second, I rarely, if ever, find one of the commonest matches, kept in an open box on the first floor in my house and at the hotel, miss fire. I *have* had trouble with a similar article in my office in New York. I have never heard any complaints from the ladies about their *hair*, but they might not think it worth mentioning to a doctor. Dr. Madden alludes to the difficulty in Madeira of keeping musical instruments in tune. There *is* a difference in this respect between Florida and some dryer climates, especially as regards catgut, but not enough to cause any very great inconvenience, and there is very little influence as regards pianos. I have not observed any damage to clothes packed and left through the summer. The writer has thought it of sufficient importance to notice in detail these tests, the best we have at present, and he is certain of the correctness of his statements, according to his own observation, and that of others here to whom he has submitted these questions. And we also find that this corresponds with what we should infer from a comparison of the *relative humidity* as taken from different records, with Vivenot's classification, which is as follows: *Moderately dry*, 56° to 70°; *moderately moist*, 71° to 85°; *excessively moist*, 86° to 100°. The relative humidity for the year being 69.6 (March, 57.5, lowest; September, 76.8, highest*). This brings the climate very nearly under the head of *moderately dry*.

It is to be hoped that the above facts will go far towards refuting the wild statements which have been indulged in very generally with regard to the excessive moisture of Florida climate, as well as to the presence of malaria. "While many authorities concur," says, Dr. C. T. Williams,† "in the superiority of dry to moist air, there are none the less some who assert, with equal positiveness, the reverse. In fact, the evidence on this point is conflicting; and this is no doubt due in part to the fact that humidity is a relative term, and that the *degree* of humidity has not been stated or studied with sufficient precision." Those who seek anxiously for *dry* climates overlook perhaps the fact that a *certain degree* of moisture in the air is

* Baldwin, op. cit.

† Lettsomian Lectures. British Medical Journal, 1876.

absolutely necessary to prevent a great diurnal range of temperature, which these same persons equally deprecate. In Florida, for instance, were it not for a certain amount of moisture in the air, and a certain amount of deposit of dew, instead of a fall of 13° or 14°, we should have one of 30° or 40°, probably. The fall is 40° in the dry climate of Upper Egypt; and in sandy deserts, as Sahara, where the dryness is absolute and radiation at night unrestricted, the temperature falls to 32° F.; the temperature ranging during the day in the shade above 100° F. On our Western plains, the range is sometimes 60° F., so that the body is almost burned up by day and frozen by night. In Florida, as we have seen by previous statements in this paper, the moisture is just sufficient to temper the heat during the day by evaporation, and by condensation and the checking of radiation to limit the cold at night. Even the summer heat is in this manner, and with the aid of a pretty steady prevalence of east winds, rendered very tolerable, the evenings and nights even pleasant.

Purity of the Air.—In estimating the climatic advantages of different health resorts, too little attention has been heretofore devoted to what may be technically called the *purity* of air. The common idea of purity has been freedom from unpleasant odors; yet the gases, which these odors indicate, are the least injurious of ærial impurities, and rarely exist in sufficient concentration to do harm. The chemist spends a considerable portion of his time in his laboratory, surrounded by various gases in a far more concentrated form than they are met with in the atmosphere (if we except a few which are never found in the atmosphere), and comes out unscathed. The gases from a sulphuric-acid factory on the Hudson river have destroyed trees for long distances, and even on the opposite bank of the river, and yet, on examining the workmen in the factory, I could not find that they were much inconvenienced by them after becoming accustomed to the irritation of the laryngeal mucous membrane. Carbonic-acid gas, which enjoys the reputation of being the most dangerous, rarely exists even in the most crowded rooms in dangerous quantity, and is not of itself poisonous. The difference in the amount of gas in city and country is not

material; for instance, Lake of Geneva, .0439 in 100 volumes of air; Chambeisy, .0460; various parts of London, .0300 to .0420 (Angus Smith's tables). The air in different theatres in London at night varied from .101 to .320. It has been commonly supposed that the 260 out of 300 prisoners confined in the Black Hole died from inhaling carbonic-acid gas, or from the deficiency of oxygen caused by its presence. But later observations, and especially experiments on living animals (Gavarret and Hammond), indicate that they died as much from the poisonous effects of organic matter in the air as from the excess of carbonic acid or deprivation of oxygen. Mr. Ernest Hart* says: "The captives in the Black Hole in Calcutta did not perish (or even suffer) for lack of oxygen." We must then look to the solids and not to the gases of the atmosphere for the causes of disease. Tyndall has lately alluded to the important fact that equally expert experimenters in treating fluids by similar methods for the *destruction* of these organisms, have failed to arrive at the same results; for which he assigns the reason that the air is in one locality purer; that is, less infected with germs than in others, and that the different fluids experimented upon were therefore contaminated by them in different degrees. Pasteur, says Tyndall, found the Glacier air of the Mer de Glace, and equally in the caves under the Observatory of Paris, free from germs of putrefaction. It is these germs, and these only, which these scientists have demonstrated to be the principal, if not the only cause, of putrefaction and decay in organic substances; and, as we may infer, of the suppuration, gangrene, septicæmia, and the consequently increased mortality of injuries, and wounds, and surgical operations in camps and hospitals; that is, where patients are more or less crowded, which the reasoning and the patient experiments of the celebrated surgeon of Glasgow have almost abolished by his process for destroying the vitality of these germs in the air in the immediate vicinity of wounds and operations; the operations being now carried on in an antiseptic atmosphere produced by a fine spray of carbolic acid or thymol. The destructive diseases of *vegetable* life have also been successfully assailed through the

* Manual of Public Health, London, 1874.

