REMARKS

ON

CLIMATE AND SEA VOYAGES IN THE
TREATMENT OF TUBERCULOSIS.*Read before the International Tuberculosis Congress in Berlin.*

BY SIR HERMANN WEBER, M.D., F.R.C.P.,

Consulting Physician to the German Hospital, London, and the Royal National Hospital for Consumption, Ventnor.

At the International Medical Congress at Berlin in 1890, I had the honour of introducing the discussion on the Climatic and Hygienic Treatment of Pulmonary Tuberculosis. On that occasion I expressed my opinion that climatic treatment by itself was insufficient in most cases; that careful supervision and guidance of the patient by the doctor was necessary, and that, therefore, treatment in special establishments was to be preferred in the majority of cases, whilst for poor patients it was urgently required.

In the present Congress you have appointed me to introduce the discussion on climatic treatment. My opinion, gentlemen, is now more decided than at the former Congress, for I hold that climate is really important, but is insufficient unless there be careful medical supervision and hygienic and dietetic guidance. Obeying your directions, I shall endeavour in a short survey to explain what share climate can take in the treatment of tuberculosis. I will divide my rapid summary under four heads:

1. Climates of mountains and high altitudes.
2. Inland climates of low elevation, including those of forest, of deserts, and of Egypt.
3. Climates of the coast and of small islands; Sea voyages.
4. Short indications for the use of different climates in different cases of tuberculosis.

I. CLIMATES OF MOUNTAINS AND HIGH ALTITUDES.

The differences are great between the various localities which are grouped together under this heading. Whilst in the tropics an elevation of 1,800 to 3,000 metres over the sea is necessary, in the latitudes further from the equator (46° to 54°) an elevation of 400 to 500 metres is generally sufficient. When the surroundings of a place are much higher than the place itself, the effect of high altitude is in many respects diminished; the effect is increased when the surroundings are lower.

You know, gentlemen, that in former years the prevailing opinion was that consumption was more likely to be cured in warm health resorts than in cold ones, and you know also how scanty were the grounds for this opinion. You are aware that in Lima, the capital of Peru, about 12 degrees south of the equator, consumption is especially frequent, and runs a rapid and fatal course; but that patients, if they go early enough into the neighbouring Peruvian Andes, at an elevation of 2,500 to 3,000 metres above sea level, mostly get better. For the recognition of this fact we are chiefly indebted to the late Dr. Archibald Smith, who for thirty years exercised the medical profession, partly in Lima itself, and partly in the silver mines of Cerro de Pasco, nearly 4,000 metres above the sea. The custom of sending consumptives from the hot coast of Lima to the cool altitudes of the Andes is supposed to have existed from "unknown times." Although I myself have never been in Lima, yet by chance correspondence with the coasts of Peru and Chili, I have had the opportunity of confirming this fact in a series of patients.

In Europe we have mostly given the late Dr. Hermann Brehmer, of Goerbersdorf, the credit of having ascertained the influence of mountain climate in pulmonary consumption; but a recent excellent work by Geheime Rath Bernhard Schuchardt,¹ in Gotha, shows that others did this before Brehmer, and that foremost amongst them Brockmann, in an excellent contribution² to Holscher's *Annalen* in 1843, proved the favourable influence of a stay in the Upper Harz in regard to the prevention and cure of scrofula and tuberculosis, and that soon afterwards C. F. Fuchs,³ though unacquainted with Brockmann's publication, made similar communications.

Brockmann wrote in 1843, Fuchs in 1851, and the first edition of Brehmer's book on chronic pulmonary phthisis appeared in 1857, preceded by a similar work in 1856.

The main characteristics of high altitudes are: (1) low atmospheric pressure; (2) small amount of the absolute and relative humidity; (3) low temperature in the shade; (4) great warmth of the sun; (5) great amount of light; (6) rarity of clouds; (7) the purity of the air, especially in regard to microbes, to which the bright sunlight and free access of air are antagonistic.

The physiological effects of high altitudes are: (1) amplification of the respiratory movements; (2) strengthening of the muscles of respiration; (3) strengthening of the heart and circulation; (4) increase in the amount of watery vapour and carbonic acid given off from the lungs; (5) increased activity of the skin; (6) increase of appetite and of the amount of food taken, improvement of the digestive functions; (7) improvement in the quality of the blood, and in the nutrition of the organs, particularly of the lungs; (8) increased activity of the nervous system.

