THE CLIMATE OF TENERIFFE: OROTAVA AS A HEALTH RESORT.

By Frederick Lishman, M.D. (Edin.).

The island of Teneriffe, the largest and most important of the Canary group, with a population of about 110,000, is situated between latitudes 28° and 29° N., and about 200 miles distant from Cape Juby, on the African coast. It is in regular and frequent communication with England—five days from Plymouth, six days from Southampton, and a week from London or from Liverpool.

It has for long been famous among all the provinces of Spain for the salubrity of its climate, and the choice it offers within so small an area, according to altitude and position, for the treatment of different classes of maladies. But, though some few English people have made the island their home for the last thirty or forty years, it is only since ten years ago that it has come to be widely known among us as one of the most benign climates in the world, and has attracted a large number of permanent English residents, with an annually increasing number of visitors, in search of health and pleasure.

The general features of Teneriffe may be very briefly described. It is fifty-two miles long by thirty-one broad. A lofty volcanic range of mountains runs like a backbone along its whole length, increasing in height from 3000 feet, towards the northern ex-
tremity, to the gigantic Peak, which pierces the heavens 12,200 feet above the sea. It is the northern and fertile slope formed by this ridge, dropping gradually towards the sea, with which we are principally concerned. The valley of Orotava is like a huge amphitheatre cut out of the northern slope, facing the Atlantic Ocean, and sheltered behind and on two sides by the mountains.

Orotava, by far the most favoured and popular resort in the island, is—as Humboldt said in his “Views of Nature”—“one of the most charming spots in the world,” and remarkable for the magnificence of its mountain and coast scenery. Its climate will be described as a general type, but, it must be emphasised, that in the island are several totally different climates, according to the altitude and local feature.

1. Winds.—Orotava is exposed to the north, north-east, and north-west. The prevailing wind is from the north in winter, and is extremely moderate in force, usually beginning some hours after sunrise, and dying down towards sunset, to be replaced by the “terral” or gentle land breeze, which lasts throughout the night. These ocean breezes are healthful and invigorating, being heavily charged with ozone, and are absolutely free from dust and germs.

High winds are very uncommon, and when they occur are brief. In summer the cool north-east trade-wind blows with great regularity day after day, tempering the heat of the sub-tropical sun; it gives place at infrequent intervals to the hot, dry south wind, which persists usually not more than three days. While the trade wind prevails the weather is never oppressive.

The temperature—as is to be expected in a small island—is remarkable for its equability and freedom from extremes of heat and cold. The relatively high temperature of the sea, varying from 65°7 F. in January to 73°5 in August, which is due to the influence of the Gulf Stream, contributes markedly to this equability.

**Table I.—Means of Shade Temperature (70 Feet Level).**

|       | Jan. | Feb. | Mar. | April | May. | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|-------|------|------|------|-------|------|------|------|------|-------|------|------|------|
| Mean  | 61°2 | 61°6 | 62°6 | 62°6 | 68°3 | 69°8 | 72°5 | 73°3 | 72°7  | 71°2 | 67°1 | 63°7 |
| Max.  | 65°0 | 68°6 | 68°1 | 68°5 | 73°1 | 77°0 | 79°2 | 80°2 | 79°7  | 78°1 | 73°9 | 70°6 |
| Min.  | 54°4 | 54°5 | 55°6 | 57°1 | 58°6 | 62°6 | 65°9 | 66°7 | 65°6  | 64°4 | 60°0 | 56°7 |
| Range | 13°6 | 13°7 | 13°9 | 13°9 | 14°5 | 14°3 | 13°2 | 13°6 | 14°0  | 13°7 | 13°9 | 13°6 |

1 This and the following tables (except Table IV.) have been compiled from the observations taken at the Meteorological Society’s Station in Orotava, by Mr. Alfred F. Perry, to whom I am much indebted for the use of them. The station is 70 feet above the sea-level.
The diurnal variation is seen to average 13°-8, and is practically the same in winter and summer. The annual variation is also very small—the difference between the mean temperature of August, the hottest month, and January, the coldest, being only 12°-1 F.

The highest and lowest shade temperatures recorded each year since 1890, are as follows:

|       | 1890  | 1891  | 1892  | 1893  | 1894  | 1895  | 1896  | 1897  | Means |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Highest | 79°-7 | 84°-5 | 82°-8 | 86°-0 | 88°-0 | 89°-9 | 90°-1 | 88°-5 | 86°   |
| Lowest  | 48°-6 | 48°-4 | 50°-6 | 50°-6 | 50°-0 | 50°-7 | 50°-2 | 50°-3 | 49°-9 |

The average extreme annual variation is thus seen to be 36°-1 F., and it will be noted that the lowest temperature in the eight years was 48°-4 F.

These figures illustrate well the benign nature of the climate.

The rainfall is very moderate throughout the island, but is somewhat greater in the parts more distant from the African coast.

