REMARKS

ON THE

BALEARIC ISLANDS AS A HEALTH-RESORT.

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ON the 30th of April, 1877, I left Mentone, to carry out a long-cherished wish, the exploration of the Balearic Islands, five in number—Majorca, Minorca, and Ivica, and two small ones—situated near the coast of Spain. These islands are said to be much frequented by the Spanish for the treatment of chronic diseases of the lungs, but are little, if at all, known as health-resorts to the rest of Europe.

The usual ports of embarkation for Palma, the capital and principal seaport of Majorca, the largest island, are Barcelona and Valencia. Barcelona is reached from Marseilles, either by sea, or by the railway that skirts the French coast, and, crossing the Pyrenees, near Perpignan, now arrives at that city without a break.

I reached Barcelona on the 4th of May, and the next day caught a bad sore-throat, owing to the presence of a cold dry snow-wind descending from the Pyrenees, some forty miles to the north. I lost it whilst in the balmy temperature of the Balearic Islands, to succumb again, at the end of May, at Saragossa, from the same cause, a north wind descending from the still snow-covered Pyrenees. I may add, that I have a susceptibility to catarrh of the aerial mucous membranes, but had not experienced at Mentone atmospheric conditions calculated to bring it into play since the previous month of January.

From what I saw and experienced during the month of May, in fine sunny weather, whilst travelling in the elevated plains of Spain, at some distance from the south base of the Pyrenees, I can only conclude that these regions are dangerous to invalids in spring, and probably in winter. The Pyrenees, sloping gradually into Spain, as is seen on the map, the cold dry winds, from their snow-covered summits, rush down their slopes as water rushes down the roof of a house, unfavourably modifying the climate. As north winds reign in Europe during the greater part of winter, the atmospheric condition I found in May must exist during the greater part of the winter, that is, north winds from snow-covered mountains. I think I am therefore warranted in concluding that Barcelona may be eliminated from the list of winter health-resorts for persons suffering from chronic chest-disease. It is in the same position as regards the Pyrenees as are Milan and Turin with regard to the Alps, too far for these mountains to afford shelter; and it has not a shield of mountains immediately behind it, like Genoa.

I left Barcelona for Palma on the 4th of May, at 4 P.M., in a large and well found steamer, which arrived at its destination the next morning, after a peaceful navigation of fourteen hours. Palma is a large medieval city of 50,000 inhabitants, formerly very dirty, now very clean, owing to the energy and despotic will of a recent mayor. In four years, he transformed it from a filthy southern den into a clean orderly city, which can be advantageously compared with any northern town.

Majorca is situated 107 miles S.E. from the mouth of the Ebro, the nearest Spanish coast, 171 miles from Algiers, and about the same from the French coast. The Balearic Islands contain an area of about 1,753 square miles, with a population of 289,000. Majorca, by far the largest island, contains 1,386 square miles, and a population of 200,000. It has the form of an irregular quadrilateral. Its greatest length, from east to west, is sixty-four miles; and its greatest breadth, from north to south, is forty-eight miles. On its northern shore, there is a range of mountains rising from 1,000 to 5,000 feet, with a depth of from ten to fifteen miles, which protects the island considerably from north winds. By their condensation of watery vapour and cloud, these mountains explain the heavy rains which often fall when the temperature lowers, with north-east and north-west winds, in autumn, winter, and spring. There is a smaller and lower block of mountains in the south-east of the island, which performs the same office with respect to the south and south-west moist sea-borne winds. The rest of the island is a plain, with gentle elevations and rocky protuberances.

The Balearic Islands are not only politically, but geologically, dependent on Spain. They continue the Sierra Morena and the great pro-

montory which advances into the sea south of the province of Valencia. The north-east mountain-range is a secondary lias formation, on which are superposed a series of chalk formations, green neocomian sandstone, chalks, and nummulitic limestone. The chalk strata constitute the highest elevations of the island: Puiz Torella, 1,463 *mètres*; Puiz Major, 1,115 *mètres*; Puiz de Galatzo, 989 *mètres*. The plain is occupied by a tertiary building limestone, alternating with thin layers of blue clay, covered, at the outer circumference of the island, by alluvial soils.

The soil which lies on the plain is not deep, the rocky bones of the tertiary limestone coming through at every step; but it is fertile, and every handful is cultivated. The population is large for the area—laborious, dependent entirely on agriculture for existence; so every patch of earth is cultivated, in and out of the rocks, in crevices, in depressions, everywhere. There is a general growth of old olive, carouba, and almond trees, and of vines, with cereals underneath and between the trees.