We may say that mountain climates are highly stimulant and tonic, but require a certain power of resistance on the patient's part.

It is difficult to ascertain exactly the results of treatment. I myself could follow out the further progress of only a relatively small number of cases. In 144 patients only have I statements on the later condition. Of these 144 patients I have noted cure in 36; in 56 there was improvement in the local signs and in the general nutrition; in 52 cases there was either no improvement, or deterioration, or death within the first three years of the treatment. Only the smaller portion were treated in special sanatoria; in the remaining larger portion the medical supervision varied very much. The results would doubtless have been much better if the patients had placed themselves under stricter medical guidance, as they were advised. In many cases as a consequence of false steps relapses occurred which confined the patients for weeks and months to their bed or their room, and prevented recovery (which had previously seemed probable) from taking place. In 7 cases, however, recovery seemed nearly complete when through some mistake, mostly over-exertion, a deterioration set in, which afterwards led to the fatal termination. I must, however, add that Dr. C. Theodore Williams,⁴ of London, records better results in his great experience than I do. Dr. Lucius Spengler's⁵ results published from his experience in Davos between 1887 and 1890 are also more favourable. Still more satisfactory, however, are the results which Dr. Turban⁶ has obtained in his sanatorium at Davos (66.1 per cent. of absolute and relative recovery), that is, obtained by an association of high Alpine climate with sanatorium treatment.

In regard to the prevention of tuberculosis by high altitudes, my results are decidedly better. In 40 cases of children from tuberculous families, education in the mountains, with good diet and plenty of fresh air, has had a favourable result, and only in 4 of these cases has tuberculosis under unfavourable conditions afterwards developed. Seaside places have likewise a prophylactic action, but so far as I can conclude from my experience, they have a greater influence against the so-called typical scrofulous conditions than against pulmonary tuberculosis, whilst with high altitudes the reverse is the case. Amongst the elevated localities of which I have experience, I give certain places in the Peruvian Andes the preference over all others; especially Jauja and Huancayo, about 3,000 metres above sea level, and the rather less elevated Quito near the equator. The advantages are—the great dryness and rarefaction of the atmosphere, the strong insolation, the medium temperature and equability of the temperature, which, day and night, summer and winter, is said to vary only between 14° and 18° C. The great drawback, especially for Europeans, is the long, tiring, and costly journey.

The Rocky Mountains, in the United States of America, contain likewise many good, but mostly not yet developed, places. The best arrangements for medical treatment are afforded by Colorado Springs, Manitou, and Denver, the two first over 1,800 metres, the last about 1,500 metres above sea level. These places are much less equable in their climatic features than are the localities mentioned in the Andes; in this respect they resemble much more the High Alps of

Switzerland; the Rocky Mountains are, however, somewhat drier and warmer than Davos and St. Moritz, and also more windy. Denison, Solly, and C. T. Williams have reported on these places. Private sanatoria have as yet hardly been established in the Rocky Mountains, but are better represented in the lower North American mountains; and the excellent sanatorium in the Adirondacks, under Dr. Trudeau's management, offers an example which deserves to be copied. The flourishing Climatological Association of North America will, it is to be hoped, encourage the foundation of many sanatoria.

In the Swiss Alps all of you are acquainted with Davos, Arosa, St. Moritz, Wiesen, Leysin, Montana, and Les Avants. I shall, therefore, not consider these localities further, nor the places on the relatively lower German mountains; the latter are rich in sanatoria, which will probably be reported on by the opener of the discussion on sanatorium treatment.

In France the Société des Sanatoria de France is endeavouring to develop climatic treatment more extensively in the inland, whilst an analogous society does the same for the coast, and to this subject we will come back later. The Trespöy Sanatorium near Pau, and the Durtol Sanatorium in the Auvergne are already opened.

The highlands of South Africa thirty or forty years ago were valued as unfailing climates, but experience has limited their reputation. Their disadvantages are the great heat and dryness in summer, the frequent alternation in winter of great heat in the daytime with great cold in the night time, and the frequency of wind and dust. However, of 21 cases, I have had 7 lasting recoveries amongst patients in the first stage of pulmonary tuberculosis; these patients settled there later, and occupied themselves or still occupy themselves with agriculture. Dr. Symes Thompson⁷ and Dr. Hillier,⁸ of London, have given us information on these regions.

