ON THE WINTER CLIMATE OF SAN REMO.*

By ARTHUR HILL HASSALL, M.D.,

Late Senior Physician to the Royal Free Hospital; Founder of, and Consulting Physician to the Royal National Hospital for Consumption, and Diseases of the Chest.

THE past winter season, extending from November 1st, 1879, to April 30th, 1880, was one of exceptional severity, both in England and in the Riviera. I propose, therefore, in the present communication, to give some precise meteorological data illustrative of the weather at San Remo, and, by inference, along the Riviera generally, during that period. It should be remarked, however, that the value and interest of the observations about to be recorded are by no means limited to the one season only—since they embrace some novel particulars, illustrating still more clearly the characteristics of the climate.

I may state that my observations were taken with Negretti and Zambra's best instruments, corrected at the Royal Kew Observatory; these were suspended in a box, furnished with a double roof, and louvered on all sides so as to admit the air freely, but to break to some extent the force of the wind; this was placed in the shade, to the north, at an elevation of about forty-eight feet above the sea, thirty above the ground, so as to be unaffected by radiation, and at a distance of about five hundred feet from the sea. The observations were taken thrice daily, at 9 A.M., 3 P.M., and 9 P.M., and the minimum and maximum readings were also recorded; they embrace not only the temperature at three periods of the day—the day maximum and the night minimum—but the sun-heat, the number of sunshiny days, the duration of sunshine, the number of days and hours on which rain fell, the amount of the rainfall, the relative humidity of the air, the temperature of the sea, and many other particulars.

The mean monthly temperature of the six months constituting the season, the mean day range of temperature, the mean maxima and minima, and the mean for the whole season, are shown in the following table.

TABLE I.—Mean Monthly North-Shade Temperature.

	9 A.M.	3 P.M.	9 P.M.	Mean Monthly.	Mean Day Range.	Greatest Day Difference.	Mean Night Minimum.	Mean Day Maximum.	Mean of Maxima & Minima.
November	52.60	56.60	51.40	53.50	6.8	13.4	48.40	59.40	53.90
December	43.50	49.90	42.20	45.20	8.3	13.1	39.20	51.80	45.50
January	45.50	52.10	44.98	47.54	7.8	14.0	40.80	53.30	47.00
February	50.07	55.89	48.55	51.50	5.8	11.5	45.61	57.32	51.46
March	55.00	59.60	51.40	55.00	5.1	8.8	47.70	60.10	53.90
April	59.90	61.70	56.30	59.30	4.3	10.0	52.80	64.10	58.40
Mean of Season ..	51.09	55.80	49.14	52.00	6.3	11.8	45.76	57.67	51.70

* The difference between the 9 A.M. and maxima readings.

The mean temperature for the whole season, deduced from the three daily readings, was 52.000; and from the maxima and minima readings, 51.70.

The preceding observations are fully confirmed by those taken at the Official Meteorological Observatory in San Remo, as will appear by an examination of the subjoined table.

TABLE II.—Mean Monthly Temperature at the Meteorological Observatory at San Remo.

	9 A.M.	3 P.M.	9 P.M.	Mean Monthly.	Mean Night Minimum.	Mean Day Maximum.	Mean of Minima & Maxima.
November	53.2	57.2	51.3	53.9	47.6	59.7	53.6
December	45.2	51.0	44.0	46.7	40.4	53.4	46.9
January	46.4	53.0	46.4	48.6	41.2	55.2	48.2
February	51.2	56.8	50.3	52.8	47.1	58.6	52.8
March	55.5	60.0	53.3	56.3	48.8	62.3	55.6
April	60.1	63.6	57.2	60.3	53.5	66.1	59.8
Mean	51.9	56.9	50.4	53.1	46.4	59.2	52.8

According to the above table, the mean temperature for the whole season, deduced from the three daily readings, is 53.1°, and, from the minima and maxima readings, 52.8°—being in the one case exactly 1.1° and in the other 0.1° Fahr. higher than my own readings.