knowledge derived from Pasteur's experiments. These very important facts, established through the genius and patient industry of the French savant, may yet enable us to limit the action of epidemics now so destructive to human life; for Schrœder and von Dusch have found that atmospheric germs may be excluded by a cotton filter, and it has, long ago, been asserted, and to a certain extent proved, that the *cause* of malarious manifestation, whatever that may be, can also be excluded from a room by a similar contrivance, as a thin cotton screen placed in the open windows.* It has heretofore been an unaccountable fact that diphtheria and similar diseases prevail to a far greater extent and with far greater destructiveness in some localities than in others not very distant, and whose hygienic conditions are similar or even superior;† that cholera and yellow fever, for instance, sometimes assail and prove more fatal in portions of a city supposed to be in a superior sanitary condition, and assail or only moderately afflict those in such a condition as seemed particularly to invite disease.‡

In a warm and moist climate like that of Florida, we should expect to find putrefaction and decay particularly active, but the facts are, so far as my observations have extended, that is, in this village and along the river for some distances, that milk sours and meat putrefies at a lower temperature, or sooner in

* A thick belt of trees, and of the sun-flower plant will also intercept these germs. The eucalyptus has lately become especially the subject of experiment wherever it will grow. It is not certain whether it acts simply as a filter, like other trees, but more effectually because its foliage commences close to the earth, or whether the effect is jointly due to this and some specific influence in virtue of its remarkable balsamic odor; perhaps, in wet localities also, to its draining property; its extraordinarily rapid growth necessitating a great supply of moisture from its roots.

† The Report of the Boston Board of Health states that diphtheria has prevailed to a greater extent in the better districts of the city.

‡ One must not infer that this statement invalidates any of the cautions which sanitarians are now so industriously urging on the public with regard to the importance of cleanliness and disinfection as a means of arresting disease or limiting the spread of epidemics. It must be understood that these, though occurring not infrequently, are exceptional cases, and are still inexplicable, but which present indications assure us will soon be better understood.

the same temperature in the northern sections of our country than here. We have already described the behavior of fresh meat when exposed for some time to currents of air. Applying the preceding considerations to these facts, we must conclude that the air here, though moderately warm and damp, conditions which, of course, give particular activity to germs, must be notably free from those agents of decay and putrefaction; and we should also infer that wounds would progress in a particularly satisfactory manner, which is a fact; also that diphtheria* is unknown, as is genuine cholera, typhoid fever, and erysipelas rare, and scarlet fever rare and mild. Whether the purity of the air here, that is, its comparative freedom from putrefactive germs, and its exemption from those diseases, bear the relation of cause and effect, can not yet be demonstrated, but it may reasonably be inferred.† At all events, a belief in this relation is fast establishing itself in the minds of some of our

* In the year 1876, according to the Report of the Brooklyn Board of Health, there were, in that city alone, 2,329 cases of diphtheria and 812 deaths. In 1878 this disease, according to the "Le Progrès Médical," carried off 2,393 persons in Paris. M. Besmer observes that density of population has little if any influence in determining the disease, but poverty is very distinctly concerned in promoting its development. This, if so, speaks well for the purity of the air here, for there is poverty enough among the native inhabitants. *Bad drainage* is thought in this country to have an important influence in promoting the disease, and there are cities in this State which will afford unusually fine examples of this, and yet we see no diphtheria.

† The army surgeons during the late war found that a *thorough* application of carbolic acid to the streets, lanes, yards, and houses of districts infected by yellow fever in New Orleans, decidedly limited the spread of that disease; and the practice has been continued there ever since.

Surgeon-Major Tuson, Sixteenth Royal Cavalry, has frequently observed, says the "London Lancet," the beneficial effects of burning fires in the epidemics of cholera in India. But as in the case of the use of carbolic acid, it must be done thoroughly. The author cites instances in which the disease apparently speedily succumbed after thorough fumigation of the affected villages and streets. The piles of wood were placed at short intervals of space, and kept burning for forty-eight hours; the sulphur is sprinkled on so as to keep up continuous fumes, while the houses are at the same time carefully fumigated. The process is disagreeable to the sense of smell, as is the carbolic acid, but not dangerous if intelligently supervised. Carbolic-acid vapor and sulphurous-acid gas are the most destructive agents against these "seeds of disease."

ablest thinkers, as Nott, Sansom, Huxley, Tyndall. "It has been established beyond all doubt," says Schrœder (op. cit.), "that these organic substances, be they the gaseous products of putrefactive processes in the animal or vegetable kingdom, or vegetable germs, or microscopical animalcules floating in the atmosphere, do reach the lungs in the current of air inspired, and are there capable of doing great mischief." "The observations of Schrœder, and especially of Pasteur," says Parkes (op. cit.), "are likely to have an important influence on the doctrines of etiology." "The septic condition of the air, as Dr. Sanderson has termed it, derives importance from the possibility of its being concerned in the production of some of the so-called zymotic diseases."

When we know that wounds and sores on the surface of the body are so injuriously affected by these germs or "seeds of disease," and that so great a change in the result of surgical operations can be wrought by preventing their access to raw surfaces, we may well imagine how injurious an influence may be produced on ulcerations and other diseased processes going on in the lungs, whenever these bodies are abundant in the air, which is constantly brought in contact with them through respiration.