Bloemfontein, Allival North, Kimberley, Burgersdorp, Pretoria, Beaufort West, and Cradock belong to the best known places in the more elevated regions (1,300 to 1,500 metres). Regular sanatoria are not yet developed. Harrismith, in the Drakenberg range, if it had a sanatorium, would be of the greatest utility for the extensive less elevated regions of the south-eastern coast of South Africa, and particularly for the not very hygienic but otherwise flourishing coast towns.

II.—INLAND CLIMATES OF LOW ELEVATION, INCLUDING THOSE OF FORESTS, OF DESERTS, AND OF EGYPT.

Like all of you, I have seen many cases of recovery on level land and even in large towns, but the proportion of recoveries to the number of patients was small. The recoveries have been chiefly in persons who spend much of their life in the open air and take sufficient food, especially milk, for instance, in the case of gardeners and those employed in agriculture and landowners, but also in bakers who deliver the bread, and in Black Forest clockmakers who carry their clocks about for sale and who have exchanged their work in shut-up rooms for work in the open air. The proportion of recoveries was certainly greater at places with shelter from wind, much sunlight, and medium temperatures, such as Pau, Gardone-Riviera, Arco, Meran, Montreux, Lugano, Locarno, and Pallanza; but repeatedly at these places also well-founded hopes of recovery have been destroyed by too long walks, by exciting games of cards in smoky rooms, and by other harmful factors.

In the question of the influence of forest on the soil and the air of a locality, Ernest Ebermeyer⁹ has made a valuable study, but our knowledge of the effects of forest in cases of tuberculosis is very limited. In general one may say that in a forest the ground (on the average for a year) is some degrees colder, and that the ground and the air are somewhat moister; the difference between day and night temperatures is less; the movement of the air is diminished; rain is more frequent; there is less light, and the amount of ozone in the atmosphere is increased. These characteristics are less marked in forests of pine than in forests of deciduous trees, and in the latter are less in winter than in summer, when the trees are in foliage. There are, however, other modifications in the atmosphere of forests which cannot be exactly estimated—possibly changes in the energy of the oxygen due to the vital processes taking place in the leaves—and which exert a refreshing influence. There are also exhalations from the trees to

be taken in account, especially in pine forests, where the aromatic substances in the air may possess an antiseptic influence. Then the protection from wind should be considered, which is felt not only in the forest itself, but likewise in the neighbourhood. It is therefore important to have a wood, especially of pine, in the direction from which the general cold winds come. From cold local winds also a forest not rarely affords shelter. Thus one may observe on mountain declivities, when the upper part of the slope is covered with trees, that the tender plants and shrubs below the wood are thereby sheltered from the cold air, which during the night moves downwards from the summit, whereas similar plants growing at an equal height, but at a spot not protected by forest, are frozen. From what has been said I should not be in favour of erecting sanatoria in level dense forests of deciduous trees, for the greater moisture of the soil (Bowditch and Buchanan) and the diminution of light cannot act favourably. However, on the slope of a wooded mountain, when there is a clear space with free access of air and light, a forest may constitute a favourable element in the climatic condition, especially when the trees are pines.

In regard to desert climate, it is an old observation that the inhabitants of deserts, the Bedouins, as long as they live in tents, remain free from consumption, but that amongst those of them who live in houses the disease is not very rare. My own inquiries in Egypt and on the peninsula of Sinai led to similar conclusions. From Bedouins who accompanied me on an excursion to Mount Sinai I learned that as long as they travel no cases of consumption occur, but that some of their relatives who seek a livelihood in Cairo, Suez, and Alexandria die of phthisis. I have made similar observations amongst other wandering tribes who do not live in the desert. Several times in Asia Minor I have met with wandering bands of Turkomans; for instance, near ancient Sardis, the capital of the Lydian monarch Croesus, I met a large horde, consisting of strong men and women, quite free from phthisis and likewise healthy in other respects. They told me by means of my interpreter that members of their horde who had obtained employment in Smyrna and Constantinople had died there of consumption. Possibly therefore the immunity from phthisis depends not merely on desert climate, but on life in the open air in thinly-populated districts.

