ON THE
ELEVATED HEALTH RESORTS OF THE
SOUTHERN HEMISPHERE.

WITH SPECIAL REFERENCE TO SOUTH AFRICA.

BY

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WORKS on special health resorts, and particularly on those of Europe are almost numberless ; but it is not easy to obtain reliable information regarding the effects of long sea voyages, or about the sanitary conditions of our more distant colonies. Having accumulated a good many facts concerning the Australian and South African colonies I venture to hope that some of these may advantageously be laid before the Society. A collateral advantage of the inquiry is that in studying the meteorology of a large continent like that of Australia or South Africa, in which the disturbing causes are less marked than they are in our own little island, much light may occasionally be thrown on the general question of wind, humidity, and the like.

In making a classification of climates the question of latitude is, of course, of prime consideration, and if side by side with this, the elevation of the district be taken into

account, we arrive at certain conclusions which have been laid before the Society by Dr. Hermann Weber in his interesting communication "On the Treatment of Phthisis by Prolonged Residence in Elevated Regions" (see 'Transactions,' vol. lii, p. 225), in which paper he shows that calculations have been made, based on the bills of mortality, for determining the elevation at which immunity from phthisis may be secured in every degree of latitude.

I pointed out in the debate on Dr. Weber's paper that this spot had reference rather to the isothermal lines than to the lines of latitude. Further than this, and without denying the value of the general principle, it appears that to judge of a place as a health resort with regard only or chiefly to its altitude and its latitude involves a fallacy, inasmuch as these form only two out of many elements which go to make up its climate. The range of temperature in summer and in winter is by no means constant at places of the same altitude and latitude, or even at the same altitude and isothermal position. For the range of temperature in summer and in winter varies greatly in places in these respects similarly placed.

Again, the question of dampness and dryness in winter and summer; of rainfall, and its distribution over the year; these and many others are determined less by the latitude and altitude than by the physical geography of the country and of the site which needs to be studied as regards each place.

Happily we are year by year becoming better informed as to the meteorological state of remote places; and the reports published day by day in the United States, showing the direction and strength of the wind, amount of cloud, moisture, barometric and thermometric readings, &c., cannot fail to lead to very valuable results.

The important matter of dryness or humidity is often influenced and controlled by far distant causes. Thus, the far off Alps, and even the deserts of Africa, affect the climate of Italy by causing the Mistral, Tramontana, &c., and also the nearness or distance of ocean tracts, and whether the preva-

lent winds blow to or from the ocean, and the character of the winds consequent on their being land or ocean winds. Again, within and for many degrees outside the tropics the monsoons and trade winds greatly affect the question of dryness and humidity, and these are influenced by the general distribution of land and water over the globe. There are many places which though elevated high above the sea level are so situated as to be damp and airless, and possess many of the characteristics of low-lying swamps.

It seems then that altitude alone, or even altitude and latitude together, can but form a part of the several conditions which go to make a place fit or unfit to be a health resort.

Let us, instead of comparing places lying on the same line of latitude in the northern and southern hemispheres, compare the places lying on the lines of equal temperature—equal temperature, that is, at the sea-level (see map). We observe that the equator of heat crosses Java, Sumatra, Madras, Aden, Sierra Leone, Panama.

The 68° Ft., isothermal line, N. lat., cuts Beyrout, Malta, Algiers, Madeira, and South Carolina. In the southern hemisphere the corresponding 68° line passes to the northward of Sydney and of Natal.

The line 59° Ft., north, crosses Japan, Pekin, Constantinople, Nice, Pau, Halifax; and 59° south crosses New Zealand, Melbourne, and the Cape.

The assumed line of immunity from phthisis at the equator is drawn at 9000 feet.

For the mean annual temperature 68° Ft. it is drawn at 6500 feet, and for the mean annual temperature 59° Ft. at 5000 feet.

Other lines might have been added, marking different immunity levels, but those shown in the accompanying diagram are sufficient to indicate the general principle involved.

It will be seen that these isothermal lines which are drawn on the map so as to pass through all places having the same mean annual temperature, differ considerably from the lines of latitude, diverging more and more from them as they recede from the equator.

The southern hemisphere, having much less land than the northern, especially in its torrid and temperate zones, has a lower mean annual temperature. Hence, it appears probable that in the southern hemisphere a much lower elevation for each parallel of latitude is sufficient for securing immunity from phthisis than in the corresponding parallel of the northern hemisphere.

It is not the object of this communication to deal with those health resorts available for persons suffering from advanced disease who are unable to bear any exertion or exposure. For such, if home is to be deserted, our own shores give us Torquay, Bournemouth, Ventnor, and Hastings; or if the Riviera can be reached, Mentone, Cannes, San Remo, &c., have each their advantages. The problem where to spend the month of May is really a difficulty, for then it is too hot in the Riviera for health or comfort, in England it is too unsettled, and in Switzerland too cold.

Pau owes its remarkable stillness and softness to the elevated plateau which shelters it from north and east. Its rainfall (forty inches) is half as much again as that of London (twenty-seven inches), but the soil is dry and exposed iron does not rust there.

Rome must scarcely be named as a health resort while fever continues so rife there.

The climate of Algiers, intermediate between that of France and the Tropics, benefits some. The air is pure and cloudless, the twilight short, and there are great diurnal variations. The ground slopes upward from the sea, and there are houses built at a height of 400 feet, having gardens which give shade from the glare of the sun.

Compared with Cairo and the Thebaid, Alexandria is moist and undesirable. The whole of Egypt is dry and bracing,

but too hot and dusty. The expense is also great, three months spent there costing as much as a year in a colony.

The exceedingly dry climate of Sinai and Palestine is certainly of value in many relaxed conditions, but the sand and glare are very trying, and a diurnal variation of 40° Ft. occurs.

Beyrout has a delightfully mild, dry climate ; care is needed there during the short rainy season of January and February, lasting about three weeks and for ten days in November.

At Malta, Corfu, and in Sicily I have had patients who spoke favorably of each.

Central Spain is high, dry, and bracing, but the sudden changes of temperature there are trying, and in its present state of transitional republicanism, it is almost unsafe.

Of the Swiss resorts it is needless to speak, for they have been ably dealt with by many and are scarcely fitted for prolonged residence. Of the salubrity of Arolla (7000 feet) above Evolena, one of the less known mountain stations, I can speak with confidence, six of my patients having there gained great benefit. The climate of the Lake of Geneva seems to illustrate the statement of Sir James Clark that the neighbourhood of fresh water is bad, humidity being of all qualities of air most injurious to human life.

The distance of a health resort from England is not a matter of great consideration, for facilities of locomotion are so marvellously increased that it is as easy now to go round the world as it was at the beginning of the century to visit Spain or Italy. The public is beginning to realise, too, that in a disease of long standing, or in a condition in which hereditary tendency to disease is strong, little permanent benefit can be expected to result from a few months spent in a health resort, and many are now ready to accept the verdict of the physician that two or more years spent in a well-selected climate can alone be counted upon as likely to secure permanent amendment or established health. The depressing influence of being surrounded as at Cannes or Mentone by respirators and Bath chairs is also avoided in our colonies.

So great is the universal testimony in favour of sea voyages that a proposal has more than once been made to take a party of health seekers for a six months' "sanitary cruise" in a first-class clipper. Cadiz, Gibraltar, Malaga, the Canaries, St. Helena, and the Cape of Good Hope being the points mentioned to touch at in the trip. If the invalids could be kept from serious sickness and in good humour with one another, such a cruise might be a success. The vessel must be comfortable and well found in every way. Many instead of gaining have lost ground in consequence of the bad food and accommodation on board ship.

It has been well observed that in going in a sailing vessel through the trade wind region to the Cape, a cabin should be chosen on the starboard side where the comfort of an open port is more often secured during the day than on the larboard side, which is often under water or within reach of the waves.