Ozone.—This agent is supposed to be closely connected with the purity of the atmosphere, being apparently a more active form of oxygen, and converting injurious substances floating in the air into inert compounds. The subject is, however, in a rather chaotic state as yet. Within the last year or two numerous observations in different parts of the country have been made by medical men mostly; but it is extremely doubtful if any of these have much practical value, from the fact that we are not yet in the possession of any reliable test, of one which will give the reäction of this agent and of no other which might be confounded with it. Schönbein's papers have usually been employed, but so many other bodies are present in the air which are capable of producing a similar reäction, especially nitrous and hypo-nitrous acids, and even nitric acid and peroxide of hydrogen, that we cannot be certain of the amount or even the existence of ozone. Houzeau's test is claimed to be less open to this

objection, the iodized red-litmus paper; but Professor Leeds, of the Stevens' Institute of Technology, who has experimented largely with ozone in Hoboken and in the Adirondack Mountains, informs me that this paper, in an artificial atmosphere of peroxide of hydrogen, gives the reäction of ozone, and that it is also not sufficiently sensitive. He states that peroxide of hydrogen has lately been detected in the atmosphere for the first time by Struve, a Russian chemist. Schreiber, in his recent paper (op. cit), reïterates the assertion often made before that pine forests are instrumental in the production of ozone. He says: "It has been the custom for quite a long time to recommend the pine woods as a place of residence for pulmonary invalids, but the 'why' of the process has only recently been discovered. The turpentine exhaled from these forests possesses to a greater degree than all other bodies the property of converting the oxygen of the air into ozone, and as the latter destroys organic matter, the air of such forests must be, and consequently is, conducive to respiration."

This was Schönbein's idea, because the oxydation of turpentine oil and other essential oils in the air caused the characteristic reäction of ozone on iodide of potassium. But "the nature of this compound has lately been examined by Kingzett* (Chem. Soc. J [2] xij, 511), who finds that it cannot be either ozone or peroxide of hydrogen, because it is destroyed at the boiling point of oil of turpentine (160°), at which temperature ozone and H. P. are permanent. Moreover, it resists, to a certain extent, the action of sodium thiosulphate, and its solution in water retains its properties after long-continued boiling." "Mr. Burgess, the inventor of the process for making paper from wood, found that the introduction of a few drops of oil of turpentine into his bleaching-room would not only prevent the further formation of ozone, but would even destroy that already existing."† It is very likely, however, that the terebinthinate odor is, of itself, rather soothing to diseased respiratory membranes; but it is so diluted that, at a very short distance from the forest, it is lost entirely; and to be benefited at all, the

* See Watts' Dic. of Chemistry. Sec. Suppt.

† Amer. Jour. of Med. Sciences, 1874, p. 420.

patient must live pretty much all the time in the midst of the trees.

The character of the *soil* and *subsoil* is of almost as much importance, in some parts of the country, of more importance, indeed, than the conditions of the air. Dr. Bowditch has published some valuable statistics on this point. A soil retentive of moisture, or a stiff and clayey subsoil impervious to it, and not thoroughly drained, is always prejudicial to the health of the inhabitants. Parkes* says of soils: "Some soils absorb and retain water more than others." "Sand absorbs very little," water passing through rapidly; "clay ten or twenty times more; and humous or common surface soil more than forty or fifty times as much as sand." "The sands are therefore the healthiest soils in this respect. In hot countries, the sand is objectionable on account of its heat, unless it can be covered with *grass*. The effect of *glare* on the eyes is obvious, and in the tropics this becomes a very important point. If a spot, bare of vegetation and with a white surface, must be used for habitation, some good result may be obtained by coloring the houses pale-blue or green." "The amount of *dust* given off from soils is not a matter of slight moment." With regard to *permeability*, no soil is better capable of fulfilling this requirement than that of Florida, as sand is the predominating and sometimes the only ingredient in the localities where invalids congregate, although it is not fair always to judge the soil of Florida any more than the other constituents of her climate by appearances. In some localities the soil, which has the appearance of almost pure sand, being quite productive. But everywhere the soil is permeable. Palatka, unlike any other locality in the State, is covered with a sod of green grass, for which exception no one has been able to offer any conclusive explanation. This obviates here many of the objections urged by Dr. Parkes to sandy surfaces. The comparative exemption from *dust* is no mean advantage to invalids suffering from lung or throat difficulties or weak eyes. Some southern resorts, otherwise unobjectionable, being rendered entirely unsuitable from

* Manual of Practical Hygiene. London, 1866, p. 267, et Seq.

this cause. We all know the serious effects produced on the lungs of artisans working at dusty trades.

Another topic deserves mention here; it cannot strictly be called a constituent of climate, but it has a great deal to do with the success of climatic treatment—the advantages which any particular location may present for *occupation* and *social enjoyment*, and without crowding the invalid class in too circumscribed a space. Patients must have some occupation and amusement, and the more the better. Brooding and idleness are always dangerous to invalids. Boating, shooting, fishing, riding, especially horseback, excursions, reading (but not too much of it) should be encouraged as far as the strength of the invalid will admit. Some will always find occupation and interest anywhere, while the great majority require to be induced, encouraged; and, of course, the more varied the means the better the chance of success. Thus, a residence on a river or lake, especially if they are thoroughfares for commerce and travel, is preferable, *caeteris paribus*, to inland localities, since the choice of sport and recreation is more varied. Patients should be taught to *exert themselves* to become *interested* in what is going on around them in their new residence.* Lanier, the poet, who has written a very interesting work on Florida, himself an invalid, forced to resort thither for his own safety, says, in giving the same advice: "The field of Florida in these matters" (agriculture and products) "is yet so new, so untried by the resources of modern agricultural improvement as to be full as fascinating, if one should get one's interest aroused in it, as it was in the old days when the Spaniards believed it to be full of gold and pearls." If the invalid cannot feel satisfied away from home, cannot keep his mind from brooding over his business interests or family affairs, he had better return to these, and avoid the unnecessary sacrifice of money and home comforts. In fact, before he leaves home "full note," says Williams

* In the case of Florida, I would advise the visitor, in order to become more interested in the industries, the occupations, the products, the sports of the State, to take the "Florida New Yorker," or the "Agriculturalist," the "Semi-Tropical Magazine," one of the best periodicals in the country of the kind, one or all of these, or the "Forest and Stream," and to read "Halleck's Camp Life in Florida."