There are no rivers—merely torrent-beds—full only at the time of the torrential rains, which occur principally at the autumnal and vernal equinoxes, but sometimes also in mid-winter; they are dry in summer. The great amount of rain that falls in a short space of time, as in the tropics, is evidenced by the torrent-beds on the sides, and at the base of the mountain-ridges. They are full of large rocks torn from the mountain, and borne along by the irresistible power of immense masses of water. The water requirements of the inhabitants in summer are principally met by the storage of water in large underground reservoirs, as in Malta. These reservoirs date principally from the time of the Moors, who formerly occupied these islands. There are some salt-water marshes near Alcudia, on the north-eastern side of the island; but they are not extensive. I have found everywhere in the Mediterranean that salt-water marshes are not so deleterious as fresh water. The rest of the island, in May, when I was there, was as dry as a highway-road in mid-summer in England; there was not a vestige of water or of marsh-vegetation to be seen.

Such a climate is favourable to cereal cultivation. Cereals get their roots well into the ground, and make a good growth with the assistance of the spring rains, and then can perfect the grain without a shower. The harvest takes place in the month of May or in the beginning of June. In England, exceptionally dry summers are always favourable to the grain-crops; in the Mediterranean climate, grain is seldom or ever damaged by moisture, as there is no rain after April. By the middle or end of June, the harvest is over, the ground is dry, herbaceous plants are withered up, and a period of intense torrid heat without rain begins; in these regions, it is the period of nature's rest. Heat does for vegetation in the Mediterranean in the summer (July and August) what cold does in the north of Europe in winter. It is the period of the year most inimical to the health of man, even to that of the natives of the country.

The above description of Majorca and of its climate is a fair specimen of the local climatic and vegetative conditions which obtain in most, if not all, the islands of the Mediterranean, with slight differences referable to geological formation and to position, north or south, east or west. The facts thus briefly enunciated give a clue to the influence of climate on health, affording a good and unerring guide.

The spring in Majorca is most delightful. Such I found it in May; mild, even warm, balmy, with fresh pleasant nights, like fine mid-summer weather in England when not too hot. I was told that April was equally fine, as I have found it in every other Mediterranean island that I have visited—Sardinia, Corsica, Sicily, Corfu, etc. The temperature varies from fifty to sixty degrees at night, from sixty to seventy-five degrees in the daytime, according to the date. The islands are perfectly healthy at that period of the year. Intermittent fever has not commenced, and there is no other climatic influence at work antagonistic to health. April and May are the two healthiest and pleasantest months of the year, as they are likewise all over the Mediterranean basin. It is the best time to visit these islands. I was told that October and November are equally cool and pleasant as to climate, barring the possibility of heavy rains falling and lasting several days. The immunity from what is called malarial fever, however, is not so decided in the autumn. The summer influences which give rise to it, be they vegetable germs or mere chill, or both, appear to linger on in autumn, all over the Mediterranean. Thus, except on the north shores, early November is a safer epoch than early October for travellers and invalids to begin their travels or residence. Even on the north shores of the Mediterranean, the last ten days of October is quite soon enough to arrive. Invalids, especially, should neither come too soon to the Mediterranean, nor leave too soon. They should settle down towards the end of October, and not leave the Mediterranean region for the north until the middle of May.

Between spring and autumn comes the summer, which is very hot and

dry in Majorca, nearly as much so as on the coast of Spain (Valentia, Murcia, Alicante), or as on the shores of Africa (Algiers, Oran). Then intermittent or malaria fever develops itself all over the island, both in the towns and in the country; in the dry rocky plains as well as in the few marshy districts. I was told, however, that in the latter the cases are more numerous and more severe. The experience of Majorca and of the other Balearic islands illustrates what I have found to be the case all over the Mediterranean area, both on the islands and on the shores, viz., that intermittent fever can and does occur, independently of the existence of marshes or of alluvial soil, under the mere influence of extreme heat. Mere exposure to even a slight lowering of temperature at night, or of a cold wind in the daytime, produces intermittent fever all over the Mediterranean area; on the mountain sides, as in dry, arid, rocky plains, and that in the absence of marsh exhalations, provided the human body has previously been for some time exposed to great heat. How is the bacillus malarie generated in such cases?