From an examination of Table No. I, it appears: 1. That Decem-

* Presented to the Section of Medicine at the Annual Meeting of the British Medical Association in Cambridge, August 1880.

ber and January were unusually cold months, but, notwithstanding this, that the average temperature of the whole season, as deduced from the three daily readings—namely, 52.00°—was rather above the average of the nine winter seasons ending April 1873; namely, 51.55°, as recorded in my work on *San Remo and the Western Riviera*; 2. That the mean day range of temperature was extremely limited, it varying between 6.3° and 8.3°; while the limit of the greatest day difference was also extremely moderate, it ranging between 8.8° and 14.0°.

It further appears, from my meteorological journal, that the temperature fell slightly below the freezing-point five times in December and once in January, the greatest degree of frost occurring on the night of December 9th, when the thermometer stood at 27.9°. On several other occasions the temperature approached the freezing-point, and on the ground and in exposed situations it even froze; and, of course, high up the valleys and on the hill and mountain tops, the cold reached several degrees of frost—so much so, that the lemon-trees in some situations were injured. On December 1st, snow fell to a depth of something under two inches, and it did not disappear until about 11 o'clock on the following day, and, in northerly exposures, it remained for a still longer period. This was a very unusual occurrence, both as to the quantity of snow that fell and the time it remained unmelted. Ordinarily, the falls of snow in and near San Remo are of the slightest description, and the flakes melt almost as fast as they fall. It is, however, by no means an uncommon circumstance to see the mountains surrounding the San Remo amphitheatre, above the limits of the olive-clad hills, more or less covered with snow, and this sometimes remains for two or three days consecutively, or even more.

The mean north shade temperature, therefore, for the six winter months of the past season, was 52.0°; but it should be remembered that people do not live in the north shade, nor even in a south shade, although the temperature of this last would be considerably higher, as shown by Table III.

TABLE III.—South-Shade Temperature.

	9 A.M.	3 P.M.	9 P.M.
January	47.5	53.0	45.1
February	52.9	56.2	48.5
March	56.7	58.3	51.5
April	60.1	61.8	56.4
Mean	54.3	57.3	50.4

The mean of the corresponding months in the north shade was 52.6° at 9 A.M., 57.1° at 3 P.M., and 50.3° at 9 P.M.—thus making a difference of 2° in favour of the south shade; but this difference would have been more considerable had it not been for the circumstance that the box containing the instruments was somewhat too freely exposed to the winds from the sea.

So far from living in the shade, most persons in winter, especially invalids, court the sun, and are out only during the middle of the day. The mean temperature to which they would be exposed when out of doors, therefore, would rather approximate to the mean of the 3 o'clock observations—namely, 55.8°. Table IV will be found to embrace the more important particulars relative to the heat of the sun, the number of sunshiny days, and the duration of sunshine for the six months composing the season.

TABLE IV.—Sun-heat and Sunshine.

	Maximum Sun-heat.	Average Sun-heat.	Days of Sunshine.	Hours of Sunshine.	Possible Sunshine.	Mean Daily Sunshine.
November	—	—	24	h. m. 182.00	h. m. 286.07	h. m. 7.58
December	120.3	113.0	28	226.00	271.30	8.07
January	128.0	114.3	30	227.17	279.04	7.34
February	135.6	118.5	27	208.42	293.28	7.46
March	135.4	123.1	29	264.14	363.38	9.10
April	146.1	129.7	28	222.37	398.13	7.57
Mean	133.08	119.72	27.6	221.40	315.20	8.05

From the foregoing table, it appears that the average sun-heat for the season, as recorded by Negretti's solar radiation thermometer, was 119.72; the mean maximum sun-heat, 133.08; and the number of sunshiny days, 166—thus leaving only sixteen days during the whole six months on which the sun did not shine; that it shone for 1,330 hours out of a possible sunshine of about 1,891 hours, equal to no less than eight hours per day, excluding only the sixteen days above referred to. This table tells in the strongest manner in favour of the climate of San Remo.

I now pass on to consider the facts relative to the rain, rainfall, and relative humidity of the atmosphere at San Remo. Various particulars in relation to these points are clearly exhibited in Table V.

TABLE V.—Rain and Rainfall.