The characteristics of the climate of the desert are purity of the air, its richness in ozone, great warmth of the sun, abundance of light, dryness, and great rarity of rainfall. The disadvantages are the violent winds, mostly accompanied by dust, which not only obscures the sun like a dense fog, but gets into the clothes, penetrates into closed rooms, and is deposited on articles lying there. These dust storms are not limited to the periodical khamseen (chiefly in March and April), but occasionally blow for one to three days at any time of the year. Another disadvantage is the absence of shelter, so that one is obliged to have tents and servants, which necessitate great expenditure. One is therefore seldom in a position to test the advantages of the desert, but in individual instances I have seen great benefit derived from it. If sanatoria were to be established near desert stations, the cost for each person would be much diminished.¹⁰

Egypt is a term which, though often employed in climato-therapeutics, includes very different climates. Egypt is best considered after deserts, because the localities of which therapeutic use is made owe their characteristics mainly to their proximity to the desert. The features which they have in common during the winter months are: (1) Plenty of sunshine; (2) a clear sky in general; (3) a moderately high temperature, with considerable variation between day and night; (4) a low degree of humidity and rarity of rain; (5) a comparatively aseptic air in the thinly-peopled districts, an advantage which is wanting in the crowded districts of Cairo. The disadvantages are: (1) The well-known strong dust winds; (2) the short duration of the medical season; (3) the return in spring to places with great climatic change; (4) the long journey; (5) the absence of sanatoria. Moreover, the constancy of the meteorological features is by no means so complete as it is reputed to be. It is said that amongst health resorts it is only in Egypt that one may depend on settled weather. After two long visits to Egypt I cannot confirm this belief. Cases for which Egypt has advantages are those complicated with albuminuria, with emphysema,

and with frequent attacks of bronchitis; cases with tendency to diarrhoea are to be excluded.

Of the places resorted to by invalids, Cairo is still unhygienic, and only the Ghezireh Palace, which is outside the town and now a large hotel, can be recommended. Mena House, about 18 kilometres from Cairo, situated at the edge of the desert, close to the Great Pyramids, is only suitable from the end of December to about the end of March; before this time the neighbouring delta is still flooded, and afterwards the heat is too great. Helouan, with its well-known baths, which can be reached by a short railway journey from Cairo, is probably at present the best place, because it lies quite in the desert, and can be used during the longest period, from the middle of November to the middle of April. Luxor is a very interesting place to stop at; it consists of hotels and the unhygienic dwellings of the ordinary population. Assuan, the most southern of these places, has much of the exhilarating influence of desert climate, but is very windy, and, owing to the heat, has only a short season—from the beginning of December to about the middle of March. As yet there are no sanatoria anywhere. The patients and the European and American doctors who send invalids to Egypt trust too much to the mere climate without supervision by the medical man, and thus many lives are lost. If there were suitable sanatoria the Egyptian climate could be made good use of. One could prolong the season if one were to erect a sanatorium near Alexandria, preferably at Ramleh, where many patients could stop perfectly well till about the end of May. Inseparably connected with the climatic idea of "Egypt" is the Nile voyage, which can either be made on private ships—the so-called *dahabiyehs*—or on the passenger steamboats, which latter are provided with a doctor. The greatest care is required on these steamboats; colds are very often contracted. The wind is often very violent; a draught can hardly be avoided; the temperature on different parts of the ship—that is, in the sun or in the shade—is always unequal. Private ships are expensive, and the invalid should always have a doctor.

III.—CLIMATES OF THE COAST AND OF SMALL ISLANDS: SEA VOYAGES.

Amongst coasts and islands there are, first, the more humid and warm climates, such as Madeira, the Canary Islands, Mogador, Tangier, Cadiz, the West Indian Islands, the Peninsula of Florida, and the coast of Georgia and South Carolina, which can be termed sedative, or even relaxing. Formerly, when cold was feared and warmth was regarded as specially beneficial, these climates were much employed, but now they are much less so, though the islands of Madeira and Teneriffe are suitable for some cases of pulmonary tuberculosis with irritable weakness of the constitution.

