Climate : its influence in the production and prevention of phthisis and other disease / by John Parkin.

CLIMATE & PHTHISIS.

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ITS INFLUENCE IN THE PRODUCTION AND PREVENTION OF PHTHISIS

AND OTHER DISEASES.

BY

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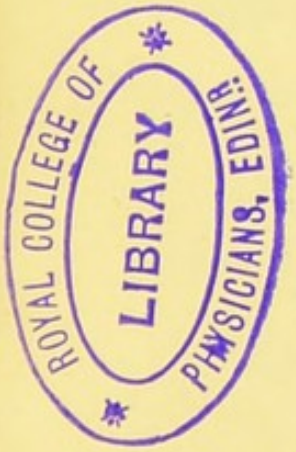

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PREFACE TO SECOND EDITION.

As so much ignorance exists, in England, on the subject of climate, even with medical men, and as so many invalids are annually subjected to what one writer has termed medical *transportation;* I am induced to publish another edition of this Work, in order to warn, once more, consumptive patients and others of the dangers attendant on a sojourn in the South of Europe and other warm climates more especially.

5, Codrington Place,

Brighton, *August*, 1882.

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CLIMATE AND PHTHISIS.

CHAPTER I.

THE PRODUCTION OF PHTHISIS.

Of the various feelings that animate the human breast, there are two which, although diametrically opposed to each other, tend sometimes to produce the same ultimate result. These are fear and hope. The effect of the one causes us to fly from actual and present danger; the influence of the other induces us to believe, that there is a safe refuge elsewhere—any where, in fact, excepting on the spot in which we happen to be placed. A somewhat ludicrous exemplification of the effect of these opposite feelings occurred during my stay in the Island of Trinidad, at which time a slight shock of an earthquake was experienced. The servant, who was waiting upon me at dinner, no sooner saw the plates and glasses rattling on the table, than he ran down stairs, as fast as his legs could carry him; but the landlady, who was below, ran up, and for precisely the same reason—an imaginary refuge. It is the same thing in sickness; the majority of persons fondly believing, that, by removal to another climate, they can shake off the diseases that prevail in their own. In many cases, this can be done, and especially with those forms of malarious fever which are peculiar to certain well-known

regions; as, also, with the epidemic cholera, when it is confined to a particular district or town. But there are other diseases, that have no such limitation of range, being found, to a greater or less extent, in all localities, and in all climates. Flight, therefore, in such cases, would not only be of problematical advantage, but it might be attended with injurious, instead of beneficial, results—those flying might be shipwrecked on Scylla, while trying to avoid Charybdis.

In England, this course is adopted principally in cases of consumption; a chronic disease, that gives, in the majority of cases, ample time for the effect of a change of climate to be tried and ascertained. The question therefore is, to which category does Phthisis belong? Is it a disease, that admits of cure or alleviation by removal to another climate, or not? Judging from the numbers that leave our shores annually, an uninformed person might conclude, that Phthisis is a disease almost peculiar to England; and that it is unknown, or prevails only to a slight extent, in other, and more favoured, regions. That it prevails to a great extent in England is undoubted; rather more than 50,000 persons dying annually from Phthisis, irrespective of other affections of the chest. The mean, from 1851 to 1860, was 53,046, which gives a ratio of 12 per cent. on the total mortality. If calculated with the living, instead of the dead, the annual rate will be 2.67 per 1,000; the general mortality, for the same period, having been 22.18 per 1,000: in round numbers, we may say, that out of every 1,000 persons living, $2\frac{1}{2}$ die annually from consumption; or 5, in every 2,000. Consumption may, in truth, be regarded as the principal endemic of England; but, then, it does not follow, that this result is due to peculiarity of climate, or that the disease is unknown

in other and different regions. If this were the case, the removal of a consumptive patient from England, to one of these favoured and healthy spots, ought always to be attended with beneficial results. But is such the fact, and does such a region exist? These questions not only require to be answered, but they ought not to be left in doubt for a single moment.

Although many hundred patients migrate south every year, in search of health and a cure, there are no statistical facts to show what the actual result of removal has been. We only know, that a large proportion of them die, either before or after their return,—a proof that removal to another climate will not cure Phthisis in the majority of cases. But, then, this want of success is ascribed to the circumstance, that the disease was too far advanced to admit of cure; thus implying that an earlier removal would have produced a different result. An important conclusion, like this, ought not to rest on mere hypothesis; hence the necessity of a searching and practical inquiry.

In order to solve this problem, we must inquire, in the first place, whether healthy Englishmen, who remove to other climates, remain exempt from Phthisis; and, secondly, whether this disease prevails among the inhabitants of such regions. Fortunately, we have no occasion to rest on mere conjecture, as regards the influence of climate in the prevention and production of Phthisis, with the inhabitants of these islands. As our soldiers and sailors now visit, and are located in, nearly every climate, and in all quarters of the globe, we have only to turn to the valuable Reports, published annually, by the Army and Navy Medical Boards, and the requisite proof will be at once afforded. In Tables A

and B, formed from the data contained in these Reports, the proportion of cases and of deaths from Phthisis, on each station, and in different climates, may be ascertained at a glance; and a comparison drawn with the result obtained in England. (Vide Appendix.)

By an examination of these tables it will be seen, that Phthisis prevails in all climates and in every latitude—in warm, the same as in cold, countries—at least with Englishmen, and with the two classes now under consideration. More than this, its prevalence and its fatality are actually greater, in some of these localities—and particularly in intertropical regions—than in the much abused climate of England. Judging from the facts thus presented to our notice, we should conclude, that removal to a warm climate is neither a preventive nor a cure for Phthisis. It may be said, however, that the victims, in these instances, carried the seeds of the disease with them, and hence the results observed. But this hypothesis will fall to the ground, if it can be shown, that Phthisis prevails among the natives of these different regions, as well as with strangers and visitors. That such is the fact, in the majority of the instances referred to, it will not be difficult to prove.

Passing over the Mediterranean Station, which will be considered hereafter, we may proceed at once to the West Indies, where sufficient data exist to enable us to form an accurate conclusion on the subject—the sickness and mortality in the native corps having been duly registered and preserved by the authorities in England. According to one of these returns, the general rate of mortality with the black troops, from 1817 to 1836, averaged 40 per 1,000. Of these 40 deaths, 16, or nearly half, were from affections

of the chest.* Supposing that the half of these were from Phthisis, the ratio would be 8 per 1,000, which is 5 per 1,000 more than with the troops in England.† Compared with the general mortality, the ratio appears still greater. In England, 12 per cent. of the gross mortality is referrible to Phthisis, but, with the black troops during the above period, the rate is 20 per cent., an enormous difference.

Speaking of the prevalence of diseases of the chest among the black troops, in the Windward and Leeward command, Major Tullock remarked:—"Upwards of two-fifths of all the deaths, among these troops, have arisen from this class of diseases; and more have died annually, by these alone, in this command, than among the same number of troops in the United Kingdom, by all diseases together."‡ Phthisis is also, as might be inferred, the cause of a large proportion of the mortality among the civil population of Jamaica, as I had an opportunity of ascertaining during my visit to this island.

With the white troops, in the West Indies, the ratio of mortality is less on the average than in England. This variation is to be ascribed, doubtless, to the fact, that fever prevails to a great extent in these islands, particularly in Trinidad and Barbadoes; and as two specific diseases, by a wise law of the economy, never prevail at the same time, in the same subject,

* Statistical Tables published by the Board of Trade.

† By a reference to the last Army Returns—those for 1873—the above calculation will be shown to be as nearly correct as possible; the admissions of the black troops, for phthisis, having been 29.2, and the deaths 8.15 per 1,000.

‡ Statistical Report on the Sickness, Mortality, &c, among the troops in the West Indies. 1838.

the comparative immunity of the white troops is readily explained, more especially as these fevers are usually very fatal. The black troops, on the other hand, being, by their peculiar organization, exempt from fever, are attacked with Phthisis and other affections. We know not to what extent Phthisis prevails among the inhabitants of Africa, but, with the British black troops stationed there, the rate of mortality is as high as in the West Indies.

If, from the West, we turn to the East, it will be found that Phthisis, although less prevalent than in the former regions, is still one of the endemics of this quarter of the globe. Dr. Green states, that Phthisis is a prevalent disease in the lower provinces of Bengal, and Dr. Godeve, referring to the diseases of *Upper India*, remarked:—"Tubercular Phthisis we have had abundance of, as the detailed autopsies, forwarded every month, show." And Dr. Webb, who quotes this statement, adds, "That he has observed this disease *extensively* among the Hindoo race and the Puharrees, inhabiting the lower belt of the Himalaya mountains."* We are unable, from the absence of statistical returns, to ascertain, what the general ratio of attacks and of deaths from pulmonic diseases is among the civil population in India: we only know, what the proportion of deaths is, from this class, when compared with the general mortality in some of the large towns. Thus, in Bombay, in 1852, the total deaths with the natives were 13,922, and those from diseases of the chest 1,854, or 13 per cent.—being 1 per cent. more than the deaths from Phthisis in England. What the ratio of mortality was among the European residents in this city, at the above period, has not been stated; but, at Calcutta,

* *Pathologia Indica*, p. 100, *et seq.*

among a section of the Europeans, the proportion was less than that given above. This is shown in the following table :—

TABLE C.—Proportion of Deaths at Calcutta, among the resident (Protestant) European population, from Lung Disease, to 100 deaths, in each of the 5 years ending 1860 :—

Males	9.24 per cent.
Females	9.84 „
Average . .	9.52 „

Instead of the dead, we will now make the living the test of comparison. With the British troops in India the ratio, as will be evident by a reference to Table B, is 2.34 per 1,000, .76 less than in England. In China, with a climate and temperature nearly the same as India, the rate is 5.11 per 1,000, 2.1 more than in England. The native troops are less liable to Phthisis than the European troops, as is shown in the following Table :—

TABLE D.—Annual ratio of cases and of deaths, with the Asiatic troops serving in China from 1861 to 1864 :—

Diseases.	Ratio per 1,000.	
	Cases.	Deaths.
Respiratory	78.1	2.89
Tubercular, or Phthisis	2.9	1.00

But although the proportion of cases to strength is less, the proportion of deaths to cases is higher than with Europeans —thus showing that thoracic diseases are more fatal with the native, than with the British, troops.

We thus learn, from the preceding facts, that Phthisis is one of the endemics of India, as well as of England. There

is no reason to suppose, therefore, that the European troops, attacked with Phthisis, carried the seeds of the disease with them. They must have been quite as likely to contract it there as in England. This inference is confirmed by a very remarkable case, mentioned in the Madras Report for 1843. It is that of a pensioner, who had been resident in India upwards of 60 years, dying of Phthisis at the advanced age of 97 years. It also appears, that the children of European parents, resident in India, are attacked with Phthisis, and to the same extent as adults. In the Bengal Presidency, according to Mr. McPherson, the annual mortality from diseases of the lungs, during 8 years, 1846—54, was as follows :—

European	officers	... ...	1.9 per 1,000
„	soldiers	... ...	4.3 „
„	women	... ...	3.9 „
„	children	... ...	4.2 „

As a large proportion of these children were born in India, we must seek for the cause of the disease in the climate, unless we conclude that they inherited it from their parents. This inference, however, is negatived by another fact; this is, that the native children are also subject to Phthisis the same as the European. In Bombay, in 1861, 4 per cent. of the deaths were caused by thoracic diseases in native children, under six years of age.

It is thus certain, that Phthisis is to be found in all localities and in all climates, to a greater or less extent; and that it is a general, not a local, endemic peculiar to certain countries and latitudes. Of what benefit, then, we may ask, can it be for a patient to leave his native shores, the comforts of home, and the solace of friends, in the hope of avoiding

those causes of disease, that thus appear to be in operation everywhere? The principal reason assigned for sending English patients abroad is, that they may avoid the cold, the fogs, and the damp, to which they are exposed in a climate like that of England. It will be desirable, therefore, to ascertain what the influence of these agents is in the production of Phthisis. And first as regards the influence of cold.

If cold and fogs be exciting causes of this disease, to what, we may ask, are we to refer the production of the disease in warm and intertropical regions, where fogs are unknown? To the warm atmosphere and the cloudless sky? This we must do to be consistent. But, then, such a conclusion would not only be inconsistent and illogical, but absurd. We may therefore infer, without much risk of error, that the cold and foggy atmosphere of England is not the cause of Phthisis. That cold *per se* is not an exciting cause of this complaint, there are many facts to show. By turning to Table B, it will be seen, that, in British America, the ratio of cases and of deaths from Phthisis, with the British troops stationed there, is only half that of the troops in England. And yet, in Canada, where the greatest number of the troops were stationed, the mean temperature of the winter months is 20° lower than in England, while the rainfall is greater. In New Brunswick, the thermometer is sometimes 35° below zero.* In Labrador, again, where the cold is still more intense, consumption, according to Professor Hind, is almost

* The climate is nearly the same as that of Norway, Sweden, and St. Petersburg—the isothermal line diverging far to the north of the same parallel on the old Continent.

unknown. This immunity does not arise from any peculiarity of constitution, for when the natives proceed southward to the St. Lawrence to fish, which they are in the habit of doing in the *summer months*, they are then attacked with Phthisis the same as the inhabitants of these regions According to a writer in the "British and Foreign Review," Phthisis is rare in Denmark, and still rarer in Norway, Lapland, Iceland, and the Faroe Islands. The disease is also much less frequent in Russia, according to Sir A. Crichton and Sir G. Lefevre, than in the south of Europe. In Sweden, the deaths from this disease are stated to be 1 in 19, or 5.26 per cent. of the general mortality, about half that in England. Dr. Hyaltalen, a native of Iceland, and a distinguished physician, stated to Dr. Leared, "that tubercular disease of the lungs does not originate in Iceland, and that in every case which he has seen there, the disease had been contracted abroad."* On board the "Hecla," also, commanded by Captain Parry, during the voyage to the North Pole, in 1819, there was only one death from disease of the lungs. Even this was not occasioned by Phthisis, but by inflammation, complicated with scurvy; Mr. Edwards, the surgeon, stating that, on examining the body after death, neither tubercle nor abscess was discovered in the lungs. In addition to the above, there were only 2 or 3 cases entered on the sick list for inflammatory affections of the chest, and these occurred in the spring. The duration of the voyage was 18 months, and the number of the crew, in-

* The climate is mild for the latitude, the mean temperature of the year being 40°. That of summer is 56°, and that of winter about 29° 30.—The "British Medical Journal," Jan. 16th, 1869.

cluding officers and men, 51. The temperature in the month of December was as follows :—

Maximum	+ 6°
Minimum	— 43°
Mean	—21.79°

We will now consider the influence of moisture in the production of Phthisis, more especially as this part of the subject has been deemed worthy of an official inquiry. In 1862, Dr. Bowditch of Boston, U.S., drew attention to the inequality of the distribution of Phthisis in Massachusetts; and the result of inquiries made, subsequently, by the resident physicians, in 183 townships led him to draw the following conclusion. "That dampness of the soil of any township, or locality, is intimately connected, and, probably, as cause and effect, with the prevalence of Consumption in that township, or locality."* Mr. Simon, also, in his 9th Report, 1867, drew attention to these conclusions of Dr. Bowditch, and, in consequence, Dr. Buchanan was appointed by the Privy Council to investigate the subject; and his Report was added to the following (10th) Report of the medical officer of health. In this Report, the ratio of deaths, from Phthisis and lung disease, in 58 registration districts has been given, as, also, a summary of the geological formations and physical peculiarities of each. These districts are comprised in the counties of Sussex, Surrey, and Kent, exclusive of the metropolitan area; as it was only in these counties, that the geological survey of England, now being carried out, had been completed. Dr. Buchanan sums up his obser-

* Consumption in New England and elsewhere, or Soil-Moisture one of its Chief Causes. 2nd Edition, 1868.

vations thus: "The whole of the foregoing conclusions combine in one—which may now be affirmed generally, and not only of particular districts—that *wetness of soil is a cause of Phthisis* to the population living upon it." (Loc. cit. p. 109.) And Mr. Simon, referring to the Report of Dr. Buchanan, says: "It confirms, I think, beyond any possibility of question, the conclusion previously suggested (in his former Report), that dampness of soil is an important cause of Phthisis to the population living upon the soil." (Id. p. 10.) Thus placed, the question is a very simple one, and becomes confined to very narrow boundaries; while it is one that, we might have supposed, could not admit of any doubt. But, although laid down thus dogmatically; and although stamped with the presumed infallibility of an official dictum, I join issue at once with these writers, and deny the truth of the conclusion at which they have arrived.

It is not necessary to follow Dr. Buchanan into all the districts visited by him; or to criticise all the facts adduced—geological and others—in proof of the conclusion at which he has arrived. I shall content myself with examining a few only of these districts—those which have the wettest, and those which have the driest, soils—for if the above theory be true, it follows, that the wettest soils will have the highest ratio of mortality, the driest, the least. The proof is as simple as the proposition. With this view, the following Table, compiled from Dr. Buchanan's, has been drawn up, the districts being arranged, not according to Dr. Buchanan's plan, "in the order of their death-rate from consumption," but in the order of their wetness or dryness.

TABLE E.—Ratio of Deaths from Phthisis, in the undermentioned Districts, during the Ten Years, 1851—60, with the proportion of population on wet and dry soils.

Districts.	Population.	Ratio per 100,000.	Ratio per cent.	
		Phthisis.	Pervious Soils.	Impervious Soils.
1. Isle of Sheppey ...	18,495	202	6	84
2. Hoo	2,864	301	36	64
3. Westbourne ...	6,957	498	38	62
4. Richmond ...	18,802	313	44	56
5. Chichester ...	14,775	536	45	55
6. Romney Marsh ...	5,708	348	49	51
7. Eastbourne ...	10,721	336	96	4
8. North Aylesford...	19,121	289	90	10
9. Steyning	24,052	295	90	10

By an examination of the above Table it will be seen, that the wettest of the above districts is the Isle of Sheppey, 86 per cent. of the population living on impervious, or wet, soils, and only 6 on pervious, or dry, ones. A better example, perhaps, could not be found of a purely wet soil; being a low, marshy, and alluvial, district. The soil is so saturated with water, that it rises, if a trench be dug, to within a few inches of the surface; and yet, it is precisely in this district, that the rate of mortality is the lowest, not only of the above but of the 58 districts examined by Dr. Buchanan. Unfor-

tunately, the Isle of Sheppey is the only example, that has been given, of a purely alluvial and wet district, the others being either mixed or dry soils. As such, the only plan is to select a few districts, which have the largest per-centage of impervious soils, and then to compare the result with the preceding, and with the driest of the dry districts.

The first of the intermediate districts is Hoo, situated between the Thames and the Medway. In this district, 3 per cent. of the population live on alluvium, 26 on London clay, 65 on gravel covered London clay,* and 6 on the lower London tertiaries, all pervious. Assuming that one-half of those living on the gravel are on low ground, there would thus be a per-centage of 64 living on impervious soils and of 36 on pervious soils. The district has various elevations and slopes, its highest point being 200 feet; thus "there will be," according to Dr. Buchanan, "fair surface drainage." But the death ratio is 301, a hundred more, save one, than in the wet and swampy Island of Sheppey, with only 6 per cent. of pervious soils. Let us take another district, that of Westbourne. Here, 14 per cent. of the population live on London clay; 24 on the lower London tertiaries, and 64 on chalk. "Nearly half the population," we are told, "live on dry high chalk," (500 feet high) but the remainder are on a flat plain, of 15—20 feet above Ordnance datum, formed by the tertiaries with a band of chalk between them. "All this part," remarks Dr. Buchanan, "must be thoroughly wet." Granted, but chalk and the London tertiaries are not so wet

* Clay is one of the most retentive of soils, but, when placed under a layer of gravel with a gentle slope, it becomes a dry, instead of a wet, soil on the surface—the water running off between the layer of gravel and the clay.

as clay and alluvium, the tertiaries being composed, in part, of sand, and are therefore to a great extent pervious. Allowing, however, that they are actually impervious, there would yet be 62 per cent. of pervious soils—all chalk – and only 38 of impervious soils, not a bad proportion. Nevertheless, the death-rate is the highest—with one exception—of all the districts, being 498—296 above that in the Isle of Sheppey. Another intermediate district, Chichester, with nearly one-half the soil pervious, has the highest death-rate of any.

We may now pass to the next series, or the dry soils. Among the 58 districts, Eastbourne is that which would appear to contain the largest per-centage of pervious soils. Nearly one-half, or 47 per cent., of the population live on chalk: 39 on green sand and the lower London tertiaries, 10 on Hastings beds, (all pervious) and the remainder, or 4 per cent., on shingle, clay and alluvium. The greater number of the towns are at some elevation, with slopes for natural drainage: Eastbourne having an altitude, varying from 21 to 39 feet, while East Dean has 144 feet. We might therefore have expected that, in this favoured spot, according to the theory under review, the deaths from Consumption would have been reduced to a minimum: that instead of 202, as in the Isle of Sheppey, there would have been 20 or 30 only: strange to say, the number is 336, or 134 more. It would be useless to continue this analysis. The preceding examples, although few in number, will enable us to arrive at distinct and positive conclusions on the subject, for they exhibit the result of diametrically opposite conditions—extreme wetness and extreme dryness. Remarking that the ratio of deaths is greater on very dry, than on

very wet soils—at least in the examples adduced—we must infer that *wetness of soil* is not a cause, either remote or proximate, of consumption.

This conclusion is confirmed by other facts. One is, that Phthisis is less prevalent in those districts in which intermittents prevail, than in others. The "antagonism of intermittent fever and of Phthisis" has been observed for ages, and has been commented on by a great many writers. In Minorca, where intermittents are endemic, Phthisis, according to Dr. Cleghorn, is very rare. Dr. Sequeira also states, that this disease is rarely seen in the marshy country of the Alentejo. Dr. Wilson, an army surgeon, who resided for many years at Xeres de la Frontera, and whom I had the pleasure of meeting on my visit to Spain, in 1834, drew my attention to the comparative non-prevalence of Phthisis in the low, damp, and alluvial plains of Andalusia, where intermittents prevail to a great extent; and I have had occasion to observe the same fact in other localities, and in all parts of the world. It was, therefore, the custom formerly, and is so now in some countries, and in particular instances, to send consumptive patients to marshy districts, as a preventive and curative measure. Dr. Wells, who has insisted particularly on the beneficial result of such a step, states, among many other instances adduced, that it was a common practice in Flanders, to remove consumptive cases from other localities to the marshy districts of that country.* The celebrated traveller Volney also informs us, that, at Aleppo, consumptive patients are frequently sent to the sea-coast, where intermittents prevail.

* Transactions of Society for the Improvement of Medical and Chirurgical Knowledge. Vol. 5, p. 471.

On the other hand, the draining of marsh lands has been found to promote, or to increase, the prevalence of, Phthisis. This has been particularly pointed out by M. Boudin, who remarks: "The drying (or drainage) of the soil, while causing the disappearance or diminution of paludal diseases (as ague), appears to predispose the organization to a new pathological condition, according to the locality, and in which *Phthisis* and typhoid fever play a prominent part." That the appearance and prevalence of typhoid fever, which was unknown in England until 1827, is to be referred in part to the excessive drainage that has been carried out, of late years, it has been my object to show on a previous occasion.* That the same operation is productive of Phthisis, we have evidence to prove. Mr. Cass, surgeon of Goole, states, that thirty-seven years ago, when he first went there, intermittent fevers were very frequent, but not often severe in form. About this time "extensive drainage of the land, in this district, was effected, since which, the mortality from Phthisis has been *very high* for many years." Dr. Whiting, sent by Government to inspect the locality, states, in addition: "There has been much *typhoid* fever of late years, and much zymotic disease prevailed at the time of my visit."† That the drainage of marsh lands is frequently productive of disease has been long known. This was the case, when the marsh, called *La Chartreuse*, near to Bordeaux, was drained in 1805, immediately after which a fever broke out, of so severe and general a character, that 12,000 persons were attacked, and 3,000 died. The same result has been observed

* Epidemiology, p. 167.