The cruelty of sending a delicate invalid with afternoon fever and advancing disease on a long voyage cannot be too strongly insisted on (see Case 11 in the Appendix).

The voyage round the Cape (lat. 35° S.) is generally more favorable than that round the Horn (lat. 56° S.), but the Pacific Steam Navigation vessels now go through the Straits of Magellan and thus avoid the storms and risks of icebergs. The trip from Valparaiso to Panama is described as like a yachting cruise, so smooth is the sea and so bright and sunny the surroundings.

The voyage to Madeira or to the Azores is long enough for discomfort, but not long enough to secure the real benefit of the sea. It is not until the Bay of Biscay is crossed that the landsman begins to enjoy life on board ship.

Cape Town, the first place reached, has many advantages to the health seeker. It is, however, subject to violent "sou'-westers." The town lies low by the water side, is confined and badly drained, and very hot from reflection from the Table Mountain (see Case 1 in the Appendix).

Wynberg, about nine miles off on the line of railway, is

very healthy and pretty, with forests of pine, oak, and silver-wood. It is a most desirable place in summer for an invalid, though in winter the whole region is damp and rainy.

Graham's Town (1800 feet) is pleasant, somewhat cooler than Maritzburg in Natal, and with less constant sunshine in winter; the country round is healthy; the society pleasant, and the shops well provided. A medical friend, now at Port Elizabeth, finds the place healthy, though in the classified list of admissions to his hospital almost every known disease is represented. Graham's Town is to Port Elizabeth what Maritzburg is to D'Urban.

Natal lies between the 28th and 32nd parallels of south latitude. It has 150 miles of sea coast, and is 800 miles distant from the Cape. The mail steamers take thirty-seven days, and sailing vessels from fifty to seventy days, in reaching it. It has been described as a series of steps or plateaux rising successively from the sea to the Drakenberg mountains; but it is rather a succession of ridges and depressions, the ridges being each higher than the last as you go inland.

Proceeding inland from Maritzburg the land rises rapidly another 1800 feet, and then declines gently 300 feet or so to the next river valley, that of the Umgeni, and then again rises rapidly more than 2000 feet, until at seventy miles from the sea it is about one mile high. This elevated upland offers a good illustration of what has been said above. The warm moisture-laden breeze, blowing very commonly from the south-east, impinges on the rapid slope of the highland, looking south-east. The air is suddenly cooled, and at once part of its moisture is condensed and deposited on the rising slopes of the hill as cloud or mist. But, on proceeding a little further inland you leave the mist behind, the air is again clear, and the sky bright. This frequent deposit of mist and cloud upon the seaward mountain slope determines the speciality of its climate, as compared with that which is found a few miles further inland on the same plateau. It is thus that the so-called "Table Cloth" is

formed upon "Table Mountain," near Cape Town. A white cloud rests upon the top of the mountain, and hangs down over the edge of the precipitous sides, somewhat like a table-cloth, while all around the sky is bright and clear.

The leading peculiarity of the climate is that in winter it has almost constant sunshine and little rain, with abundant rain and cloud in summer, so that the mean temperature of the winter is agreeably raised, and of the summer depressed.

At Maritzburg the mean winter temperature is 60° , and summer 69° , for the whole year 64.7° ; that of the coast being 4.5° higher.

The hot land-winds often raise the temperature to 85° or 95° , but these winds are followed by rain, and are less trying than the hot dusty winds of the Australian Colonies, which render exertion in the open air very trying and difficult.

The accompanying table, prepared by Dr. Mann, shows the average rainfall at Natal, which has been placed in parallel columns with that of London, Melbourne, and Rome.

Mean rainfall for a year at—

	London.	Melbourne.	Natal.	Rome.
January . . .	1.56 ...	1.36 ...	3.56 ...	3.62
February . . .	1.45 ...	0.95 ...	4.33 ...	3.38
March . . .	1.36 ...	1.60 ...	3.11 ...	4.52
April . . .	1.55 ...	3.13 ...	1.40 ...	2.95
May . . .	1.67 ...	3.67 ...	1.02 ...	1.89
June . . .	1.98 ...	2.41 ...	0.12 ...	0.11
July . . .	2.44 ...	2.18 ...	0.25 ...	1.18
August . . .	2.37 ...	3.61 ...	1.12 ...	3.58
September . . .	2.97 ...	3.27 ...	1.16 ...	9.37
October . . .	2.46 ...	2.54 ...	3.97 ...	4.13
November . . .	2.58 ...	4.27 ...	4.78 ...	4.08
December . . .	1.65 ...	1.86 ...	5.21 ...	4.01
Total for year . . .	24.04 ...	30.85 ...	30.03 ...	42.82

It will be seen that in Natal the chief rainfall is in summer, *i. e.* the months of November, December, and January, and it is in this respect especially that Natal is superior to the

Cape Colony, in which the summer is dry, and the winter rainy.

Among the Kaffirs, strumous and phthisical conditions are much less common than among the English poor. The medical men of the colony, who have reported on the subject, all speak of the remarkable immunity from these diseases among the English residents, and imported disease becomes latent in a large proportion of cases. The climate is certainly conducive to the longevity of those who come to it in middle life. The mortality among young men is (as in all colonies) somewhat large, but this is attributable to the rough life and unsettled habits of many colonists.

The Rev. Dr. Callaway's Mission Station at Springvale was selected by him as a specially salubrious spot, and in winter it has all the requirements of a health resort. He has a branch establishment at "High Flats," about 1000 feet higher, for the summer's residence of invalids who may be under his care. He has proposed to build a commodious sanatorium, where well-to-do invalids, besides the poor Kaffirs, could be under his skilful treatment. A grant for its maintenance is under the favorable consideration of the local government.

Springvale appears somewhat too near the coast, and its elevation (2500 ft.) is not quite so great as one would desire. Still there can be no doubt of its salubrity during the winter months.

The geological formation* of the Town Hill, behind Maritzburg, consists of sandstone and shale, containing coal, wood, and reptilian remains, but the "Table Mountain Sandstone," which is supposed to be Silurian, is met with on the coast and intervening ridges, overlying granite, gneiss, or porphyry. The town of Maritzburg is built upon shale, broken around by sandstones and dykes of trap. The special "plateau" character of the country is due to the extensive presence of the Table Mountain sandstone, which always occurs in horizontal beds. The Free State and whole

* See coloured section in Griesbach "On the Geology of Natal," 'Quart. Journ. Geol. Science,' Dec. 1870, vol. xxvii.

interior of South Africa consist of limestone intersected or covered by amygdaloid deposit.

The country about Maritzburg is healthy, and well suited to delicate people; the air is drier than on the coast, and the evenings cooler, but the moist influence of the Indian Ocean is still felt over much.

The country between Maritzburg and the Mooi River Hills is even more remarkably healthy. White people work in the open air, very much as in England, without suffering. This is far from being the case on the coast lands. The alternations of temperature, however, at all seasons, and the sudden changes from wet to dry in summer, as the sea or land winds prevail, are apt to try persons of weak nerve or irritable mucous membrane. An alternation of temperature amounting to 40° Ft. in the twenty-four hours is no uncommon occurrence.

The temperature of the narrow strip of tropical coast land is from 5° to 10° above what might be expected in that latitude, owing to the influence of the Mozambique current—the “African Gulf Stream.” Healthy people thrive on this tract, which is free from epidemics, but weakly ones find it wearing and relaxing, remittent fevers and biliary derangements being not unfrequent.

The coast lands at the northern border of Natal are subject to a form of low fever, probably due to bad water. The fever becomes more frequent and more virulent as you go northward into Zulu land. The peculiar entozoon (*Hematobium Capense*) described to this Society by Dr. John Harley specially flourishes there as it does in Mauritius, where the climate is very similar.