(op. cit.), "must be taken of the patient's inclinations, means, and, above all, of his disposition and temperament; and exile must not be decreed to those who are incapable of making themselves happy under the changed conditions of life, or all our scientific grounds for a climatic decision may collapse like a house of cards."

The question of the sources of the *water supply* of a health resort is a most important one, and should always be ascertained, if possible, by physicians who give advice on the subject of change of air. More attention is now being devoted to sewage contamination on account of the many serious accidents occurring at northern watering-places within the last few years. But there are other sources of contamination, especially in southern resorts, which should receive more attention than has been accorded them. It is well known that water, contaminated by vegetable organic matter, as well as by minerals, as the salts of lime, produces dysentery and diarrhœa, but it is not so generally admitted that it may also give rise to malarious fevers. It is important that this fact should be generally recognized by those living in malarious localities, since *water* may contain the seeds of disease in winter as well as in summer. Want of space will only allow of allusion to a small number of arguments and facts which support this theory. As a general rule, people consider water which is transparent and has no unpleasant odor or taste safe. But physicians and scientists know that these are not reliable tests. All sorts of dangerous impurities may lurk in such water, while a comparatively repulsive-looking water may be wholesome to those accustomed to it, as the water of some rivers. When water contains a great deal of organic matter, as when it permeates a rich vegetable soil, it is brown or yellow, as the waters of the Ocklawaha and St. John's rivers, and may contain as much as 15 to 30 grains to a gallon. Water from marshes may contain from 75 to 100 grains. "It is a very general belief," says Parkes (op. cit.), "among the inhabitants of marshy countries that the water can produce fever. On making some inquiries of the inhabitants of the highly malarious plains of Troy during the Crimean war, I found the villagers universally stated that those who drank marsh water had fever at all

times of the year, while those who drank pure water only got fever during the late summer and autumnal months. The same belief is prevalent in the south of India, and in Western Candeisch, Canara, Balaghut, and Mysore, and in the deadly Wynaad district." "It is notorious," says Mr. Bettington, of the Madras Civil Service, "that the water produces fevers and affections of the spleen." He presents conclusive evidences of it. Parkes adduces similar evidence from various parts of France, and from what happens on ships furnished with river water."* He also states that the fevers produced by impure water are more fatal than others. It is not improbable that the malarious affections which have been so prevalent in the city of New York, in the older as well as in the newer districts, have been caused by the Croton water bringing the malarious germs from the sources of the streams; the severe droughts of summer and very small supply of snow in winter, characterizing the last eight or nine years, having caused, as has already been stated, an unusual development of malarial fever, rendering many localities, which had been proverbially healthy, just the reverse.

The water of many wells in Florida is clear and sweet, and therefore regarded as perfectly suitable for drinking and cooking, but a proper examination would show it to be entirely unfit, though less so than that from the shallow wells and brooks so frequently used by the country people. It was supposed that, by boring down to or through the coral rock underlying the State, a safe drinking-water would be obtained. This water, after a small amount of sulphuretted hydrogen gas has passed off, is beautiful and palatable, and far better than any well or spring water; but it gives, on chemical analysis, too large a percentage of salts and of organic matter to render it perfectly safe, though it is a very fair substitute for rain water when this cannot be obtained. The latter is the only *safe* water to use in Florida, and no doubt in large portions of many of our Southern States. Rain water should always be filtered. Kedzie's filter, animal charcoal, gravel, and sand, is generally used here. But an in-

* Practical Hygiene, London, 1866, p. 56.

genious person, who cannot afford this, can make one for himself. It should be borne in mind, however, that, after a time, the filter itself may become a source of contamination, and the charcoal should occasionally be removed, spread out, and exposed to the air.*

Food—the kind and quality, and the manner of its preparation—is a matter of no small importance to an invalid; and no climate, however suitable in other respects, is proper for him if he cannot obtain good and decently-cooked food. Many come to Florida with so little money that they must obtain board where the food is such that they cannot eat it, or if they do, it causes dyspepsia and an aggravation of their already existing disease. In this case I usually advise them to go home. Good food can be had anywhere in the State and at reasonable rates; so can wines, medicines, and all the comforts of life, which was not the case a few years ago. Perhaps one article ought to be excepted, for some localities, *milk*. But this will probably soon be obtainable in larger quantity and better quality, as cows need only to be fed with nutritious food to give good milk, whether they are in Florida or New York. The *amount* and *kind* of food, however, should be adapted to the great change of temperature to which the invalid has been subjected. This is seldom thought of, and when nature attempts to prompt him, her hints are misunderstood, and, after a few weeks' residence, he complains of loss of appetite for his accustomed articles of food; he cannot relish his usual quantity of beefsteak or roast beef twice a day; he becomes dissatisfied, and wishes a change. He should remember that less food and a different kind is required in a warm climate; less meat, and the lighter kinds, poultry, fish, eggs, vegetables, fruits. A want of observance of rules of diet induces "biliousness," dyspepsia, and perhaps diar-

* Palatka is supplied with large wooden cisterns, and there is an abundant supply of rain water for all purposes. The healthfulness, for which this place has always been noted, both in winter and summer, is no doubt largely due to this fact. It had, however, this reputation among our officers even during the Seminole war, and was on this account selected, in preference to posts higher up the river, for the site of a general hospital. The first purchase of a settler ought to be a cistern holding from 800 to 1,500 gallons, costing from thirty to fifty dollars.

rhœa, and as a physician is seldom consulted, except in severe cases, all this is attributed to the climate, and perhaps to malaria, and Florida has to bear the odium of this as she does of all the other imprudent acts of invalids and tourists.