† 6th Report of the Medical Officer of the Privy Council, p. 444. 1863.

in many other instances, as in the Pontine marshes, for example, which have become more unhealthy since they were drained than before. But the most conclusive proof that humidity, or wetness, of the soil is not a cause of disease, will be shown by the fact, that the most pestiferous spot in the world may be rendered perfectly innocuous by covering the surface with water.

These conclusions granted, we can understand why Phthisis should be less prevalent in the Isle of Sheppey than in other and drier localities; as, also, why Phthisis should be so common in this country, England being the best drained country in the world. Not only must we conclude, that humidity, or dampness, of soil is not the cause, or a cause, of Phthisis; but we may draw the same conclusion with respect to moisture, or dampness, in the atmosphere.

That a damp, or wet, atmosphere is not a cause of Phthisis may be inferred from what has gone before,—a conclusion confirmed by a variety of other facts. Referring to the presumed injurious effect of moisture in the production of ordinary diseases, Major Tullock, the compiler of some of the early Medical Army Reports, remarked: "This hypothesis seems at variance with the facts contained in the previous report, for if the mortality of the troops depended materially on the influence of moisture, we might expect it to attain its maximum in those stations where the fall of rain was the greatest; whereas the average mortality of the troops in Jamaica is, at least, double that which prevails among those in British Guiana, though the quantity of rain which falls in that island is little more than half as great." The Malabar coast, also, which is deluged by rain for six months in the year, is one of the most healthy stations in the Madras Presidency. The same immunity is observed in

certain cold climates, as in Newfoundland, which is not only a very cold, but a very damp and foggy, climate. Dense fogs prevail there, and especially in May and June. But the climate is a very healthy one, the death-rate, according to the population returns, being only 1 in 76. In England, the rate is 1 in 45, and in the temperate and cloudless atmosphere of Italy, 1 in 25. Phthisis also prevails there to a much less extent than in England, or in more southern latitudes. During five years, there were seven cases, and two deaths, from Phthisis among the troops stationed in this island, out of a mean force of 260 men. This gives a mean annual ratio of 5.36 per 1,000 for the cases, and 1.53 for the deaths —a ratio rather less than half that in England. These facts are exhibited in the following Table :—

TABLE F.—Proportion of Cases and of Deaths from Phthisis, and of men invalided for the same Disease, in Newfoundland, in the following years :—

Years.	Force.	Number of		
		Cases.	Deaths.	Invalided.
1860	215 men.	5	None.	None.
— 1	196 „	None.	„	„
— 2	273 „	„	1*	„
— 3	318 „	1	1†	„
— 4	302 „	1	„	„
Total	1304 „	7	2	

NOTE.—In 1860 and 61, the force consisted of a local corps, but in January, 1862, a battery of the Royal Artillery arrived from England, and, in November, a company of the Canadian Rifles—the Newfoundland corps having been disbanded.

* Invalid. † Ditto.

Even these two deaths occurred with men previously invalided, and who had belonged to the corps recently arrived from Canada. We may presume, therefore, that these men contracted the disease elsewhere; in which case, there would have been no deaths in the colony from Phthisis, among the troops, during these five years.

It is evident, from the preceding facts, that the cold, damp, and foggy, atmosphere of England is not the cause, the exciting cause, of Phthisis; and that the opinions entertained on this subject have arisen from prejudice, rather than from the exercise of a sound judgment, and from a strict induction of facts. As is well known, a damp, moist, air generally feels colder than a dry one—temperature and all other circumstances being the same. The reason is, that a damp air is a better conductor of heat than a dry one, particularly when accompanied by a strong wind. But no such effect is produced when there is a calm, or with a fog, which has a tendency to check radiation from the surface. Hence it is, that a moist atmosphere is frequently close and muggy, or, in other words, warmer than a dry one. On the other hand, a cold, dry, air may produce a much greater radiation of heat from the surface than a cold, moist, one, especially when accompanied by a strong wind. Fogs and moisture may therefore prove beneficial rather than otherwise, under certain circumstances and in cold latitudes.

These inferences are confirmed by the fact, that a dry and warm climate, so far from proving beneficial, or acting as a preventive of Phthisis, would seem to produce the very opposite effect. This is the case in the south of France, or in Provence and Languedoc, which possess one of the driest climates in Europe. The average number of

days, on which rain falls in Provence, is 67: in London, it is 178: while the quantity is 19 inches in the former, and 25 in the latter. Sometimes, this dryness continues for 5 or 6 months without interruption; and there is generally, in winter, a clear, blue, sky, with brilliant sunshine; and yet, affections of the chest and Phthisis prevail in these provinces to an extent, that will excite the surprise of those who consider cold, moisture, and fog such injurious agents. According to one writer, of 2,756 persons, treated in the hospital of Montpellier, 154 died. Of this number, 53, or a third—34 per cent.—were suffering from disease of the chest.* At Marseilles, according to M. Sigaud, a large proportion of the youth of both sexes is carried off by Phthisis. "It causes," he exclaims, "unheard-of ravages, and mows down youth and beauty."† M. Murat, also, while alluding to the great prevalence of Phthisis at Montpellier, remarks; "Pulmonary consumption is but too prevalent in this district: it even carries off whole families. The position of the town, and *the dry* and variable constitution of the climate, are the local causes which always develop it." It is somewhat curious that writers in America and in England should consider moisture an exciting cause of Phthisis; while M. Murat ascribes the prevalence of the disease in the south of France to the opposite state, or dryness of the atmosphere. This shows how prone medical theorists are to adopt the common fallacy, that coincidence is cause; and to ascribe effects to causes cognisable to their senses; rather than to those deduced from a strict analysis of all the phenomena, and

* Topographie Médicale de la Ville de Montpellier, par M. Murat.

† Exposé des Travaux de la Societé de Medicine de Marseilles.—1816.

from a comparison with those presented in other localities and under different circumstances.

Having thus endeavoured to show, that cold and moisture, separately or combined, are not the real and efficient causes of Phthisis, the question arises, to what cause are we to refer the prevalence of this disease in England? On the solution of this question will necessarily depend the expediency or inexpediency of removal to another climate, and hence its importance.

In entering into a consideration of this important subject —the causation of Phthisis—it may be as well to remark, that it admits of division into several distinct heads. As diseases prevail everywhere, at least ordinary diseases, those belonging to the two classes termed Epidemic and Endemic, there must be a general cause productive of them, usually termed the remote cause. There is, also, a predisposing cause, or that condition of the body which predisposes one individual to be affected by the operation of the remote cause, while others escape. Then, again, there is the exciting cause, that circumstance, or combination of circumstances, which calls the other agents into action, in the same way that the air, or the wind, fans into a flame the spark that would otherwise become extinct. And, lastly, we have the immediate cause, that abnormal condition of the body or of an organ, which is the effect of the operation of the other causes, and which lays, as it were, the foundation of the disease that is subsequently developed. These are the causes that I intend to consider on the present occasion. And first as regards the remote cause of Phthisis.

It is apparent, from what has gone before, that Phthisis prevails in all climates and in all situations to a greater

or less extent. The cause of its production, therefore, must be a general one—one that exists equally in the torrid and in the temperate zones. Now there is only one morbid agent, with which we are acquainted, that is to be found in all situations and at all times, to a greater or less extent,—this is the poison termed malaria (mal'aria) by the Italians. Not only have we proof of the existence of such an agent, but we are almost as well acquainted with the laws that regulate its extrication from the surface, and its diffusion in the atmosphere, as with the laws of gravity itself. As heat is known to be one of the principal agents in the extrication of this matter from the surface, it follows, that the quantity of this poison present in the atmosphere will be greatest in intertropical climates, least in temperate and cold ones. Hence it is, that the severest forms of fever, met with, are in the torrid zone, the mildest, or ague, in cold climates, and remittents in the intermediate regions. That these variations are to be referred to variations in the quantity of the morbid matter, present in the air, we have proof from another circumstance. As malaria becomes innocuous, by dilution in the surrounding atmosphere, at certain heights above the surface from which it is given out, we frequently observe, on *the same spot*, the severest forms of continued fever prevailing on the plains below; remittents on the heights above; and intermittents at a still greater elevation. This is not all. Not only do we observe a variation in the forms of fever, according to the greater or less quantity of malaria in the atmosphere; but we also find, that there is a variation in the forms of other diseases. For instance, in intertropical regions, there will be, in addition to fever, acute attacks of inflammation of the liver and bowels, or dysen-

tery: but, without the tropics, we only observe chronic affections of the liver and spleen, more especially in situations in which ague is endemic. In other localities, again, as in more elevated situations, where intermittents are unknown, thoracic diseases, or Phthisis, will be found to prevail more particularly—a result that must be ascribed to the lesser quantity of malaria in the surrounding air. If it existed in greater quantity, it would produce fever, and be determined to the external surface: this not being the case, it is determined to the internal organs, and the lungs in particular. The *apparent* greater prevalence of Phthisis in this country must, therefore, be ascribed, not to the fact, that the cause productive of it exists to a greater extent than in others, but to the circumstance that, not being cut off by other and more acute diseases, more persons are left to be attacked with Phthisis. This I consider to be the remote cause of Phthisis, viz., the presence of malaria in the atmosphere, and its introduction into the system.

It would be foreign to my present object to enter into the question of the predisposing causes of Phthisis; more especially as we are, to a great extent, ignorant of these causes; or, why, when a general cause is in operation, one person should be attacked and another not. We may therefore pass on to a consideration of the exciting cause of this disease.

As regards the exciting cause of Phthisis, this may, no doubt, be referred to atmospherical vicissitudes. It has been before inferred, that malaria, when present in the atmosphere in small quantities, and absorbed into the system, is determined to the internal organs, rather than to the external surface. This effect will be accelerated by the application of

cold to the body, more especially when preceded by heat. It is then, more particularly, that the blood, with the substances contained in it, is driven from the external surface to the internal organs, producing inflammation and other morbid effects. We have, in fact, daily proof, that the application of cold to organs or surfaces abnormally heated, is sufficient to produce inflammation and death. A plunge into a cold bath, when the body has been over-heated, is generally followed by some injurious result; and, frequently, by death: while inflammation of the stomach is often produced by a draught of cold water, taken after violent exercise. The same effect is sometimes caused by mental excitement. According to the Peruvian adage, *Toma aqua fria in cima de cholera* (to take, or drink, cold water during, or immediately after, a fit of anger) is considered, in that climate, to be a frequent cause of hepatic and abdominal disease. Similar causes will produce similar effects in the delicate structure of the lungs, heated to a temperature of 98°, whenever a sudden transition occurs, and cold air is inspired of a very low temperature. This result is nowhere better observed than at Madrid. This city, situated on a wide plain, 2,200 feet above the level of the sea, is bounded on one side by a lofty range of mountains, the Somô-sierra and Guadarrama, constantly covered with snow. As a consequence of its elevation the cold in Madrid is intense in winter, and the heat in summer as great, or, as the Spaniards express it, "*Neuve meses de invierno, y tres meses de infierno*"; and, certainly, I never suffered more from the heat, or from the cold, than during my stay in Madrid.* Under such circum-

* The mean temperature in winter is 43°, though the thermometer frequently falls to 32° and under. In summer, the mean is 76°, the maximum being from 90° to 105° in the shade.

stances, we can readily understand how injurious a cold blast from the mountains will be, in the middle of summer; as, also, that attacks of pneumonia and pleurisy should be of common occurrence there, in the hot, as well as in the cold, months. They are of so severe a character, that the patient is frequently carried off in three or four hours. This effect is observed, not only when there is a perceptible wind blowing from the mountains, but, also, when it is imperceptible, excepting from its effects on the health of man. Hence the Spanish proverb, that "the air of Madrid will kill a man, and yet not put out a candle;"* and hence, also, why the inhabitant of Madrid carries his cloak with him, on the hottest day in summer, when he goes for his evening walk. For the same reason, he will retire within, and close his window, if he feels the slightest chill, while standing in the balcony enjoying the freshness of the summer evening. Similar results are observed, although not to the same extent, or in the same intensity, in all similar situations—those where the cold blast from the mountain is mixed, for a longer or shorter time, with the warm air of the plain below.

If such are the results produced by great atmospherical vicissitudes, we may conclude, that the operation of the same cause, although less in degree, will produce similar effects, but of less intensity—or chronic, instead of acute, inflammation. This inflammatory or congestive state of the lungs may be so slight as not to attract attention at the moment: and yet be sufficient to manifest itself, at a future period, in some other and serious form, as the deposit of tubercle, and the formation of pus. It is this peculiar morbid state, that I

* El aire de Madrid es tan sotil que mata á un hombre y no apaga á un candil.

consider to be the immediate cause, the foundation, as it were, of the disease termed Phthisis. The first effect of the inflammation, when it does not pass off by resolution, as the medical phrase is, or when it is not cured, will be the deposit of tubercles in the lungs. We have an example of this in gout, in which disease gouty deposit takes place in the joints, after repeated attacks of inflammation. In the lungs, however, either from a difference of structure, or other cause, suppuration follows, but not always, the deposit of tuberculous matter. When this occurs, we have the true, or pathognomonic, symptoms of Phthisis: those which constitute the last, or suppurative, stage of the disease. That Phthisis is the result of inflammatory action in the lungs may be concluded from a variety of other circumstances.*

I would remark, in the first place, that Phthisis is a common result of acute attacks of pneumonia, the only difference being that the disease, in these instances, is generally more rapid in its course than in others. If, therefore, the disease be the direct effect of inflammation in one case, we shall be justified in inferring, that the result, in other cases, is due to the operation of the same exciting cause, more especially if we coincide in the axiom, that like effects must be produced by like causes. It is to be noted, in the next place, that the principal characteristic of Phthisis is the formation of pus in the tissue of the lungs: and as this

* Professor Bennett, of Edinburgh, says:—"There is first an impaired state of nutrition causing alteration of the blood. 2nd. A local change, which some say is inflammatory, others not. This local change ushers in or accompanies the tubercular deposition, and is, in my opinion, in its essential nature, inflammatory." (The Pathology and Treatment of Pulmonary Tuberculosis.—Ed. 1853.)

matter is invariably the result of inflammation, either acute or chronic, we might have concluded, *à priori*, and without reference to any other circumstance, that the immediate cause of this disease is inflammation of the pulmonic tissue. And it is to be remarked, in the third place, that Phthisis affects those, more especially, in the prime of life, when the system is in a sthenic rather than in an asthenic state; precisely at that period when the body is the most prone to inflammatory attacks.

A confirmation is afforded of the above conclusions from the result of the treatment of this disease by mineral sulphureous waters—the stimulating quality of which is well known. This is very clearly demonstrated in the following Table:—

TABLE G.—Statistical Table of the Cases treated at Cauterets, in the Pyrenees, for a period of ten years, with the results obtained.

Diseases.	Number of cases.	Number cured.	Number only relieved.	Number uncured or rendered worse.
Phthisis, 1st stage ...	240	None.	68	172
Do., 2nd & 3rd stage	127	„	13	114
Do., laryngeal	70	„	15	55

This Table has been extracted from the general Statistical Table furnished by Dr. Buron, Government In-

spector of the waters at Cauterets, and contained in the work of Sir A. Taylor.*

That Phthisis is the result of inflammation of the tissue of the lungs may be inferred, irrespective of all other considerations, from the chemical composition of tubercle—the presence of which, in the lungs, is the cause of all the other morbid effects. The basis is coagulable lymph, or, in other words, the serum of the blood.—It is, also, the matrix of scirrous tumour.—According to Scherer, the ultimate analysis of tubercle gave—

Carbon	53·888
Hydrogen	7·112
Nitrogen	17·237
Oxygen	21·767

Or C. 43, H. 35, N. 6, O. 13. Hence tubercle may be regarded as *protein* from which five atoms of carbon, one of hydrogen, and one of oxygen, have been removed. A tubercular mass, analysed by Preuss, contained 19·5 of solid matter and 80·5 of water; the former composed of a substance resembling *casein*, in its relations towards acetic acid and heat. M. Thenard states, that tubercle, in its primary, or unsoftened state, consists, in 100 parts, of 98·15 of animal matter, and 1·85 of the muriate of soda. When, however, the tubercle had undergone the cretaceous transformation, these substances were found in an inverse ratio, viz. 3 per cent. of animal matter and 96 of saline.

If these deductions be sound, it will be easy to ascertain, which climate a consumptive patient should select, and which he should avoid. If disposed to migrate, in the hope of

* Page 233—French Edition.

ameliorating his condition, he should avoid a country, or a locality, in which malaria abounds to a greater extent than in his own: where the atmospherical vicissitudes are more marked, and where the temperature is greater—heat being the great promoter of suppuration, the ordinary result of inflammation of the tissue of the lung, and the cause of its fatal termination. By a parity of reasoning, those localities should be selected in which the opposite conditions exist. But is this generally the case? So far from it, we shall find, on inquiry, that consumptive patients, in the present day, almost invariably select the localities, in which all those conditions exist, that, it has been inferred, are most detrimental in the disease under which they are labouring. A brief account of the peculiarities of the climates resorted to by this class of persons will prove this.

CHAPTER II.

HEALTH-RESORTS FOR CONSUMPTIVE PATIENTS.

Following the course usually pursued by such travellers, the needle of whose compass, unlike that of the mariner, points invariably to the south, we arrive in the sunny regions of France--in Languedoc and Provence, so renowned in song. But although a warm and sunny, it is, also, a very variable, climate, occasioned by the prevalence of remarkably cold winds, especially in the winter and spring. These effects are due to the peculiar position of these provinces, and the contiguity of high mountain ranges. Special names have been given to these winds. One, a N.W. wind, is the *Mistral,* a very cold and violent wind and severely felt in the whole of the South of France. Another is called *La Bise,* a northerly and, necessarily, a cold wind.* The east wind, known in the *patois* of the country, under the peculiar name of *aoura-roussa,* or *marin blanc,* is a still colder wind, as it blows directly over the Alps. It is more dreaded than the two former winds, which pass over the Haute-Loire, the Lazère, and the Cevennes Mountains--ranges which are only

* La Fontaine has alluded to the injurious nature of this wind in one of his fables, intended to mark the providence of the ant, and the improvidence of the grasshopper—

"La cigale ayant chanté tout l'été,
Se trouvât fort depourvue
Quand *la bise fut venue,*" etc., etc.

occasionally covered with snow. The existence of these winds in a comparatively warm climate—the mean temperature being 10° above that of Paris—will account for the great prevalence of affections of the chest, not only at Montpellier and Marseilles, as previously shown, but, also, over the whole of these provinces. "This climate," remarks Dr. Higgins, "is decidedly unfavourable to all *phthisical* patients; and to all those who are suffering from an irritation of the mucous membrane of the stomach, the larynx, and the trachea." And Dr. Burgess, while questioning the propriety of invalids making this part of France a resting-place, on their way to or from home, adds:—"I know not, in effect, any spot less favourable for patients whose lungs are affected, than the two towns of Aix and Montpellier, so celebrated, and which have become resting-places for consumptive persons." *

Leaving this uncongenial clime, and pursuing the usual route, we shall arrive at Hyères, sometimes called the Island of Hyères. This is a misnomer, the town being on the mainland, but opposite to a small island of the same name, and hence the mistake. Being further removed from the Alps and other snow-capped mountains, atmospherical vicissitudes are not experienced here to the same extent as in other parts of the South of France. Still, as Hyères is exposed to the influence of the *mistral*, it is dangerous for consumptive patients, as is generally acknowledged there, to expose themselves to its action, particularly beyond the precincts of the town. Added to this, Hyères being placed on the border of the Mediterranean, it is warmer than the majority of the

* Climate of Italy in relation to Pulmonary Consumption, p. 43. 1852.

other towns in France. It is termed, in fact, by French writers, *une veritable terre-chaude*, or hot-house. This circumstance, which, by others, has been considered a recommendation, is precisely the reason why I should conclude, that it is an improper abode for consumptive patients, and for the reasons previously given. There are no statistics or other information, that I have met with, to indicate the prevalence or the mortality among the natives from diseases of the chest: we must rest contented, therefore, with the particulars now given, and draw our own conclusions on the subject.

Continuing our route in the same direction, we shall arrive at Cannes, which has not been, hitherto, much resorted to by consumptive patients. It has been frequented by a certain class of Fire-worshippers: by those who, like the late Lord Brougham, think it is better to have their blood warmed by the sun than by a coal fire: and, by some of those, who fondly imagine that a serene azure sky cannot cover a treacherous country. This was the case with two gentlemen, of whom I heard last winter, and who, anxious to escape from the fogs of London—those horrid fogs that hypochondriacs, *not* poets, delight to dwell on—thought they would take a short trip to the south of France. Soon after their arrival at Cannes, one was attacked with typhoid fever and died. Had he remained in England, he would probably have escaped.

With regard to consumptive patients, the same objections exist as to Hyères—the temperature is too high. Although not subject to as great atmospherical vicissitudes as some other places, they are yet experienced to some extent—sufficient to make this circumstance an additional reason for the avoiding of Cannes by this class of persons.

Taking up our staff, and pursuing our hygienic pilgrimage, we shall arrive at the next resting-place for consumptive invalids, viz., Nice. This town, as is familiarly known, is situated on the northern shore of the Mediterranean, and at the foot of the Maritime Alps. These mountains recede towards the north, and the north-west, thus leaving a small plain between the houses and the lowest range of hills: but on the east, a spur of the mountains dips into the sea, completely embracing and protecting that side of the town. It is this mountain—the Turbith—about 3,000 ft. high, which separates Nice from Monaco and Mentone. On the north, the first range of mountains is not so high, at the same time that they are intersected by several ravines, and as the range dips, as it turns to the west, it follows that the town is more exposed on these two sides than on the east side. Towards the south, as the houses face the Mediterranean, and are built close to the sea, there is no protection from the south, or sirocco, wind. The town, in fact, is open from W.S.W. to E.S.E. and closed from about 20 points of the compass. Were these mountains the only ones that existed, the position of Nice would be as favourable as that of Brighton—temperature only excepted—protected by its Downs from northerly and easterly winds. But the mountains at Nice are only the lowest range of a series, that rises, by successive steps, to the highest summit of the Alps—the region of perpetual snow. When, therefore, a northerly wind prevails, it will, by passing over these snow-capped mountains, have its temperature lowered below the freezing point. As, also, it will descend, with great rapidity, by these mountain steps to the houses at their feet, the inhabitants of Nice must be liable to great atmospheric vicissitudes—the average tempe-

rature in winter, in the shade, and with a southern aspect, being 60°, and, in the sun, 90° or 100°. Hence the apparent anomaly, that it is winter on one side of the street, and summer on the other: while, if a person is standing in the sun, he may be exposed, on one side, to a temperature of 90°, and, on the other, to a blast of air at or below the freezing point. On these accounts, it is usual to see invalids and others with a great-coat on, even in the middle of the day, and an umbrella over their heads—the one to guard against the cold wind, and the other against the rays of the sun.

It may be said, that the north wind does not always prevail, which is the fact; for it only blows, on the average, for about 50 days in the year, although it so happens, that these days fall generally in the winter season. But, then, independently of the ordinary northerly winds, there is, in addition, a current of cold air, which descends from the mountains, even on the hottest days, and with a southerly wind. This is more particularly the case after sunset, and during the night. The cause of the phenomenon is easily explained. Warm air has a tendency to ascend; cold air to descend; to the operation of which law we are indebted for the trade winds in the two hemispheres. As the air at the equator is warmer than on any other part of the habitable globe, it ascends, and the partial vacuum thus produced is filled up by a rush of cold air from extra-tropical regions. This operation being a constant one, there are experienced within the tropics two regular, or trade, winds; the N.E. in the northern, and the S.E. in the southern, hemisphere, with an interval of calm between them. Now this is precisely the result observed at Nice. The warm air, on the plain below,

will naturally ascend, more especially as the mountains at the back prevent its being dispersed laterally; while a rush of cold wind will as naturally descend from the mountains to fill up the vacuum. Hence the chilly sensation constantly experienced at Nice, even when there is no perceptible wind; and especially at, and after, sunset, for it is precisely then that the vacuum produced by the ascent of the warm air will be the greatest. As such, there must always be, in this town, a current of cold air flowing from the north to the south, or, from the mountains to the plains below, and with nearly as much regularity as the flow of the trade wind; the only difference being, that, as the trade wind traverses a considerable portion of the globe, it becomes gradually warm before reaching its equatorial limit: while, as the Alpine blast passes rapidly over the intervening space, and from a higher to a lower level, its temperature will be nearly the same, when it encounters the inhabitants below, as when it issues from the icy and snow-covered regions above. This air, being highly rarefied and dry, appears to penetrate to your very bones, sucking up, like a vampire, every particle of caloric in the body. What, then, must be the effect of such a current of air, in such a climate, with a temperature nearly equal to the summer in England; and with invalids, the pores of whose skin are easily opened with the least exercise? Attacks of pneumonia and pleurisy in some; or, when these states have existed previously, the production of pus, and the conversion of an incipient case of Phthisis into a confirmed one.