The greater part of Natal may be considered as somewhat too relaxing for a perfect climate.

Owing probably to the rapid changes of temperature just referred to, and to the amount of evaporation going on for the greater part of the year, biliary derangements are common, but rheumatic affections are benefited, probably by the free action of the skin. The climate is good for persons with complaints of the throat and chest, those liable in England

to bronchial affections being here surprisingly free from them. (See Cases 5, 6, 7, and 9.)

It appears, on the whole, better suited to *poitrinaires*, to borrow a French word, than to other classes of invalids.

During the winter may be seen the often snowy tops of the distant Drakenbergen. These mountains, which form the broken edge of the whole of the plateau of Southern Africa, rise here and there to a height of 9500 feet, the general ridge is between 5000 and 6000 feet, one peak being 12,000 feet high. Taking a course irregular, but, on the whole, nearly parallel to the sea coast, they shut in the lower lands of Natal and the adjacent territory, as with a gigantic wall, buttressed with its offsets.

Travellers describe the sudden change in descending in summer time from the great plateau beyond the summit of these mountains into the steaming region below. The portion of the plateau immediately beyond the north-west frontier of Natal is called the Free State, or the Orange River Republic, and it is to this region that I would now refer.

Of the moisture which is carried inland from the Indian Ocean by cloud and wind a very large proportion is intercepted by the series of slopes and high ridges which lie between the main chain and the ocean. Of the remainder a still further portion falls upon the slopes of the Drakenbergen. The residue has to supply the wants of a vast space of territory lying beyond the main chain towards the Atlantic Ocean, a distance of many hundred miles. Such results as we might expect from a consideration of these data are found to exist in fact.

If we draw a line from the heights of the Drakenbergen towards the interior of the great continent, we have first the Free State, a dry, pastoral country, with few rivers, and these swollen only at uncertain intervals—devoid of timber and forest, with clear sky and bracing air. Passing north-westward beyond the Free State the climate becomes yet drier and the land more sterile, till we reach at length the

rainless, and utterly arid, barren country of the interior towards Namaqua land.

A theory has been developed by Mr. Shepstone (Secretary for Native Affairs in Natal) to account for the formation of the Central South African table land. This plateau, it is thought, was at one time a vast inland sea, surrounded by the Drakenberg and other mountain chains. Upheaval has occurred at some distant period, and the waters have been disgorged through the Limpopo and the Orange River.

The point, then, to be sought in this long reach of country is that at which neither humidity nor dryness is extreme. We believe this point is to be found somewhere near the capital of the Free State.

The average elevation of the whole Free State is about 5000 feet above the sea level.

Bloemfontein, the capital, was built and laid out by the African-Dutch Boers, and has long straight streets, and abundance of gardens and watercourses. A few years ago there was much difficulty in obtaining suitable provision for an invalid (see Case 9 in Appendix), but the increased and increasing prosperity which has followed in the wake of the diamond discoveries has improved all this, and when the long journey in ox waggons is superseded by the now hoped-for railway, we may expect that this almost inaccessible region will be brought within the reach of a class of invalids to whom it is at present closed.

The climate of the Free State is extolled by all as exhilarating and health restoring. Many go there from the Cape and Natal by the advice of the local doctors, and, as a rule, return to their less bracing homes greatly invigorated.

The diurnal variation of temperature is not so great in the Free State as in the Engadine. Snow and frost are very exceptional. It has been maintained by Dr. Burney Yeo that a short stay in an elevated resort is better than a prolonged residence there. This, though probably true as regards the Swiss mountains, is not so in the South African table lands at the same elevation.

The country slopes gradually from Bloemfontein, which

seems to be the most eligible part of all South Africa for those suffering from chest complaints and general debility, to the junction of the Orange and Vaal Rivers, and the tract occupied by the diamond diggers. Grass gives place to prickly shrubs, clay to sand and chalky lime. The climate here is excessively dry, and in summer overpoweringly hot : by day ranging to 100° F. in the shade. The nights, however, are on account of the elevation comparatively cool, and there is generally a lively breeze.

For all who are not obliged to live in a canvas town of 40,000 inhabitants, reeking with sewage and other garbage, and nourished on beefsteak and rum, the climate is very salubrious, especially in the winter, and many derive benefit from six months' sojourn under canvas ; there is, however, some risk of fever, due to the tainted air and water of the camp rather than to the malaria of the climate.

India, with its wonderful mountain ranges, affords many elevated health resorts, which are now accessible even to English invalids.*

The finest ships in the world are now running from England by Suez to India in from twenty-five to thirty-five days, and there are railways to the foot of the hills. There cannot be a greater contrast than between the climate of the hill stations of India and that of England. The climate is in the highest degree stimulating, like that of Australia, and many invalids who have friends in India may naturally incline thither rather than to the Australian and South African colonies. The attendance of a good Indian servant may partly make up even for the absence of friends, as the devotion of a native " boy " to his master amounts almost to idolatry, whereas in a colony the difficulty of obtaining a tender and devoted servant is often very great.

It is only in a meteorological sense that any part of India can be regarded as belonging to the southern hemisphere. It will be seen on referring to the map that the line of equatorial heat passes north of Ceylon and of South India.

* See the recent articles by Dr. Druitt in the ' Med. Times and Gazette,' June, 1873, pp. 580 and 634.

The chain of the Himalayas is to the northward of this line, and only a passing allusion must be made to Dalhousie and to Darjeeling, the elevated health resorts of the Calcutta invalids, where the peculiarity of the climate is its remarkable equability of temperature. A friend, who kept a registering thermometer in his verandah, tells me that for four months he never registered a higher temperature than 64° or a lower than 62° ; summer and winter being equally unknown. There is, however, much fog and drizzling rain. The average rainfall is 140 inches.

Chillong is the newest popular health resort in this part of India, but is very inaccessible.

The difference in the rainfall of the various hill resorts of India is striking. In one, Cherapongy (lat. 24° N.), the rainfall is from 600 to 800 inches, whilst at Chenar in the Punjab (lat. 34° N.) it is only four inches.

The Neilgherries, lying south of the equatorial heat line, rise abruptly from the plains to a height of from 6000 to 7000 feet, the highest point being 8760 feet.

The foot of the hill may be reached from Madras in fifteen hours by railway, and in half an hour after leaving the station, whether you travel in bullock waggon or palanquin, you escape from the heat of the plains. From Bombay coasting steamers go to Bypoor, whence the railway takes passengers to the foot of the hills.

The Suez route to India cannot be recommended for very sensitive invalids (see Case 2), and the voyage round the Cape is as long as that to Australia; indeed, the Australian coast is often sighted before turning northwards to Calcutta or Singapore.

Ootacamund, the principal station of the Neilgherries, is at the centre of the table land (7400 feet elevation) and quite European in climate and scenery. Heavy rains occur during the monsoons (July and August), 400 inches being a frequent annual rainfall. At Conoor, a few miles off (elevation 6400 feet), there is but little rain, cloud, or mist. In this latitude fever range is calculated to be at 4500 feet elevation. The whole of the Neilgherry range is therefore much above this. The

base of the hills is surrounded by dense jungle from six to twenty miles wide, and extending 2000 or 3000 feet up the side of the hills. There is then an open space a mile or two wide, and above this again woods like those of temperate climates. There are swamps at the summit, but no miasma. In the hottest part of the year clouds prevail, and there being no snowfields, as in the Himalaya range, this climate is very equable.

When the Neilgherries were first resorted to many English lost their lives, rapidly fatal inflammation being set up by exposure, the contrast to the low lands being too great, but with caution this risk may be avoided. The healthy appearance of the residents is a striking evidence of the salubrity of the climate.

Newera Ellia, the sanatorium of Ceylon (5000 feet), eighty miles from Kandy, the capital, is much resorted to from Calcutta and Bombay, especially by ladies with pulmonary complaints. It is, however, difficult of access, and the cost of living in proportion to the comfort obtained is great.