A few words are necessary with regard to the *clothing* suitable for a Florida winter. It may be inferred, from what has been said with reference to variations in temperature from time to time, that a considerable variety of clothing should be at the command of the invalid. Thicker clothing is required in Florida than in New York at the same temperature. Linen clothes, for invalids at least, are seldom wanted. That which is suitable for moderate winter or early spring weather at the North will be best. One should have a thick and a thin overcoat. Flannels or merinoes should, of course, be worn at all times, and underclothes of different weight should be provided so as to be prepared for all emergencies.

Of the diseases which may be benefited by change of climate, and especially by Florida climate, only one has yet been mentioned—pulmonary consumption, because the question of change of climate arises far more frequently with reference to this than any other, and yet this powerful therapeutic agent is more successful in the cure of almost any other disease than this. It would be otherwise, however, were the cases properly selected, if the remedy were resorted to in the early stages of the disease, if the climatic change were aided, as all writers urge that it should be, by other therapeutic measures, and by judicious advice as to the mode of life suited to each particular case, and to the adopted climate.

It is notorious that large numbers are annually sent to the South who are entirely unfit to leave home on account of the advanced state of the disease or extreme debility. By what symptoms, then, or conditions of the patient are we to be influenced in deciding the important question as to whether he should or should not leave his home? Some physicians are apparently guided by the local condition, the amount of disease existing in the lung; some by the general aspect and symptoms presented; some by both; while others, it is to be regretted, seem to be guided by no principle at all, allowing their patients to

follow, to a great extent, their own inclination, to drift about according to their own caprice, or the notions of their family, or of friends who have been benefited perhaps by some particular climate which happened to suit their case. Some seem not to have the nerve, the moral courage to announce to the hopeful friends that the case is hopeless, and that it would be cruel to banish the patient from home; and thus so many distressing cases fall into the hands of those of us whose lot it is to minister to the last sufferings, mental and physical, of those whose fate it is to die away from the comforts of home and friends, and thus is the reputation of climatic treatment depreciated. A good deal of unnecessary stress is, it seems to me, laid on the fact of the disease being in the so-called "third stage" as a condition unsuited for change, especially a change to a warm, sedative climate. It has prevented many from availing themselves of the advantages of change who might have been much benefited; the third stage, or stage of softening, being often the curative means which nature adopts to get rid of dangerous deposits in the lungs. The *extent* or *condition* of the cavity, or of the *foyer purulent*, should be carefully determined. A large cavity, or one not circumscribed by a limiting membrane, or invading the lung in different directions, or accompanied by an unfavorable condition of the general health, would contraïndicate change. But the simple fact that softening has commenced, that a cavity exists, or even more than one, that the third stage has arrived, should not, *per se*, condemn a patient. All physicians who have made many autopsies, or who have dissected extensively, must have met with not a few instances of the healing of cavities in the lung, or in both lungs. H. Bennet observed numerous instances of the healing of the cavities in the lungs of old women who died at the Salpétrière in Paris. MM. Ferrus and Cruveilhier noticed the same fact in the Salpétrière and Bicètre in the bodies of both sexes. While "M. Beau states that 157 out of 160 who died in his wards in Salpétrière had cicatrices in the apex of one or both lungs." M. Prus found similar traces. There are certain cases of phthisis which may be recognized at a glance as unsuitable for change, whatever may be the condition of the lungs; in

fact, when physical examination reveals but trifling change, as where there is excessive emaciation, a serious alteration of the composition of the blood, as indicated by a peculiar pallor, failure of digestion and nutrition, diarrhœa, hectic fever, frequent pulse, profuse expectoration, exhausting sweats, accelerated breathing, inability to exercise to any extent. It is not necessary that *all* this formidable array of symptoms should be present to warrant an unfavorable opinion on the part of the physician as regards change of climate. The most superficial examination is sufficient to enable one to judge of the future of these cases. Numbers of these invalids are, nevertheless, allowed to go, let us not say are sent, hundreds of miles from home. This is one reason why climatic treatment so often fails. Another prominent cause of failure is the advice commonly, almost universally, given by physicians to "*trust to the climate*," to "avoid drugs and doctors." An immense number of drugs have, doubtless, already been found useless, perhaps worse than useless, and it is natural that the patient should be told to avoid them. But a remedy which, in one climate, has proved valueless, might be of decided value in another and under changed circumstances. A mere change of air and scene may, and often does, prove all that is necessary in a few cases of incipient disease; but, as a very general rule, invalids require more or less medication at one time or another during the winter. Complications, some of which may be incident to the change of climate, food, water, etc., and especially to the fatigue and excitement of the journey, require attention. Invalids are notoriously careless and reckless, and require to have some one at hand with authority to check them. All writers on climate have warned against this proclivity to trust too much to climate. Sir James Clark says: "In the first place, I would strongly advise every person who goes abroad for the recovery of his health, whatever may be his disease, or to what climate soever he may go, to consider the change as placing him merely in a more favorable situation for the removal of his disease; in fact, to bear strictly in mind that the beneficial influence of sailing and of climate requires to be aided by such a dietetic regimen and general mode of living, and *by such remedial measures as would have*

been requisite in his case had he remained in his own country. All the circumstances requiring attention from the invalid at home should be equally attended to abroad. If, in some things, greater latitude may be allowed, others will demand even a more rigid attention. It is, in truth, only by a due regard to all these circumstances that the powers of the constitution can be enabled to throw off, or even materially mitigate, in the best climate, a disease of long standing." "It was, indeed, a matter of surprise to me, during my residence abroad, to observe the manner in which many invalids seemed to lose sight of the object for which they left their own country—*the recovery of their health.*" "The more common and more injurious deviations from that system of living which an invalid ought to adopt consist in errors of diet, exposure to cold, over-fatigue, and excitement in what is called 'sight-seeing,' frequenting crowded and over-heated rooms, keeping late hours," etc.