Secondly, we have the drier climates with moderate warmth during winter. Amongst these the localities on the Western Riviera are especially popular; they are characterised by the great warmth of the sun, abundance of sunshine, dryness of the air and moderate amount of rainfall, and may be termed stimulant or exciting. Special caution is required on account of the great difference between the temperature in the sun and the temperature in the shade, on account of the sudden fall of temperature before and at sunset, and on account of the frequency of strong winds with dust. Allied to these climates are those of the Eastern Riviera and of Sicily (Palermo, Taormina, Acireale, Catania), but there is less shelter from cold winds. Algiers and Ajaccio may likewise be compared to them, but they are somewhat moister, and Ajaccio is nearly quite free from dust.

You will understand that on these localities and on many similar ones I must not enter more fully. There is a great want of suitable sanatoria, and the majority of patients trust too much to the climate, and often only seek medical guidance when it is too late. My results here are still less favourable than in the case of mountain climates, but, with careful supervision of the patients, would be similarly much improved. I can likewise not stop to speak of the English seaside places, which have a moderate degree of humidity and a lower winter temperature. You are aware that till recently well-to-do English, including medical men, showed a great disinclination towards treatment in closed establishments, and that sanatoria and hospitals for the treatment of the poor,

though they were not quite so lacking as in other countries, were yet insufficient to meet requirements, but you know also that the struggle against tuberculosis has seriously commenced in England, that to the sanatoria which already exist many new ones will soon be added, and that for those also who possess private means a few establishments have recently been founded.

Of great value are the places on the North Sea and the English Channel in the treatment and prevention of scrofula. They are likewise useful for the prevention of pulmonary consumption in cases of hereditary disposition, but, in my experience, not to the same extent as mountain climates are.

Ocean voyages are not rarely recommended because the following characteristics are attributed to them: (1) Purity of the air; (2) slight range of temperature; (3) abundance of light; (4) constant movement of the air; and (5) mental rest. However, if one examines the conditions of an ocean voyage more exactly, one finds that these advantages are not always completely presented. For instance, the purity of the air is limited almost entirely to the deck, and is generally wanting in the sleeping cabins and the saloons; the pleasant movement of the air is often transformed into a violent storm, whilst in the zones of calm the reverse is the case; the temperature does not vary much from day to day, but on a long sea voyage the oppressive heat of the tropics has to be supported. Hence the treatment of a serious illness on a sea voyage is rendered difficult by the bad air of the small cabins. I must not pause to discuss the advantages and disadvantages of the different kinds of ships—sailing ships, steamships, wooden ships, iron ships, mixed kinds of ships. Moreover, in respect of the choice between different voyages, I must limit my remarks to mentioning that, to obtain the full effect, one of the longer voyages must be selected, one which lasts about six to sixteen weeks, without including the time spent on land between the voyage out and the voyage home. The best for patients are the voyages to Australia and New Zealand around the Cape of Good Hope (not Cape Horn on account of the great cold), and that to the Cape of Good Hope itself, which in suitable cases may be combined with a stay of several months on the highlands of South Africa.¹¹

Of my observations on the influence of sea voyages in pulmonary tuberculosis, I will only give those which relate to the voyages just mentioned, and which lasted from six weeks to seven months. In 70 cases there were 34 showing improvement, 18 showing little change, and 18 showing deterioration. The great majority of the cases were in the first or commencement of the second stage; only 7 were in the third stage.

From what I have observed I would give it as my opinion that sea voyages can do good service in a certain number of tuberculous cases, but that in most such cases other climatic and hygienic methods of treatment exercise at least just as good an influence. If, however, persons of strong constitution, who like sea voyages, develop phthisis under the influence of overwork or mental worry, long sea voyages are to be preferred to all other methods of treatment. A decided advantage of sea voyages is that patients are much more protected from excesses than at many well-known health resorts. Permanent weakness of constitution, very decided tendency to sea-sickness, unalterable dislike of monotonous diet constitute contra-indications. Some practical remarks are contained in the article *Ocean Voyages in Phthisis*, by Dr. Parkes Weber, in the *Practitioner*, June, 1898, p. 662.

It would be an advantage if there were well-arranged medical ships, a kind of "sea sanatoria," both for long voyages and for short ones—for instance, in the Mediterranean and to the West Indies during winter, and in the North Sea during summer; but this will be hard to arrange without great cost to the patients. In the case of rich persons I have for many years recommended—often with very favourable result—the use of yachts for climatic and hygienic purposes, generally with a medical attendant. Sea voyages can be recommended for prophylactic use against scrofula and also against tuberculosis. Amongst sailors and seafaring persons there is less phthisis than amongst soldiers of the same age on land. Out of 18 boys of very tuberculous families, whom I advised to enter the navy, only 2 became consumptive, whereas amongst their brothers and sisters who chose learned, mercantile, or sedentary occupations, the number of deaths from phthisis was at least three times as great.