These effects will necessarily be increased, when a southerly, or a south-west wind, prevails. As these winds are warm ones, having passed over the hot and arid plains of

Africa, they will increase, rather than decrease, the downward flow of cold air from the Alps. Impinging against the sides of the mountains, and being unable to escape beyond, they will ascend into the higher regions, and thus produce a still greater vacuum below. This can only be filled up by the cold, mountain, air. Independently of this effect, these winds are injurious in another way. They produce, during their prevalence, lassitude, debility, and relaxation of the pores of the skin; thus causing all persons, and especially invalids, to become still more susceptible to the influence of the Alpine blast, or of the tramontane, or north wind, when this takes the place of the former.* The sirocco is frequently as injurious to plants as to man. "In the winter of 1838," says M. Raubaude, "it caused great injury to the olives: burnt up the peduncle at its point of insertion, interrupted the circulation of the nutritive fluids in the fruit, and the olives fell to the ground." †

It is right to remark, that the sirocco is sometimes a cold wind. This is, when, instead of being a direct southerly, or south-west, wind, it veers round a few points to the eastward, and becomes a south-east wind. It will then, by passing over the Apennines and the mountains of Corsica, which are generally covered with snow in the winter season, have its temperature so far lowered as to become a cool wind when it reaches Nice. It is there termed the sea-breeze. Not being a very cold, or a very strong, wind, it is insufficient, whilst it prevails, to lower the temperature to any material extent, or

* Homer describes the sirocco as—

"Vapours blown by Auster's sultry breath,
Pregnant with plagues, and shedding seeds of death."

† Nice et ses Environs.

to counteract the flow of the current of cold air in the opposite direction. It merely renders the air of Nice rather more agreeable, during its continuance, than when the direct sirocco blows. "There is often," says M. Carriere, referring to the changes of the temperature at Nice, "a struggle, a fight between the land and the sea winds: this struggle is increased, or complicated, by the concurrence of other winds, and there follow violent atmospherical changes, the effects of which disturb the higher region of the atmosphere, and are felt along the whole of the Nice valley or basin. The thermometer is as changeable as the barometer, during the continuance of the phenomenon: the temperature, as capricious as the winds which contend for the mastery, exhibits for a time *both heat and cold.*" And the writer then adds; "These effects are very serious, on account of the opposite and repeated impressions which they produce on weak organisations and especially on the sick. If strong constitutions can brave, with impunity, the inclemency of the weather, invalids ought to show themselves more prudent: the strong wind in the town or in the country might destroy, in a moment, the effects of the most assiduous care, or dissipate for ever the best-founded hopes."*

The preceding are not the only winds inimical to health, experienced at Nice. There is the north-west wind, or the mistral, which is felt here the same as in the South of France, although not to the same extent, or so regularly. Another is the east wind. It might have been expected, from the topographical description previously given, that the east wind would not have been felt to any extent at Nice, nor is it in the winter months: but it prevails in the spring, and its

* Le Climat d'Italie, p. 537.

effects, notwithstanding the protection of the Turbith mountain, are then very injurious.

Such being the peculiarities of the climate of Nice, we should not have erred greatly, had we concluded, that it is a very unfit abode for consumptive invalids. That it is so, there cannot be any doubt. Catarrhal affections and inflammation of the lungs, as we are informed by Sir James Clarke, rank among the most frequent diseases of the inhabitants of Nice. Strangers, therefore, and those susceptible to such attacks, must be still more liable to them than the inhabitants, or than what they would have been, in other localities. One case, that fell under my own observation, is a corroboration of this conclusion. A young Frenchman, staying with his father, in the same hotel as myself, and who arrived on the same day, had been sent to Nice, in consequence of having experienced a *slight* attack of pleurisy, some time previously. He appeared to be in perfect health then, dining at the Table d'Hote every day, and taking regular exercise out of doors. Three weeks after his arrival, he had another attack, of so severe a character, that his life was despaired of, and his relations (mother and sisters) were summoned to his bedside from the north of France. He recovered, but was removed, as soon as possible, by easy journeys to his home, by *the advice of his Nice physicians*, who thus showed, that they had not quite so good an opinion of the climate as those who sent the patient there. Bronchial affections also prevail to a considerable extent at Nice; while the symptoms, with those suffering from this form of disease, are invariably aggravated by a residence there. "In dry bronchitis" remarks Dr. Farr, who was formerly in practice at Nice, "the climate exerts a deleterious influence. I have seen

cases (patients), who never slept during their stay at Nice, and on their leaving it for Pisa or Rome, natural rest returned."*

Knowing the connexion which exists between other affections of the chest and Phthisis, we shall be prepared to find, that the climate of Nice is unfavourable to those suffering from or predisposed to the latter disease. We are told by Sir James Clarke, that, "when this disease is complicated with an irritable state of the mucous membranes of the larynx, trachea, or bronchi (and when is it not?) or of the stomach, the climate is decidedly unfavourable." Dr. Farr also states, that "the climate is prejudicial in most cases of Phthisis, when advanced beyond the invasive stage; but especially to those of irritable habits, and quickened circulation, attended by hæmorrhage."* This writer, while referring to the effects of the easterly wind, remarks, in another place: "This wind sets in with the first moon in March, called by the natives, the blood-red moon (*la lune rousse*): it is severely felt by the invalid, and those in delicate health; and even the strong feel and acknowledge its evil tendency." And Dr. Farr then adds: "I besought those whom I attended, and many that I did not, to quit Nice before the birth of this fatal moon; but they, confident in their amended health and strength, heeded not my counsel; and thought I had overrated the danger. They remained, and the day after this easterly wind began, of the thirty (the number that year in Nice suffering from pulmonic affections) I only met one afterwards, and him I had previously pronounced to have no disease of the lungs." The French medical writers

* Medical Guide to Nice. By W. Farr, Esq., M.D., page 17.

† Loc. cit., page 59.

do not give a more favourable opinion of the climate. M. Carrière, although an advocate for a southern climate, in diseases of the chest, says:—"In spite of the favourable side of the climate, there prevails, each year, among the colony, which the British Isles send to Nice, a mortality which is very discouraging for those who may be tempted to follow their footsteps."* And M. Valeri, who has written a work on the climate of Nice, observes:—"There are certain maladies, against which the climate of Nice, so far from being efficacious, *as imagined*, is mortal; thus, every year's experience tends to prove, that it *hastens the end* of persons, attacked by pulmonary consumption." "And yet this rapid progress of pulmonary consumption is," observes M. Foderé, "very rare elsewhere, and in the interior of the continent; in countries rather cold and humid the disease, although far from offering any solid hopes of cure, may yet produce a sufficiently long truce." . . . "Hence I am led to believe, that it is contrary to observation and to experience to send phthisical patients to the border of the Mediterranean. Whence then comes the custom of sending them there? Has any radical cure ever been obtained? If such a result has ever been effected, of which I am ignorant, it has only been with phlegmatic patients; in spurious consumption; and in affections of the mucous membranes."† "I have always been astonished," continues the writer, "that the ancient physicians (and we are often only their apes) were accustomed to send consumptive patients to the sea coast, for, in our days, medical experience, obtained on the spot, shows in a manner not to be doubted, that the air

* Loc. cit., p. 542.

† Loc. cit., p. 257.

of the Mediterranean is injurious to such patients. I have seen a great many perish at Marseilles, and I thought, that the dry and exciting air of this town is that which was injurious; but the warmer, soft, and humid, air of Nice is not more beneficial; all the patients here attacked with hereditary consumption die, even at a very early age, as, also, at Villafranca. Here the disease is not chronic, as in Switzerland, on the banks of the Saône, and in Alsace, for I have very often seen it terminate in forty days; and a physician, in the countries named above, would be surprised at the rapidity with which hæmoptyses appear, the tubercles suppurate, and the lungs become destroyed. The English make this experience every year, and *their cemetery furnishes the proof.*"*

Another effect of the climate of Nice is the tendency to hæmoptysis, or hæmorrhage from the lungs. This result can be readily understood, when we find, that hæmorrhage from the kidneys or bladder is, according to Dr. Farr, very prevalent in this town; and especially with children and elderly persons. This hæmorrhagic tendency is not peculiar to Nice, being met with in nearly every part of Italy. When also it is added, that the Nisands, as the inhabitants of Nice are termed, suffer as much from Phthisis as the inhabitants of Great Britain, if not more, we need not be surprised, that the latter, when they resort to Nice, with the disease more or less developed, should suffer to the extent they do.

These are not the only results produced by a residence at Nice; there are other diseases to which strangers are more especially liable. One of these is mucous, or pituitous, fever,

* Voyage aux Alpes Maritimes. Vol. 2, p. 256.

a form of fever in which relapses are very common. Gastric fever and gastric irritation, according to Sir J. Clarke, together with gastro-bilious fever, are also very prevalent. The last-named disease prevails commonly in all places situated to the south of the 45th degree of latitude. When severe, the patient seldom recovers entirely from the effects of the attack. Jaundice is another common complaint, while diarrhœa is very apt to attack strangers newly arrived. According to Dr. Farr, a residence at Nice is contra-indicated to persons suffering from dyspepsia, attended with, or arising from, irritation : while the climate is particularly injurious to those predisposed to derangement of the liver, " and, in fact, to all habits which are irritable and inflammatory."* In confirmation of these statements, or, of the unhealthiness of Nice, I may add the following narrative. A pupil at Harrow, who had an attack of pleurisy, last autumn, was advised by his medical attendant to go to the South of France for the winter. His mother, therefore, took him, together with her other children. Two or three months after, the father received a telegram one morning to say, that his wife was attacked with fever ; but not to be uneasy, as there was nothing serious. On the following morning, another arrived from some friends staying there, who advised Mr. —— to go to Nice as they thought Mrs. —— seriously ill. On the third morning, either before the departure of this gentleman, or immediately after, another telegram arrived to say, that this unfortunate lady was dead and—buried !—a few hours only intervening, in those countries, between the death and the burial. What the disease was I am unable to say ; I only know it was called a " black

* Loc. cit., p. 59.

fever:" and I therefore infer, as, also, from the shortness of the attack, that it was a case of malignant ague—a disease sufficiently common in the South of France, in Italy, and in Spain; and in which the patient dies in a state of collapse, similar to the *blue* stage of cholera. On the arrival of the father, he found his son laid up with *a severe attack of pleurisy*, and his other children with scarlatina. So much for the climate of Nice, to which invalids are sent for the recovery of their health!

With these remarks we may now pass to the next, and contiguous, resort for this class of invalids, and the favourite one, at the present moment. This is Mentone, which is situated about thirteen miles to the eastward of Nice, and separated from it, as before remarked, by the Turbith Mountain. When I first visited Mentone, some ten or twelve years since, it was only inhabited by a few English families —anxious for retirement and retrenchment. Since then it has been brought into notoriety and favour by the advocacy of Dr. J. H. Bennett—not Professor Bennett of Edinburgh—and it has now become a colony, not only for English, but for German, consumptive patients—at least, in the winter months. As Dr. Bennett's recommendation of this town is based on certain theoretical opinions, which he entertains, it may be as well to state them here. According to this writer: "this dire malady, by which a considerable portion of the human race pass into eternity, is the result of defective nutrition—a disease of the blood." And he observes, in another place: "If, as I have assumed, the deposit of tubercles in the lungs is a disease of defective nutrition; itself the result of exhausted, or lowered, vitality, the debated question as to what climate is the most calculated to arrest and cure the

disease is easily answered.....Theoretically or sooner practically a cool, dry, sunny, stimulating, climate is the most likely to arouse depressed vitality, and (restore) health."* These conclusions, as must be evident, are diametrically opposed to the arguments and conclusions previously drawn. So, also, is the following. Dr. Bennett adds: "The temperature which I describe, one ranging from 45° at night to 65° in the day, is, physiologically, the most conducive to the well-being and longevity of the human race."† This opinion is entirely at variance with my own experience, and with all the facts that have been collected up to the present time. If such a climate were conducive to the well-being and longevity of the human race, Italy ought to be one of the most healthy climates in the world: whereas it is one of the most unhealthy, and always has been so. It has been, in fact, little better than a pest-house from the most remote period to the present day. To show how erroneous are Dr. Bennett's conclusions, it is only necessary to add, that longevity, instead of increasing, after leaving the cold, damp, atmosphere of England, decreases *pari passu* with every degree of latitude. From the calculations of Mr. Finlayson, during a period of 40 years, among the nominees of tontines and Government life annuities, the expectation of life, with these classes was, then, about fifty years. Let us see what it is with a nearly similar class in Italy. A register was kept in Rome of the age, sex, diseases, and deaths, of the Roman citizens, from the time of Servius Tullius to Justinian—a period of 10 centuries. According to these tables, as given by Ulpianus, the mean term of life, with these picked classes

* Lancet: Sept. 22, and Oct. 13, 1866.

† Loc. cit., Oct. 13, 1866.

was 30 years. What the general average is, we have no means of ascertaining, but in some parts of France and of Italy it is not more than 20, and even 18, years. While longevity decreases, the ratio of mortality increases, as we descend towards this "medium temperature." In England, there is one death annually to 45 living, equivalent to 22 per 1,000: in Nice, the proportion is 1 in 31, or 32 per 1,000: in Rome, 1 in 25, or 40 per 1,000, and in Trieste, 1 in 18, or 56 per 1,000!* The mortality, therefore, in the medium climate of Italy, may be set down at double that in England. "To such a pest-house," as MacCulloch has remarked, "are its blue skies the canopy; and where its bright sun holds out the promise of life and joy, it is but to inflict misery and death." † With this digression, we may now return to the subject more especially under discussion—the influence of climate in the prevention of Phthisis. According to Dr. Bennett, "the most favourable and accessible climate for chronic disease of the respiratory organs, and especially for Phthisis, as, also, for all diseases characterized by organic debility, is the undercliff of southern Europe, or the coast ledge which forms the north shore of the Mediterranean from Cannes to Pisa."‡ As Nice is included in this geographical circuit, it follows, that Dr. Bennett's opinion of this town is very different to that of the writers before quoted. Whether there be any circumstances, which render the climate of Mentone—to which town Dr. Bennett gives the preference, and which he visits every year, in order to afford

* This last ratio is given in a recent pamphlet: "Denkschrift des Oesterreichischen Ingenieur and Architekten vereines über die von ihm beantragten sanitären Verbesserungen. Wien. 1875.

† On Malaria. ‡ Lancet: Oct. 13, 1866.

English visitors the benefit of his advice—more salubrious and less objectionable than that of Nice, it will be desirable for the sake of suffering humanity now to inquire.

Like Nice, Mentone is situated in a bay, which, however, is divided into two unequal parts by a spur of the mountains, that back the town. They are called the Eastern and Western Bays. It is on this spur, or hill, which extends into the sea, that the old town of Mentone has been built. There are two ranges of mountains immediately behind Mentone; the lower, extending from the eastern end of the eastern bay to about the centre of the western bay, varies in height from 600 to 1,400 feet; and the higher, stretching from a point still more to the eastward to the extreme end of the western bay, in the form of a semi-circle, varies from 3,000 to 4,000 feet high. At the eastern end, the two ranges are intermixed, but they separate as they approach the western bay, thus leaving a valley between them—the base of which is turned towards the western bay. The ravine thus runs in a direction from about N.E. to S.W. From this arrangement it follows, that the houses in the western bay are more exposed to northerly and easterly winds than those in the eastern bay, which is warmer than the former for other reasons. In the eastern bay, the mountains are so close to the houses, that the gardens of some of them are on a level with the first-floor windows, having been formed on the slope of the hill; while there is only the width of a common road between the sea-shore and the houses. In the western bay, the road is between the houses and the hills, at the same time that there is a terrace, or promenade, between the beach and the houses. Independently of these circumstances, the temperature of the eastern

bay is increased by the presence of a mountain—the Berceau—3,650 feet high, situated immediately behind, and in the centre of, the lower range of hills. As the principal hotels and boarding houses are in this bay, it is necessary to bear these facts in mind, for the residents there will be exposed to a more elevated temperature than elsewhere. Both bays are open to the South-east, the south (the sirocco) and the east (the Levante) winds, which blow directly into them; but they are protected from the west and the north-west, or mistral, winds. During the four cold winter months, November, December, January, and February, northerly winds prevail: in March and April, south-westerly and south-easterly winds have the ascendancy. In January, February, and March, the sirocco, by passing over the snowy Apennines, becomes a cold wind, and is sometimes accompanied by snow. During January and February, then, there would be two cold winds prevailing at Mentone, as is frequently the case at Nice. It is not surprising, therefore, that I should have left the latter town, in the month of March, in a snow storm, or that snow should have fallen heavily all the way to Genoa.

From the above topographical description it appears, that the position of Mentone is nearly the same as Nice: the principal difference being, that it is several degrees warmer. This arises, not only in consequence of the houses being more hemmed in by the mountains, but, also, because they are rather more protected from the direct influence of the Tramontane. The mean temperature at Mentone is stated to be 55° in winter; the range of the thermometer being from 45° at night to 65° in the day. At Nice the mean, according to Sir James Clarke and others, is 48°—7° less

than at Mentone. The variations of temperature are, however, much greater than the above, as appears from a table kindly furnished me by a friend, who passed some time there in the winter of 1867. According to this table, the thermometer at 5 P.M. in the shade varied from 70° to 48°; the temperature, consequently, in the middle of the day must have sometimes been above 75°, and at night below 40°. This would give a mean of 57°, and a variation of temperature of 35°, between the night and the day. In consequence of the sheltered position of Mentone, and the increased temperature, there will be a rapid ascent of warm air from the surface during the day, and a descent of cold air from the mountains above, both then and during the night. This will be more particularly the case when the Tramontane prevails; and hence the great vicissitudes of temperature to which persons are exposed in Mentone, at the same moment and in the same spot. As this wind has, in its passage over the Alps, had all the moisture wrung out of it, there is nothing to interrupt the rays of the sun. Hence their power, and the blueness of the sky—the beautiful azure blue that painters and poets delight in—so characteristic of this climate:—"Generally speaking," observes Dr. Bennett, "the sky was clear and the sun shining in the heavens like *a globe of fire*. So powerful were its rays, that, even in December or January, it was disagreeable to walk in it without a lined parasol, or umbrella. Notwithstanding this, the nights were cold, the thermometer generally falling to between 40° and 45°, and sometimes, in bad weather, below 40° during four months—December, January, February, and March. During the day, it was generally cold *in the shade*, and when the sun was obscured by clouds; and it always became cold as soon as the sun

went down." Referring to the state of the thermometer it is stated:—"In a *south* room, whenever the sun was on the room, the windows could be left wide open and without a fire, the thermometer generally remaining at 60°, or thereabouts. As soon as the sun disappeared, however, the window had to be shut, and a good fire lighted. In mid-day also the north windows, on the same floor, during these months, were generally 6, 8, or 10 degrees colder than the south. Again, immediately after the sun had disappeared behind the mountains, there was generally a difference of 8 or 10 degrees in the temperature of the air; and whenever the sun was permanently obscured by the clouds, it became chilly and cold, and *the complaints against the climate were loud and numerous.*"*

Such being the conditions of the climate at Mentone, almost identical with those at Nice, we cannot be surprised to find, that inflammatory affections of the chest are very prevalent in this town. This we learn from Dr. Bennett himself, who gives various precautions to invalids in order to guard against those vicissitudes, which have just been described. One is, to avoid the cold evening air, and "*as the same danger exists even in the mid-day,* in passing accidentally from the sun to the shade, it is always necessary to be dressed for the latter," *i.e.*, in a *thick great-coat,* or cloak. This is the custom of the inhabitants of Mentone, or, at least, of the better classes—a sure proof of the treacherous nature of the climate. Again, "the invalid," it is added, "should inhabit a south room, and never go into a north room, unless previously warmed by a fire. *The one is summer, the other winter*..... with these precautions, the climate is safe and beneficial:

* Lancet, July 7th, 1860.

without them, it is *unsafe and treacherous.* This is evidenced by *the great mortality* of the natives of the Nice and Mentone districts by pneumonia and pleurisy—two of the *commonest maladies.*" * As it is precisely after attacks of pneumonia, either acute or chronic, that Phthisis becomes developed, we should say, after these facts, that it is unsafe for a healthy person even to visit such a climate, for strangers are more likely to be attacked than the natives with the prevalent diseases of a place—no matter what those diseases may be. But to send a person, who has already had an attack of inflammation of the lungs, or who is suffering from even incipient consumption, to either Nice or Mentone, appears to me to be an act of sheer insanity, and is very like signing his death warrant. It is to be regretted, that there are no statistics to which to refer of the prevalence of Phthisis at Mentone: but we may be certain, that the disease is as prevalent among the natives as at Nice: and there we know that Phthisis prevails to the same, if not to a greater, extent than in England.

We are told, however, by Dr. Bennett, that, among the visitors, "those who were in the early stage, or, even, secondary stage, of the disease, and had vitality and constitutional stamina left, *mostly* did well. Those who were in the latter stages of the disease, on the contrary, appeared to derive but little benefit from the change. The disease seemed to progress slowly, but steadily. They suffered from the cold and the wind, and especially from the occasional outbreaks of wet, chilly, weather. Moreover, they felt bitterly the absence

* The Lancet, July 7th, 1860. This and the previous extract were written, as will be apparent, some years before the communication from which the other extracts are taken.

of home comforts, and their separation from friends. Several dropped off in the course of the winter, as they would have done at home, from hæmorrhage, from pleurisy, from *bronchitis*, or diarrhœa." *

As regards the recovery, or the amelioration, of the symptoms of a certain number of phthisical patients, who have visited Mentone, no conclusion can be drawn from such a circumstance. Phthisis is not, as we might infer from the arguments of some writers, an incurable complaint; on the contrary, it is not more fatal than some other forms of disease, as cholera and certain fevers. This has been more particularly the case since the introduction of cod-liver oil. Dr. Wood, of Philadelphia, stated, in 1852, that previously to its introduction, the rate of mortality from Phthisis, in that city, was 1 in 6.73 from all causes; or 14 per cent.; but, since its employment, it has been reduced to 1 in 8·33 or 12 per cent. And Dr. Bennett, of Edinburgh, in a lecture on Tuberculosis, remarked; "I venture then to say, that, in the same manner that, in recent times, we have diminished the mortality in cases of acute inflammation, so we have diminished the mortality, and increased the duration of life, in cases of Tuberculosis, and *more especially in that most fatal form of it*—Phthisis pulmonalis." † That a large proportion of these chronic cases do recover, is a fact that has been noted by Dr. Bennett (of Mentone). "I had found," he remarks, "in the dead room (at the Salpetrière, Paris) in the lungs of women, who had died in advanced life from other diseases, large cretaceous deposits and puckered cartilaginous cicatrices, which proved, emphatically, undeniably, that they had been consumptive at some antecedent period of their

* Lancet, July 7th, 1860. † Lancet, Sept. 4, 1863.

life, but had got well, probably spontaneously, dying at last of other diseases." * When therefore we are told, that such and such persons have recovered by a visit to this or that place, we may reasonably doubt the assertion; unless we have other and confirmative evidence of the beneficial influence of the climate, for the same result might have occurred in England. The evidence, however, as far as I have been able to ascertain, is, as regards Mentone, all the other way. For instance, I was informed, during a visit that I paid to Mentone, in the spring of 1868, that although the English visitors had not suffered so much, the mortality had been great among the German visitors, of whom there were a good many. It was also stated to me, that two of the medical practitioners there—the one an Englishman and the other a Frenchman—were both suffering, at the time, from severe affections of the lungs. This shows that the climate of Mentone is neither preventive nor curative of pulmonic complaints: a conclusion which we might have drawn, *à priori*, and from a knowledge merely of the climate. We may go farther than this and conclude, that such a climate will be actually provocative of disease of the lungs. That it may be so, the following case will afford some proof. A young lady had suffered two attacks of pleurisy. On the last occasion, the inflammation of the pleura had extended to the lung; but, as it was not a serious or regular attack of pneumonia, this, under ordinary circumstances, would, no doubt, have ended in simple resolution. Unfortunately, however, the patient was ordered, by her medical attendant, to go to Mentone, for the winter, where she arrived in the month of November. When I met this patient a few months

* Lancet, Sept. 22, 1866.

after, at Cannes, her state was somewhat pitiable. Independently of great prostration and debility, there was a severe and troublesome cough, with expectoration—nearly half a pint of matter being expectorated, in the course of the 24 hours,—and as there were night sweats, at the same time, the state of the lung will be sufficiently apparent, without specifying particulars, which, for obvious reasons, had better be avoided. As the patient had also experienced an attack of diarrhœa shortly before—a suspicious symptom—her removal from Mentone was determined on; but it was only by an effort on the part of her friends, that this was effected. And yet, this young lady travelled, on her way to Mentone, in the train from Paris to Marseilles without stopping. After a stay of a week at Cannes, the patient moved northwards, travelling by easy stages; and had so much improved, on her arrival in England, that the night sweats had entirely ceased, while the expectoration was reduced to a minimum. Up to the present time, this patient, although in delicate health, has continued free from any actual, or serious, affection of the lungs. Had she remained in Mentone, however, another fortnight, I have no hesitation in asserting, that she would never have left the place alive: for as it would then have been impossible to have moved her, the disease, in that most pernicious climate, could have had only one termination —death. Nothing can show more clearly, than the previous recital, the injurious nature of the climate of Mentone, and the advantage of a more northern one, during the treatment of Phthisis.