	Days of Day Rain.	Hours of Day Rain.	Rainfall.	Mean Relative Humidity.	Highest Humidity.	Lowest Humidity.	
November ..	6	h. m. 31.30	Inches. 2.40	65.6	94.4	44.2	Strong N.W., W., and N.E. winds.
December	3	20.00	1.65	58.7	93.1	33.3	Strong N.E. wind.
January	1	.10	.08	63.2	84.6	44.2	Strong N.E. wind.
February	5	27.00	2.70	74.0	95.8	53.0	
March	3	3.00	.20	75.0	85.9	47.7	Strong N.E. wind.
April	9	35.30	3.30	70.6	84.6	50.6	S.E. gale.
	27	117.10	10.26	67.8			

Observations.—When only a few drops of rain fell, and the quantity was too small to be measured, they were not included. There were three days in November and three in February when this occurred. The figures of the rainfall are calculated from the register of the Observatory at San Remo.

It thus appears that there were but twenty-seven days on which a measurable quantity of rain fell; that the period during which it actually descended embraced only 117 hours, between 9 A.M. and 9 P.M.; and that the total rainfall amounted to but little over ten inches; further, that the mean relative humidity of the air for the whole season certainly did not exceed 67.8°, if it were as much. Thus I find that there is very considerable difference between my observations relative to the dryness of the atmosphere and those taken at the Observatory at San Remo. According to the observations at the latter place, the mean monthly humidity was as follows: for November, 60.5°; December, 46.0°; January, 54.9°; February, 66.3°; March, 62.8°; April, 66.4°—the mean of the whole season being 59.5°, against my mean of 67.8°. This difference is to be explained, I believe, by the instruments at the Observatory being placed very high above the ground, and even above surrounding vegetation—namely, at an elevation of sixty-four feet.

But there is still another element to be taken into consideration, as exercising an important influence on the climate of San Remo, and, indeed, of the Riviera generally—namely, the temperature of the Mediterranean Sea itself. The more important particulars in reference to this subject are exhibited in Table VI.

TABLE VI.—Sea Temperature.

	Mean Temperature.	Highest Temperature.	Lowest Temperature.	Mean Temperature of Air.	Sea Warmer than Air.	Greatest Difference.
November	9 A.M. 60.2	9 A.M. 63.2	9 A.M. 58.8	9 A.M. 52.6	9 A.M. 7.6	9 A.M. 19.6
December	53.8	56.4	51.6	43.5	10.3	18.4
January	52.8	54.9	52.1	45.5	7.3	16.4
February	53.8	55.0	52.2	50.0	3.8	6.7
March	55.2	56.2	52.1	55.0	.0	6.0
April	57.4	60.4	55.7	59.9	2.5†	8.8†

† In this month, the sea was 2.5° colder than the air.

† The air was on one occasion during this month 8.8° warmer than the sea at 9 A.M.

It is thus seen that the sea was considerably warmer than the air at 9 in the morning during the whole winter season, with the exception of a very few days only, the difference in some cases amounting to nearly 20°; and hence, that its influence must be very considerable in increasing and equalising the temperature of the air, especially during the night. Indeed, so warm is the sea at San Remo that there is scarcely a day during the whole winter when bathing, to a healthy Englishman, would not be agreeable, and for the most part beneficial.

It thus appears that the climate of San Remo, during the winter season of 1879-80, was rather above the usual average temperature; that it was very bright and sunny; that there were very few days on which rain fell; that the air was, on the whole, dry, but not excessively or undesirably so—in fact, that it possessed all those conditions and qualities of climate which have placed San Remo in the foremost rank amongst health-resorts. During the ensuing winter season, I propose not merely to resume my meteorological observations, but to extend them, so as to include some further particulars. Although much statistical information has been collected illustrative of the climate of San Remo and the Western Riviera, yet the subject is by no means complete; and some of the observations made and recorded are open to the objection that they have not been taken on the best, or indeed on any uniform system.

THE WATERING-PLACES OF THE AUVERGNE: SAINT NECTAIRE AND LA BOURBOULE.*

By A. RABAGLIATI, M.A., M.D.,
Honorary Surgeon to the Bradford Infirmary.