Williams (op. cit.) remarks: "Climate is only one portion of the system of attack which we organize against the dread foe which decimates our population, and would be worth little if not combined with medicine and hygiene, and a determined will to wrestle bravely against the home-thrusting enemy." Dr. T. G. Horn (Trans. Colorado State Med. Soc.) thus discourses: "Invalids, as a class, are generally careless, self-willed, and unreasonable. Many naturally so; more made so by instructions given them by their physicians East telling them almost invariably that they will not need to consult a physician here, but 'go into the mountains,' 'live out of doors,' etc. So, with his pocket full of prescriptions from home, the poor sufferer rushes madly into this altitude, and without proper medical advice, soon rests in his grave." The following remarks of Forry, than whom no one is better qualified to give advice in this connection, are so apposite that I quote them at length: "Let not the invalid, however, trust too much to change of climate. Unfortunately for the character of the remedy, it has been recommended indiscriminately and without proper consideration. It has been too often resorted to as a last resource or a forlorn hope; or, in cases susceptible of alleviation or permanent cure, it has been wholly misapplied. One person is hurried from his

native land with the certainty of having his sufferings increased and his life shortened, instead of being allowed to die in peace in his own family; while another, who might derive much advantage from the change, is sent abroad wholly uninstructed in regard to the selection of a proper residence or ignorant of the various circumstances by which alone the most suitable climate can be rendered beneficial. It is one of our most powerful remedial agents, and one, too, which, in many cases, will admit of no substitute. But much permanent benefit will result neither from travelling, nor change of climate, nor their combined influence, unless the invalid adheres strictly to such regimen as his case may require. This remedy—change of climate—must be considered in the light of all other therapeutic means, and to insure its proper action, it is requisite that the necessary conditions be observed. The patient should, in a measure, regard the change of climate as merely placing him in a situation more favorable for the operation of the remedies demanded by his disease."

Another cause of failure is this: patients with only a moderate amount of disease often improve so much in one winter that they, and sometimes also their physicians, yielding to a natural desire of the invalids to remain at home, permit them to do so during the second or third winter. The consequence is that a catarrh, or pneumonia, or some complication incident to the climate and to overwork, or possibly only the devitalizing influence of a cold and damp winter, causes a relapse which is fatal, or insures a travel over a still longer road of invalidism than before. No matter how slight the evidences of phthisis in a young person may be, especially if there be hereditary predisposition, he should be fully impressed with the idea that his change of base must not be for one or two seasons, but probably for several, however flattering may be the results of the first or second season.

It has been deemed advisable to introduce the above cautions, which every prominent writer on this subject has felt constrained to employ, because such incalculable harm has resulted from the prevailing habit among medical men of advising their patients against availing themselves of that which is absolutely

necessary to the success of climatic change in the great majority of instances—proper medical supervision and prescription. In the first place, patients leaving home in a feeble condition, travel rapidly down to Florida, not resting, as they should, on the way, and arrive more or less exhausted by the journey, and then, instead of perfect rest for a day or two at least, and in bed if necessary, they drag themselves about, and sometimes do not get thoroughly rested for weeks. Sometimes from a too sudden change from a very cold to a warm temperature, gastric or hepatic troubles arise, and require treatment. Some patients with hectic fever, with a temperature ranging from 103° to 104°, pursue the same course, struggling to make a show of strength, and determined not to give up, when they should be in bed and taking the proper remedies. Sometimes a harassing cough, contracted perhaps from the exposure of their journey, or on some pleasure trip, or in sight-seeing, drives away their own sleep and that of their neighbors night after night, yet they are deluded into asserting in the morning that they have had a "pretty good night," their whole aspect denying the assertion. Profuse and exhausting sweats are allowed to go on unchecked by remedies, or are tampered with as are their other complications, not infrequently by domestic remedies, or the advice of sympathizing acquaintances. Dyspeptic symptoms often arise from injudicious eating, or perhaps as a consequence of their disease, and interfere with nutrition during the whole winter perhaps. Loss of appetite, especially during the latter part of the winter often troubles the invalid. Diarrhœa is a not infrequent complication, which is generally neglected until it becomes a serious matter. These are a few of the many exigencies which may require the attention of a judicious physician, and of one on the spot. Dr. J. R. Nichols, in his recent pamphlet (Essay, read before the Essex North Massachusetts Medical Society, May, 1878), truly says: "After you have reached Florida, you can no longer safely rely upon any advice you may obtain from your home physician in response to your representations to him by letter. If you need advice, seek it of some of the very able, cultivated, experienced resident physicians where you may stay."

The occurrence of these various complications, and the want of proper advice as to their management, lead to another prevalent and dangerous habit of invalids, which, more than any other, perhaps, opposes their efforts and sacrifices in search of health. Experiencing aggravation of some of their symptoms, or the advent of new annoyances, they arrive at the conclusion that they have not found the proper location, and seek some other, to go through a similar experience, perhaps; thus they go on, wasting the winter in experiments, and finally return home in the spring no better, probably worse. Whereas, a little judicious medical advice or caution, in the first instance, might have put them on the road to the melioration or cure of their complaint.