A consideration of the preceding facts, induces me to reverse the conclusion of Dr. Bennett, and to add: that one of the most *unfavourable* and dangerous climates for chronic disease

of the respiratory organs, and especially for Phthisis, is the undercliff of Southern Europe, or the coast ledge which forms the north shore of the Mediterranean from Cannes to Pisa! This conclusion will be confirmed, if we turn to a nearly similar climate, viz. that of Italy, and inquire into the effect of a residence there by this class of invalids.

Bounded at one extremity by the Alps, while the other approaches the African coast, Italy is alternately exposed to the Alpine blast on one side, and to the hot and moist sirocco on the other. The Apennine chain of mountains, which traverses this country from north to south, affords no protection from either the tramontane or the sirocco; while it impedes the sea breeze from the Adriatic, and from the Mediterranean, which would, otherwise, temper the inclemency of the one, and the suffocating, enervating, effect of the other. In addition to this, as the greater part of these mountains is covered with snow during the winter, the chilling effect of the tramontane is increased, instead of being decreased, by coming in contact with the Apennine ridge. The easterly and the westerly winds, also, by passing over the snow-capped Apennines, will be cold, instead of temperate, winds to the inhabitants on the opposite side of the ridge during the winter months. It cannot be a matter of surprise, therefore, that Italy should be subject to great transitions of temperature, and particularly in winter, or that inflammations and other affections of the chest should be very prevalent there. That such is the case can be shown, and, perhaps, more satisfactorily, from the evidence of an unprejudiced and unprofessional witness—the Rev. Mr. Matthews.* In his journal are the following entries :—

* See Diary of an Invalid.

"Naples, February 11th. The weather is beautiful, and as warm as a June day in England. We sit at breakfast without a fire, on a marble floor—with the casements open—enjoying the mild breeze." "February 12th. Oh! this land of zephyrs! Yesterday was warm as July; to-day we are shivering with a bleak easterly wind, and an *English black frost.*" "March 14th. The sirocco wind, which has been blowing for six days, continues with the same violence. The effects of this south-east blast, fraught with all the plagues of the deserts of Africa, are immediately felt in that leaden, oppressive, dejection of spirits, which is the most intolerable of diseases. This must surely be the '*plumbeus auster*' of Horace." To this succeeded the cold, chilly, tramontane, and what we might, *à priori,* have anticipated; for on the same page and in the same month, there is the following entry. "Seized with an acute pain in my side. Decided pleurisy. Summoned an English surgeon: high fever: copious bleeding. Owe my life, under heaven, to the lancet. I find pleurisy is the *endemic* of Naples." And the writer adds, in another place, "Naples is one of the worst climates in Europe for complaints of the chest." And how, we may ask, can it be otherwise with such transitions of temperature—transitions which, as previously remarked, it is impossible to measure by the thermometer. Commenting on this particular subject, the late Dr. James Johnson expressed the same opinion, and in the following terms:—"If a stranger were to arrive at Naples by sea, and that for the first time, in the month of November or December, he would be apt to form a very erroneous idea of the climate. If the wind came from the south, he would be inclined to think that there was little difference between Naples and the

black-hole of Calcutta. If from the north-east, he would begin to doubt whether he had not sailed in a wrong direction, and made the Gulf of Finland, instead of the Gulf of Salerno. Yesterday, the sirocco, 'auster's sultry breath,' steamed over Naples, depressing the animal spirits and the vital energies to the lowest ebb.....To-day, started at sunrise for Pompeii, in an open barouche, under the chilling influence of a tramontane, or north-easter, that came down in piercing gusts from the Apennines, more cutting and keen than the winds that sweep along the winter snows of Siberia.....If, thermometrically speaking, we say that the summer heat of the Italian valleys approaches the temperature of the tropics; while the tramontane blast of winter depresses the mercury as much as a Caledonian north-easter, we convey a very inadequate idea of the *feelings and the physical effects* occasioned by these opposite conditions of the atmosphere in Italy. The thermometer, in fact, is no index or criterion of our feelings under the influence of the sirocco and tramontane. The *former* appears to suspend, exhaust, or paralyse, the nervous energy of the body, and the sensorial vigour of the mind; both of which fall prostrate beneath the flood of enervating steam engendered by the aërial current, sweeping over burning sands and evaporating seas. The *latter*, or tramontane, comes down from the Alps or Apennines, with such a voracious appetite for caloric, that it sucks the vital heat from every pore; shrivels up the surface of the body, impels the tide of the circulation, with great violence, upon the internal organs, and *endangers the lungs*, or whatever other structure happens to be weakest in the living machine."*

* Change of Air; or the Pursuit of Health. By James Johnson, M.D. 1831. Pp. 207 and 260.

The same variations of temperature are experienced in Rome, and other parts of Italy, and with precisely the same results. "Having," says the Rev. Mr. Matthews, "provided myself with a warm cloak—which is absolutely necessary, where the temperature varies *twenty degrees between one street and another*—I have been proceeding leisurely through the wonders of Rome." If from the diary of the invalid we turn to the evidence of the physician, we shall find a melancholy confirmation of the previous statement. Sir James Clarke, who practised in Rome for ten years, observes, in his work on the Climate of Italy: "Inflammatory affections of the chest rank next, in point of frequency, among the diseases of *winter* and *spring*. Acute inflammation of the lungs appeared to me *more violent and more rapid* in its course than in England and other northern countries. This remark does not apply to Rome only, but, I believe, to the whole of Italy, and to warm climates generally. When at Dresden, Dr. Kreigsig, of that place, remarked to me, that he had never witnessed such violent cases of pulmonic inflammation in Germany, as he saw during his stay in Pavia."

Such are the more immediate and apparent effects produced by the climate of Italy; but there are others which, although less apparent, are, nevertheless, due to the operation of the same cause. One of these, as we have a right to infer, is the production of Phthisis. Unfortunately, there are no means of ascertaining what the actual rate of mortality is, from this disease, with the inhabitants of Italy. We can only judge of its general prevalence and mortality from certain isolated facts and particular instances. That it is not a *rara avis* in Italy may be inferred from the previous history, and from the great prevalence of kindred diseases, as pleurisy and pneumonia. The late Dr. James Johnson

remarks, in the work before referred to, that he counted no less than 70 cases of confirmed Phthisis in one hospital only, during his visit to Naples. According to another writer, there is, in this city, one death from Phthisis to every $2\frac{1}{3}$ deaths from ordinary diseases.* This would be equivalent to a rate of 43 per cent.; 31 per cent. more than in England. In the hospitals of Paris, there is 1 death from Phthisis to $3\frac{1}{4}$ of the gross mortality—equal to 30 per cent. Granting that these statistics are correct, we must conclude that Phthisis prevails to a very unusual extent in Naples, a third of the gross mortality in the hospitals being ascribed to this wide-spread and almost universal malady. It is, also, a very prevalent and fatal disease in Rome; but is much less so in those districts farthest removed from the influence of the Apennine range of mountains; and on the malarious plains, where intermittents prevail to so great an extent, and in so severe a form. In Malta, in 1842, there were, according to Mr. Wells, in the Naval Hospital there, 17 deaths from Phthisis, out of a total mortality of 51. This gives a ratio of mortality of 33 per cent., 10 per cent. less than at Naples, and 21 per cent. more than in England.

There is one town in Italy, respecting which it is desirable to say a few words, inasmuch as it was formerly much frequented, as it is now to a certain extent, by consumptive patients. This is Pisa, the climate of which is different, not only to that of Naples, but to that of the Riviera and the South of France. The characteristic of the climate of Pisa is that of humidity. The fall of rain annually is very great, being 45 inches on the average. As in Devonshire, it rains

* Climate of Italy. By T. H. Burgess. London, 1853.

there continually, only with more violence.* The mean temperature is 46° in winter, 2° less than at Nice, and 7° less than at Mentone: while the atmospherical vicissitudes are about the same. These vicissitudes, together with the "medium temperature," of Dr. Bennett, without any other evidence, will enable us to account for the disfavour into which Pisa has fallen of late years, and for the fact, that the climate, instead of being beneficial, is actually injurious in all cases of confirmed consumption. Let us hear what M. Carrière says, one of the advocates of a southern climate in such cases. "The quality of the air, efficacious probably (improbably I should say) during the first stage of the disease, and at the commencement of the second, may become *quickly fatal,* when the disease has undermined the vital powers.....It is sad to say so, but a great many patients die a few weeks after their arrival. In spite of the reaction produced by the hope of a speedy cure, the climate does not fail to triumph over this false energy and *to accomplish its work.* The Princess Mary, that brilliant artist of the Orleans family, is one of the numerous victims of this fatal influence." This result cannot excite surprise, when we know, that pneumonia and bronchial affections are very prevalent in Pisa—these affections and Phthisis always bearing an exact ratio to each other.

That the Italian climate favours the development of Phthisis, can be shown, unfortunately, by a reference to the Medical Naval Reports, and to the returns from the ships on the Mediterranean station. Although the rate of mortality

* "Mezzo dormando, ancor domando: piove?
Sia maladetta Pisa! ognor ripiove."

(Alfieri, Sonn, 134.)

on this station, as shown in Table A, is less, by a few fractions, than in England, the rate of invaliding is more than double. But for this circumstance, the ratio of mortality would probably have been twice as great. This ratio—the average one for 10 years—was greatly increased in the years 1859, —60, and —61, and more especially in the year 1860, as shown in the following Table :—

TABLE H.—Ratio per 1,000 of Cases, of Deaths, and of Invalided, from Diseases of the Chest, in the Mediterranean Fleet, in the following years :—

Diseases.	1859.			1860.			1861.		
	Cases.	Deaths.	Invalided.	Cases.	Deaths.	Invalided.	Cases.	Deaths.	Invalided.
Inflammation of the Lungs and Pleuræ...	20.4	.5	.6	32.1	.6	1.6	28.9	.7	1.4
Hæmoptysis & Phthisis	9.	2.7	9.7	18.4	2.4	27.2	7.8	2.2	11.8

The unusual prevalence of Phthisis, in these years, attracted the attention of the authorities, and was brought to the notice of Parliament by Lord Charles Paget, who offered the following explanation of the cause. On bringing forward the Navy Estimates, for 1862, his Lordship is reported to have said :—"Everybody, who has been on board ship, in the lower deck, will know, that the atmosphere is sufficiently bad to provoke almost any kind of disease, *especially Phthisis* and fever, as has been shown by the returns from the Mediterranean Fleet. We propose, therefore, in the large ships

of the line, to reduce the complements of the men from 880 to 800 ; in the large frigates, from 570 to 510 ; and, in the small frigates, from 350 to 310. I advert to this merely," continued his Lordship, "to say, that the principal reason for reducing the complement of the men is, that *the ventilation* may be improved." These opinions were, of course, merely the echo of the conclusions of certain medical writers: but, then, these writers, as well as Lord Charles Paget, overlooked the fact, that, on the Home Station—where, in consequence of the ports not being kept so much open, the ventilation is less, and the so-called contamination of the atmosphere, between-decks, greater—the ratio of mortality from Phthisis is actually less than in the Mediterranean. Then, again, as regards fever ; the only *place of safety*, in the pestiferous spots of intertropical climates, is the between-decks of a man-of-war, or of a merchant ship : those who venture to sleep on deck, or on shore, where there is plenty of ventilation, and where the atmosphere is uncontaminated with the breath of man, being sure to be attacked with fever. The same results are observed in more northern latitudes.

Sir John Pringle states, that four battalions, of about 700 men each, were stationed, in 1747, in the Island of Walcheren and South Beveland—one of the most malarious districts in Europe. "The troops, both in *the field* and in quarters, became so very sickly, that, at the height of the epidemic, some of these corps had but 100 men fit for duty. But all this time, Commodore Mitchell's squadron, which lay at anchor between these islands, was neither afflicted with the fever nor the flux."* The same results were

* Observations on the Diseases of the Army.

observed during the disastrous expedition to that country in 1809. According to Sir Gilbert Blanc, of 18,000 men left to garrison Walcheren, *one half* either died, or were sent to England, in the space of *three months;* and yet, the men sleeping in the impure atmosphere of between-decks, on board the ships of war, entirely escaped.* The following example is still more instructive. When the fleet under Admiral Haddock arrived at Port Mahon, Minorca, a party of eight men from each ship, with a midshipman, were ordered to remain on shore to assist the coopers and to fill the water-butts. There being a large cave near, the men took their bedding and slept there, on account of the coolness, and the *refreshing air!* The consequence was, that every man, *who slept on shore,* was attacked with Tertian fever, of whom only 1 in 8 recovered. During this time, the men on board remained entirely exempt; while the men, who were sent to replace those that were taken ill, being ordered to return *on board to sleep* (in the *pure and salubrious* atmosphere of between-decks) also escaped."† Oh! when will medical theorists learn to seek for facts, instead of feigning hypotheses? Here are two bodies of men, placed under precisely the same circumstances, excepting that the one is obliged to sleep in the confined atmosphere of between-decks, while the other is inhaling the refreshing and—so considered—uncontaminated atmosphere without. Yet the former escape the disease that decimates the latter.

That the expired air of man is not productive of ordinary diseases, it will not be difficult to show. Dr. Guthrie, who was a resident in Russia, states, that "the Russian boor

* Report on the Mission to Walcheren.

† Lind., Essay on the Health of Seamen.

lives in a wooden house, caulked with moss to make it air-tight. Five or six persons are generally packed in one small room, which being constantly heated by a stove, it becomes so offensive as to be scarcely supportable to a stranger—the apartment never being ventilated for at least six months in the year. In addition to this, these people live upon salt fish, without any fresh vegetables, for the whole time. And yet," adds Dr. Guthrie, "it is a fact, that they are strangers to putrid diseases; and to *all diseases* excepting scurvy, which is caused by the want of vegetables."* But we need not seek for examples on shore; we can find similar ones in the records of our navy. Commodore Anson, during his celebrated voyage, in 1742, captured a Spanish galleon, with a crew of 550 men; of these, 67 were killed and 84 wounded. With the exception of the officers and the wounded, all the prisoners—in number about 380—were placed in *the hold*. Mr. Walter, the chaplain, who gives the account, states, that "their sufferings were great; the weather being extremely hot, and the allowance of water only just sufficient to keep them alive; while *the stench of the hold was loathsome beyond all conception.* All this considered, it was wonderful," adds the writer, "that not a man of them died, during their long confinement"—from June 20th to July 28th. But the most remarkable instance of over-crowding, on board ship, occurred in the French frigate Decade, in 1797. On board this ship, 193 individuals—political offenders transported to Cayenne—were placed on the lower deck, between the mainmast and the foremast, and receiving no light but from two scuttles of about 3 feet square. "Those above," remarks M. Aimé in his narrative, "could not raise

* Philosophical Transactions. Vol. 68, page 623.

their heads without striking against the deck, nor those below without hitting those above (being placed in two rows of hammocks); neither could any of us make the smallest motion without disturbing his neighbour, for we all touched each other, and not having the least spare room, we formed, as it were, but one mass." Here the prisoners were confined for 14 out of the 24 hours, and the place not being ventilated, "the air which passed from this hole was so hot and fetid, that the sentinels placed at the hatchways, as the guard, demanded that the time of their duty, at *so dangerous a post*, might be shortened." In addition to this, these unfortunate creatures (many of whom had been accustomed to the elegancies of life) had to subsist on the coarsest and most disgusting food, being half putrid. In this state they were kept for 96 *days*, and "astonishing as it may appear," adds M. Aimé, "not one of us perished. The crew, also, remained quite healthy, only one man having died on the voyage; the result of an accident, not disease."* Now if it were possible to generate Phthisis in the atmosphere of between-decks of a man-of-war, it would have been produced in the above instance, but not a case, as we have seen, occurred.

On the other hand, if Phthisis be generated by the expired air of man, in a state of concentration, how are we to account for its production, in other instances, and particularly among the negroes in the West Indies; or among the settlers in the hilly districts of Jamaica, living in isolated houses, built of bamboo, through the crevices of which the air rushes as it would through a sieve? We must either infer, that the so called impure atmosphere in crowded habitations is not a cause of Phthisis, or, else, that there are different, and even

* Narrative of the Deportation to Cayenne. London.

opposite causes productive of the same effects. Such a conclusion, however, is not only in opposition to common sense, but it is contrary to the axiom laid down by Newton: *a multiplicity of effects but a paucity of causes.*

It is not difficult to arrive at a correct conclusion on the subject, with the facts previously adduced before us. The great prevalence of Phthisis among the sailors of the Mediterranean Fleet, must be ascribed not to their breathing a contaminated atmosphere within the ship, but to their inhaling the pestiferous atmosphere without. This truth was known and acknowledged, two thousand years ago, by the Father of Medicine himself. Hippocrates states, that in the towns of Greece, exposed to the south winds and sheltered from the north, fevers, bowel complaints, and paralyses prevailed; in those, on the other hand, which are sheltered from the south wind, but with a northern aspect, pleurisies and *consumption* were the principal diseases. Hence the axiom laid down by him, who was worshipped as a God after his death, and whose profound knowledge of the causes of disease puts to shame the absurd and illogical theories of the majority of writers of the present day: *Aer est omnium, rex, morborumque causa.* There can be no difficulty, therefore, in accounting for the great prevalence of Phthisis in the Mediterranean Fleet, more especially as the men are also exposed to the night air during their watch on deck—a fruitful source of disease in a warm climate. Increased ventilation, in such a climate, would probably be followed, not by a diminution, but by an increase, of disease.

These inferences will be confirmed by a reference to the facts connected with the prevalence of Phthisis on board the St. Jean d'Acre —the ship which suffered more than any other

in 1860. "Fevers and pulmonary complaints increased to a considerable extent on board the St. Jean d'Acre in the spring of 1860, and the space," remarks the compiler of the Official Report, "was thought to be insufficient for a proper supply of fresh air; though the proportionate space and the mode of berthing the crew were the same as they had been before, and nearly the same as in the other line of battle ships on the station. More than all, they were the same as had been common in the service from time immemorial."* Nevertheless, Phthisis did not always prevail to the same extent in the Mediterranean Fleet. The average rate of mortality for the 7 years—1830—7, inclusive—for Phthisis, was only 1.48 per 1,000; while in 1830, it only amounted to a fraction—.8. On the other hand, increased ventilation, we shall find, did not produce a diminution of the attacks. The preceding writer adds: "As it was supposed the sickly condition of the crew (on board the St. Jean d'Acre) might be connected with the defective ventilation of the lower deck, a number of the hammocks were removed to the deck above; the ports and scuttles were directed to be kept open, when possible, and additional means of ventilating the ship throughout adopted, but, apparently, with no benefit, for pulmonary attacks continued as before."† It is also stated,

* Statistical Report of the Health of the Navy. 1861, p. 31.

† From April, 1860, to the end of the year, there were, on board the St. Jean d'Acre, 285 cases of affections of the chest, thus specified :—

Bronchitis	7
Pleuritis	19
Pneumonia	13
Hæmoptysis	7
Phthisis	102
Cachexia pulmonalis (incipient phthisis)	117
Plurodynia (rheumatic pleurisy) ...	20

Of these, 6 died and 112 were invalided, equal to one-sixth of her complement.

in the same Report, that "the large numbers in the Cressy and St. Jean d'Acre, were caused by the disease attacking men, sent to the Malta Hospital for the treatment of other complaints. In fact, so many men were attacked, while in this establishment,—*one of the most perfect in the Naval Service*—that, as previously mentioned, there were just grounds for believing, that the disease, first developed in the St. Jean d'Acre, had acquired the power of propagating itself, even amongst men in *the well-ventilated wards* of the hospital." In order to account for this anomaly—the development of the disease in the well-ventilated wards of the hospital, the writer is thus obliged to resort to the stale, effete, doctrine of contagion, although all the facts, with which we are acquainted, are in opposition to such a conclusion. If, indeed, Phthisis could be propagated from individual to individual, there is no reason why it should not have spread among the crews of other ships, and to the same extent as on board the St. Jean d'Acre. But nothing could be more varied than the number of cases, and the number invalided—a sure criterion of the severity of the attack—in the different ships: while this variation had no reference to the size of the ship or the number of the crew. Thus, the cases of Phthisis varied from *one* in the Queen (500 men) the Racoon (400 do.) and the Recruit (420 do.) to 129 in the St. Jean d'Acre (600 do.). So, also, as regards the invalids. *One* man was invalided in the Garnet (150 men) the Firefly (220 men) and the Hibernian (450 do.); but there were 112 in the St. Jean d'Acre, being rather more than $\frac{1}{6}$ of her complement. Next to this ship, the greatest number invalided was 46 in the Cressy (400 men) and 37 in the Neptune

(500 do.).* Dismissing this hypothesis, we may now continue the narrative.

The St. Jean d'Acre, then in Malta Harbour, now went to sea, but as this had not the slightest effect in arresting the progress of the disease, she was ordered to Gibraltar and Lisbon. On the arrival of the ship at the latter place, the health of the crew improved: "still, the disposition to pulmonary disease existed on board." On the 12th April, 1861, the ship returned to Gibraltar, and thence proceeded to Malta, returning again three weeks after. The surgeon, in his report, says; "The weather is unexceptionable; the ship is kept very clean, and as *well ventilated* as the present means will admit of—better ventilated than most other ships." Notwithstanding, during this period, or, from the beginning of April to the end of June, there were 6 cases of bronchitis, 1 of pleuritis, 9 of pneumonia, 25 of "cachexia pulmonalis" (incipient Phthisis), and 5 of pleurodynia, put on the sick list. July was spent between Gibraltar and Tangiers; and 15 cases of Phthisis, 6 of pleurodynia, and 3 of an inflammatory character were added to the list. At the end of August, the ship was ordered to return to England to be paid off. "A few days after leaving Gibraltar," remarks the surgeon of the ship, "we encountered light north-west breezes and very *cool weather*, which had a most salutary effect upon the invalids (those suffering from fever as well as from pulmonary complaints); the sick list rapidly diminished, and on the arrival of the ship at Plymouth most of those even, who had been embarked from the hospital, had

* Altogether, there were 387 men invalided, this year, in the Mediterranean Fleet for Phthisis.

become fit for duty." * The same favourable result occurred with the Cressy, on board which ship pulmonary complaints prevailed to a greater extent than in any other, excepting the St. Jean d'Acre; and which was also ordered to return to England. The surgeon of this ship, Mr. T. H. Keown, referring to these affections, remarks: "One fact deserves to be noticed, and it is this: that however much I have been disposed to blame the ship, nevertheless, after leaving Gibraltar to return to England, *the disease ceased*, and slight cases rapidly recovered." †

We have thus a clue, irrespective of all previous arguments and conclusions on the subject, to the cause of the unusual prevalence of Phthisis on board the ships of the Mediterranean fleet. It was the climate. This circumstance will also enable us to explain, why one ship was more sickly than others: for as their positions and stations would vary, so, also, would their liability to attack be different. So capricious, in fact, are some diseases, more particularly when epidemic, that they will not only attack one part of a town in preference to the other, but even one side of a street, or one side of a ship, the opposite side not presenting a single case. This we can readily understand, if, as was before inferred, the seeds of disease are generally borne upon the "wings of the wind:" or, if, as the poet expresses it:

> "The angel of death rode by on the blast,
> And smote in the face of the *crew* as he passed."