Immediately above Penang there is an elevated sanatorium which may be reached in about two hours from the port.

As regards the climate of Australia great diversity of opinion has prevailed, and an angry controversy has been raging in Melbourne on the subject. The climate, speaking generally, is highly stimulating owing to the prevalence of ocean breezes. There are no lofty mountain ranges, and really elevated health resorts are wanting.

Western Australia is superior, as regards general salubrity, to the other Australian colonies, and efforts have been made to establish a sanatorium there, but a prejudice exists against it owing to the fact that it was made (in 1851) a penal settlement. In early chest disease the effect of the climate has proved in three instances that have been brought under my notice strikingly beneficial, but advanced cases are rapidly hastened to a termination. Heart disease is reported to be very common.

Adelaide in South Australia is dry and dusty. Its rainfall is twenty-one inches, but Mount Lofty (2000 feet) behind the

town is dotted with suburban villas which are both pleasant and healthy.

Melbourne itself is hot and dusty. The large mortality from consumption in the town is attributed by Dr. Thomson, in his work on the Victoria climate, to the fact that much of the town is built upon swamps.

Some of the up-country stations are cooler than the town and very healthy. Parts of Gipps' Land are elevated and salubrious.

Sydney is bright and pleasant in winter, but decidedly too hot in summer. The climate is dry, though the rainfall is fifty inches. The soil is sandy, and the hot sirocco-like winds are very trying. The hurricanes from the south, which are called "southerly busters," and from the dust they bring, "brick fielders," are very trying to sufferers from chest disease.

The mean annual temperature is 65° (London 58°), that of the summer being 74° (London 60°), and of the winter 55° (London 37°).

Goulburn and Bathurst stand high (nearly 2000 feet) and are bracing. People come thence into Sydney with ruddy cheeks. The Murray and Murrumbidge regions supply a fine race of squatters. Betchworth, the capital of the Murray river district, is 1750 feet above the sea level.

A two hours railway journey from Melbourne brings the traveller to Kyneton or Woodend (height 2000 to 3000 feet). Ballarat is 1500 feet, and much sheltered. The Darling Downs (2000 to 3000 feet) afford a splendid summer climate. Judging from the sensations of travellers it would seem that an elevation of 3000 or 4000 feet affords as invigorating an influence as is to be gained at twice the altitude in the northern hemisphere at a corresponding parallel of latitude.

Queensland, though somewhat hotter, is much like Natal in climate. The wet season coming in summer produces the steaming tropical heat which gives rise to rank and luxuriant vegetation, and a form of colonial fever, ague and dysentery combined, not unlike the fever of Zulu land, is often met

with. Still, as sheep thrive there it is evident that there are tracts in the colony of Queensland where other characteristics prevail.

On comparing the climate of Victoria with that of Natal, while the mean temperature appears to be much the same, a very important difference exists between the two climates, viz. that in Natal the wet season occurs in summer, in Victoria in winter. The result, so far as the lower animals are concerned, is, that the Australian climate is more favorable to health than that of Natal, and the same is possibly true as regards human life. This conclusion is not, however, so evident as might appear at first sight, for an effect of the rainless winter is, that in Natal the grass is most scant in cold weather when it is most needed.

The Natal winter is, on the whole, more healthy for invalids than summer or winter in Victoria, and the Victoria summer probably more healthy than the summer in Natal.

The climate of Victoria taken altogether is drier (and probably hotter) than that of Natal. Vegetation shows this. The blue gum tree of Australia increases in height and bulk more rapidly than in its own country.*

In Australia, South America, and in the Swiss mountain resorts deaths from acute diseases or catarrhal fever, pneumonia and pleurisy, are very common, while those from chronic diseases, and especially consumption, are rare. The contrast between the prevailing maladies of England and Australia, being similar to that pointed out by Dr. King Chambers as existing between the English and Italian diseases,† we find that diseases dependent on degeneration of tissue are as rare in Australia as in Italy.

In the Northern States of America phthisis is very fatal and frequent, whereas in the Southern States it is rare, while pneumonia and bronchitis are very common.

Tasmania or Van Dieman's Land has a very delightful sunny climate. The weather is variable, though less so than

* See Dr. Callaway's 'Report of Spring Vale.'

† *Vide* his 'Climate of Italy,' p. 47.

in England, there being no sudden extremes of temperature. English comforts are cheap and abundant.

At Hobart Town the sea breeze is sometimes strong, though it does not last long (see Case 12), and may be escaped on going inland.

The Tasmanian climate has a great and well-deserved reputation as a health resort for broken-down Anglo-Indians.

It is a very exciting climate, and many sudden deaths occur to persons in the prime of life.

Dr. Bird, in his work on the 'Australian Climate,' speaks of Launceston as the Pau of the southern hemisphere. Its situation is, however, low and swampy.

There are no *really* elevated towns or villages in the island. The Tasmanian mountains do not rise higher than 3000 or 4000 feet.

New Zealand, on the other hand, is very mountainous, some of its peaks rising to 14,000 feet. These are snow clad, and have extensive glaciers. Being like the Sierra of Spain there are no elevated table lands or settled accommodation for invalids in the uplands, *i. e.* above 3000 feet. The islands extend from latitude 34° to 46° S., and the varieties of climate are naturally great. South-east winds prevail, and the climate is generally bracing.

Wellington, lying on a point between the two islands, is perhaps the most windy place in the world (see Case 7).

The climate of Cook's Straits is very salubrious, and Nelson lying in its sheltered bay, has a charming climate. The unvarying character of the climate makes occasional change desirable.

Auckland, the capital of the Northern Island, a cheap and prosperous district, is moist, warm, and relaxing, but with boisterous winds. Although strong, the winds are usually 2° or 3° warmer than the atmosphere generally, and, owing to the absence of neighbouring deserts, there is nothing like an east wind to be met with.

A medical friend, who for a quarter of a century has been settled in Canterbury district, describes the climate as tem-

perate and delightful. He has all the consulting practice of the neighbourhood, but the place is so healthy that except in the treatment of accidents (he has himself broken seven bones and his daughter two) he has little or nothing to do.

Slight earthquakes sometimes occur. Speaking generally, Otago and Auckland have too much rain, and Canterbury and Wellington too much wind.

The elevated South American health resorts are too numerous to mention. Each important town of the Pacific shore has its elevated sanatorium.

Though some (as Arequipa) are very cold, others are spoken of with great praise, and doubtless have many advantages over the hot and crowded ports below. The country is highly volcanic, and exposed to frequent earthquakes, and in many parts the government is neither stable nor satisfactory. There are few English doctors and, indeed, few persons speaking English there. Rain seldom if ever falls, and there is no dew. Cultivation is entirely dependent on irrigation, the water arising from the melting snow on the Andes. As seen from the sea, much of the coast is thoroughly barren and without any sign of vegetation.

Piura above the port of Payta in Peru (lat. $5^{\circ} 9' S.$), has a wonderful reputation especially in cases of chronic syphilis.

At Lima, on the equator, removal to the mountain health resorts (9000 to 12,000 feet above the sea level), is regarded as preventive and curative of hæmoptysis and phthisis (Archibald Smith). In the dry climate of the West Coast of South America, the deaths due to drink are very numerous; the water drinkers dying of dysentery and the spirit drinkers of delirium tremens.

Having had full information from a number of different sources, it has been possible in the foregoing paper to compare observations made, and opinions formed in the various parts of South Africa and Australia; whereas the information obtained from the other countries, and especially with regard to the South American elevated health resorts, has been of a less complete and detailed character.