Among the diseases for which a climate like that of Florida is particularly suitable may be enumerated *Bright's disease* in its earlier stages; for, as in the case of tubercular phthisis, it is worse than useless to send the very advanced cases. *Throat* and *bronchial affections*—these usually recover rapidly. But now and then a case of "sore throat" is sent as a curable one, when there is tubercular ulceration of the epiglottis, consequent on disease of the lungs, of which the patient has been kept in ignorance. These are, of course, hopeless, and very much damage the reputation of climatic treatment; cases of *uncured pneumonia*, consolidation, which has survived the usual treatment and has left the invalid feeble, short of breath, with cough, loss of appetite, etc. Dr. Bizzell (Trans. of Med. Asso. of Alabama) says: "Such cases recover almost magically in the warm, mild air of Florida"; children of *strumous or tubercular diathesis*, particularly those convalescing from *measles*, *scarlatina*, or *whooping-cough; rheumatism and neuralgia.* It may be thought singular that the former should be decidedly benefited here, owing to the amount of moisture supposed to exist in the air. But the *fact* is that, without any medication, it does yield, and sometimes rapidly. This may be added to the evidence already adduced in my first letter to prove that the climate is not so moist as has been represented; that form of *dyspepsia*, which may be called *nervous*, and which is becoming more and more common every year, as the nervous system is more and more

overtaxed, and which often promptly yields to the *bromides*, is alleviated in Florida; many of the *nervous and neuralgic symptoms attending uterine disease*, or surviving its successful treatment (as far as local lesions are concerned), do well. Patients convalescing unsatisfactorily, in a cold climate, from almost any exhausting disease, even from malarial affections (witness the writer's own case), will find a change to a temperature which will enable them to derive the benefit, through a long winter, of constant fresh, open air, extremely beneficial. Very *old* persons without any disease will have their lives prolonged and rendered more comfortable by a winter residence in the mild, genial air of Florida; especially old *men*, who suffer from *bladder and prostatic troubles*. "Lastly, Florida offers a haven of rest and quiet for that condition which is unfortunately becoming so prevalent among the restless, driving denizens of our Northern towns and cities, which comes under the comprehensive designation of *nervous prostration;* what Handfield Jones terms *cerebral paresis*, and which was thus described by James Johnson nearly fifty years ago: 'There is a condition of body intermediate between sickness and health, but much nearer the former than the latter, to which I am unable to give a satisfactory name. It is daily and hourly felt by tens of thousands in this metropolis (London) and throughout the empire; but I do not know that it has ever been described. It is not curable by physic, though I apprehend it makes much work for the doctors ultimately, if not for the undertakers. It is that WEAR AND TEAR of the living machine, mental and corporeal, which results from over-strenuous labor or exertion of the intellectual faculties rather than of the corporeal powers, conducted in anxiety of mind and bad air.' For this cerebral consumption, as we may justly term it, Florida affords as healing a balm as for the pulmonary variety."*

These cases are met with every year in increasing numbers in men of great business capacity and untiring energy and industry, in all kinds of business and in all the professions; men ambitious of wealth or distinction, often goaded on by the neces-

* Florida as a Health Resort. By F. D. Lente, N. Y. Med. Jour., Nov. 18, 1876.

sity of supplying the extravagant wants of large and expensive families; heads of our great corporations, railways, trust companies, insurance companies, etc.; men not content with the management and responsibility of one such organization, but often at the head of several, whose mental powers have been at their utmost tension, with very rare intervals of relaxation, for years. Sad it is to witness the wreck of such minds. In the light of this experience, we are almost disposed to regard the invention of the telegraph, and especially of the ocean telegraph, which enables us and forces us to compress so much business into so small a space of time, as a very equivocal blessing. The facilities for accomplishing, and the inducements for undertaking, increased work and responsibility, thus multiplying year by year, it does not require a prophet to predict a yearly increase of nervous diseases and cerebral wrecks if our people generally, our educated and mercantile classes, are not aroused to the necessity for a decided reform in their reckless career. Dr. Nichols says, in his recent pamphlet (Essay read before the Essex North Mass. Med. Soc., May, 1878): "Without further remark, we will say now, that for that class of ailments depending upon abnormal nerve functions, no climate is better calculated to afford relief than that of Florida. The poor, broken-down man of business, the nervous wife and mother, wearied and worn with household cares and duties, will find in this delightful air a balm well calculated to restore nerve action to its healthy conditions. The rest, the mental and physical rest, which comes even during a brief residence in Florida is, in our view, one of the most remarkable results of its climatic influence." "The best possible medicine for weak nerves is out-of-door life in a climate not subject to violent changes; such a climate is afforded by Florida in winter."

These conditions of the nervous system are not only of themselves of the most serious import, but still more so when we consider that they are very frequently only the forerunner of phthisis. This disease begins usually in impairment of nerve power, with exhaustion from overwork, mental or physical. "In fact," says Edwin Lee (Fiske Fund Prize Essay), "the destroyed illusions, the deceived hopes of the realizations of expectations too often exaggerated by vicious systems of education,

the difficulties and anxieties which so often beset the path of life, etc., may well be regarded as mainly instrumental in the production of organic diseases, and especially of *pulmonary consumption.*"

It is the duty of the physician to be watchful of the development of such cases, especially in phthisical families. These symptoms, of what has been termed the pre-tubercular stage, are generally quite obvious—failing health, loss of appetite, of interest in events or surroundings, dyspepsia, lassitude, sometimes anæmia, but no *physical signs.* These are the cases for *cure* by change of climate. "The number of cases like these," says Dr. Geddings (op. cit.), "is simply enormous, and the physician who, forgetting that his mission is to avert disease, as well as to cure it, sounds no note of warning, is not only derelict in duty, but guilty of negligence, for which the term criminal is none too harsh. Year by year cases come under the writer's observation, where neglect on the part of the physician to give this warning, or its disregard when given, has caused a sacrifice of human life which might have been prevented."