From all that I heard on the spot, from a careful study of the vegetation, and from what I have read, I do not consider that the climate of Majorca can be considered an exceptionally favourable one in winter. The mountain range, on the northern shore, running from north-east to south-west, does not thoroughly protect the island from north-west or north-east winds—the more so as its altitude is not very great. The altitude is, however, sufficiently great to condense clouds and to give rise to abundant rains, accompanied by storms of wind. Except the orange trees, there is no botanical evidence in the islands of perfect immunity from winter cold, such as we find at Malaga, at Mentone, and on the more sheltered regions of the Riviera. The orange and lemon trees are, almost without exception, confined to the bottom of a deep crater-like valley in Majorca (that of Soller), and to a narrow valley-crevice, or geological fault, in Minorca. At the bottom of these pits they are thoroughly sheltered from every wind that blows, winter and summer. None are seen elsewhere.

All islands are exposed to winter winds, but the Balearic Islands must be more especially so exposed. Occupying as they do the north-east corner of the Mediterranean, they are exposed in winter to cold north-west winds from the snow-covered Pyrenees, and to cold north-east winds from the snow-covered mountains of the South of France and of Switzerland. The collision of these cold north winds in winter with warm moist south-west and south-east marine winds, no doubt renders the Balearic Islands a battle-field. On this battle-field, they usually fight it out many times in the course of the winter.

The above geographical conditions explain the fact of tropical rains falling in Majorca, in moist winters, about the autumn and spring equinoxes. Sometimes, these rains are so heavy as to devastate the country. In the fifteenth century, 1,600 houses were destroyed by the inundations, and 5,000 people were drowned. In 1850, an all but equally disastrous inundation occurred—not, however, causing the death of so many people. The average annual rainfall, however, is small, and does not amount to more than 380 millimètres, less than that at Valentia, where it is 400 millimètres (about 16 inches). Some years none, or scarcely any, falls—as in 1847 and in 1849, when there was a terrible drought. The rainfall in Minorca is said to be greater than in Majorca.

The Province of Murcia, in Spain, is even drier than that of Valentia. It is, I believe, the driest region in Europe; and yet, last autumn, the rains were so heavy that terrible inundations occurred, occasioning great loss of life. This I can easily understand, for I myself have seen there many houses built in the very bed of the torrents and rivers, as if water were an unknown element to consider. No such rains had occurred in Murcia since the year 1600—that is, for nearly three hundred years. In the Balearic Islands, owing to their marine situation, even when it does not rain, the air is always moist.

In this latter sense, these islands enjoy the usual advantages of island climates in the Mediterranean. The temperature is more equable, and there is not the sudden variation in temperature between day and night that obtains on the shores, and especially on the north shores, of that sea.

The vegetation of these islands is that of the Mediterranean islands in general. The principal tree (covering the mountain sides up to an elevation of 2,000 feet) is the pinus halapensis; as elsewhere, there is the usual brushwood of cistus, pistacia lentiscus, myrtle, juniper, etc., with no alpine, or even sub-alpine, vegetation. It is too warm even on the summits of the mountains.

Ivica, which I had not time to visit (twenty-three miles long by twelve broad; population 11,000), appears to be merely a series of arid hills, partly covered with Aleppo pine trees, and with the usual brushwood (the Corsican maquis).

The annual temperature of Palma, according to Weyler, deduced from five years' observation, 1849-1853, is 18.25° Cent. (66° Fahr.);

that of the Algerine coast not being quite so high, and that of Valentia being rather higher. The thermometer only once descended to the freezing-point (32° Fahr.) in these five years. Snow falls very rarely on the plains, and melts as it falls. The minimum temperature is reached in February. The mean winter medium is about 46° Fahr. (7.7° Cent.)—the same as at Mentone. The maximum reached in August is 92° Fahr.; at Valentia, it is 97° Fahr.

Minorca is situated to the west of Majorca, separated by a straight about twenty-five miles in width. It is a much smaller island, thirty-three miles in length, thirteen miles in width at the widest part. It lies from north-west to south-east, and has an area of three hundred square miles. It presents the character of a rocky undulating plain, with a central ridge of hills attaining an elevation of 1,500 feet at the highest point (Monte Toro). There is a large town (Port Mahon), with a splendid port—one of the finest in the world—formed by a crack or fault in the geological formation. This port and the island were occupied by the English during the greater part of the last century, and were the Mediterranean centre of our naval and maritime power in the Mediterranean before we took Malta. Many essays and works were written about Minorca and about its pathology during that time.