IV.—BRIEF INDICATIONS FOR THE USE OF DIFFERENT CLIMATES IN DIFFERENT CASES OF TUBERCULOSIS.

1. It is very difficult to formulate exact rules, partly because tuberculosis occurs in such various forms and with such various complications, partly because the constitutions of the affected individuals are very different. In all our medical work we consider the constitution at the same time as the disease, and in tuberculosis we have to do this very particularly, in the apparently slight cases as well as in the severe ones. First of all, we must be clear as to whether we have to do with a strong or a weak constitution. This is often difficult to tell at first sight, because a naturally strong person may be so lowered in health—partly by the disease itself, partly by preceding unfavourable conditions—that he may seem to have a weak constitution.

In deciding this matter the family history often helps us, not only as to whether the family is free from tuberculosis or not, but still more as to whether the patient belongs to a long-lived or to a short-lived family. If he belongs to a long-lived family, we may suppose that he possesses a strong constitution, even if other members of his family have died of tuberculosis. If he belongs to a short-lived family, we generally have to deal with an originally weak constitution, even if no member of his family has died of tuberculosis. This kind of hereditary tendency—to a long or to a short life—is very important in regard to prognosis and treatment. Another hereditary tendency, which points to a considerable power of resistance, is that towards gout, which to a certain extent is antagonistic to tuberculosis.

Amongst other circumstances which can guide us in forming an estimate of the power of resistance, the personal history may be mentioned. Those persons who from youth up always feel better, are more energetic, can eat better, and put on weight in warm weather, but in cold weather become less capable of work, generally belong to the class of weak constitutions, whereas those who have always done better in the cold possess stronger constitutions. Patients who from childhood onwards have always had high fever with every slight illness, and have recovered with difficulty, and who always have moist hands, must generally be reckoned amongst the weak, erethic constitutions—a conclusion which is mostly confirmed by the colour of the skin and mucous membranes, the general appearance, and the weak and irritable action of the heart. If we have come to the conclusion that the patient has a weak constitution, we must be guarded in recommending high altitudes and long sea voyages, and give the preference to warm, sunny, and sheltered places, such as Beaulieu and Mentone on the Riviera, and Pau; sometimes Madeira and Teneriffe may likewise be recommended. On the other hand, in strong, somewhat torpid constitutions mountain climates are to be preferred, and occasionally also long sea voyages. In these cases one can do much by keeping them continuously in the open air, by good feeding, and by regulated exercise.

In regard to the following indications the constitution has always to be considered:

2. In cases with limited disease at one or both apices, without or with an only slight amount of fever, nearly all climates can be made use of, but especially high altitudes and sea voyages if the constitution is a strong one.

3. Cases with limited local disease and high fever must be at first treated in their houses or in the neighbourhood of their homes.

4. Cases with extensive disease of one lung or of both lungs, without fever or with only slight fever, are more difficult to advise. In the majority of these cases treatment at an only moderate elevation, or at warm seaside localities, deserves the preference.

5. In advanced disease with fever long journeys should be avoided, and, if possible, neighbouring sheltered health resorts, together with careful supervision, should be recommended.

6. In progressive tuberculosis with scattered foci in both lungs and much fever sheltered localities near the patient's home, or the home itself, are probably the best places.

7. In cases of chronic, slowly progressive phthisis I have seen, on the whole, better results from warm winter resorts, and sometimes from sea voyages.

8. Quiescent cases with extensive damage or cicatrization

are generally better off at only slight elevations, such as Meran or Arco or Montreux or Badenweiler, or on the Riviera or in Egypt.

9. Cases with albuminuria without fever should avoid high altitudes, and select dry places like Egypt or the Riviera.

10. The complication of moderate diabetes does not exclude the use of high altitudes, but the latter are injurious in cases with advanced diabetes and emaciation. Similarly, high altitudes should be avoided in cases where the tuberculosis is secondary and the diabetes the primary affection.