The rapid amendment of the sick, after leaving the Mediterranean, is the best proof that could be given of the expediency of the course usually adopted by the medical officers of the navy: this is, to send the con-

* Loc. cit., p. 33. † Report for 1860, p. 38.

sumptive patients on this station home. The surgeon of the Marlborough, referring to the prevalence of Phthisis in the fleet, remarks: "When it is ascertained that Phthisis has decidedly established itself, the proper course is to send the subject of it home, *as speedily as possible*, provided there be a month or two of mild weather at home, before the commencement of winter." * A similar course is pursued by the medical officers of the army, with the same class of patients. Is it not a mockery, then,—or, rather, is it not a sin and a crime—for medical men in England to send consumptive patients, expressly for the recovery of their health, to a climate, which is found to be so prejudicial and dangerous to our soldiers and sailors, that their only hope of recovery is a return to that home from which others are flying as from a pest-house? This course is to be referred, no doubt, to ignorance: but, then, a medical man has no right to take upon himself the awful responsibility of sending a patient—whose life may depend on his *fiat*—to a climate, the peculiarities of which he is not well, and perfectly, acquainted with!

Having thus considered the influence of the climate of Italy, in consumptive cases, we may now retrace our steps, and visit one of the places omitted, in the route taken from north to south, viz., Pau.

In some respects, the situation of this town is similar to Nice and Mentone, but differs materially in others. Although placed at the foot of the Pyrenees, it is not hemmed in by the mountains as the former towns are, while the plain on which it is built extends a considerable distance on either side. The mountains, also, are situated to the south of the

* Report of the Health of the Navy, 1863.

town, and as it is a warm and moist, not a cold and dry, wind, that blows over them, its temperature is not reduced to the same extent as the Tramontane. On the other hand, the heat is less at Pau than at Nice and Mentone, the mean, according to Dr. Taylor, during 8 years, for the 6 winter months—November to April inclusive—having been 45°.22—10° less than at Mentone. It is not the mean, however, but the changes of temperature, that have to be principally considered. These, as must be evident from the facts just stated, will be less than at Nice or Mentone. Still, Pau must always be subject to a cold draught from the snow-covered mountains even in the day time, an effect that I myself experienced during the whole time that I remained at Pau—a few days only. This, with a warm and burning sun in the day, will be productive of considerable vicissitudes of temperature, to which invalids are so peculiarly susceptible. These inferences are in accordance with the account of this climate given by other writers. According to Dr. Playfair, "the characteristics of the climate of Pau are: calmness, moderate cold, bright sunshine of considerable power, and a dry atmosphere. Against these must be placed, changeableness, the fine weather being as short lived as the bad: rapid variations of temperature, within moderate limits. In autumn and spring there are heavy rains."*

"The first effect of the climate of Pau," as we are informed by Dr., now Sir A., Taylor, "is sedative, hence, by diminishing the energy of the nervous system, and influencing the arterial circulation, congestion of the veins is produced. The symptoms, which a stranger in good health experiences, consist in a sort of languor and prostration, which do not

* Quoted by Sir J. Clarke. Op. cit., p. 197.

arise from a want of physical power, but from a sort of repugnance for all exercise: a feeling of weight in the head and in the chest, and, lastly, a certain oppression at the pit of the stomach. . . . In this state, every imprudent exposure to the rays of the sun is very likely to bring on arterial reaction, or an attack of fever of greater or less violence."*

A great diversity of opinion exists, respecting the influence of the climate of Pau in cases of consumption. Sir A. Taylor, who has been in practice there for many years, considers it one of the best: but I should draw the opposite conclusion. The morbid effects produced on strangers—effects that must be referred to a state of general venous congestion, in which the brain, the liver, and the lungs, will participate—cannot but be very injurious in actual disease of the lungs—almost as much so as active inflammation. That the climate of Pau is not curative, in such cases, I should infer from the fact, that of a number of patients whom I have known, who passed a winter in Pau, not one received any benefit—the majority died soon after their return. Dr. Louis—the celebrated French writer on Phthisis—took his only son, suffering from the same disease, to Pau; but the journey was a fruitless one: he died there in the spring. And, lastly, Dr. Fovill, who resided two years at Pau, states, that the climate is not congenial to persons with delicate chests. This conclusion is confirmed by a case, that fell under my own observation. When in Paris, a few years since, a young English gentleman, staying in the same hotel as myself, died suddenly in the night, from the bursting of an abscess in the lungs. On inquiry I learnt, that he was

* On the Climate of Pau.

on his way home from Pau, having spent the winter there. Although obliged to be carried up and down stairs, in a chair, he had dined at the Table d'Hôte, and had attracted the notice of some friends of mine, who remembered seeing him at Bournemouth, the previous autumn, riding about every day on horseback. There could have been no serious affection of the lungs, therefore, at this period: the probability being, that he had merely had an attack of inflammation of these organs, and that he had been sent to Pau in the vain expectation of preventing a relapse. Instead of doing this, it had, we may presume, produced the opposite effect—a state of congestion or inflammation of the lungs, which, aided by the heat of the climate, had ended in suppuration. It may be said, that the same result might have occurred in England; that is possible, but, then, I venture to affirm, that it would have taken years, instead of months, to have produced the same effect in this climate. More than this, the probability is, that the attack, if he had remained in England and been placed under proper treatment, would have ended in resolution, instead of in suppuration. While speaking to the proprietor of the hotel, and lamenting the death of this young man, on the eve of reaching his home, he remarked: "This is no uncommon occurrence: we observe a great many of your compatriots, who pass through Paris, every year, to the South, but very few return; or, if they do, it is in a state somewhat similar to that in which the deceased was."

Having thus visited all the usual resorts for consumptive invalids, in the South of Europe, we may now return, and take, instead of a land journey, a sea voyage to another somewhat celebrated locality, the Island of Madeira. There is no place which has held its ground so long as Madeira, it

being strongly advocated by some writers in the present day; while a subscription was raised, a few years since, in order to send a certain number of the inmates of the Consumptive Hospital, at Brompton, to this island; the intention being to make it a sort of sanitarium for this class of patients. Sir James Clarke says:—"The climate which, of all others, I consider best suited for consumptive patients generally, is that of Madeira." * If this be the best climate for consumptive patients, all we can say is, bad is the best; for if statistical facts and other evidence be of any value, a voyage to Madeira is worse than useless. The climate of Madeira is warm, equable, and moist; almost to saturation, excepting when the *leste*—a dry wind from the coast of Africa—blows over the island. As such, Madeira may be said to stand at the opposite Pole to the dry climate of the South of France, of Nice, and of Mentone, while it assimilates to the moist climate of Pisa. The temperature is considerably higher than that of the last-named localities, the mean in the winter months, being 60°. Although the climate is considered to be a very equable one, Dr. Mason, who visited the island, complained of the cloudy sky, the high winds, and the variability of the climate.

The first effect of the climate is soothing; but great depression and debility, the consequence of the warm, moist, atmosphere are soon experienced. As regards its influence in consumption, we have some important evidence from Dr. Renton, who resided for a long time on the island, and who has furnished us with the result of a certain number of cases among the visitors, treated or observed by himself. The following is the summary of 47 cases of confirmed Phthisis:

* The Sanitary Influence of Climate. London, 1846.

There died within 6 months of their arrival .	32
Died, after their return home . . .	12
Not since heard of, probably dead . . .	3
Total	47

Of 56 invalids, with tuberculous lungs only, who arrived at Madeira, between January 1st, 1838, and May 31st, 1840 :—

There died	30
Left the Island	22
Remaining	4
Total	56

Of 35 cases of so-called "incipient Phthisis," 4 died at Madeira, and the remainder left the island apparently improved. These "incipient cases" were generally young people, who were said to have overgrown themselves, and who had experienced, in England, inflammatory attacks, with cough, &c.; cases, in fact, of, spurious, not real consumption.* The two last classes may be rejected altogether. The one, because there are few persons free from tubercles in the lungs, to a greater or less extent; and the other, for the reason already mentioned. To find the lungs of an adult entirely free from tubercles is a very rare occurrence. It is not until they have accumulated to such an extent, as to obstruct respiration, or until the suppurative process has commenced, that the presence of tubercles can be regarded in a serious light. As such, the only cases of decided consumption were those in the first class; all of which, with the exception of three doubtful cases, proved fatal. It may be concluded or imagined, that the majority of these cases

* Edinburgh Medical and Surgical Journal. Vol. 27.

were incurable. But this cannot be the fact, not only because patients, in an advanced stage of the disease, would be unfit for such a voyage, but, also, because more than a fourth died after leaving Madeira. The most remarkable circumstance, however, is, that of the 56 invalids with tubercles in their lungs, 30 died before leaving the island; thus showing that the suppurative process had supervened after their arrival. Granting that this result was not the direct effect of the climate, still it shows, that a visit to this island will not prevent the supervention of Phthisis, in those predisposed to it; or be the means of arresting its progress after it has commenced. It is no wonder then, that Madeira has been called the "grave of English consumption." But it is not the grave of English consumption only; it is, also, the grave of native consumption. Dr. Mason, who fell a victim to this disease, after a residence of two years in Madeira, states, that both Dr. Heineken and Dr. Gourlay agree, that no disease is more common amongst the natives than consumption.* Such being the case, we cannot be surprised at the high rate of mortality among the English visitors, more especially when the temperature, experienced at Madeira, is taken into consideration! This island, therefore, like the other places previously visited, instead of being sought after, ought to be avoided by every consumptive patient. "The rising and falling repute of one health-resort after another might form an amusing, though not very creditable, narrative. Set going originally by accident, or by the vigorous partisanship of interested observers, each has its day of fashion and then

* On the Climate and Meteorology of Madeira. By the late Dr. J. A. Mason, edited by Sheridan Knowles—1850.

sinks out of notice.....This is now very much the case with Madeira, and will, probably, soon occur to Mentone, the favoured spot of the day." *

Of late years, Algeria and Egypt have been recommended as desirable abodes for phthisical invalids. As regards Algeria, the recommendations thus given, on imperfect data and false assumptions, have been shown to be erroneous by the result observed with the French troops. A recent traveller in that country states, that "the colony is not adapted to those whose constitutions are *predisposed* to this disease—Phthisis—and, more especially, if the affection has made even but little progress." † This result need not excite surprise, when we know what the peculiarities of that climate are, viz., great heat and a rapid change to an opposite extreme. It is for these reasons, that the French medical officers now invariably send their consumptive patients to the North of France, to be cured; although English patients, of the same class, are being sent *to* Algeria for precisely the same reasons. Who then is right? There can be little doubt upon the subject. The French medical men are well acquainted with the climate and its effects; the English doctors know nothing about it, and hence the folly of those who send patients to this colony.

The absence of statistical facts prevents our drawing any precise conclusions respecting Egypt; we only know, that Phthisis is not a common disease there. Aristotle remarked long since, that Phthisis was very rare in Egypt, and we thus understand, why this country was recommended, by the

* W. D. Stone, Esq., F.R.C.S., in Lancet, Dec. 2, 1865.

† Report upon the Sanitary Condition of French Troops serving in Algeria. By Joshua Paynter, Deputy Inspector-General of Hospitals.

ancients, as a residence for consumptive patients. Clot Bey, a French physician, who settled in Egypt, has also commented on the rarity of Phthisis among the natives. That may be, and, no doubt, is the fact; but then, it does not follow, that the climate will prove beneficial to strangers predisposed to, or suffering from, pulmonic disease. On the contrary, it has been already demonstrated, that the inhabitants of cold regions, when they migrate to more southern latitudes, not only suffer more than the natives; but to a greater extent than in their own country. We may say, in fact, that every degree of latitude, southwards, that a consumptive patient traverses, is simply putting another nail in his coffin. If so, Egypt must be an improper abode for such persons, more especially as there are, in addition, considerable variations of temperature. In the Delta, the mean temperature, in winter, is 58°, but the nights are cold and damp, occasioned by the setting in of a northerly wind at sunset, while there are, even in the day time, frequent and sudden variations of temperature. Some very erroneous notions are entertained respecting the climate of Egypt. For instance, it is supposed, that there is seldom any rain; but fogs and heavy rain are frequent, during winter, in the whole of the Delta, and are also experienced occasionally at Cairo, and even as far south as Thebes. Then, again, it is imagined, that only light clothing is required; whereas there are few places in which warm wrappers are more necessary. Not only are the nights cold, and the dews heavy, but a cold northerly wind, reminding the traveller of a cold March wind in England, is also frequently felt in the Delta, even in the day time. Hence, while strangers may be seen shivering in the warm, cloudless, sky of Egypt, the wealthy inhabitants of Alexandria

and of Cairo are as warmly clad as the natives of northern regions. Then, again, Egypt is exposed to the influence of the warm, enervating, sirocco—there called *kamin*—thus increasing the variations of temperature, and rendering them more dangerous. Dr. Copland, influenced principally by the writings of the Rev. Dr. Barclay,* has recommended Upper Egypt, as a winter residence for phthisical patients. That the Rev. Gentleman, whose symptoms were not alleviated either at Malta or at Alexandria, obtained decided relief after his arrival at Thebes is probable. But, then, what was the complaint from which this patient suffered? Chronic bronchitis—a disease that requires not only a different treatment to that of Phthisis, but which admits of relief, or cure, in a different climate. An increase of temperature is sometimes beneficial in the one case, it is fatal in the other. The mean temperature of Cairo—the border town between Upper and Lower Egypt—is 60° in the winter months. But at Thebes, from the middle of January to the middle of February, the day temperature, according to Dr. Barclay, ranges from 68° to 78°; while it gradually increases after this date. Now I venture to assert, that such a temperature as this would assuredly develop the disease, in those in whose lungs tubercles had been deposited; while it would hasten the progress of the disease, in those cases in which the tubercles had already become softened, or, in which suppuration had already taken place. A somewhat curious confirmation of the truth of these conclusions has been lately afforded. Of the British troops passing through Egypt during 1872, *en route* for India, it appears that 29.9,

* The Climate of Egypt. By the Rev. Thomas Barclay, D.D. 8vo. Edinburgh, 1854.

per 1,000, were attacked with Phthisis, and 2.3 per 1,000 died. When it is remembered, that these patients manifested no symptoms of the disease, when they left England, otherwise they would have been detained; this result speaks trumpet-tongued as regards the influence of such a climate in the development of Phthisis; while it shows, what is to be expected with those in whom the disease has already commenced.

Many consumptive patients are induced to take a trip to Australia, but such a voyage is contra-indicated for several reasons. In the first place, the heat necessarily encountered during the voyage, and while sailing within the tropics, would be injurious in all phthisical cases, more especially if the disease had made any progress. It has been my misfortune to witness several instances of the development of Phthisis, during the voyage to India, soon after entering the tropics, and with men who did not exhibit previously any symptoms of the disease. With steamships, passing quickly across the equatorial region, there would be less risk; the temperature and the climate, after passing out of the tropics, or between the Cape and Australia, being everything that could be desired. In the next place, a residence, or stay, in Australia, even for a short time, will be injurious to all persons with diseased lungs, or with whom a predisposition to Phthisis exists. This will be evident by a reference to the Army Statistics. Although the average ratio of mortality for the year included in Table B—1869—is much higher than in England, the ratio has been still higher at times. In 1863, there were 9 cases and 8 deaths out of a force of 788. This gives a ratio, per 1,000, of 11.4 for the cases, and of 10.15 for the deaths. This high ratio has been referred to the depar-

ture of a part of the force to New Zealand, and to the retention of the sick and weakly in Australia. Hence, the lower ratio in New Zealand, that year, which was 6.5, per 1,000, for the cases, and 1.73 for the deaths. Taking the average of the two forces, we shall have 8.9, per 1,000, for the cases, and 5.94 for the deaths—a very high ratio still. Such a result, in the otherwise healthy climate of Australia, may be ascribed to two circumstances—the great heat and the variability of the climate. The thermometer at Melbourne, in one particular year, on the 19th December—the middle of their summer—reached 104° in the shade; while even at Grant—an alpine region—it stood at 88°, on the 10th of the same month. On the 12th, only two days after, the thermometer, at the latter place, was at freezing point; and snow was lying, 6 inches deep, on the ground.

Instead of a sojourn on land, some writers strongly recommend a sea voyage, as a curative measure in Phthisis. This is the case with Dr. Copland, who remarks:—"Voyaging in the Mediterranean, or in the Atlantic, between the degrees of latitude named above—viz., from 30° to 50° in summer, and from 10° or 15° to 30° in winter—and preferably in the Pacific Ocean, especially when prolonged, either in naval cruisers, or by repeated voyages, so as to avoid the winter and spring of this and other countries, unfavourable to consumptive patients, deserves to be more frequently recommended than it has hitherto been." *

With respect to the Mediterranean, it has been before shown, how injurious a cruise in this sea is to English sailors: and yet, these men, when they leave our shores, are

* Dictionary of Practical Medicine. Art. Tubercular Consumption. Paragraph 305, p. 1149.

in a sound and healthy state. At least, there could be no outward, or apparent, disease: otherwise, they would have been sent to the hospital, instead of proceeding on their voyage. What, then, must be expected, when, instead of healthy men, invalids, with the disease more or less developed, are exposed to the operation of the same malign influences? The result has been already shown. A voyage in the Pacific Ocean, so strongly urged by Dr. Copland, would be nearly as bad; the rate of mortality, with the sailors in our ships of war, being as high, on the average, as in England. In one particular year, 1864, it was nearly four times as high, the cases, for Phthisis only, having been 6.6, the deaths 4.1, and the invalided 4.24, per 1,000, of the force.*

These results are precisely what might have been expected, *à priori*, not only as a consequence of the deductions previously drawn, respecting the exciting causes of Phthisis, but, also, from the well known fact, that heat is the most powerful agent of all those concerned in the formation of pus,—the pathognomonic symptom of Phthisis. It is only on the above supposition, that we can account for the unusual prevalence of Phthisis with the troops in China, in 1865. These troops consisted of the 2nd battalion, 9th Regt., which arrived at Hong Kong from Gibraltar, the beginning

* According to this return, the total number of deaths and of men invalided is greater than the number of cases. This apparent discrepancy is to be referred to the fact, that, in some of these cases, Phthisis became developed while the men were under treatment for some other disease, and for which they were returned. As such, the cases were actually 8.25; one-half of whom died, and the other half were invalided, without a single recovery of those treated on board, although they were all recent cases.

of February; and of the 2nd battalion, 11th Regt., which arrived from the Cape, the end of May. They went, therefore, from a temperate to a hot climate—and it is awfully hot at Hong Kong—and at the worst time of the year—the spring. Now mark the result. The ratio of cases, that year, with these troops was 24.4 per 1,000; and of deaths 11.35—ten times more than with the troops at Gibraltar and the Cape.*

This is not all. In addition to the preceding results, there is another equally lamentable. The fatality of the disease, or the ratio of deaths to cases, is greater in warm than in cold climates. The truth of this conclusion will be rendered apparent by a glance at tables A and B; the lowest rate being in the coldest climate (Canada), and the highest in one of the warmest (China).† This, in fact, is an inevitable result; the consequence, not only of the intensity, but, also, of the rapidity of the disease, and the shorter time there is for treatment, in warm, or hot, climates. The warmer the climate, the greater will be the rapidity of the disease, and, consequently, its fatality. Dr. Hunter, while commenting on the great prevalence of Phthisis, in Jamaica, adds:—"The disease proves sooner fatal than in more temperate climates. Of this we had repeated examples among the soldiers, several of whom arrived in the island with *beginning consumption*, and were all quickly carried off by that disease."‡ This account was confirmed by the late Dr. Ferguson, Inspector-

* At Gibraltar, that year, the ratio for Phthisis, was 7.1 per 1,000 for the cases, and 1.05 for the deaths; at the Cape, it was 9.7 for the cases, and .99 for the deaths.

† Deducting the invalids from the cases, which is necessary.

‡ Observations on the Diseases of the Army in Jamaica.

General of Hospitals, who resided many years in the West Indies. He stated, that there Phthisis resembled an *acute* rather than a chronic affection. And Dr. Chisholm, remarking that catarrh, pulmonic inflammation and Phthisis Pulmonalis are very frequent in the West Indies, adds :—"These diseases are very rapid in their progress. When fully established, a sea voyage and a temperate or *cool* climate present then the best, if not the only, chance of life."* The same result has been observed in the Mediterranean. Mr. Wells, then attached to the Naval Hospital, Malta, has remarked on the great rapidity of the disease in that island; and he states that :—"In two cases, six weeks was the extreme period, from the signs of commencing deposit of tubercle, to the fatal termination. I have myself had occasion to witness similar results, both in Spain and in Italy; and, in one particular case, a patient in one of the hospitals in Rome—*el Santo Spirito*—the duration of the disease was only three weeks. And yet, no symptom existed, previously, of disease of the lungs, the patient being under treatment for another affection—intermittent fever. On expressing my surprise, the attendant physician replied:—"Such cases are not at all uncommon here." The Rev. Mr. Matthews also remarks, while referring to the influence of an Italian climate:—"*Ægri somnia*; if a man be tired of the slow, lingering, progress of consumption, let him repair to Naples and the *denouement* will be much more rapid."†

Not only is a hot climate inimical to consumptive patients, but the summer season, in temperate and cold climates, more especially when the temperature is above the average, is found to be more prejudicial, to such persons, than the winter

* Climate and Diseases of Tropical Climates. † Diary of an Invalid.

season. Professor J. H. Bennett, of Edinburgh—*not* Dr. Bennett of Mentone—states, that patients, with confirmed tubercular disease, do better in very cool weather than in very warm: in winter than in summer.* Referring to this circumstance, the Surgeon of H.M. Ship Marlborough remarks: "The development of tubercle is undoubtedly much favoured by the summer on this station (the Mediterranean): in some of my cases, it was very rapid, and no measures of treatment had much effect in arresting its progress." And he adds: "Several men of the Marlborough, who had continued to do their duties, in all parts of the ship, while the cool season lasted, broke down rapidly as the summer advanced."† Dr. Archibald Smith, in *an account of the diseases of Peru*, states, that "in spring, a season when many severe cases of pneumonia present themselves, the commonest catarrh generally appears under a more febrile form, and when it unfortunately affects one of a consumptive tendency, it is frequently the exciting cause of a galloping decay. For *at this season* it is remarked, that consumptive patients, with which the hospitals in Lima are well supplied, die very speedily, while, at other seasons, they linger on for a longer period."‡ According to M. Foderé, affections of the chest are more common in very hot seasons than in others. For instance, the summer of 1807 was excessively warm, both in Paris and in London. In the months of June and July, the heat was excessive, with calms of long duration; catarrhal affections, Phthisis and affec-

* The Pathology and Treatment of Pulmonary Tuberculosis.—Ed. 1853.

† Statistical Report of the Health of the Navy, 1863, p. 51.