In Orotava the observations are as follows:

|       | Jan. | Feb. | Mar. | Apr. | May. | June. | July. | Aug. | Sept. | Oct. | Nov. | Dec. | Annual |
|-------|------|------|------|------|------|-------|-------|------|-------|------|------|------|--------|
| Amount (inches). | 3-10 | 1-83 | 2-31 | 1-34 | 0-49 | 0-05  | 0-02  | 0-05 | 0-27  | 2-64 | 2-09 | 2-5  | 16-0   |
| No. of rainy days (‘01 in. or more). | 8-5  | 6-8  | 8-5  | 5-3  | 2-2  | 0-3   | 0-5   | 0-5  | 1-8   | 6-8  | 9-5  | 8-7  | 59     |
| No. of rainy days (during day). | 5-5  | 4-0  | 3-1  | 2-9  | 0-5  | 0-1   | 0-0   | 0-1  | 0-7   | 3-4  | 5-5  | 4-7  | 30     |

The average rainfall of the last eight years has been 16-0 in., spread over fifty-nine days, but during the daytime on only thirty occasions. During the ten years, 1874–84, the rainfall was not so high, averaging 13-02 in., spread over forty-three days; the observations were taken by Mr. Honegger at Orotava, 300 feet above the sea.
Table IV.—Rainfall—Ten Years, 1874-84 (Honeyger).

| Months | Jan. | Feb. | Mar. | Apr. | May. | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Annual |
|--------|------|------|------|------|------|------|------|------|-------|------|------|------|--------|
| Inches | 1.96 | 2.50 | 2.08 | 0.74 | 0.43 | 0.00 | 0.00 | 0.03 | 1.07  | 1.72 | 2.12 | 13.2 |
| Days of rain (01 in. or more) | 6.5  | 6.3  | 8.4  | 5.0  | 3.0  | 0.6  | 0.4  | 0.2  | 1.4   | 5.7  | 7.1  | 7.2  | 43     |

Practically no rain falls, from the end of April to October. The wettest months are usually December and January.

During bad weather short and heavy showers are the rule, and mostly in the night.

As an example of the large amount of rain, which may fall in a short period, may be mentioned the experience of 25th October 1895, when 4.15 in. fell in fifteen hours.

Owing to the dry and porous volcanic soil and the general inclination to the coast, the heaviest rains soon disappear and leave no trace.

A day wet all through is not often experienced, and the occasion rare when an invalid cannot at least spend some hours in the open air. Fogs are, I believe, unknown in Orotava.

Table V.—Relative Humidity. Saturation, 100.

|       | Jan. | Feb. | Mar. | April | May. | June | July | Aug. | Sep. | Oct. | Nov. | Dec. | Mean  |
|-------|------|------|------|-------|------|------|------|------|------|------|------|------|-------|
| Day   | 71.3 | 67.7 | 70.3 | 69.5  | 69.2 | 72.9 | 73.0 | 72.1 | 73.4 | 73.0 | 72.2 | 71.1 |
| Average | 75.4 | 72.4 | 74.7 | 75.2  | 73.5 | 74.4 | 78.3 | 79.7 | 78.0 | 78.2 | 77.0 | 75.5 |
| Night | 74.7 | 72.4 | 74.7 | 75.2  | 73.5 | 74.4 | 78.3 | 79.7 | 78.0 | 78.2 | 77.0 | 75.5 |

The humidity of the atmosphere is much less than might be supposed from the insularity of the climate. The average percentage during the day being 71.1 per cent. of saturation, which may be compared with the average for Brighton 81°, Ventnor 81°, Torquay 81°, Falmouth 82°, and Guernsey 85°.

During the night the humidity is greater, but it seldom reaches the point of saturation, and dew is rarely deposited.

Table VI.—Sunshine, 1890-1897.

|       | Jan. | Feb. | Mar. | April | May. | June | July | Aug. | Sep. | Oct. | Nov. | Dec. |
|-------|------|------|------|-------|------|------|------|------|------|------|------|------|
| Hours | 147  | 167  | 170  | 174   | 200  | 192  | 165  | 165  | 180  | 166  | 153  | 145  |
| Days with less than one hour recorded sunshine | 3.5  | 1.3  | 2.4  | 2.4   | 3.0  | 3.7  | 4.9  | 3.2  | 2.4  | 3.0  | 3.0  | 3.5  |
The annual average of recorded bright sunshine is 2007 hours. The actual amount is greater in the summer months, but the percentage is slightly less in that season—for this reason: the "parasol of clouds," formed by the impact of the moisture-laden trade winds against the cold mountain heights, gathers with great regularity in the hottest hours of each day. This parasol sometimes extends for a distance out to sea, but frequently is limited to the upper parts of the valley, the coast line being in bright sunshine. The effect of this cloud is somewhat to increase the humidity under it, but it provides a truly welcome shade from the scorching rays of the midday sun, and is an important feature in contributing to the equability of the temperature.