11. Chronic cases with much catarrh require places with as little wind as possible, such as Pau and Arcachon, and, in England, Bournemouth; but in the case of young persons places of high elevation with little wind need not be excluded, and are often even to be preferred.

12. High altitudes are contraindicated in chronic cases with extensive emphysema; these cases require warm winter resorts, such as Madeira, the Canary Islands, Pau, or places with pine woods, like Arcachon and Bournemouth.

13. When asthma is a complication, in persons whose idiosyncrasies in regard to localities are unknown, no certainty in the choice of climates is possible; but in the majority of relatively young persons high elevations should be preferred, whilst in older persons moderately warm localities at only slight elevations should be selected, such as Grasse (near Cannes) or Montreux, or Locarno, or Meran, or places amidst pine woods (like Arcachon and Bournemouth).

14. In all climates for the treatment of tuberculosis selection of the dwelling-house is of great importance; it should get much sun, should be sheltered from winds and free from dust, and should be built on dry ground; it should be removed from stagnant water and swamps, and from the impure air of factories and similar drawbacks.

15. For the prevention of scrofula and tuberculosis all healthy climates can be used, as long as a good diet and plenty of time in the open air can be obtained; but high altitudes and marine climates have advantages—the former rather against pulmonary tuberculosis, the latter (including sea voyages) more against scrofula.

16. The cure of tuberculosis during the early stages is possible in all healthy climates; some climates, however, have advantages for various cases over the other climates; for instance, notably those of high altitude. But climate by itself without careful medical supervision is generally insufficient. The patient's blind reliance on the climate often leads to errors, to aggravation of the disease, and to death. For the majority of patients, therefore, treatment in sanatoria should be preferred, but for the treatment of the poor it is a necessity. The erection of numerous sanatoria for the people is therefore a national requirement for the cure, the prevention, and extermination of tuberculosis.

NOTES AND REFERENCES.

- ¹ Zur Geschichte der Anwendung des Höhenklimas (Gebirgsklimas) behufs Heilung der Lungenschwindsucht (Lungentuberculose), *Jahrb. d. Königl. Akad. gemeinnütziger Wissenschaften zu Erfurt*, neue Folge, Heft. xxiv, 1898.
- ² Der Oberharz, ein Schutz- und Heilort für tuberculöse Schwindsucht, Holscher's *Annalen für die gesammte Heilkunde*, 1843.
- ³ Das Verhältniss der Krankheiten in senkrechter Richtung von der Küste der Nordsee bis zum Rücken des Thüringer Waldes, *Janus, Central-Magazin*, Gotha, 1851 und 1853.
- ⁴ The Treatment of Pulmonary Tuberculosis by Residence at High Altitudes, *Practitioner*, June, 1898, p. 633.
- ⁵ Zur Phthisiotherapie im Hochgebirge, *Fortschritte der Krankenpflege*, 1893.
- ⁶ Beiträge zur Kenntniss der Lungen-Tuberkulose, by Dr. K. Turban, 1890, p. 154.
- ⁷ On the Elevated Health Resorts of the Southern Hemisphere, *Med.-Chir. Trans.*, 1873.
- ⁸ The Climate of South Africa, *Practitioner*, June, 1898, p. 649.
- ⁹ Die physikalischen Einwirkungen des Waldes auf Luft und Boden, Aschaffenburg, 1873.
- ¹⁰ The latest communication on the climate of the desert is Dr. F. M. Sandwith's Desert Climate for Lung Tuberculosis, *Practitioner*, June, 1898.
- ¹¹ On all these points see Dr. Faber's work on the Influence of Sea Voyages on the Human Body, and its Value in the Treatment of Consumption, *Practitioner*, 1876, vols. xvi and xvii, and 1877, vol. xix. See also Dr. W. S. Wilson's *The Ocean as a Health Resort*, second edition, 1881. Some notes are likewise contained in my article Zur therapeutischen Verwertung von Seereisen, *Zeitschrift für diätetische und physikalische Therapie*, 1899, vol. iii, Part I.

CREMATION IN GERMANY.—The number of the adherents of cremation in Germany appears to be rapidly increasing. According to statistics recently published there are at present 37 cremation societies in the German empire, with an aggregate membership of 37,600. At the beginning of last year there were only 20 such societies, with a membership of 12,000.