The pathology of the Balearic Islands is very similar to that of the islands and large towns of the Mediterranean in general, both in the past and in the present. Palma has been a populous town for centuries. In the middle ages, it used to be ravaged by the plague, three, four, or five times each century. In 1653, 406 houses remained uninhabited in Palma, the occupants having all died of this pestilence; 2,198 men died out of 3,015 attacked; 3,293 women out of 5,797; 3,981 children out of 4,634. Since then, plague has disappeared, but there have been all but equally serious epidemics of malignant fevers. An epidemic of malignant sore-throat (diphtheria?) occurred in 1741, which carried off the sufferers in a few hours. Yellow fever reigned in 1821, and made great ravages. Cholera morbus appeared at Port Mahon in 1833 and in 1844. From thence, it reached Majorca, where three hundred persons died in a fortnight.

I mention these facts to show that the health-history of Palma has been the same in the past as that of Malaga, Barcelona, Marseilles. However healthy the position of a southern city may be, even when, like Palma, built all but in the middle of the sea, on a declivity, open to all the winds that blow, free from any external source of contamination, it may be a pestilential residence. If the laws of town-hygiene are neglected, if the streets are narrow and defiled by dirt and refuse, if the drainage is left to fester, all the pestilences to which the human race is subject run riot and reign supreme. They keep destroying life constantly, but imperceptibly; and every now and then they assume the epidemic form, and sweep off the population by wholesale.

Palma, and also Port Mahon, are now better prepared, however, to meet pestilence than formerly. I found them both exquisitely clean, swept, whitewashed, and brushed until scarcely a speck of dirt could be seen or found in either. As I have already stated, Palma has been recently regenerated, cleansed, transformed, by a vigorous "tyrannical" mayor. Having first secured the assistance of his town council, he made a vigorous and successful crusade against all the dirt-habits of the south, pulling down houses, forbidding people to sit in the streets in the southern way, forbidding mendicity, and by fifty other measures improving the sanitary state of the city. There is one point, however, respecting which he has not succeeded in modifying the convictions and habits of his fellow-citizens, if I may judge by the state of the hotel in which I resided—the first in the place—and also by that of several other houses which I casually visited.

In Southern Europe, the entire population seem to be ignorant of the fact that the fermentation of human faecal accumulations, especially in hot weather, generates pestilential gases, which give rise to putrid or diphtheric sore-throats, to typhoid fever, and to other serious diseases. The closets are constantly built in the very centre of inhabited houses, leading to large cesspools, without traps or precautions of any kind. Consequently, the houses are constantly permeated with gases offensive to the smell, indicating the danger. Such was the case in the Palma hotel I inhabited. I could only get rid of the smell in my bedroom by leaving the window wide open day and night. I was asked on my arrival to contribute to the funeral expenses of a young commercial traveller who had died the day previous of "fever" after a few days' illness. His death appeared to me very suspicious, and I wrote to the authorities communicating my sentiments on the matter. Such was the state of houses in cities in the middle ages, no doubt, and this must have been one of the principal factors in town unhealthiness and mortality.

In our times, the diseases that reign in the Balearic Islands are those of similar regions of the Mediterranean—intermittent fever, rheumatism, catarrhal fever, typhoid, diarrhoea, dysentery, etc. Pulmonary con-

sumption is said not to be uncommon in Palma. It is the same in all the large close towns of the Mediterranean, no doubt principally from defective ventilation. Night air is feared all over the Mediterranean, and windows are shut at sunset only to be opened next day. Intermittent fever, as I have stated, is very common in summer and in autumn in every region of these islands—in Minorca, which is a mere rock, without a rivulet or a marsh, as in Majorca—quite irrespective of marshes of any description. This fact explains the climate of Cyprus, and its assumed unhealthiness. Both islands, Cyprus and Majorca, have the same kind of climate: what may be called the Mediterranean climate. A large body of troops disembarked in midsummer in Majorca, and located on the healthiest and driest plains, and then treated as if they were at Aldershot, would have the same fate that our troops had in Cyprus. I never could understand how or why our army medical men, knowing, as they must do, from their experience of Malta and Corfu, the natural history of the Mediterranean climate, could have allowed such a foolish irrational step to be taken, without at least making a formal protest.