In addition to its magnificent climate and natural beauties, Orotava offers more social attractions than any other resort in the Canaries.

There is a permanent English society, with church and resident chaplain all the year round. The accommodation for invalids is most comfortable—there is a choice of hotels at different levels, and some resident English families take in boarders.

The water supply is excellent and the food good.

The best level is from 100 to 400 feet above the sea. Bedrooms looking to the north are best, they are cooler in the day and warmer at night.

The best months are from November to June, at the ordinary levels.

A much cooler climate is always available and within easy reach for such as require a change to a more bracing atmosphere. For instance, at Laguna and Tacoronte (nearly 2000 feet), a few hours' drive from Orotava by a good road, the invalid has good accommodation, and will rarely in summer find the maximum shade temperature exceed 70° F.

In the higher parts of the valley of Orotava, i.e. above the cloud level of 4500 ft., nothing is more delightful nor healthful than camping out among the fragrant pines and the heather under the brilliant cloudless skies.

During the rainless months such a life is an ideal one for those in search of health, and English residents in Orotava frequently avail themselves of it.

At the village of Vilaflor, 4662 feet above sea level, beautifully situated in the zone of pines above the level of the clouds, perpetual sunshine and an exquisite air delights everyone who is energetic enough and able to undertake a fatiguing day in the saddle.

The following observations were taken at Vilaflor, during part of the summers 1890 and 1891, by Mr. P. R. Bedlington, Assoc. Met. Inst. The atmosphere is remarkable for its dryness:
Of the other resorts in Teneriffe the most important are—

1. Santa Cruz, the port of call of all steamers; it is hotter and dryer than Orotava, and the best months are January, February, March.

2. Güímar (1200 ft.), on the southern side of the island, possesses an excellent, dry, bracing climate, the best months being January, February, March.

3. Laguna (2000 ft.), already spoken of, has a delightful bracing summer climate, and is much frequented from June to October.

These places are all to be more recommended as offering an occasional desirable change from the monotony of Orotava than as permanent resorts.

For the large class of cases, which require something more than a "winter abroad," Teneriffe offers unique advantages.

First among these must be put cases of Bright's disease, which do extremely well, particularly cases of the large white kidney in young adults; the skin acts freely, the secretion of urine is soon greatly increased, together with the amount of urea, albumin diminishes, and the desirable change into the contracted kidney is gradually effected.

For all chronic kidney cases a safer climate could hardly be found.

Secondly, Cases of emphysema and chronic bronchitis all do well and are specially suitable.

Thirdly, Cases of tubercular lung disease for the most part do extremely well, as in no other climate can the open-air treatment be more completely carried out.

Some of the more robust of patients from our northern latitudes find the climate too mild and uneventful, but for all who want warmth it is admirably adapted.

Cases that do specially well are those associated with much catarrh, with haemorrhage, or with disproportionate constitutional symptoms; laryngeal cases sometimes do very well in Orotava, but a cure cannot always be looked for.
Those cases with any intestinal complications are contra-indicated, being almost always aggravated, and also cases of advanced lung disease.

Tubercular conditions of the urinary organs are usually regarded as being uninfluenced by climate, but I have notes of two cases of tubercular cystitis, which have almost completely recovered. One sent here by Mr. Reginald Harrison, after many years unavailing treatment; the other sent to me by Dr. Williamson of Ventnor, after having undergone prolonged treatment for the bladder condition in a London hospital, which had only aggravated matters.

Rheumatic cases with associated heart disease are usually much benefited by the absence of all cold winds and the warmth of the nights. Concerning asthma, here as elsewhere, no rule can be laid down; I have known some cases do remarkably well in the island, particularly those with much associated emphysema and bronchitis.

Of the many popular foreign resorts, to which English physicians recommend their patients, probably there is not one which offers the same facilities and climatic advantages for such cases as require prolonged continuous treatment, and especially permanent residence abroad, as the island of Teneriffe. Take Egypt which has an excellent winter climate, take the various resorts on the Riviera and in the Engadine, to which invalids crowd in search of health. In most of these the annual variation of temperature is so great as to preclude all the year round residence. No sooner has the damaged constitution begun to react to the favourable climatic influences than the patient is ordered home to escape the summer heat, the cure which was begun is never consolidated, and ultimate results are disappointing.

The short sea voyage should not be considered a disadvantage; it can be made in luxurious steamers, and is almost always beneficial to invalids; while on the return to England, the week at sea is a safeguard against the dangers of a sudden transition into colder weather.

CLINICAL RECORDS.

A CASE OF MEMBRANOUS COLITIS.¹

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The comparative rarity of the condition described under the above and a host of other names seems to justify the publication of the following case:

¹ Somewhat modified from a paper read in the Section of Medicine, Royal Academy of Medicine in Ireland, 20th May 1898.