SAINT Nectaire and La Bourboule, the places to which I wish to direct attention in this communication, are situated on the southern border of the district already referred to, the Mont Dore lying between them. Both St. Nectaire and La Bourboule are highly recommended for the treatment of scrofula or struma, and for what the French medical men are fond of calling "lymphatism", the description of which I give here in the words of Dr. Dumas Aubergier, medical inspector of the mineral waters of St. Nectaire Le Haut and St. Nectaire Le Bas.

"Among children", he says, "there is often observed a state intermediate between health and disease; a state in which the circulation, the secretions, the respiration, present nothing abnormal; and yet the life is subject to certain disorders. There is noticed a full belly, and the limbs are developed slightly in comparison with the head and the body. The gait is often slow or uncertain. Fatigue is very easily induced. At other times, the excretions are passed involuntarily, that of the urine in particular. From these symptoms, we can often recognise a lymphatic constitution, or the precursive signs of rachitism." The invention of the term "lymphatism" seems to indicate the opinion that it is in the lymphatic glands and ducts that the origin of the state above described is to be found. Certain it is that, in this condition, the glands tend to become affected. But they are not by any means alone in the indications of weakness and disease, for these are shared along with them by the bones, joints, skin, teeth, and sense organs—the tissues, in short, formed from the outer or serous layers of the embryo. Among the surgical out-patients of the Bradford Infirmary, about one-third of the applicants for relief suffer from some form of strumous or scrofulous affection, a fact which gave the treatment of these intractable, chronic, and generally subacute cases a special interest.

Saint Nectaire consists of two villages separated from one another by about half a mile, and called respectively the high and the low. The former is the one at which I stayed, though I visited the other, and inspected the establishment and springs. Hardly anything can be more charming than the situation of St. Nectaire Le Haut. It is about 2,400 feet above sea-level (latitude about 46° N.), and yet vines grow all along the hillsides, so fertile is the soil, and so genial the sun. The vines are not so fine as those in the valley at Clermont, still less are they equal to the luxuriant spreading runners of the Italian peninsula; but still they are very fair vines. The village is hardly more than a name, for it contains very few houses on the hill-top, and these only poor hovels; while the sanitary condition is as atrocious as it is usually found in French villages. The chief hotel is, however, well appointed, well drained, not expensive, well patronised by cheerful and often aristocratic visitors, and beautifully situated on the south face of the Mont Cornadore, which shelters it from the north. To the west is a large hill covered with pine-woods, among which are laid out pretty walks, with seats in shady places. South-east from the hotel is a small hill, surmounted by a Byzantine church dating from the sixth century, though the oldest part of the present structure dates only from the eleventh century. Beyond the church is the village. If the visitor cares to make the easy ascent of the Mont Cornadore, which he can do in from fifteen to twenty minutes through the pine trees, he can have a magnificent view of the Pic de Sancy and the neighbouring hills, of the ancient Château de Murols, of the Puy de Tartaret, and the Gorge d'Enfer, while he can almost hear the ripple of the Couze, as it winds along its cheerful way to join the Allier.

The Establishment is an appanage of the hotel, to the enterprise of whose proprietor, M. Versepuy-Mandon, it in fact owes its existence. It is built of whitish-yellow stone like the hotel itself, and presents a very tasteful appearance. The central portion forms a kind of hall, having a glass roof, and furnished with plants. On to this hall open the thirty *cabinets de bain*, arranged in the usual manner, with large baths and douches, hot and cold, similarly to the method employed at the Mont Dore. The medical man arranges, of course, as to the duration, temperature, etc., of the bath in each case. There is at St. Nectaire no *salle d'aspiration*.

The waters of St. Nectaire le Haut are obtained from two principal springs: that of the Mont Cornadore, furnishing about 79,000 litres in twenty-four hours, while that of the Rocher supplies 15,000 litres. The former has a temperature of about 41° C. (106° F.), and the latter of 43° C. (110.6° F.). Besides the bath service, there are, at Saint