We have said that patients must not *rely* too much on climate; neither must they *expect* too much. This also has led to frequent disappointment and a failure to appreciate the benefit of climatic change. A decidedly consumptive invalid comes to Florida, and because he has not regained his health and strength in the spring, he concludes that the change has done him little or no good. Perhaps he feels little or no better. Yet he does not know how much *worse* he might have been had he remained at home. He comes to Florida to avoid dangers to which a northern climate would have exposed him, and if he gains nothing more than the escape from these dangers, catarrhal troubles, pneumonia, pleurisy, bronchitis, etc., he has been well paid for his sacrifice.

A medical invalid thus philosophizes on the subject: "One chief object in spending the winter in Florida is this: a man with chronic disease should be satisfied if, during the winter, he merely keeps his enemy at bay. He is content if his disease, his enemy, makes no progress there, while, during the spring and summer, he tries to get well. In this the climate of Florida helps him; it is the best place in which the invalid can put his

disease into winter quarters previous to undertaking the summer campaign. And if life is to be a constant retreat, a running fight with and from death, this is a strong fortress into which he may retire, and from which he may often set his enemy at defiance."

With regard to the proper *time* for going to Florida, one may go from the first to the middle of November if his condition requires so early a retreat from inclement weather. If, however, he has only a limited time at his disposal, he had better wait until the first of February. The oranges are then in perfection, and the weather also. If he does not wish to spend the whole of a long winter and spring in Florida, and cannot remain at the North, or if he pines for a change, he may go up to Aiken, or he may stop at Aiken in the early part of the winter. October is delightful there, and there is usually no cold to interfere with an invalid until Christmas, and often later. "This," says Dr. Geddings (op. cit.), "is undoubtedly the finest portion of the year, the air being just cold enough to act as a tonic without chilling, or in any way adding to the discomfort of even the most sensitive invalid." Aiken has also one of the finest hotels in the southern country.

When shall one leave Florida on his return north?—is a more important question. The warning has been repeated again and again by all writers on climate: "Don't get home too early." But still the fatal mistake continues to be made, and the sacrifices and benefits of a whole winter are often thrown away by a premature return in the spring. Quite a long spell of warm and beautiful weather in April, or even in March, which often characterizes our treacherous northern climate, when the grass becomes green and the early flowers put forth their petals, and the birds begin to sing, beguiles the invalid or his friends, who long to see him home among them again, into the belief that an early summer is at hand, and he hastens away from his safe retreat, to be greeted, on his arrival, with a cold and chilling blast, not seldom with sleet or snow, and to experience perhaps weeks of weather more dangerous than that of mid-winter. This the writer experienced even in May last. Better remain at home all winter than return too early in spring.

PALATKA, FLORIDA.

Note on Sea-Sickness.—The question whether it is preferable to travel by land or by sea naturally presents itself to the invalid and the tourist. Railways are usually preferred, many fearing to face the dangers of the sea and the horrors of sea-sickness. As regards danger to life, that of the sea is certainly not greater, according to statistics, than by land. There are many advantages of travel by sea. The fatigue is less; the comfort is usually greater; the danger of taking cold and of exposure generally is less, or precautions against it are more under the control of the individual. The voyage is almost always beneficial to the consumptive or bronchitic invalid; the cough is for the time arrested. Even if the invalid suffers from sickness, it is only a temporary suffering, and does not increase his disease. If he is so feeble as to render a sea voyage dangerous, he is unfit to travel at all, and should remain at home.

As regards *sea-sickness*, this may be in many cases entirely prevented; in others promptly cured, or greatly mitigated. I have elsewhere* written at considerable length of the treatment of nausea and vomiting from various causes. For the *prevention* of sea-sickness I employ bromide of potassium or calcium in full doses, half a drachm, three times a day, for about three days before the day of sailing, or enough to get the system fully under the influence of the drug at that date, as evidenced by a feeling of pleasant drowsiness. I keep this influence up by one, two or three doses a day after sailing, especially if the sea is high. Some persons prevent sickness by wearing Jobard's belt buckled as tightly around the waist or pit of the stomach as can be borne with comfort. Ladies can bear it better than gentlemen. These can be had at Tiemann & Co.'s, 67 Chatham street, New York. The invalid should, if the weather permit, keep on deck, and, if threatened with sickness, in the recumbent posture, and take the meals on deck. If he takes his meals in the saloon, he should not linger a moment after he has finished a moderate meal of *plain* food, but go in the open air, and lie down if threatened with nausea.

* Treatment of Vomiting by Electricity. Archives of Electrology and Neurology, 1874. New York Medical Journal, November, 1876. Medical Record, June 22, 1878.

Among the numerous *cures*, I know of none equal to electricity. A person can get a small, inexpensive Gaiffe battery for from five to ten dollars, which requires no destructive acids to run it, which any one may learn to apply moderately well very soon. A flat sponge *moistened* well or a wet napkin should be *wrapped around* the brass cylinder electrodes, not *inserted into* them, so as to furnish a large surface. One of these should be placed on the epigastrium, the other opposite, over the spine or *solar plexus*, and the latter, during half the time, over the seventh cervical vertebra. The electricity may be continued for half an hour or an hour in bad cases, only strong enough to give a pleasant sensation. Apomorphia in very minute doses (the homœopathic triturations furnish the most convenient form) is well worthy of trial. For sleeplessness associated with sea-sickness, chloral hydrate may be taken (in a wafer to prevent nausea) in doses of ten to fifteen grains. A stop-cock cork-screw may be put into a bottle of dry champagne; this kept in ice, and small doses taken every half hour or so, especially in debilitated subjects. By strictly observing the above precautions and remedial measures, sea-sickness may be prevented, or cured in most cases, not in all. Those who get sick upon coming in sight of the steamer, or *thinking* of the voyage, had better take to the railway.