‡ Edinburgh Medical and Surgical Journal. Vol. 54, p. 6.

tions of the chest were extremely frequent, and appeared to be, in some way, connected with this great elevation of temperature."*

It is evident, therefore, from these facts, that an elevated temperature is injurious to all consumptive patients, as, also, to those in whom a predisposition to Phthisis only exists. And yet, with these facts before them—facts that are, or ought to be, patent to all—medical men in England are sending hundreds of patients from their country and their homes, every year, in order to seek an impossibility—health or a cure! As that able writer and clever practitioner, the late Dr. James Johnson, truly remarked: "When health is assailed and life menaced in early youth, the solicitude of parents is ever ready to make any sacrifice for warding off the danger; and it is at this critical period, that a remedial or preventive measure, difficult in its execution, hazardous in its results, and, too often, erroneous in its principle, is put into operation on a slender foundation of hope, and, perhaps, on a doubtful accuracy of discrimination." And the writer adds, in another place; "Medical men incur a fearful responsibility in proposing, to the parents and friends of invalids, a measure, which is fraught with danger, involved in uncertainty, and, too often, attended by the most destructive sacrifices of the feelings, as well as the finances, of the parties concerned. Those who have not witnessed lingering illness and death-bed scenes in distant climes, can form no just conception of the tide of mournful emotions, which daily rushes over the mind of the dying stranger in a foreign land. Death is deprived of more than half his terrors by the sympathy of friends, and the consciousness, that our ashes shall

* Voyage aux Alpes Maritimes, p. 266.

be deposited in the land that gave us birth, near those whom, in life, we cherished, loved, or revered!* This may be a prejudice—perhaps even a weakness—yet it is natural, and the instincts of nature can seldom be entirely repulsed, even by the most philosophic minds. But the sigh of sorrow, perhaps of regret, is not always buried in the grave of the sufferer, on these occasions. The companion, who counts the tedious hours of protracted disease, and closes the eyes of the departed friend, in a foreign country, undergoes a terrible ordeal, always harassing to the feelings, and not seldom hazardous to life; while the surviving relatives, at home, are subject to the painful anxiety of suspense, sometimes to the poignant stings of remorse for having suffered the victim of an irremediable malady to expire on a foreign shore."†

* "In the dear land, that gave them birth :
They find a tranquil grave."—*Montgomery.*

† Change of Air, or the Philosophy of Travelling. London, 1831.

CONCLUDING REMARKS.

Having thus taken a rapid flight to all the places and all the localities, usually resorted to and recommended for this class of patients: and having been unable to find a single spot of ground, on which a consumptive patient can rest the sole of his foot, it only remains to return, like the dove to the ark, to the sea-girt habitation that we left. When this has been done, the question will then arise, should such patients remain in England, or should they seek another and a different locality, iu the hope of a cure for the disease under which they suffer? The solution of this problem is not so difficult as it may at first sight appear.

It has been previously shown, that Phthisis prevails to a greater extent, and is actually more fatal, in every country south of the latitude of Greenwich than in England. We have also seen, that it is now the invariable custom of the medical officers of the army and navy to send their consumptive patients, when attacked abroad, to England—some to be discharged the service; some for change of air. We might infer, therefore, from such facts, that England is of all others the best climate for this class of patients. This is not actually the case, for if we proceed still farther north, we shall meet with much more favourable localities.

If, therefore, a consumptive patient wishes to leave England, he should bend his steps northward, and not southward. Such a course is indicated, not only because heat is injurious in all

cases of actual Phthisis; but, also, because the causes productive of this disease are not in operation, or, only to a slight extent, in high northern latitudes. To reach such an Elysium—one where Phthisis is unknown—the patient must take a voyage to Iceland, Lapland, or the Arctic regions. What the accommodation may be in the first-named country I am unable to say; but as the huts of the Laplanders and of the Esquimaux are not particularly well suited for invalids; and as we have not yet heard of the establishment there of a grand hotel, by a limited liability company, we may exclude those regions from all consideration at present. There will then remain British North America: where Phthisis, although endemic, is much less prevalent than in England. That removal to such a climate, would be beneficial in incipient cases, and with those predisposed to Phthisis, certain facts tend to show. Mr. Orton, surgeon, at Beeston, near Nottingham, inserted a paper in the "Edinburgh Medical and Surgical Journal," January, 1844, on the advantages of Upper Canada, as a residence for those predisposed to consumption. This he did in consequence of having been informed by his brother, practising at Guelp in that province, that Phthisis is hardly known there. In a letter dated December, 1836, it is remarked; "Mr. Allen (an old practitioner here) instanced to me several families hereabout, that had emigrated from his own neighbourhood (Suffolk), who, in the old country, had suffered severely from consumptive bereavements; and several of them, who were in alarming conditions themselves when they came out, had never shown a symptom of the sort, since they came to Canada." Whether the same benefit would be derived in other cases, and in other stages of the disease, it is impossible

to say, without further evidence on the subject. Then, again, there are Sweden, Denmark, and Russia, in all which countries Phthisis is comparatively rare. There is, however, one objection which applies to such climates, and it is a serious one. A consumptive invalid would be prevented to a great extent, if not entirely, from taking outdoor exercise during the winter, in consequence of the rigour of the climate; while the heat in summer is as great as, if not greater than, in England. Then, again, if we descend into lower latitudes, we come to the region, or home, of Phthisis, this disease being more prevalent and fatal at Berlin than at London. According to Dr. Caspar and Mr. Ancell, the ratio of deaths from Phthisis in different towns, is as follows :— *

	Phthisis.	Ordinary diseases.
Berlin	1 death in	5.7
Stuttgart	1 „	4.7
Hamburgh ...	1 „	4.6
Paris	1 „	5.5
London	1 „	6.2†
Rome	1 „	3.4
Naples	1 „	2.33

There is, therefore, it would seem, no resource left for consumptive patients but to remain in England, and to seek for relief and a cure by other means than by change of climate.

This ought not to be considered as a punishment, by this class of patients, while it cannot, if the preceding arguments have any weight, be detrimental in a curative point of view.

* A Treatise on Tuberculosis, &c. London, 1852.

† In 1845 and 1846, the ratio was 1 in 7.18 and 7.11, respectively, and from 1850–60, 1 in 8.33.

We hear constant complaints of the variableness, and the uncertainty, of the English climate, and of the presumed evils that arise from it; and yet England is, and always has been, one of the healthiest countries in the world, while Phthisis is actually less prevalent than in any other country south of the frozen regions of the north. Although frequent, the changes are very *limited* in their range, and it is this circumstance which renders them innocuous. The contrary is the case in the South of Europe. There, it is the *long intervals of fine weather between vicissitudes of great magnitude*, which render the climate so dangerous—more especially to consumptive invalids. "This," as one writer justly remarks,* "is the bane of Italy, whose brilliant suns and balmy zephyrs flatter only to betray. They first enervate the constitution; and, when the body is ripe for the impression of the tramontane, that ruthless blast descends from the mountains on its hapless victim, more fierce and destructive than the outlawed bandit on the unsuspecting traveller! The rapid, the frequent, but the *tiny*, vicissitudes of an English atmosphere, are no more to be compared to the mountain blast, superseding the sirocco, than a squall at Spithead can be likened to a typhoon in the Indian Ocean."

Then, again, the fogs, the clouds, and the rain form constant themes of complaint to M. Jean Bull and his progeny—a grumbling, discontented, and unhappy race—whose motto should be,

"Man never is, but always *to be*, blessed."

Although rain falls less frequently in southern regions than in England, it makes up for this infrequency by precipitating

* Dr. James Johnson, loc. cit., p. 261.

itself in cataracts, that form mountain torrents, which flood the plains, and saturate every inch of ground for weeks and weeks. Hear what a recent traveller says of his experience of the locality and the climate, that Dr. Bennett is so much in love with. The facts were furnished in a letter addressed to the *Times* :—

"San Remo, my present home, is said to be the balmiest, sunniest spot in all the balmy, sunny Riviera. A half-moon of olive-clad hills shelters it from every cold wind, and it is only open to the soft breezes of the blue Mediterranean. Palm trees flourish in the open air, and the orange gardens are yellow with abundant fruit. In fact, it constitutes a very charming *mise en scene*, which only requires to be made perfect by the addition of myself reclining in the sunshine, lulled to lazy sleep by the murmuring plash of the calmest of seas. So far San Remo, in the eternal fitness of things ; and such was the glowing picture that consoled me *en route* as I endured the agonies of sea-sickness and all the weariness of travel. Now, let me tell of the realization. I arrived in drenching rain some six weeks ago. Four horses dragged me and my belongings, for two days, along the Cornice road from Genoa, over hills and along precipices, in driving mist and rain, with the roads one mass of mud, until I thought the most glorious drive in Europe as great a bore as a crowded street in the heart of the City. For days I only ventured forth when health demanded fresh air, and despair made me endure a vapour bath above and a mud bath below. The day of the great eclipse saw a leaden cloud stretched from horizon to horizon, and sun and sky were alike shut out from view. Then came a brief spell of deceitful sunshine, tempered by bitter winds, and only to be followed by heavy snow. There was a kind of humour in the sight of orange trees heavy with snow as well as yellow fruit, and palm trees looked absolutely ridiculous in their wintry garment of white. This snow melted to make place for fresh, which still whitens the tops of the hills around, and morning after morning I broke the ice on the pools that are dotted about the shore.

"This agreeable phase of a southern climate was succeeded last week by another form of bad weather, that had, at any rate, the charm of

excitement and novelty. One morning a fresh wind sprang up from the south, and the sea soon ran high. By midday it blew a gale, and by night a storm, and the waves came tumbling into shore with Atlantic force. Great blocks of rock that had been piled at the end of the little breakwater were tumbled about by the sea, and the wind made the raindrops smart on one's cheeks like pellets.....

"After the storm came a calm, and with it a sunny warmth that brought content for a while to my grumbling spirit. But it is now raining again, and a *two days' downpour* seems only to be the recommencement of the weather programme for the season. Paths through the olive woods, which my guide-books tell me lead to endless beauty of wood and mountain, are now all turned into tumbling watercourses, yellow with the precious earth of the olive terraces, and I am driven to take my daily walk along a straight muddy road, where I am alternately cursed by importunate beggars and bespattered by jingling diligences. It makes matters worse that the inhabitants here are essentially a fine-weather people. The houses are mostly without chimneys or fire-places, and all the world is used to live out of doors. Rain and cold suit neither people nor place; they make the place look sordid instead of picturesque, and the people morose instead of light-hearted. Each person one meets has a reason for the ill-luck of this winter.....But whatever the reason the fact remains, and I hereby denounce the Sunny South as a profound humbug.

"I remain, Sir, your obedient servant,

"VIATOR INVITUS."

"San Remo, Jan. 25, 1870."

It is also a mistake to suppose, that cold weather is not experienced even at the extremity of Southern Europe. When it is cold there, it is very cold; and I have sometimes experienced more cold in the South of France, in Spain and in Italy, than I ever did in England. Mr. Matthews, who suffered under a real or imaginary pulmonary affection, and who repaired to Italy in consequence, speaks thus of his experience on this part of the subject: "To come to Italy with the hope of *escaping* the winter is a mistake. This might be

done by getting into the Southern hemisphere: but, in Europe, it is impossible: and I believe that Devonshire, after all, may be the best place for an invalid, during that season. If the thermometer be not so low here, the temperature is more variable and the winds are *more bitter and cutting*.....The only advantage of Italy then is, that your penance is *shorter* than it would be in England: for I repeat that, during the time it lasts, *winter is more severely felt here than at Sidmouth.*" *† With such facts before us, we may conclude, in the words of a popular and truthful ballad, that "There is no place like home", or England, for consumptive patients. It is to be hoped therefore, that an end will soon be put to this "transportation by order of medicine," as the editor of the "Indian Gazette" terms it, while referring to the folly of sending rheumatic patients to India: but which I should term, as regards the transportation of phthisical patients to the South of Europe, *medical homicide.*

Although it is unnecessary, and would, in the majority of cases, prove useless for consumptive patients to remove to another climate, merely with the view of effecting a cure: a change of residence may yet be desirable for other and different objects. It may be desirable, in order to relieve the tedium of a lingering disease: in some cases, to obtain better accommodation; and, in others, to remove from an unhealthy to a more healthy locality. All this can be effected without

* Diary of an Invalid, p. 72.

† "Let us remember," as a writer in the *Daily News* has observed, "one of the many good sayings of the king who, according to the rhyme, never said a foolish thing and never did a wise one—that, in England, one can with comfort be more hours a day, during more days a year, in the open-air than in any other country in Europe."

leaving England. Bearing in mind the conclusions previously drawn, respecting the cause of this disease, little doubt can exist as to the places to be selected. These are, those in which malaria does not exist, excepting in the smallest possible quantity.* Now malaria is known to be given out, to the greatest extent, from alluvial soils, and the banks of rivers; less on secondary strata; and, least of all on primary formations; while it is almost unknown in the immediate neighbourhood of mineral springs.† We have not many mineral springs in England, but there are Cheltenham, Buxton, Harrogate, and Tunbridge Wells, all desirable abodes for consumptive invalids, although all the waters would not be suitable for this class of patients; and particularly the sulphureous waters of Harrogate, for the reasons previously given.

On the other hand, there are no towns, or habitations, situated on primary formations in England, for these are seldom met with excepting in mountainous regions; while,

* It has been before stated, that Phthisis prevails less in those districts, where ague is endemic, and where, consequently, malaria abounds, than in other localities. As such, the previous recommendation would appear to be a contradiction, but it is not so. The immunity, now referred to, is to be ascribed to the fact, that the inhabitants of these districts suffer from another and a different form of disease, and, therefore, are not so liable to be attacked by Phthisis; although it is no uncommon thing for this disease to supervene on the termination of ague; thus showing that both diseases are produced by one and the self same cause. If, however, a consumptive patient went into such a district, the morbid agent, instead of producing fever, would probably act on the weakest and most susceptible organ—the lungs—and aggravate, rather than relieve, the local affection.

† Vide Causation and Prevention of Disease, and the Laws Regulating the Extrication of Malaria from the Surface.

while, if there had been, other circumstances have to be taken into consideration before selecting such a situation. In the first place, it is generally necessary to ascend considerable heights before reaching any primary rocks, the climate of which, irrespective of the quantity of malaria in the atmosphere, may be detrimental in these cases. In the next place, although malaria is given out in greatest abundance from alluvial soils; less so on secondary strata, and least, or not at all, on primary formations; it may so happen, that this poison exists in the air, not only on secondary strata, but also on primary formations. Malaria, as we have proof, has a tendency to ascend in the atmosphere, and is frequently driven, in particular directions, by the wind or currents of air, so as to impinge against the sides of contiguous hills and mountains. Thus, the exhalations from Lake Aquano, in Italy, reach as far as the Convent of Camaldoli, which is situated on a high hill three miles (15,000ft.) distant.* Lind† states, that the effects of this poison have been experienced in ships lying three miles from the shore; if so, it must have been driven that distance by the winds, as Malaria is never known to be given off from the surface of the ocean.‡ It also appears, from the valuable statistical tables of Captain Smith, that, of 76 unhealthy towns and villages in Sicily, 35 are situated on hills or declivities—some of them at a considerable distance from the tracts whence the poison is known to be given out. We observe precisely the same results with Phthisis, which is found to prevail, sometimes,

* *Vide* Causation and Prevention of Disease, p. 81.

† On the Diseases of Hot Climates.

‡ *Vide* Law 3, Causation and Prevention of Disease, p. 78.

to a greater extent on the surrounding hills than on the plains below, whenever the hills are situated near to a source whence the malarious poison is given out.

Dr. Harrison states, in a paper read before the Medical Society of Horncastle, Lincolnshire, that idiopathic consumptions, which are frequent in the wolds or hills of that county, are seldom found in the fens. This conclusion was confirmed by Mr. Wayet, a practitioner of some experience at Boston.

Archdeacon Blackburn, in a letter to Dr. Percival, referring to Richmond, Yorkshire, says :—"The air seems peculiarly unfavourable to consumptive disorders. Many strangers come here from different parts, in the first stage of phthisis pulmonalis ; but, after 35 years of experience, I may truly say that not one has recovered, although the utmost care has been paid to their respective cases."* In a short sketch of the topography of Richmond, inserted in the 1st vol. of the "Medical Repository," it is said to be elevated and healthy, but *particularly obnoxious to phthisical patients.*

Mr. Mansford, who wrote a small treatise, in order to show that Phthisis increases with the elevation, has given a Table of places in his immediate neighbourhood—Frome—in which the ratio of deaths and the relative height have been inserted. This Table is now added, with this only alteration, that the order of the places has been reversed, those with the lowest elevation being placed first, and the highest last. The elevations given, for the different places, are, Mr. Mansford states, the mean of barometrical admeasurements taken on different parts of their surface.

* Philosophical Transactions, vol. 65.

TABLE I.—Prevalence of Phthisis at different elevations:—

Places.	Elevation in feet.	Population.	Deaths in one year.	Ratio per 1,000.
1 Glastonbury	25	4,400	7	1·75
2 Axbridge	50	1,100	0·18*	0·20
3 Wedmore	50	3,000	4½	1·50
4 Wimbourne	50	3,300	7	1·95
5 Wells	50	5,000	11	2·20
6 Frome	450	10,000	31	3·10
7 Hinton	580	600	2	3·36
8 Horningham	650	1,000	3	3·
9 Maiden Bradley . . .	750	500	3	6·
10 Leigh-upon-Mendip. .	790	750	3	4·
11 Kilmington	825	600	3	5·

* As there was no death from Phthisis that year, this was the average ratio for a certain number of years.

Mr. Mansford states, that "the Mendip Hills, which traverse the county of Somerset, are from 800ft. to 900ft. above the level of the sea. The soil, which is of no great depth, lies on a substratum of limestone and of a calcareous sandstone. The air possesses all the virtues which dryness and purity can give it, and has the character of being very healthy, many instances of extreme longevity having been adduced. *Intermittent fevers are almost unknown* through its whole extent; but *pulmonary consumption exerts a wide and fatal sway.*"

"The south side of the Mendip Hills consists of many thousand acres of meadow and moor land, but little raised above the level of the Bristol Channel; and a considerable portion of it a few feet below high-water mark. Here, the intermittent and remittent forms of fever are frequent, but not so of pulmonary consumption: from which this *happy region* may be said to be comparatively exempt."* As the variations of temperature, in these different situations, cannot differ very materially, we must refer the differences in the result, now described, to the greater or lesser concentration of the poison productive of Phthisis.

Similar results are observed at higher elevations, and in mountainous regions, at least up to a certain height, which varies, however, according to the latitude. Dr. Locher-Balber states, that he found tuberculous diseases twice as frequent in the mountainous regions of the Canton of Zurich as in the places situated on the level of the lake.† Dr. Ulschly has also mentioned the great frequency of Phthisis at Gessenay (3,325ft.), and Dr. Lombard says; "As regards the mountainous regions of this country (Switzerland), I have no hesitation in declaring, that tuberculous diseases are so much the more prevalent, as we quit the bottom of the valleys to mount above the level of the rivers and the lakes." And he adds; "If we traverse the chain of the Jura, and if we interrogate the practitioners of the towns and villages situated at the foot, and on the sides of the mountains, as well as in the numerous valleys that intersect them, we shall receive everywhere the same answer,

* An Inquiry into the Influences of Situation on Pulmonary Consumption, 1818, p. 29.

† Schweizerische Zeitschrift für Natur-und-Heilkunde, 1841.

respecting the unusual prevalence of diseases of the chest among the inhabitants of these regions. And if we make the same inquiry in the neighbouring Alps, we shall find whole families everywhere decimated by Phthisis, which may be regarded as the *principal disease* of these mountainous valleys."* In these situations in the Alps, the poison, we may infer, is extricated on the spot, not derived from a distant source, which it would be difficult to discover in a great many instances.

Precisely the same result is observed with cattle. M. Liguistin, a French army veterinary surgeon, in his "*Etudes sur le Mexique,*" states:—"Pulmonary Phthisis in cattle is frequent on the plateaus. At all times endemic and hereditary, it attacks animals which are predisposed, as well as those whose privileged constitution would almost appear to guarantee them against its invasion."....."Congestions in general are common, but apoplexies of the lungs are, above all, of remarkable frequency."†

When, however, we ascend to higher elevations, we emerge from the consumptive zone, and enter a region where this disease is either unknown or extremely rare. That there is a consumptive zone in elevated regions, beyond which Phthisis is unknown, the same as when we proceed towards the north pole, there can be no doubt. Dr. Archibald Smith, who resided some years in South America, states that:—"Incipient tubercular Phthisis, usually attended with more or less hemoptysis, is one of the most common pulmo-

* Les Climats de Montagnes considerés au point de vue médical, page 95. Genève, 1873.

† Journal de Médecine Veterinaire Militaire, 1865-7, and Veterinarian, 1868, p. 497.

nary affections known in Lima, and other parts of the coast of Peru. It is, besides, a disease almost certainly curable, if taken in time, by removing the coast patient, so attacked, to the *open* inland valley of Jauja, which runs from 10 to 11,000ft. above sea-level" in the Cordillera of the Andes. "In advanced stages of Phthisis," remarks the same writer in another place, "attended with opaque, and purulent sputa, colliquative sweats, bronchial and cavernous respiration, with all the aggravated symptoms of hectic fever,—even in such a plight,—the change from the climate of Lima, or the coast, to that of the Andine slopes (at moderate elevations relatively to the snow-line) has been known to prolong life for years, and allow the patient renewed strength to return, from time to time, to the coast, with marked improvement in general health, as well as in the condition of the lungs, and quite free from fever. But, after a few years, such partial convalescents have succumbed to a fresh accession from cold or other exciting cause."....."But, while I state these facts, and could cite individual instances in point, it should never be forgotten, that the timeous removal to the sierra is intended to *prevent the advancement* of Phthisis beyond its first initiatory stage, in the hæmoptoic form of invasion so prevalent in Peru, or to cause it to retrograde altogether, even from this primary condition. It must be clearly understood, therefore, that I claim the curative effects of the Andine climates, on the broadest grounds of facts and experience, in favour of the *early stage only*, and not the more advanced periods of pulmonary consumption, when there is, correctly speaking, no sound lung to rescue."*

* Dublin Quarterly Medical Journal, May, 1866; and British and Foreign Medico-Chirurgical Review, 1856, p. 483.

Although very prevalent in the plains of Peru and Brazil, Phthisis, according to M. Guilbert, is unknown on the high table lands, 10,000ft. and upwards above the level of the sea. Hence, it is the practice there to send patients to these altitudes. We are also informed by Dr. Jourdanet, that a similar immunity exists on the high plateaus of Mexico.* Two reasons can be given for the beneficial results obtained in these instances—the non-prevalence of malaria and the low temperature. "The air of the mountains," remarks Dr. Smith—"in those elevated localities, pointed to as suitable to the recovery of the phthisical invalid—is free from the malaria of the coast, and (as we have already learnt) clear, light, cool, and invigorating—alike removed from the extremes of heat and cold, and, upon the whole, remarkably *equable*."† At Lima, situated 500ft. above the level of the sea, the average temperature is 72° Fah.—the minimum winter temperature being 60° and the maximum summer temperature 84°, in the shade. To show how great is the influence of temperature, I am induced to add the following example:—"On the lowest summit of the western Cordillera as it approaches the shore of the Pacific, is the Indian village of Cachen. Now this," continues Dr. Smith, "is one of the acknowledged health resorts of phthisis and hemoptysis, contracted, or developed, on the coast of North Peru. In the open air, at midnight, and in the dry season, the temperature is 4° Reamur (36° Fah.), and 7° or 8° Ream. (47° to 50° Fah.) in the day, in the shade. But the equable climate of the strath of Huanuco, with a night and day

* Du Mexique au point de vue de son influence sur la vie de l'homme. Paris, 1861.

† British and Foreign Med.-Chir. Review, 1856, p. 483.

range of temperature from 66° to 72° Fah all the year over, is *not* favourable in similar cases, as I had an opportunity of testing; but at *colder* elevations up the side of this Elysian valley, I have known decided benefit accrue to the phthisical and hemoptic patient."* The consumptive zone exists in Europe the same as in America, with this only difference, that the line of exemption varies, like the line of perpetual snow, according to the latitude. In the tropics, or from 8° to 15° S., the height is from 9,000 to 10,000ft.: in the Peruvian Andes, from 7,500 to 8,500 ft.; and in Mexico, between 20° and 30° N. lat., about 6,500ft. In extra-tropical regions, the line descends much lower. Thus Phthisis is rare among the Monks at Mount St. Bernard (7,000ft.), as, also, among the inhabitants of Engadine, 5,800ft. high,—one of the most elevated inhabited regions in Europe. Dr. Albert, who resides at Briançon, 4,244ft. high—the most elevated town in France—considers Phthisis and tuberculous diseases as exceptions to the prevalent diseases of that place. Dr. Fuchs mentions, that at Brotterode, in Thuringen, 1,840ft. above sea-level, the percentage of Phthisis is only 0·9 (Medicinische Geographie, 1859, p. 35); and Brehmer states that, in the neighbourhood of Görbersdorf, in Silesia, (1,700ft.), he has never seen phthisis among the inhabitants (Die Chronische Lungenschwindsucht, p. 134, Berlin, 1857). Kuchemeister concludes, that the consumptive zone descends as we proceed north, so that the removal of one degree from south to north would render the necessary elevation about 375ft. lower.† In the Pyrenees, it is rare, according to

* Dublin Quarterly Medical Journal, May, 1866.