Cases of recovery from lung disease in the various stages and varieties are happily to be met with under all circumstances and at every place. Among hospital out-patients subjected to conditions little favorable to such a result, it is easy to select many instances of regained health even from advanced disease, and among the in-patients at a hospital such likewise occur, so that the description of instances of phthisical disease undergoing arrest and ultimate recovery under altered climatic conditions could only prove that what is true of hospital out-patients badly housed and fed is true also of those who have travelled the world over in search of health.

It seems useless, therefore, to append full details of one or two cases, nor have the number of cases under observation been sufficient for a statistical table giving the percentage of recoveries to attacks in different countries.

The impression that a larger proportion of those who go to the colonies with chest disease do well than of those who remain, is strong in my mind as in that of most authorities on the subject. Yet this opinion may be strengthened by the fact that the cases that go out at our bidding are carefully selected, that those who go out against our will and notwithstanding our warnings rarely write to confess their error, nor are we always informed when death occurs.

The following cases, though too meagre to be of much scientific value, may not, it is hoped, be altogether devoid of interest, as being the grounds on which the general results of this paper have been built.

APPENDIX.

CASE 1.—*Chronic phthisis ; life at the Cape useless ; voyage out and home injurious.*

A pianoforte toner, æt. 35, first seen September, 1869. Complained during the last twelve months of occasional cough with frothy phlegm and streaks of blood. A tall, fair, anæmic-looking man ; tongue white and dry : fauces granular and congested ; chest sounds normal ; weight 8 st. 11 lbs.

April, 1871.—Cough frequent and sputa scanty ; digestion disturbed ; weight 8 st. 4 lbs.

On examining the chest, breathing on the right side feeble throughout, with conducted heart sounds and crepitation at the apex. Left side, breathing blowing (compensatory).

May 4th.—Symptoms relieved under cod-liver oil, good diet and counter-irritation. Respiration still feeble on right side with crepitation at the apex. Left England in August in a sailing vessel (500 tons), caught cold in the Channel and never lost it. Landed at the Cape worse than when he started. Soon after landing had diarrhœa, the town being badly drained, and quickly lost ground. He then went to Wynberg ; this proved wet and did not suit him (he now regrets that he did not take a little house there in a garden), so was persuaded to go up to Beaufort,* as being the driest place near. He bought a cart and mule and drove up there in seven days. Beaufort (3000 feet elevation) proved to be very dusty ; it is situate in the bed of a river. Although windy it is less so than Cape Town. He remained there ten months ; food was insufficient, but he gained flesh. The place was so dreary and monotonous that the doctor advised his return ; he got into a waggon and drove down in three days and three nights to the Cape. There he remained a month and gained somewhat though he had diarrhœa and liver disorder. The voyage home in the “Celt” (2000 tons), Union Company Steamship, proved rough and food bad.

On arrival he was much emaciated. Pulse 120 ; sputa copious, hawked up with difficulty and with some laryngeal discomfort.

Physical signs.—Right side dull, flat ; conducted heart sounds and impulse ; crackling crepitation to base. Left side, blowing upper lobe ; fine crepitation base.

Remarks.—In this case the disease was not advanced or extensive on leaving England, but it developed uninterruptedly in the colony. The patient lacked the energy and self-reliance necessary for “roughing it” in a new country.

* Some details about Beaufort, &c., are given in the ‘Lancet,’ “The Sanitarium of South Africa,” pp. 63-4, July 12, 1873.

CASE 2.—*Phthisis; second stage; extensive disease; arrest in Natal.*

A publican, æt. 25, first seen in September, 1867. Cough two years, following severe cold, caught from getting feet wet after a ball; hæmoptysis a month ago; sputa copious and hummular.

Physical signs.—Right side normal. Left flattening, dullness, *bruit de pôt fêle*; gurgling at apex; no natural vesicular murmur; rhonchus and crepitation throughout the lung extending nearly to the base. Pulse 100; tongue white; weight 9 st.; height 5 ft. 8 in. Improved under beefsteaks three times a day, cod-liver oil, nitric acid, and Lint. Tiglii.

March, 1868.—Weight 9 st. 7 lbs.

Physical signs.—Left side dullness; humid crepitation; bronchial breathing; bronchophony; crepitation to base. Cod-liver oil continued, ordered horse exercise.

On April 8th he went to Natal, which he reached in a sailing vessel (500 tons) in eighty-two days; enjoyed the voyage; got daily better; coughed less; gained 7 lb. in weight (10 st. 7 lbs.); arrived June 31st. Spent two months at Durban (Royal Hotel, very good); but cough continued.

On his return, October 26th, pulse 84.

Physical signs.—Right side, respiration blowing; left, dull upper third; dry crackling râles mixed with vesicular respiration; slight sibilus with vesicular murmur in supra-scapular fossa; slight, coarse, crepitant râles nearly to base behind.

Dec. 2nd.—Troublesome cough and catarrh. Physical signs unchanged. This patient writes that he is now free from cough.

CASE 3.—*Early phthisis; sea voyage; Cape Town and Natal; cure.*

A banker's clerk of delicate family; sister phthisical; at age of twenty-two began to lose flesh and colour, and in the winter had cough with sago-like expectoration containing

coils of lung tissue, occasional streaky hæmoptysis; red streaks on margins of gums; slight dulness on percussion at left apex, with wavy inspiration. A sea voyage being recommended he went to the Cape in one of H.M.'s frigates, improved on the voyage and at the Cape; remained three months at Natal, where he gained flesh and strength and was able to bear exposure to all weathers. The voyage home established the benefit gained.

On examining the chest, wavy breathing beneath the left clavicle is the only noticeable sign of lung affection.

Returned to the bank, in which he is now partner. Has married and has three rather delicate children; he looks thin and pale, but never complains of serious illness, and has not consulted me nor, I believe, any one else, for years.

CASE 4.—Consolidation and softening of lung; sea voyage round the Cape and sojourn at Natal useless; death.

A clerk, æt. 25, in wholesale tea trade; small and of delicate build. Father asthmatical. First consulted me in September, 1871.

History.—Cough sixteen months; increased when in the Isle of Man, where he had hæmoptysis to the extent of half a pint; streaky hæmoptysis since; night sweats; has recently lost flesh; tongue pale; complains of sickness and flatulence; no afternoon fever.

Physical signs.—Right side blowing; left, slightly dull at base and apex, with conducted cardiac sounds; crackle on cough and on deep inspiration beneath clavicle.

Sea voyage to Sydney or Natal proposed.

In October there was some bronchial breathing besides the crackle in the subclavicular fossa, with flattening and diminished movement.

Nov. 9th.—Left England for Natal in a sailing vessel, the "Umzinto" (400 tons), pleasant people on board but food coarse; was nine weeks going out, caught cold, and was much depressed. Landed at Durban, found it very hot;

ordered up to Richmond (sixty miles) ; found it frosty ; was never hopeful ; got steadily worse and died suddenly from diarrhœa in July, 1872, six months after his arrival.

Remarks.—In this case disease seems to have advanced during the voyage, and was, perhaps, making insidious progress before he left England, but there was no elevation of temperature and it was hoped the open-air life on board ship would have done much ; the food, however, was not good and no rally was made from first to last.

CASE 5.—*Chronic bronchitis and emphysema ; freedom from acute bronchial attacks ; but deterioration of general health in Natal.*

Architect, æt. 56, when exposed to the glare of Egypt, thirty-two years ago, suffered from conjunctivitis, which has proved a trial through life. Went to Australia in 1849, lived in Victoria four years, enjoyed good health on the whole, but suffered from glare and dust. Returned to England in 1854, found climate trying, and determined to emigrate to Natal, where he lived sixteen years, during which time he narrowly escaped sunstroke ; suffered from eczema capitis, and deteriorated physically. Had dyspnœa on exertion, but rarely cough or expectoration. Came to England in 1858, when he was very subject to catarrh and recurring bronchitis on slight exposure. Much emphysema ; chest dilated, and moving *en masse*. Rhonchus, sibilus, and prolonged respiratory murmur all over.