The conclusions at which I arrived, after a careful survey of the two principal islands of the Balearic group, are, that they cannot be recommended to invalids as winter residences. The climate is mild and moist in winter, it is true, which would agree with some forms of chronic disease. It is as mild and moist, apparently, as that of Algiers; but the winds are too constant and too vehement, and the storms and rains, when they occur, are too violent in the winter seasons. The mountain range on the north-west is not sufficiently high or wide to exhaust these storms coming from the north, and to protect the island from their influence. Indeed, there appears to me to be no condition that makes

these islands preferable to the mainland of Malaga, Muria, Elche, Alicante, Valentia (see my work on the Mediterranean, chapter ix, Spain). I must add that there is no accommodation whatever for invalids. The inns at Palma are simply vile, and there is no other refuge for them in this large city. Invalids appear to be neither wanted nor cared for. The Spanish invalids must be taken in by friends and relations, for I failed to discover any place to which they could go. Out of Palma, in the numerous villages, there is simply no good accommodation to be found. Port Mahon, it is true, does contain a decent *posada* or inn. It was so long in the possession of the English that, like Corfu, it still shows many of the evidences of our civilisation. But there is nothing in Minorca to attract the stranger, except the mildness of its climate, the facilities its long beautiful port gives for boating, and a fine old cathedral.

The Balearic Islands, in conclusion, seem to me merely suited for a spring tour in April or May, such as I made. Then they are truly delightful, and the tour, allowing for bad accommodation, was to me a most enjoyable and fascinating one. For further information respecting these islands, I would refer to the appendix of the third edition of my work on the *Treatment of Consumption*, to the work I have quoted by Fernando Weyler, *Topographie Physico Medicale des Iles Balears, Palma, 1854*—if it can be obtained, which I failed to do—and to M. George Sand's *Un Hiver à Palma*. Although merely a literary production, the latter work gives a most graphic, and no doubt a true, description of the winter climate of Palma, and of the island in general, as also of the difficulties of social and material life.

ON THE INFLUENCE OF ALTITUDE WITH REFERENCE TO THE TREATMENT OF PULMONARY DISEASE.*

By WILLIAM MARCET, M.D., F.R.S.

THE following communication may be divided under three heads.

1. The effects usually produced on a person in good health on ascending high mountains.
2. The influence of altitude in disease, with especial reference to pulmonary affections.
3. The influence of altitude upon respiration as accounting, in a great measure, for the beneficial effects of high stations in some cases of phthisis.

When, from a low altitude, approaching that of the sea-level, a walk is taken over high cliffs or a neighbouring hill, a sensation of easy breathing is experienced, the body appears to feel lighter, and a state of general vigour and comfort ensues. If a mountain a few thousand feet high be ascended, the sensations experienced on low hills are intensified, the breathing becomes fuller, and a pleasurable excitement from the pure state of the atmosphere, united to Alpine scenery, well repays the fatigue of the climb. Seven or eight thousand feet in the Alps appear to be the limit which those accustomed to mountaineering usually attain with perfect comfort; above that height, the respiration, in the sitting posture, begins to indicate infrequency, although in an unconscious way; the breathing also becomes deeper, and an unpleasant nervous discomfort is often induced, productive of fatigue, and interfering with sleep at night. At ten or eleven thousand feet, the cold from the low temperature of the atmosphere, and increased evaporation from the skin and lungs, begins to be seriously felt, mostly at night, when no amount of blankets can keep the body warm. After a chilly restless night, an attack of mountain sickness is not unlikely to set in at three or four o'clock in the morning; and, although attended with considerable distress, resembling very much that of sea-sickness, the attack may have passed off altogether in time for a fairly early start for some higher altitude. I need not add that those who are in good training for mountain excursions can rise to a very great height without inconvenience, or any degree of ill-health.

A sojourn of eight days in succession, in 1875, on the well known pass of St. Theodule (10,899 feet), another of three days, this last summer, at 11,050 feet (Col Sen Géant), and excursions to much greater heights, have afforded me many excellent opportunities of observing the influence of altitude on health. It is singular that the power of digesting food should often fail at a considerable elevation above the sea; as a rule, tourists eat little; their guides have a large share of their provisions to fall back upon, and to that they usually do not fail to do justice. It is not that the appetite is at fault, but, after partaking of very little food, there is no desire for more; and the food taken is often

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