† Die hochgelegenen Plateaus als Sanatorien für Schwindsüchtige. Zeitschrift für practische Heilkunde. Wien, 1868, p. 17.

Schnepp, at Eaux Chaudes, 2,205ft.; Eaux Bonnes, 2,450ft; and other similar places. But the exemption, in these instances, is to be referred, in all probability, not to the elevation, but to the fact that mineral springs exist there—situations in which malaria is not generated, or only to a slight extent. As such, if any person has a dread of Phthisis, and wishes to escape an attack of this disease, he could not do better than take up his abode in one of the above-mentioned places. But that is not now the question. What we want to know is, would the removal to a mountainous region, after the disease has become fairly developed, be attended, in the majority of cases, with beneficial results? This will depend very much on circumstances. That such would be the case, by the resort of consumptive patients to the localities in South America, previously mentioned, admits of little doubt, provided only that the removal be effected at an early stage of the disease. As, however, there are few English patients, who would be enabled, or willing, to undertake such a voyage, and as they would have to first pass through a climate, that I believe to be injurious in every case of consumption, it is desirable to ascertain whether equally eligible resorts cannot be found in Europe. This we might expect would be the case both in the Pyrenees and in the Alps; but we shall find, on inquiry, that a resort to these localities can only be undertaken under particular circumstances and with considerable limitation. We must bear in mind, that the question is, not whether healthy patients, who take up their abode in these localities will remain exempt from the disease, but whether those, in whom the disease has been already developed, will be relieved or cured by a sojourn there. A climate that is beneficial to the first class, may

not be equally, or at all, so to the last. There is a healthy state of the body in the one case, a morbid state in the other.

As regards the Pyrenees, the position of the places usually resorted to there is too low, in such a latitude, for this class of patients—at least, in the summer months. This will be apparent by turning to the Table, p. 28, by which it will appear, that of all the consumptive patients who resorted to Cauterets, 3,254ft. high, none were cured, not even of those who were in the first stage of the disease, and only about a fifth part (22 per cent.) relieved. We will therefore turn to the region of the Alps, which, situated between 46° and 48° N. lat., presents a much colder climate at the same elevation, as also a more varied one.

The climate of the Alps is necessarily a very varied one, depending not only on the height of the station, but the form of the ground; its aspect, as regards the point of the compass; the neighbourhood of snows and glaciers; the currents of air, &c., &c. In the valleys, the cold is greater in winter, by the accumulation of cold air; and warmer in summer from the reflection of the rocks, and the want of circulation of the air. A northern aspect is colder, but more uniform than a southern one.

In order to obtain a fall of 1° centr. (1·8 Fah.) in the Alps, we must, according to Dr. Lombard, ascend 540ft.; in the temperate regions, 552ft.; and, in the torrid zone, many feet higher. But there are many exceptions to this rule, both in extra, and inter, tropical regions. For example, Dr. Smith states, "At the elevation of Surco, about 7,000ft. up the valley of Rimac, the average temperature will be little under that of Lima,"* viz., 72° Fah. instead of 50°.

* Dublin Quarterly Journal, May, 1866.

At the silver mines of Cerro-Paseo, between 13,000 and 14,000ft. high, on the western side of the eastern Cordillera, the mean temperature, as observed by Rivero, is 44° Fah. by day, and 35° by night—an average of 39°, instead of 23°.

There are other peculiarities, particularly as regards the Swiss Alps, that it is desirable now to inquire into.

In the first place, the climate of the Alps is foggy and damp, particularly in the summer. "If," says Dr. Lombard, "there is a characteristic mark of the Alps, it is, without doubt, the frequency of fogs (or mists) and of clouds, which cover their heights, and surround their flanks; with an intensity so much the greater, that the difference of temperature is more marked between the mountain and the plain" (p. 15).

This cloudy zone occupies a variable position, according to the season, the country, and the chain of mountains. In general, mists and clouds in the Alps are most frequent at an elevation of from 1,500 to 5,000 feet. It also results, from the observations made in different places, that, on the plains, summer is the least foggy season; whereas on the mountains, and particularly if they be much elevated, winter is the clearest season. Hence, there are 26 clear days at Geneva in summer, but only 17 at Peissemberg, 1,023m. (3,325ft.) above the level of the sea. In higher localities, the mists and clouds become less frequent, and the clear days increase in number. Still, there falls, according to M. Lombard, twice as much rain at Mount St. Gothard (6,743ft.) and Mount St. Bernard (7,312ft.) as at Geneva.

The climate of the Alps is also a stormy one, unlike that in the Andes, where hurricanes and thunderstorms are almost unknown.* "Though earthquakes are common,"

* For an explanation of the cause of this phenomenon, see Remote Cause of Epidemic Diseases, part 2, p. 16.

remarks Dr. Smith, "a thunderstorm had not been seen in the neighbourhood of Lima, during the lifetime of anyone now living." The reverse is the case in the Alps. Hence, of the various accidents caused by lightning in France, the greatest number, according to the calculations of M. Boudin, occur in the mountainous region of the Alps.* There is, in fact, a stormy zone (*zone orageuse*), the same as a snow and a rainy zone.

It follows, as a matter of course, that those situations which are the most cloudy, should also be the seat, in particular, of storms. Hence it is, that, at Peissemberg, storms are much more frequent and violent than at Geneva. But at Mount St. Gothard and Mount St. Bernard, which are situated beyond the zone of clouds, they are much less frequent. But even here there are certain isolated spots or crags, as, also, chains of mountains, which are noted for attracting the lightning, so that the rocks on the surface become vitrified, and tubes of agglomerated sand, called *fulgurites*, are produced.

The principal characteristic, therefore, of the climate of the Alps is that of a rainy and a stormy one. This conclusion is confirmed by the following somewhat ludicrous and pitiable letter from a roving Englishman, whose wanderings were suddenly arrested in this alpine region :—

"In Cloudland. Pension Weissenstein, Jura Mountains.

"'*Pauvre baromètre, tout le monde le regarde.*' Now, although I am quite prepared to admire the pretty conceit, which suggested to a lively French lady the modesty and bashfulness of a stupid old barometer, which has been stared

* *Traité de Geographie et de Statistique Medicale*, v. 1, p. 473.

at a dozen times a day for three days, and by fifty pairs of eyes, still, on the whole, my pity rather extends to the half-hundred unfortunate people, who are still kept prisoners by stress of weather, in Cloudland. We are, I assure you, in the most unfortunate predicament. Here we are at the Weissenstein, four thousand odd feet up the Jura Mountains, facing a glorious plateau of distant mountain and smiling valley; here we are surrounded by woods and glades and groves of fir; here, on a fine day, we can see with the naked eye, so they tell us, Mont Blanc and the Jungfrau, the Schreckhorn, the Wetterhorn, the Titlis, and the Righi, with all its hotels; here we are, the jolliest of parties, French, German, Swiss, and a fair sprinkling of English Undergraduates, University Fellows, and so on, athletic and eager for the fray; here, in the Weissenstein garden, where are lawns upon which the burning sun is said to stream in the summer time—here, where there are caves to explore and horses to ride, and mules to drag us up anywhere—here, where they have sent us to get brown and taste the air—we have been shut and boxed up for half a week, and are becoming sulky with despair. As for the views of Mont Blanc and the Titlis, we cannot see three yards in front of the windows. The gardens and mountain slopes are obscured by clouds of mist which go drifting and tearing round the hotel. The wind howls and moans among the fir-trees, which are broken and bent with the force of the storm. The horses are eating their heads off in the stables. The cattle absolutely refuse to put their noses outside their stalls. We have got wet through and through so frequently, in sheer desperation, that both mackintoshes and boots refuse their good-natured offices, and now, on the third day, the

reserved pleasures of eating and sleeping begin to pall upon one. That beautiful evening when I walked out at Soleure after sunset, and envied the pleasures in store for me at Weissenstein high up on the mountain, I remember noticing, with some apprehension, dark, angry-looking clouds settling over the Juras and gradually darkening them from sight. From that moment to this the clouds have never disappeared. They have brought torrents of water and tempests of rain; they have swollen the water-courses, which tear down the mountains with volumes of yeasty-looking foam; they have made the mountain paths and roadways almost impassable, and they are rendering the society at Weissenstein a little *triste*. . . . All hopes of fine weather at the Weissenstein were soon at an end. I found two of the oldest inhabitants, wrapped in mackintoshes and sheltered by umbrellas, taking a melancholy constitutional on the terrace, from which the grand panorama has been seen, and possibly will be seen some day again, while the athletic division of the party were at odd moments repairing to the smoking room and consulting the luckless barometer. . . . The first few days of wet weather at the Weissenstein are not, after all, so very disagreeable, and all assembled do their best to think lightly of a very bad job. When the grim duty of consulting the barometer is over—when the most accurate calculations have been made by the University dons, and the most wonderful scientific theories have been broached by the German professors—when every prophecy concerning the continuance or cessation of foul weather on the Juras has been offered—when the London newspaper sent by kind Providence to one of the party has been duly handed round and devoured to the most humble advertisement—when we

have all discovered everybody's name and all our neighbours' business—when we have compared notes as to where we have come from and whither we are going—when the various views on politics, languages, and philology have been bandied about—there are still those lighter amusements in which ladies so cheerfully assist, which save us altogether from *ennui* and despair. . . . Music in the morning gives way to a steady course of reading in the afternoon; novels are exchanged; and many of the ladies are discovered in odd corners deep in the learned tomes which have been brought up by the undergraduates who are in for the divinity schools next term. And then at night despair gives way to dissipation; the liveliest young lady of the party boldly proposes a dance, the drawing-room is cleared, and the impromptu ball is kept up until all the waiting-maids are discovered at ten o'clock wringing their hands in the passage, and lamenting the loss of their beauty sleep. But for all this there does come a time when even the gaiety of despair fades and disappears. After three days it disappears like the bubbles in champagne. The 'pauvre baromètre,' whose modesty was so much pitied by the sentimental French lady, is getting quite brazen and bold; every song and piece in the house has been heard until we are all sick of them; the ladies are tired of reading divinity; smoking and billiards are becoming a nuisance; the best chess player has so triumphantly asserted himself that no one will attack him though he is blindfolded; and you may guess matters have become desperate at the Weissenstein when I discover a newly-married couple reduced to a sad promenade along the uppermost and most melancholy corridor, and when, in the corner of the smoking room, I find an accomplished

whist player doddering over a game of patience! As for myself, I should not so much mind if I were allowed the humble excitement of looking out of the window. It is impossible—we are in the clouds. The rain is so far encroaching upon us that it is coming under the doors and streaming into the passages. All the window panes are obscured with steam, and, at last, the request of a deputation of ladies has been attended to, and fires have been lighted in all the stoves. A grim rumour was heard this morning that, when it rains like this on the Weissenstein, it continues for fifteen days. The Righi is over the way across the valley, but, alas! you cannot see the Kaltbad, for a barrier of impenetrable mist separates us."*

As regards the distribution of rain on the plains and on mountains, M. de Gasparin states that, on comparing the places situated near the sources of the Rhone, the Rhine, the Po, and the Danube, it is found, with only few exceptions, that the quantity of rain that falls augments with the elevation of the place; so that, the more we approach the mountains, that give rise to the principal rivers of Europe, the greater is the abundance of rain.

In the next place, the line of perpetual snow is much lower in the Alps, from 4,000 to 6,000ft., than in the Andes, where it ascends to 15,000 and 17,000ft. above the sea level. Hence it follows, that the atmospherical vicissitudes, produced by these accumulations of snow, are experienced at much lower elevations in the former than in the latter region.

These vicissitudes are inevitable, and are produced by

* The Daily Telegraph, August 21, 1875.

the ascent of a body of warm air from below ("Thalwind"), and the descent of a body of cold air from above ("Berg-wind"), or—*le vent des glaciers*. This interchange of opposite currents of air will be greater and greater as we approach the snow-line, for the heat of the sun increases with the height, since its rays traverse strata of air less and less dense. These effects are sometimes increased by the Sirocco (there termed the "Fohn"), which is also felt, at times, in the mountainous regions of Switzerland. It frequently blows with great violence, is remarkably hot, and melts the ice and snow very rapidly, carrying with it a large amount of moisture. In the valley of Grindelwand, the "Fohn" frequently melts, in twelve hours, a layer of snow of the depth of two and a-half feet.* While it prevails, the same effects are observed as on the plains. "The nervous system of most persons becomes remarkably depressed by this wind; the inclination to undergo exertion is diminished; sleep and digestion are disturbed; the animals, too, seem to suffer—effects which closely resemble those caused by the 'Vent d'Espagne' (or southerly wind) in the Pyrenees."† This heat is sometimes alternated with snow and frost. In 1871 and in 1872, snow lay on the ground for a fortnight at St. Moritz, on the Engadine; and, in 1799, the French artillery is said to have crossed the *Sils Lake*, on the ice, in the month of May.

It must be evident, from this description, that visitors to these regions will be subject to great variations of temperature: a fact acknowledged by one of the advocates of

* Tschudi's Alpenwelt, p. 18, 1860.

† Dr. Weber, Dublin Quarterly Medical Journal, February, 1864.

these mountain health-resorts. "We ought," remarks Dr. Lombard, "to put patients of this class (those with affections of the chest) on their guard against the chills, which so frequently occur in elevated situations; where the difference of temperature between the day and the night is often so great, particularly when a slight rain is sufficient to cause a fall of several degrees in the thermometer" (p. 129). That these vicissitudes are injurious, in all cases of consumption, may be concluded from the arguments previously employed; while they have been acknowledged by all writers on Alpine climates. Dr. A. Smith, whose recommendation of the Valley of Jauja has been already given, adds:—"In like manner the cold—often damp and variable, and always highly rarified—atmosphere of the mountain district of the Cerro-Paseo and other localities *near the snow-line*, is unfavourable to recovery from hthisis."* In the valley of the Jauja, on the other hand, which, although 10,000 feet above the level of the sea, is yet 5,000 feet below the snow-line, such vicissitudes are not experienced: the climate being very "uniform," and the range of the thermometer very trifling. Although called a valley, it is, in fact, a plain, being, on the average, ten or twelve miles broad, and about fifty miles long. To the uniformity of the climate, and its freedom from great atmospherical vicissitudes, as well as to the low temperature, the great benefit said to be derived from a residence in this valley is doubtless to be referred. But in other situations, where great atmospherical vicissitudes are experienced, as at higher elevations in the Andes, and at the usual health-resorts in the Alps, the same beneficial results can hardly be expected.

*British and Foreign Med.-Chir. Review, October, 1856, p. 480.

Although Phthisis is scarcely known at these elevations, other and analogous diseases are. According to Burton, pneumonia is a very common and dangerous disease in the highlands of Brazil; and he also states, that the caravans suffer much from this disease and from pleurisy, while crossing the higher altitudes of East Africa.* It is the same at Paz (12,195 feet), the capital of Bolivia, according to Weddel; at the city of Mexico (7,400 feet), according to Humboldt, and in the Andes, according to Tschudi. The last-named author states, that these affections present a severe and grave character. Dr. Albert, who was in practice at Briançon (4,284 feet) for seventeen years, in a letter to M. Lombard, remarks; "Generally speaking, I am not called to treat any excepting inflammatory affections, especially bronchitis and pneumonia. It is to the last-named disease that the greater number of the deaths of adults is to be ascribed" (p. 71). Dr. Michon, who resided fourteen years at Chamonix (3,419 feet), states, that pneumonias form about a *fifth* of the diseases that attack the inhabitants of these regions. Dr. Ulschly, of Gessenay (3,069 feet), concludes, that inflammations of the chest occupy the first rank, in the regions in which he practises; and that their frequency is in exact proportion to the elevation—being more frequent at Gsteig (3,900 feet), and at Launen (4,095 feet), than at Gessenay (3,324 feet). Dr. Bezancenet (sen.), of Aigle, also considers, that pneumonia occupies the first place in the diseases of these regions, and that it occasions about a *third* of the general mortality. It is also stated, that the French soldiers, encamped in 1796 on

* See "The Highlands of Brazil," Vol. I., p. 240, and "The Lake Regions of Central Africa," Vol. II., p. 318.

Mont Cenis, were attacked with pneumonia in great numbers.* Dr. Fuchs, in his observations on the diseases of the Harz and Thuringia mountains, states, that complicated pneumonia (*pneumonia complicata*) caused 8.2 per cent. of the deaths at Oberhof (2,648 feet), 5.5 at Batterode (1,898 feet), and 4.7 at Kleinschmalkalden (1,583 feet). The same proportion—increasing with the elevation of the locality, and decreasing with the descent—was remarked with the broncho-pneumonia of infants.†

In addition to the ordinary, or endemic, attacks of pneumonia, Alpine regions are subject to epidemic visitations of *pleuro-pneumonia* of a malignant form, usually termed *Alpenstich*. One visitation, in 1864, is described by Conrad, under the name of *pleuritis pestilens, maligna et contagiosa*. Dr. Guggenbühl has also narrated the terrible ravages made in 1833, by this disease, in the Alps; since which it has continued to return at certain intervals.‡ Dr. Casacci informed M. Lombard, that a severe outbreak took place in 1857 at Engelberg (3,357 feet); and he adds, that he had never before observed so fatal a disease. Sometimes it assumes the form of pleurisy, sometimes that of *pleuro-pneumonia*, accompanied by typhoid symptoms.

Cattle are equally subject to these affections of the lungs. Delafond states, that pleuro-pneumonia exists almost constantly, among cattle, in the mountains of Switzerland, Piedmont, the Juras, the Dauphiné, the Vosges, and the Pyrenees. This he ascribes, in common

* Grisolle. Traité de la Pneumonie, p. 135, Paris, 1846.

† Medizinische Geographie, Berlin, 1853.

‡ Der Alpenstich endemisch im Hochgebirgeder Schweiz. 8vo., Zurich, 1838.

with the Veterinarians of these districts, to the cold temperature during six months in the year, the heavy fogs, the coldness and moisture of the nights and mornings, the frequent atmospheric currents in spring and autumn, sudden changes from heat to cold, dry to wet, and *vice versâ*. These are the causes which he considers give "*naissance à la peripneumonie, dans la haute et dans la basse montagne.*"*

Another inflammatory disease very common in the Alps is Rheumatism—an affection that is connected with disease of the heart rather than with disease of the lungs.

"We live," writes Dr. Beck, of St. Maurice, "in an atmosphere the most rheumatic that is possible; but there, where this disease, at least in a chronic form, seems to predominate is in the elevated valleys of our Alps of Valais and of Savoy." Dr. Ulschly, of Gessenay, also says: "Rheumatism is one of the principal scourges of our people;" and Dr. Einseedeln considers, that it occupies the first rank among the diseases of the mountaineers of Schwytz. Dr. Brugger, of Samaden, in the high Engadine, places the frequency of rheumatism in the same rank as pulmonary affections. In the elevated plateaus of Peru and Bolivia, this disease, according to Dr. Tschudi, is unknown—an exemption referrible, doubtless, to the absence of those great atmospherical vicissitudes experienced in extra-tropical climates.

Next to inflammations, hemorrhage from the lungs and other organs is the most frequent disease met with.†

*Traité sur la Maladie de Poitrine du Gros Betail. Paris, 1844.

† Dr. Lombard considers that hemorrhages take the first place, and inflammations the next.

This is the case, according to Dr. Lombard, in the valleys of Locle and of Chaux-de-Fonds (3,075 feet), where the Genevese workmen, who go there to work, are frequently attacked with hæmoptysis. It has also been mentioned by Dr. de Pury, that there are five and six times more exemptions from military service in the elevated valleys of the mountains, than in the districts of Boudry and of Neuchâtel, at the level of the lake. Spitting of blood is stated, by Dr. Flechner, to be common in the Styrian mountains; and Drs. Cullen and Mansford also mention the same fact, even in the Highlands of Scotland, although the elevation of these is not nearly so great. The higher we ascend, the more common are these attacks of hæmorrhage; and Tschudi speaks of an officer, charged with despatches, who, on passing the Cordilleras, South America, died from hæmorrhage of the lungs and intestines on the same day.

In the elevated valleys of the Andes, in Peru, a severe and fatal malady—called Veruga—somewhat similar to *purpura hemorrhagica*, and to which strangers are more particularly liable, is constantly observed. *Veruga* shows itself by buttons, or warts, on the external surface of the body, which bleed: and Tschudi states, that he has known between two and three pounds of blood to be lost from one button only.

Epistaxis (bleeding at the nose), hæmatemesis, (vomiting, and purging of blood), menorrhagia, and congestion of the brain, are also common at great elevations. Hence it is, that plethoric persons can seldom remain on the elevated plateaus of Bolivia, for any time, without risk of an apoplectic seizure. We can also understand, by a reference to the same cause—congestion of the brain—why, of six Englishmen who

made the ascent of Mont Blanc, three, as we are informed by Dr. Lombard, were subsequently attacked with mania, two of whom died.

These effects are to be referred not only to atmospherical vicissitudes, but also to the reduction in the weight of the atmosphere, that takes place, on the ascent from the plains below to mountainous regions—the reduction being in exact proportion to the elevation. At 16,000 feet, the atmospheric pressure is only half as great as at the sea-level. At the top of Mont Blanc, the pressure on the human body would be less by 17,000lbs. than at the sea-level. "Hence," remarks M. le Dr. Lombard, "it is easy to understand the cause of these sudden and violent (*foudroyantes*) cerebral inflammations, in which the atmospheric pressure is diminished a third, or even half" (p. 57). Even at slight elevations, the reduction of the pressure, on the human body, is sufficient to produce marked disturbance, particularly with invalids, and with weak, nervous, people.

The diminution of the pressure of the atmosphere acts upon our organs in a variety of ways, either by destroying the equilibrium between the external air and the liquids and gases contained within the body; or, by diminishing the density of the air, and, consequently, the quantity of oxygen which is necessary for respiration; or, lastly, by rendering the evaporation from the external surface easier and quicker, so that the body of persons exposed to the air of mountains dries and shrivels up with great rapidity. An elevation of 500 feet diminishes the average weight of the atmosphere, on the human body, about a sixtieth part, or nearly 600lbs.; and Mr. Mansford states, that he has found, at such an elevation, an acceleration of the pulse to the extent of five or six beats.

The same results are sometimes observed even at the lowest levels, when a reduction in the ordinary pressure of the atmosphere occurs, as is the case previously to the occurrence of storms.* Mr. Mansford has given the result of his observations in the following cases—three patients in different stages of pulmonary consumption—in support of these conclusions† :—

December 8th.—Barometer 28.3.

Michael King, æt. 24	Pulse 116.
Sarah Hurl „ 20	„ 116
John Heritage „ 15	„ 120.

December 9th.—Barometer 29.1.

Michael King	Pulse 104.
Sarah Hurl	„ 108.
John Heritage	„ 104.

In addition to this effect on the pulse, the patients experienced a sense of oppression at the chest, with difficulty of breathing; effects readily understood, when we consider the state of the pulmonary tissue; the irritability of the vessels, and their exposed and unprotected condition, as compared with the other blood-vessels of the body. The respiratory movements are increased in frequency and depth; and the contractions of the heart become more frequent in proportion to the elevation of the place, particularly when combined

* Boyle showed, long since, that the bodies of frogs and other animals, when placed in the vacuum of an air-pump, swell, and the respiration becomes quickened.