Examined by Dr. Andrew Clark, who diagnosed chronic fibrous involvement of lung. Being unable to bear the English winter returned to Natal, where he again became free from bronchial attacks, but the dyspnœa never left him, and the somewhat enervating effect of the subtropical climate of Richmond (3000 feet elevation) seemed further to deteriorate tissue.

In England there is much rheumatic sensitiveness, less in the colony, though in the summer rains, when the air is full of moisture, he suffers somewhat. Now in England again, the

emphysema with perpetually recurring bronchial attacks and constant wheezing continues. The blood is so imperfectly aerated that much effort, physical or mental, leads to headache and oppression. The extremities are cold, and there is great sensitiveness of skin to draughts, cold air or cold sheets, also to damp. The digestion is feeble, owing probably to poverty of blood, and power of locomotion small, especially in cold weather.

When bronchial congestion exists, paroxysmal asthma or asthmatic and useless cough is frequent.

Italy with its bright sunny climate suits well for some months of the year, and the waters of Ems had a favorable influence on the chronic digestive disorder which is little amenable to drugs.

In this case the Natal climate certainly holds in check the bronchitic tendency, and allows of much general out-door exercise, but it is possible that it has exercised an unfavorable influence on the tissues, such as is usual in tropical or subtropical countries.

Remarks.—The voyage to and from the Cape had a decidedly favorable effect, bronchitis ceased, and difficulty of breathing lessened, though the latter returned on re-exposure to land influences. This good effect of a sea voyage is remarked by most consumptive patients as real and certain.

CASE 6.—Phthisis, first stage; arrest in Natal coast lands.

Rev. G. H—, æt. 30, always delicate, obliged to leave his curacy in north of England, and after two or three attempts to return to clerical duty in England went to Natal suffering from established lung disease. (I did not examine him at this time.) Much benefited by the voyage. Settled at Durban, the port, where he has ever since been able to accomplish hard work though the climate is often very hot. When in England last year had not lost his pale, thin, delicate aspect, but all trace of active lung mischief had gone. In England he was obliged to be very cautious of

exposure to night air, but in the colony took no special precautions.

He has married and returned to active life in the colony. Somewhat improved in general tone by a year spent in a temperate climate, though the lung sensitiveness seemed to be again developed when in London.

The last reports of the patient are unfavorable.

CASE 7.—Bronchitis and spasmodic asthma ; bronchial attacks absent in coast lands of Natal.

A missionary clergyman with asthma and general bronchitis, able in the coast lands, the hotter part of the Natal colony, to work for thirteen years at clerical duty, but when in England he suffered so frightfully from recurring bronchitis and perpetual paroxysmal asthma that it seemed doubtful whether he could safely undertake the voyage out.

But since his return he has been able to prosecute his duties, although when in England his appearance—rounded shoulders, gasping breath, with loud rhonchus, sibilus, and prolonged expiration all over the chest, with heart pulsating forcibly in the scrobiculus cordis—made the idea of work impossible.

Another missionary clergyman, an M.D. once well known at Bartholomew's Hospital, was obliged to leave practice in London on health grounds (early tubercular phthisis). From the time he landed at Natal he has been able to work hard and bear much exposure without any return of hæmoptysis or chest symptoms.

CASE 8.—Phthisis, second stage, with hæmoptysis, thrice arrested in Natal and recurring in England.

A banker ; phthisical parents ; had cough, hæmoptysis, much loss of flesh, and after two or three trials was obliged to give up work at the bank. Went to Natal, but was so critically ill that it was doubted whether the voyage could be safely attempted. Rallied much at Natal, improvement was rapid, and in eight months he came back well in his own

opinion, but on returning to the office the old symptoms returned. Went a second time to Natal with like results, accepted post of bank manager there, and after five years of health, came to England on bank business, but in a week was seized with severe hæmoptysis.

I then saw him for the first time, and found evidence of old disease in a flattened chest on one side, and on the other the physical signs showed the presence of recently effused blood. The progress made in England was slow; as soon as possible he was again on board ship; before reaching Durban he felt nearly well, and now reports favorably, though he has made up his mind that he can never safely return to England.

CASE 9.—*Chronic phthisis, arrest in Natal, return in England; second arrest in Free State; death.*

This case, which illustrates many points alluded to in the foregoing paper, is more fully detailed than the others.

An architect, æt. 21, always weakly; of delicate family. Exerted himself much in stopping a runaway horse, and immediately spat up about a pint of florid blood. Hæmoptysis twice recurred afterwards. Cough commenced from this time, with muco-purulent, occasionally streaky phlegm; night sweats and loss of flesh. Spent the winter of 1862-63 in Ventnor with slight benefit. I first examined his chest in September, 1864. Expansion and resonance good; voice loud on right side; respiration wavy and tubular left. Went to Natal and improved, but did not lose cough; got "jungle fever" when living in a tent during the wet season, and afterwards got tænia and a small flat worm.

When he returned to England the breathing at the left apex was rough and sibilant, and some dulness was detected at the left base, with sibilant and coarse crepitant sounds. Tapeworm removed (head and 20 ft.) after starving twenty-four hours, and then taking ʒij of oil of male fern.

In London, cough so violent and spasmodic that Hastings was tried, and as winter approached, Cannes. The journey to the Riviera tired him much, and the vicinity of the Medi-

terranean prevented sleep; but on retiring to the hills behind the town sleep became possible. In December reported, "Cough and sputa less; appetite good; digestion 'first rate.'"

May, 1867.—Caught cold on the Rhine, with increased bronchial mischief; and such was the craving for Natal sunshine (almost all who have lived in Natal feel that) that the patient determined to return to it. The voyage out lasted seven weeks, and did good; so did Maritzburg; but being advised to take the journey to the Free State, he bought a waggon and started thither.

The journey occupied twenty-four days, and the patient evidently had not strength to undertake it safely; sometimes he could get no food for twelve hours, and once had to go for twenty-four hours with nothing but a rusk and a cup of tea. He described his experiences thus:—"Country very barren; grass withered or burnt up; not a vestige of a tree. Heat in the middle of the day intense; cold at night intenser; yet I never took cold, and if I could have eaten more should have got well."

When at Bloemfontein he wrote—"The air is purity itself; when recovered from the fatigue of the journey I shall pick up fast; my strength is increasing daily. I never cough, except a single fit in the morning. This is a land of extremes, dry weather comes so that your nails crack; the air is hot, close, and motionless, or there is such a wind as to carry you off your feet; the rain comes down in torrents, flooding the rivers and drowning the mail cart and horses."

February 2nd, 1869.—"A change is rapidly coming over my life; health is again improving, and to a more considerable extent than for three years past." A week after this note the patient had an acute inflammatory attack, which lasted till May, when the appetite returned and the cough ceased.

June 22nd.—He notes, "Weather wintry, am glad of warm clothing, and sit over the wood fire. For two days the wind has been blowing a perfect hurricane; the dust affects my chest much; these winds are due in August and September."

July 7th.—“Now the weather is indescribably magnificent; mornings and evenings cool, but the days are glorious, warm, sunny, with an atmosphere unsurpassably breathable, and yet I cough on till sick daily.”

September.—“Weather really hot; the warmth has done wonders for me.”

October 18th.—“Temperature 90° F. in the morning. Health improving.”

January, 1870.—“If a dry climate can ever cause my lungs to heal or arrest the disease, here I shall be successful; but will the inconveniences not counterbalance all these good effects?”

February 8th.—“We have had a ten-days’ deluge after a terrible drought; when the rain comes the whole country becomes green in three days. If at a farmhouse I might get better, but in town one can get something to eat; whereas at a farm you get bad bread and tough mutton, and nothing else.”

The last note, made a few days before his death, is this—“Day follows day without a shade of improvement, and the heat is most fatiguing.”

Remarks.—As the disease in the lungs was in this patient both advanced and extensive, recovery could not be looked for. Nineteen months were spent in Bloemfontein in comparative ease from cough. The great trial was separation from friends and a felt inability to live among them. The patient was exceedingly sensitive to climatic changes, and certainly was unfit for the vicissitudes of a month’s waggon journey, but that he survived this and lived so many months is a striking evidence of the salubrity of the climate, and shows that the open-air life, with a fur-lined bed to retire to from sun and wind, is less trying than might be supposed.

From this patient I received many details of analogous cases to his own. Two young men left England in the same ship, both consumptive, and seemingly about equally ill. One remained near the coast, and at first made progress, but soon relapsed and died in fifteen months. The other gradually rallied at Bloemfontein, was eventually able to dispense

with furs and wraps, became a hardy settler, returned to England, married an heiress, and went back to live in the region that brought him health.

The arrangement of a bullock waggon is laborious, and the cost considerable. Kaffir "boys" are often very troublesome, cattle get lost, the waggon, perhaps, sticks in a river or drift, and there is much risk of exposure. With a well-organised team, however, the waggon goes smoothly on its way, and the invalid may lie in bed for days with a pleasant view of the country from his rocking couch, with books, maps, and comforts around him.

CASE 10.—*Threatened phthisis; life in Natal and Free State; well.*

A. B—, æt. 19, a tall youth, with soft skin, easily perspiring, and easily tired; lost three brothers and two sisters from lung disease. Consulted me in September, 1870, to ascertain whether he had any tendency to consumption. He had a soft pulse of 84, was prone to catarrh from exposure to night air, and slow to throw off colds. I could detect no decided chest mischief, but advised a voyage and colonial life.

Went to Natal, and subsequently to the Free State to an ostrich farm, but got moped in the absence of all society. Very happy at Maritzburg, and on his return home in autumn of 1872, a sturdy, vigorous, powerfully built colonist, determined to go again to Natal to settle as a silk farmer on the coast. It is, however, very doubtful whether the subtropical climate of the coast will prove as salubrious as the high, dry, and cooler region of the Free State.

CASE 11.—*Phthisis, second stage, affecting both lungs; Ceylon useless; death at Aden.*

C. D—, æt. 30, Kentish farmer; phthisical family, first seen in October, 1871; always delicate; married, three small children; much recent anxiety. Ten years ago had per-

sistent cough and loss of flesh, and went to Australia with much benefit. Pulse 100; tongue large and flabby; drowsy after meals; flatulence; debility on exertion.

Physical signs.—Dullish on percussion; bronchial breathing; creaky crepitation in the supra-clavicular and supra-spinous fossæ. Height 5 ft. 10 in.; weight 11 st. 8 lbs.

Went to Jersey; rough passage; found climate very humid; returned no better on November 7th. Cough; expectoration streaky; hæmoptysis. Suggested Egypt for winter, but preferred to remain in his dry sheltered home on "Kentish Rag."

In January went to Ventnor, where he had bronchitis and hæmoptysis; lost flesh and appetite; returned home in May improved. Pulse 94.

Physical signs.—Right side dull, resistent; bronchial breathing; supra-clavicular and supra-spinous fossæ; rhonchus upper fourth back and front. Sick of Ventnor, where all patients did badly in April, and going to Ceylon next winter.

July, 1872.—Cough; expectoration; hæmoptysis; but can ride about his farm chasing bullocks, and walk ten miles at a stretch.

September.—Pulse 100; sputa copious; losing flesh. Right side very dull on percussion; feeble respiration; crepitation almost humid. Left side, sibilus and prolonged expiration, with crepitation at the extreme apex, back and front. Takes cod-liver oil and iron, and keeps skin sore with iodine paint.

Went to Ceylon by overland route. Had bad food on voyage from Suez. Found Colombo very hot in the day, cold and damp in the evening. Did not reach the Ceylon sanatorium at Neura Ellia (5000 ft.), but after a month's trial of the climate determined to return home. Dr. Rowe, of Colombo, advised Mentone, and said that Ceylon was a very good place for threatened consumption, but when the disease was established the very worst. On returning through the Red Sea he was prostrated by the heat, and died on February 18th, 1873.

Remarks.—As both lungs were implicated, and the disease was evidently advancing, the result in this case would not, it was feared, prove satisfactory. But the active life the patient was able to lead in England made the case seem more hopeful. The sad termination of the experiment showed that the trip ought not to have been sanctioned.

CASE 12.—*Fistula and threatened phthisis ; voyage to Calcutta ; life in hills ; cure.*

Clerk to a tea broker, æt. 19 ; mother asthmatic ; father cardiac disorder ; left school at seventeen, and grew very rapidly. After uncontrolled constipation suffered from piles, followed by fistula, necessitating operation ; the incision was deep, as the sinus opened into the bowel, nearly four inches within the anus ; healing was very tedious. He lost flesh ; perspired at night ; had afternoon hectic, and very rapid pulse ; and it was feared that lung mischief would be established, and notwithstanding change to the seaside, and vigorous feeding and stimulation, he remained for a year with the unhealed wound.

A sea voyage was advised, and he started for Calcutta, sailing round the Cape. He improved immensely on the voyage, went up to the hills with further benefit, and the return voyage seems permanently to have re-established his health. Having only just reached England, it is not possible to say more, but he is now broad-shouldered, firm, healthy looking ; skin whole, and so far as physical signs go perfectly sound. He has returned to work with vigour.

CASE 13.—*Phthisis, second stage ; voyage to Melbourne of benefit ; death on return to England.*

Schoolmaster, æt. 38, first seen in consultation with Dr. M. Mackenzie in January, 1868. Had then suffered from cough two years, following pleurisy ; slight white frothy expectoration every morning. Pulse 96, soft ; breath short

on exertion; fauces relaxed and granular, increased by coughing or torpid bowels.

Physical signs.—Right side, wavy breathing; prolonged expiratory murmur; slight crepitation beneath the clavicle and above the scapula, where the breathing was bronchial in character. Left side, wavy breathing with prolonged expiration; tubular respiration at base. Aphonia lasting several months, relieved by creasote inhalations, the application of nitrate of silver to the glottis, and the removal of the uvula.

A sea voyage advised, but patient being able to teach in his school, could not be prevailed on to leave England.

February, 1869.—Sputa copious and muco-purulent; pulse 115; night sweats; weight 9 st. 10 lbs., when first seen 10 st. 4 lbs. Right side, bronchial breathing; bronchophony in subclavian region; slight crepitation in supra-scapular fossa. Left dull, on forced inspiration, at the base. Went to Malta, where he spent three months happily, but made no progress.

August 24th.—Physical signs same but that humid crepitation was noted at the left base, with friction sound below scapula.

Patient now anxious to go a long voyage; dissuaded from it, but went and gained good on voyage, but not on shore at Melbourne, so returned home to die.

CASE 14.—Cerebral exhaustion, with persistent headache; voyage to Australia, and life at Melbourne very beneficial.

A tall delicate boy, æt. 17, formerly lazy, made a sudden violent effort to work at high mathematics; in a few weeks rose from the bottom to the top of his class. But headache, at first slight and occasional, became severe and uninterrupted; was obliged to leave school, and rest at home, and in Derbyshire. At the end of four months the headaches were not constant, yet recurred whenever he read, even a novel, for more than half an hour.

A long sea voyage was now advised. An opportunity of

taking a trip to the Mediterranean occurred, and he went to Gibraltar, Malta, Alexandria, and back. When at Alexandria was exposed to the midday sun in an open boat, and had an attack described as "sunstroke," during which consciousness was lost for half an hour, and great drowsiness and torpor followed. Prior to this attack he had felt well, and was almost free from headache, but afterwards the old head pain recurred. On his return to England he had improved in appearance, but there was no gain in power of application to work.