† *Loc. cit.*, page 24.

with muscular exertion. Dr. Smith states, that, "with the Cornishmen in the service of the Peruvian Mining Company, the breathlessness, hurried action of the heart, and sensation of throbbing and tension at the temples—symptoms which usually accompany a sharp attack of the *seroche* (or Cordillera sickness)—were always readily induced by active exertion.....In its more severe and fatal examples, the *seroche* is attended with formidable hemorrhages, such as nasorrhagia, gastrorrhagia, pneumorrhagia, etc.....In cases of pure *seroche*, which always depend on an over-attenuated atmosphere, the removal of the sufferer from a higher to a lower level, as from Serro-Paseo to Huariaca, at once removes the malady."*

Describing the effect of the mountain air, during his ascent of the Andes, the same writer says:—"We had not left Casacancha far behind, when one of our fellow-travellers experienced the most distressing headache: his face became turgid, the temporal arteries throbbed with violence, the respiration was difficult, and it seemed to him as if the chest was too narrow for its contents."†

Animals suffer in the same way, particularly when brought from lower elevations, and while in motion. Jourdanet states that cattle, imported into the highlands of Mexico, suffer much

* Peru as it is. London, 1835.

† At medium elevations, and particularly with persons whose lungs are sound, the respiration becomes more free or easy, the circulation of the blood more regular and somewhat quicker, the digestion more perfect, the muscular forces increased, and the sleep sounder. A sojourner in these regions experiences a feeling of *lightness*, instead of the *heaviness* which is so frequently felt at low elevations.

from the change: horses run with difficulty, pant, and are sometimes obliged to lay down. Cats, it is said, cannot live at an elevation above 12,000 feet, being attacked with convulsions. Dogs will live some years, although liable to the same kind of attacks as the cats, only less in degree. Indigenous cattle and horses, as also the natives, suffer much less—a difference that has been referred to the greater development of the pulmonary organs. "The late Professor Bennett, of Edinburgh," as we are informed by Mr. Hill, "examined the lungs of some of the Indian inhabitants of the Sierra (in the Andes), and had found them of considerably greater volume than those of the people of the lower country. All the living creatures of the inferior species, it is also well to know, are furnished with larger and more voluminous pulmonary organs in the mountains than in the plains."*

In addition to inflammations and hemorrhages, other affections of the pulmonary organs are also prevalent. The most common is asthma. At Mount St. Bernard, the greater number of the monks there become asthmatical, after a few years, and are obliged to descend into the plains again; and Dr. Lombard remarks:—"We are authorised in concluding, that asthma, in its various forms, is a natural consequence of a residence in elevated situations: and that it appears with the greater intensity, as the place of observation is more elevated above the level of the sea." What is known among mountaineers as the *souffle court*, and with scientific writers as *asthma montanum*, is very prevalent, and, we may add, endemic, in high Alpine regions.

From asthma to chronic catarrhs, affections of the larynx and bronchial tubes, the transition is easy and natural—

* Travels in Peru and Mexico, Vol. I., p. 163.

affections so common that there are few persons, of a certain age, entirely exempt from them, in the highest inhabited ranges. "We can easily understand," remarks Dr. Lombard, "that it would be so, when we reflect on the frequent variations of temperature, that are met with there; as, also, on the low temperature and *the extreme dryness of the air*" (p. 59). Disease of the heart, as we might *a priori* have concluded, is, also, very prevalent among the natives.

Effusion into the thoracic and abdominal cavities would also appear to be an occasional result of a residence in Alpine regions—a result that has been explained in the following way. According to the observations and experiments of M. Jules Guerin, the two folds of membrane, that line the thoracic and abdominal cavities, and cover their organs, are only kept in contact with each other by means of the atmospheric pressure. From which it follows, that, when this pressure is diminished, exudation or increased secretion from these membranes is liable to occur, giving rise to accumulation of water in the thoracic or abdominal cavity.

Having thus ascertained the physiological and pathological effects of Alpine climates, we may now proceed to consider the beneficial result, that is to be expected, from a residence there of consumptive patients. The first circumstance, that demands our attention, is the unusual prevalence of inflammatory affections of the chest, and, in extra-tropical regions, in the very localities usually selected for this class of patients. Now it so happens, that consumptive patients are peculiarly liable to be attacked with inflammation of the lungs, as, also, with hæmoptysis; and it is to the supervention of these affections that many of them succumb. It would hardly seem prudent, therefore, to send consumptive patients to a region

in which these affections prevail to a much greater extent than in their own country or in England. "The Kaltbad on the Righi (4,732 ft.)," remarks Dr. Lombard, "is adapted to broken-down constitutions, to those with weakened digestion, or who are suffering from muscular debility; to hypochondriacs, and to those with languid circulation, who require a stimulating mountain air. But all persons who have palpitations; who are subject to hemorrhage, and cerebral or *pulmonary congestions*, ought to avoid an abode which is too stimulating for them. It is the same with phthisical patients."* This advice is applicable to nearly every other Alpine resort: St. Moritz, Weissenstein, &c., &c. If, however, there be any person sceptical of the advantages of his own climate—and this is a common feeling with consumptive patients—and if he be determined to try a change, it will be better for him to visit an Alpine region than a southern one. Dr. H. Weber states, that "5 patients, who passed an aggregate time of 80 months in southern localities (the Riviera, Rome, Naples, &c.) were confined nearly 20 months (a quarter of the whole time) to their rooms or their beds, on account of intercurrent diseases—bronchitis, pneumonia, pleuritis, rheumatic fever, and hæmoptysis; while, of the 160 months passed on high ground, they were only confined 10 months, or one-sixteenth of the time."† When, however, the disease has advanced beyond the first stage, such a journey would be something more than a folly; not only on account of the liability to inflammatory attacks of the lungs, but also on account of the impossibility of such patients bearing the accelerated respiration, necessary at high altitudes.

* *Loc. cit.*, p. 169.

† Dublin Quarterly Journal of Medical Science, May, 1864, p. 235.

If persons in sound health experience difficulty of breathing, with oppression at the chest, and palpitations at the heart, at certain elevations, these effects must be experienced to a still greater extent, and even at much lower elevations, by those whose lungs are more or less impervious and diseased. Referring to the cases of anasarca and debility, complicated with organic disease of the heart, Dr. Lombard remarks: "The activity produced in the circulation, as well as the impossibility of taking exercise without ascending hills, more or less steep, are absolute prohibitions, generally speaking, against having recourse to these remedial means"—a residence in Alpine regions. And he adds: "The same remarks are applicable to Phthisis, when the disease has made much progress, for experience has shown, that the fever increases, instead of diminishing, at *every elevation;* and it is frequently remarked, that diseases of the chest take on an acute form and a rapid march under such an influence. The fear, also, of seeing pulmonary hemorrhage appear or being reproduced is also a sufficient reason for hesitating to send to mountainous regions those who are predisposed to this kind of affection" (p. 127). In an article—the Upper Engadine—in the "Fortnightly Review," March 1st, 1876, Mr. L. A. Tollemache, referring to the quickened circulation consequent on a residence at St. Moritz, remarks; "In certain disorders of the respiratory organs and of the heart, the human mechanism cannot increase its speed, and then there is no gain to compensate its loss. A most melancholy case in point occurred in 1872, when a young lady, in an advanced stage of consumption, was taken to Campfer, and died of sheer suffocation in two days." "But when there is no hectic fever," observes Dr. Lombard, "and when the tubercles are not in an

advanced state, or too numerous, it frequently happens, that the disease becomes arrested or circumscribed (*enrayée*) by a residence in a locality not too elevated" (p. 127). It is, however, in spurious cases of consumption—of which there are so many—that a residence in mountainous regions is most likely to be attended with beneficial results. Hence we are told, by the same writer, that "an Alpine climate is beneficial in that form of *chlorosis* which is accompanied by fever and cough—a form of disease, which resembles pulmonary phthisis so nearly, that the most observant practitioners are sometimes deceived." For these persons, the autumn, or the months of September and October—for the winter snows do not usually fall until the middle of November—would appear to be the best time.* Mr. Tollemache says, September is the best month at the Engadine, the weather being then cloudless. "Several of those, who have derived the greatest permanent benefit from St. Moritz, agree that the air only begins to brace them in September; they hold that the actual summer is more stimulating than strengthening; nay, that, in July and August, St. Moritz has only the negative merit of being non-relaxing, while other places are relaxing: not the positive merit of being bracing.....At any rate, one happy change comes over the weather in September. The hot Italian winds, *so frequent and so trying* in the summer, gradually diminish: and the air, as it becomes colder, becomes also stiller. When the winter has fairly set in, there is, generally, a complete calm; which, indeed, together with the

* According to Dr. Luffer, of Altorf (1,713 feet), the spring is the season when affections of the chest in the lower regions of the Alps are the most frequent; and he adds, that these diseases increase with the melting of the snow.

dryness, is what enables many people to bear the winter cold so easily." At the termination of this period, Mr. Tollemache says—and this advice is, no doubt, the best :—" I am inclined to think, that the normal Englishman should regard dry cold only as an alterative; and that (looking merely to health) he should, when his short change of air and scene is over, take Clough's hint, and—

'Turn to
England, which may after all be for its children the best.' "

Some persons, of late, have been induced to try the effect of a winter residence, but the result, according to Mr. Tollemache, who has resided two winters on the Engadine, is not encouraging. This writer says : " Some patients who, only 20 years ago, would have been more or less boiled in Madeira, are now frozen on Alpine heights. How far has this experiment succeeded? In the Engadine, certainly, the results (so far as they go) have not been encouraging. Out of the very few who, within my knowledge, have spent winters (or parts of winters) there, at least 6 have died—a startlingly large proportion of the entire number; whereas consumptive cases, where the cure of *certain* disease is itself certain, and certainly due to the Engadine winter, are—I will not say, unknown, but—exceedingly rare." As Mr. Tollemache truly remarks : " An occasional recovery from lung-disease, on Alpine heights, proves little; for, even in the bad air of London hospitals, such recoveries occur unexpectedly " ; or, rather, constantly and regularly.

Although the cold is greater in winter, and the rays of the sun less intense, than in summer, still, the atmospherical vicissitudes are nearly as great when the two extremes meet, *i.e.*, the sun and the frost. A correspondent of the " Times,"

who dates his letter St. Moritz, Feb. 8, 1876, says: "The climate in winter is indescribable. With the thermometer, in the early morning, registering *minus* 9° Fah., and while there are many degrees of frost in the shade, the ladies of our party can sit out on the rink, working or reading in the brilliant sunshine for hours together."* "So little is the Hill cold felt," remarks Mr. Tollemache, "that, once in February, the small party at the Kulm Hotel, after clearing away the snow from a sufficient area, had a pic-nic on the flat roof—*the sun being so hot*, that some had to hold up their parasols. Encouraged by the apparent warmth, one of the ladies tried sketching out of doors; but she was stopped by an untoward event—the paint froze in her brush!" So great, in fact, is the heat in the mid-day, when the sun shines, that Dr. Berry, of St. Moritz, informed Dr. Weber that a young phthisical patient was able to drive from St. Moritz to Silvaplana and back (about 3 miles) in an open sledge on January 23rd, when the temperature at 7 a.m. was 13° Fah. below zero. What the effect of being thus burned in the sun and frozen in the shade, or of being exposed to the heat and the cold at one and the same moment, must be, may be surmised from what has gone before. Saussure, while referring to the greater heat of the sun's rays in high than in low situations, adds: "They irritate the eyes, the brain, and the spinal cord;"† and, he might have added, the lungs and other organs. Muhleupford, while referring to the highlands of Mexico, says: "In summer, sunstroke is frequent." I cannot, therefore, conscientiously recommend any one labouring under actual disease of the lungs to migrate to

* The Times, March 8, 1876. † Voyage dans les Alpes.

these regions; believing that the risks, arising from the great atmospherical vicissitudes, more than counterbalance the benefit to be derived from the cold climate, and the absence of the cause or causes productive of the disease. One advantage, however, has been gained by the visit of phthisical patients to these Alpine regions: this is to prove, that such persons can bear an extreme degree of cold with impunity; the morbid effects, before referred to, being the result, not of the cold but, of the heat, or, rather, of the atmospherical vicissitudes produced by these two opposing causes—aided by the rarified air of the mountains.

It would thus seem that, for the majority of consumptive patients, England is the only proper and safe abode; those places where Phthisis is unknown being either inaccessible or else detrimental for the reasons already assigned. There are, it is true, the different localities, in France and in Germany, where mineral springs exist, all of which are desirable abodes for this class of patients. As, however, we possess the same advantages in England, there is no actual necessity for any one to leave his home, unless he prefer a foreign to an English watering-place. The worst is, when patients go abroad, that they not only leave their doctor behind, but, generally speaking, their medicine also. This would be all very well if they were convalescent; they might then throw physic to the dogs and trust to change of climate alone for their recovery. But it is precisely at the commencement of the disease, that consumptive patients are, in general, induced to try the effect of a change of climate; at that period, when medical treatment is likely to prove most beneficial. It is desirable, therefore, to ascertain, whether there be not other places in England, to which this class of patients can resort, besides those previously

mentioned. There are many. Such are the chalk downs and cliffs that skirt our sea-girt isle—among the healthiest situations in the world—and which extend from the extreme north to the Land's End. In the various towns situated on these cliffs, a consumptive patient will always be able to find a suitable abode. Some discretion, however, is necessary in the choice. The towns on the eastern coast should only be visited in the summer, on account of the prevalence in the winter of northerly and easterly winds—the latter a malarious wind. When this sets in or prevails, Brighton is the best abode, being protected by its downs from the influence both of the northerly and easterly winds. In the spring, again, the south coast becomes disagreeable, *not* detrimental, by the presence of south-westerly winds and mists, which render out-door exercise difficult or impracticable. When this is the case, an inland abode is to be preferred.

Although somewhat foreign to my present subject, I cannot close these remarks without offering a caution to other invalids, besides phthisical ones, as, also, to persons in good health. This is, not to suppose, that they can improve their health, when sick, or escape with impunity when well, by a residence in the southern part of Europe. Neither the one nor the other is likely to be effected, except under peculiar circumstances. The reason is clear. The ratio of mortality increases, as previously shown, *pari passu*, with the decrease of latitude—the rate in Rome being nearly double what it is in England or in London. The cause is, the greater prevalence of malaria in southern than in northern latitudes, with the exception of Holland, which owes its insalubrity to its peculiar position, being merely a marsh or quagmire. With this exception, thequantity of poison present in the atmo-

sphere will, in general, be found to bear an exact ratio with the degree of heat—being greatest near the equator, and diminishing gradually from that line to the Arctic regions. Not that the sun has any influence in the generation of this universal agent; it merely acts by aiding its extrication from the surface.* To the presence of this deleterious substance in the air, two-thirds, at least, of the diseases to which the human race is subject are to be referred. "The value of life," remarks Dr. Macculloch, "of survivorship, the average chance of approaching to the proverbial limit of three-score years and ten, is the measure of the salubrity of a country, and that salubrity depends, mainly, on the presence or absence, the range or limitation, of Malaria. How widely Malaria is a cause of death will be apparent, almost on a moment's consideration, when we recollect that, in all the warmer, and hence more populous, countries, nearly the entire mortality is the produce of fever, and these fevers the produce of Malaria."† But, as Dr. James Johnson has truly observed, "a moment's consideration must show us, that fever and ague, two of the most prominent features of the malarious influence, are as a drop of water in the ocean, when compared with the other less obtrusive, but more dangerous, maladies, that silently, but effectually, disorganize the vital structures of the human fabric, under the operation of this deleterious and invisible poison. The jaundiced complexion, the tumid abdomen, the stunted growth, the stupid countenance, the shortened life, attest, that habitual exposure to Malaria saps the energy of every bodily and mental function, and drags

* For the Cause of the Production of Malaria, see "Causation and Prevention of Disease."

† Essay on Malaria.

its victim to an early grave."* Or, as the preceding writer expresses it: "to live a living death, to be cut off from more than half of even that life, to be placed in the midst of wealth and enjoyment, yet not to enjoy, such is the fate of man in the lands of Europe, where Malaria holds its chief seat; while, in the tropical regions, it is to fall by thousands and tens of thousands, the summer harvest of death walking hand-in-hand with that of the vegetable world."

It may be thought, however, that persons, who only make a temporary visit to such localities, will escape the evils to which the residents are exposed. This, however, is a very erroneous idea, strangers being more liable to be attacked with the endemic diseases of a country than the residents. At least, this holds good with respect to the more acute forms of disease—such as fevers—the inhabitants suffering principally from chronic complaints. Hence, the great fatality that frequently occurs with our soldiers and sailors on their arrival in a malarious, and, more particularly, a warm climate. Mosely asserts, that *none* of the Europeans, sent in 1780, in the expedition to San Juan, retained their health above 16 days, and not more than 300 ever returned. He also states, that, at the taking of Fort Cinoa from the Spaniards, "half the Europeans, who landed, died in 6 weeks."† It is, in fact, no uncommon thing for a stranger to be attacked, within 24 hours of his arrival, in some of the pestiferous tracts of intertropical climates, as Batavia, the Habana, Vera Cruz, &c., &c., and to expire, shortly after, in furious delirium or in all the horrors of black vomit. Humboldt gives a curious instance of this. Two rich inhabitants of the city of Mexico, where Yellow Fever is unknown, arrived at Vera Cruz, in

* Loc. cit. † On Tropical Diseases.

which city this disease is endemic, in the evening, in order to take the Packet for Europe the next day. Haunted by the idea of infection—that greatest of all bugbears—although the disease was not then prevailing in the town, they determined, instead of going to the Hotel, to sleep in their carriage all night—thus exposing themselves more freely to the external air. In the morning, they were attacked with *black vomit*, and, before the evening, were both corpses. We observe the same results in temperate regions only in a minor degree; a stranger, who traverses the Campagna of Rome during the night—at which time the poison is more concentrated near the earth's surface than during the day—being sure, at certain seasons of the year, to be attacked with intermittent fever, and this too at times when the inhabitants are altogether exempt. Although intermittent fever is not usually fatal, excepting when it assumes a malignant form, there are other and more fatal diseases common in Italy. One of these is typhoid fever, which prevailed in Rome each of the winters that I resided there, and particularly among the English and other visitors. It was the same last winter, as the following painful occurrence will show. A professional gentleman, who resolved to spend his Christmas vacation in Italy, took with him his wife and two daughters. All three were attacked with fever, shortly after their arrival in Rome, and one of them died. Now I venture to affirm, that neither of these ladies would have been attacked, had they remained in England, not only because typhoid fever was only prevailing in certain localities, but also because they would have been less susceptible to disease in this country than in Italy. A similar case at Cannes has been previously recorded.

Such a result will not excite the surprise of any one acquainted with the unusual prevalence of disease in these latitudes. By an account of the diseases that prevailed in the Maremma of Tuscany, in 1842, it appears, that the following numbers were attacked, the diseases being specified as under:—

Intermittent fever, 10,509; malignant ague, 295; continued and gastric fever, 2,730; phlegmon, 588; angina pectoris, 283; diseases of the lungs, 1,507; dysentery, 250; malignant pustule, 23; dropsy, 66, and the remainder, 17,194, with various diseases. Total, 33,051. As the inhabitants were only 75,966, it follows, that nearly *one-half* of the population was attacked with disease, of some form or other, during the year. Of those that died, the average duration of life was 21½ years*—the ordinary average in this part of the world.

Should the stranger, who visits these localities, be fortunate enough to escape these evils, he must not, even then, halloo, or suppose that he has escaped out of the wood—beyond the influence of the malarious Upas tree—for a poison may then be circulating in his veins, from the effects of which he may succumb at a later period. Many of the men who returned from the unfortunate Walcheren expedition, before referred to, in perfect health, were attacked with the disease that carried off so many of their comrades, 2, 3, and 4 months after their return. That they had imbibed the seeds of the disease in Holland, admits of no doubt, for the complaint was a peculiar one, and unknown at the time in England. Hence the risk that Englishmen run when they

* Statistica Medica delle Maremme Toscane, compilata per ordine de S. A. I. and R. el Gran Duca de Toscana, da Antonio S. Marchetti, Medico espettoré, &c., &c.

visit, what is sometimes satirically termed, "*foreign* parts," or, when they travel to a locality south of the latitude of England. That those who make a sojourn in the south of Europe, frequently bring back the seeds of disease with them, will be evident, if any one will take the trouble to reckon how many of his acquaintances are attacked with disease, if not carried off, shortly after their return from passing the winter in the south of Europe, either for the benefit of their health, as it is termed, or for pleasure and recreation. I could reckon up a goodly number, victims of John Bull's monomania of running to the south of Europe, merely because the sky is blue and serene, and because the sun shines; and who are as unconscious of being lured on to their fate as the moth that rushes to the light, which is to be its tomb. But, as Macculloch remarks, "to him who knows what this land is, the sweetest breeze of summer is attended by an unavoidable sense of fear; and he who, in the language of the poets, woos the balmy zephyr of the evening, finds death in its blandishments."

FINIS.

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APPENDIX.

TABLE A.—Abstract of Cases and of Deaths from Diseases of the Lungs, and of the numbers invalided, in the Royal Navy, at the undermentioned Stations. Average for the 10 years—1859-68 (*a*).

	Ratio per 1,000.																				
	Home Station.			Mediterranean Ditto.			West Coast of Africa ditto.			East India Ditto (*b*).			China Ditto (*c*).			Australasian Ditto.			Pacific Ditto.		
	Cases.	Deaths.	Invalided.	Cases.	Deaths.	Invalided.	Cases.	Deaths.	Invalided.	Cases.	Deaths.	Invalided.	Cases.	Deaths.	Invalided.	Cases.	Deaths.	Invalided.	Cases.	Deaths.	Invalided.
Pneumonia and Pleurisy.	17.94	.34	.27	16.14	.42	.63	13.43	.85	.85	20.4	.43	.64	14.63	.23	.63	13·54	.32	.34	15.6	.43	1.03
Phthisis & Hæmoptysis .	6.85	1.44	4.04	8.65	1.15	9.74	6.95	2.04	4.36	5.24	1.95	4.80	8.04	2.24	5.65	6.63	1.23	3.53	5.84	1.03	4.24

(*a*) These years have been selected, in consequence of there being no separate entry for Phthisis after 1868; Hæmoptysis, Asthma, and other Diseases of the Lungs being entered under one head. (*b*) These Statistics are for the years 1861-63 and 1869-70 only, as the returns, for the intermediate years, include those also of the Cape of Good Hope—a different climate. (*c*) The returns for this Station are only for the 5 years—1864-68 inclusive—those of the East India Station being included in these returns for the other years.

TABLE B.—Abstract of Cases and of Deaths from Diseases of the Lungs, and of the numbers invalided in the Army, at the undermentioned stations, in the following years.

Diseases.	Ratio per 1,000.																				
	Home Station.			Mediterranean Ditto.			West India Ditto.			East India Ditto.			China Ditto.			Australian Ditto.			British America ditto.		
	Cases.	Deaths.	Invalided.	Cases.	Deaths.	Invalided.	Cases.	Deaths.	Invalided.	Cases.	Deaths.	Invalided.	Cases.	Deaths.	Invalided.	Cases.	Deaths.	Invalided.	Cases.	Deaths.	Invalided
Respiratory . . .	[a] 74.5	1.14	[b] 2.03	34.54	.92	2.42	27.4	..	[e] 7.58	[d] 51.33	[d] .53	1.32	62.4	1.73	1.95	31.07	..	1.41	72.05	1.53	2.05
Phthisis . . .	12.06	2.74	7.07	[c] 9.06	[c] 1.56	3.54	[c] 9.58	[c] 1.70	11.66	12.03	2.03	3.37	15.06	6.94	10.75	[c] 15.02	[c] 4.84	4.43	[c] 9.02	[c] 1.65	2.32

(*a*) When not otherwise specified, the statistics are for 1869. (*b*) As, with some few exceptions, the ratio per 1,000 is not given in the Army Reports, only the gross number invalided, the ratio for one year—1865—has been calculated. As the numbers have not varied materially in different years, this will give a sufficiently near approximation for the average of the 10 years. (*c*) This ratio is the average for 10 years —1859-68. (*d*) As the returns for Bengal had not been received when the Report for 1869 was published, the average ratio for the 4 years 1860-4 has been inserted instead. (*e*) The rate of invaliding on this station being unusually high, necessarily reduces the ratio of mortality.

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