At the end of a year from the first attack a voyage to Melbourne was undertaken. During the voyage, after passing Madeira, he felt perfectly well, had a splendid appetite, gained flesh and strength, and on his arrival in Australia described himself as better than since commencement of his illness. Went up to the gold mines, at Egerton, and to the Murray River. Improvement progressed, and he now describes himself as well, living in the saddle; he can bear great fatigue of body, and can read or write for hours without headache. A medical man, consulted in Melbourne, advises him to spend a second year in the bush, and believes that then he will be able to return safely to England, and work for the bar.

Somewhat analogous to this case, although differing in its result, is the following:

A medical student, anxious to take high honours at the M.B. Examination, worked sixteen hours a day for several weeks, broke down from sleeplessness and persistent headache, followed by disturbed vision, and convulsive muscular twitchings. A year's rest in England was of little benefit, and he could not work. Went to Sydney and back with great benefit. On his return he was able to work cautiously, with the view of taking the M.R.C.S. He was attacked with scarlet fever; on the second day cerebral symptoms set in, and on the fourth day he died comatose.

The cerebral mischief, though controlled by the voyage, was clearly in this case only partially benefited; a further sojourn in the colony might have established the cure.

CASE 15.—*Two phthisical brothers benefited by the voyage to Australia and life in the elevated health resorts of the Murray River.*

E. F.—, æt. 24, Luton, first seen November, 1871. Had cough for six months; improved at Ventnor in September; breath short; cough and dyspnœa on exertion; scanty sputa; lost a stone in weight, but is now gaining (weight 10 st. 4 lbs.). Pulse 94, soft; tongue pale and patchy.

Physical signs.—Left side flattening, dulness upper third; feeble breathing to base; crackling on deep inspiration in third interspace. Right side normal.

Went to America and Canada for six weeks.

July, 1872.—Overwork drilling with volunteers; increased dyspnœa; weight 10 st. 9 lbs. Physical signs same as last year. Voyage to Australia or South Africa advised.

Got less cough, no expectoration; pulse 90; out shooting; active out-door life suits, warehouse does not; appetite large, drinks two or three pints of beer daily.

December, 2nd.—Never free from cough; weight 10 st. 13 lbs.

Physical signs.—Left, dull feeble; dry crackle on cough upper third front and back. Started for South Africa and was so hearty and vigorous that he was laughed at on the voyage for considering himself an invalid, and feels perfectly well in Australia.

CASE 16.—Brother of the above, æt. 24, Luton, farmer, first seen November, 1872. Always delicate; height 5 feet 11 inches; weight 8 st. 7 lbs. Mother's family phthisical. Cough two years, loss of flesh (weighed 9 st. 4 lbs. two months ago); pulse 112; lives in a cottage, low rooms, ten feet square; farm exposed and on the clay; a year ago had pleurisy, never well since.

Physical signs.—Dulness throughout right side, respirations amphoric with crackling above and feeble below. Left side, breathing puerile.

Under alkalies and cod-liver oil improved, and the crepitant signs became more dry.

In December started with his brother in the 'Windsor Castle' with nine other valetudinarian youths. Dangerous storm off the Cape; had dysentery in the tropics and was very ill (with pleurisy) on the voyage. At Melbourne improved, and the improvement was more marked when last heard of on the Murray River Highlands; he was living in the bush, riding much and had gained seven pounds in weight.

Remarks.—These brothers have both gained by the voyage and Australian sojourn. The first may have regained permanently established health. The second was suffering from such advanced disease that arrest only could be anticipated.

CASE 17.—*Recurring bronchitis and asthma; severe in Tasmania and in England, absent in Melbourne.*

Mrs. —, æt. 55, went to Tasmania in 1840 and lived there in health for seven years, but sudden changes of temperature and exposure to keen winds set up several pulmonary, chiefly bronchial and pleuritic, attacks. These became so constant and severe that she was obliged to leave Tasmania for Victoria, where she had no return of pleurisy or bronchitis, but the great unhealthiness of the town told injuriously on the nervous system, and after exposure to summer sun she had sunstroke followed by obscure cerebral symptoms, incapacitating her entirely for two years from the duties of life. The voyage to England restored nerve tone, but on arrival in England she had frequent bronchial attacks complicated with spasmodic asthma, and now a winter never passes, whether spent in London, Bournemouth, or Ryde, without two or three attacks of severe bronchitis. A sea voyage always proves beneficial, and in Melbourne she never had bronchitis or asthma, but was prone to get palpitation and great nervous depression.

CASE 18.—*Spasmodic asthma cured during voyage and at Melbourne and in Canada.*

An asthmatic youth suffered so alarmingly from nightly spasmodic attacks that he was ordered to Melbourne. From the time of leaving England till his return (a period of nearly two years) he only had one attack, but on the night of landing at Plymouth he was seized with a bad fit of spasmodic breathing (due possibly to a heavy supper of ham and porter), and, though in better general health, the asthma was very severe.

A voyage to Canada was then taken, and he is now living in health exposed to all the vicissitudes of the Canadian winter, often camping out at night in all weathers.

CASE 19.—*Phthisis, second stage ; arrest ; cure established in Australia and New Zealand.*

An artillery officer, æt. 25, quartered at Gosport ; mother phthisical ; had cough ; hæmoptysis ; night sweats ; loss of flesh.

Physical signs.—Dulness, with bronchial breathing and crepitation in first and second interspace right side.

Kept in doors at Bath during winter, and in spring joined his regiment and went to New Zealand, where he was actively engaged in the war (obtained promotion for brilliant services). Went to Melbourne, improved health became established ; married and is now in England quite well, but there is decided flattening with feeble breathing beneath the right collar-bone.

In this case the amendment was confirmed and established in New Zealand and Australia. Had he remained in England a recurrence of lung disease would probably have occurred.

CASE 20.—Laryngeal disease and early phthisis, developed in Wellington, New Zealand; voyage to England beneficial; arrest.

Clerk to Upper House of Representatives, Wellington, New Zealand. After hard work reading aloud long Acts of Parliament in Representative Assembly lost his voice and came here for advice. A tall, thin, flaxen-haired man, æt. 28, of phthisical predisposition, suffering from cough; expectoration occasionally streaked with blood, but mainly from aphonia. First seen in July, 1869. Dr. Morell Mackenzie, who was subsequently consulted, discovered paralysis of left crico-arytenoid muscle. At Ventnor made no progress, and is now delicate in the chest with feeble voice, he is better than when in New Zealand.

The tremendous winds of Wellington ("the Funnel of the World," as it is called), in New Zealand were, by the patient, regarded as greatly causative of his throat affection.

N.B.—A Wellington man can always recognise a fellow townsman when walking in the street by his invariable habit of clutching his hat as he comes to a corner.

The following case, as the evidence of a person with world-wide experience, may be accepted as a contribution of some value.

Chronic hepatic disorder; benefit in Spain, Engadine, Cape Town, and Free State.

A gentleman, never under my professional care, who has travelled the world over in search of health, writes—"What a pity it is that all the dry places of the world (or most of them) should be so disagreeable. The Free State, the desert of Egypt, the central plateau of Spain, are amongst the places that suit me best, but how can one live in such places. Cape Town is the nearest approach to a habitable spot in a dry and warm climate. Next winter I

intend trying Australia, for I will never voluntarily stay in England again after October. To me the most detestable of all English climates is that of Bath and Bristol, where I happen to be often tempted to go to see friends. I never chose the vicinity of fresh water for a residence. Pontrasina, in the Engadine, is the most bracing place I know of. In England I was very liable to bronchial affections, but escaped them almost wholly during a residence of several years in Natal; rheumatism, too, I escaped in Natal."