

The above are the principal mountain peaks of Mexico, the first ten being volcanoes, with their heights according to the most recent measurements :

## HYDROGRAPHY.

The eastern Mexican coast, washed by the Caribbean Sea and the Gulf of Mexico, is low, flat, and sandy, except near the mouth of the Tabasco River, where at some distance from the coast appear the heights of San Gabriel, extending northeast and southwest for several miles ; but the majestic mountains of Veracruz, especially the volcano of Orizaba, visible for many leagues to seaward, form a picturesque background which relieves the monotony of the shore region of that State. On the Pacific side the coast, although generally low, is here and there roughened by spurs extending from the cordillera to the ocean.

The principal gulfs are those of Mexico, California, and Tehuantepec, the first of which ranks among the largest in the world.

We are not blessed with good harbors on the Gulf coast. Veracruz is an open roadstead, and we are now spending large sums of money in trying to make it a good port. Our best harbors are on the Pacific coast, as Acapulco, which is a large one ; Manzanillo, a very fine although a very small one ; and La Paz, on the Gulf of California. By artificial means we expect to improve our harbors considerably.

The development of the harbor of Tampico is remarkable. A short time ago the depth of the bar roadstead was only eight or nine feet. Now steamships drawing twenty-four feet of water enter the port. The deepening of the entrance to the harbor has been accomplished by means of jetties, just as the mouth of the Mississippi was deepened by the Eads jetties. A very large part of the imports of Mexico enter now by the port of Tampico.

The more noteworthy bays are those of Guaymas, Santa Barbara, Topolobampo and Navachiste, in the Gulf of California ; Concepción, La Paz, and Mulejé, on the west coast of the same gulf ; San Quentin, Magdalena, and Amejas, on the Pacific coast of Lower California ; and San Blas and Valle de Banderas, on the coast of Tepic.

We have no lakes as large as those with which the United States is favored, and the Lake of Chapala, a beautiful spot where country houses are now being built, is the largest lacustrine basin in Mexican territory. The Valley of Mexico has six lakes, two of fresh and six of salt water. The other lakes in Mexico are Catemaco, in the State of Veracruz ; Cairel and Carpintero, in the State of Tamaulipas ; Encantada, in Tabasco ; Bacalar, in Yucatan ; Alcuzague, in Colima ; Cuitzeo, Tacasquaro, and Patzcuaro, in Michoacan ; Yuriria, in Guanajuato ; and Meztitlan, in Hidalgo.

Mexico has a great many islands, situated near the coast, although not any of very great area, the greater number being uninhabited, although some of them are very fertile, and could be the seat of a large population. Among the most important are : El Carmen, the largest in the Gulf of Mexico ; San Juan de Ulua and Sacrificios, opposite the port of Veracruz ; Mujeres, in the Caribbean Sea ; Guadalupe, about seventy-five miles from the west coast of Lower California ; the Tres Marias group, about thirty miles from the same coast ; the Revillagigedo group, not far from the coast of Colima ; and adjoining the coast of the State of Michoacan, the Alcatraz Island.

As I have already stated, Mexico has a very broken surface, with high mountains, causing streams to run down a very inclined plane, forming torrents with rapid cascades, which contribute to embellish the natural features of the country. These conditions, however, prevent us from having large navigable rivers, and furnishing a cheap way of transportation, which is one of the greatest advantages the United States enjoys, and which so largely contributed in its early days to the development of the country, making transportation to long distances both easy and cheap. While the torrents descending from the mountains afford an immense water-power—which, in the course of time, may be used as a motor for industrial purposes—they meet when they reach a valley and run smoothly there through a ravine until finally they reach the coast, and it is therefore only at a comparatively small distance from the sea that they can be made navigable.

Our principal rivers, measuring their positions from north to south, are the Rio Grande—which from El Paso, Texas, to the sea, is the boundary line between the two countries, and which used to be a large river ; but as it rises in Colorado and passes through New Mexico, and the inhabitants of both have taken for irrigation purposes most of the water that it carries, it becomes entirely dry during the dry season after the freshets, very much to the distress of the inhabitants of its borders from El Paso to Ojinaga, especially on the Mexican side, which has been inhabited for three hundred years, the people using the water for irrigation—on the other side there being hardly any population,—and now they find that their farms are entirely worthless for want of water. After passing Presidio del Norte, now called Ojinaga, the Conchos River and other tributaries of the Rio Grande River supply it with water, although not to the extent it had before the water was taken in Colorado and New Mexico. The Mescala, or Balsas River, rises in the central plateau near the Valley of Mexico, passes by the State of Puebla to the southwest, by Mixteca of Oaxaca, and finally empties into the Pacific at Zacatula. As indicated by its name, it is, to a limited extent, navigable along its lower reaches ; above the bar it is accessible to small craft, which, higher up, are arrested by rapids,



whirlpools, and a high cascade. The Pánuco River rises north of the Valley of Mexico. Under the names of Tula and Montezuma it describes a vast semicircular bend towards the west across the Hidalgo uplands and collects the waters of the Huasteca of Veracruz and Tamaulipas, beyond which it is joined by the various streams flowing from Queretaro, and finally empties into the Gulf of Mexico at the port of Tampico. The Tampico bar, improved by jetties, is now the best harbor on our Gulf coast. The Rio Lerma or Santiago, the Tololotlan of the Indians, is also a considerable stream. By the riverain populations it is, in fact, known as the Rio Grande, while the inhabitants of Michoacan call it also Cuitzeo, from the large lake situated in their State. It rises in the State of Mexico in the very centre of the Anahuac plateau, and its farthest sources, issuing from underground galleries, descend from the Nevado de Toluca down to the twin lake of Lerma, the remains of an inland sea which formerly filled the Upper Toluca valley north of the Nevado volcano. At its issue from the lake, or rather marshy lagoon, the Lerma stands at the great altitude of 8600 feet, and during its winding northwesterly course across the plateau, the incline is very slight. In this upland region it is swollen by several affluents, some of which, like the main stream itself, flow from lakes dotted over the table-land. After completing half of its course at La Barca, the Lerma is still 5600 feet above sea-level. Here, some 280 miles from its source, it enters the large Lake Chapala, near its eastern extremity; but about twelve miles below the entrance it again emerges through a fissure on the north side of the lake, and still continues to flow throughout its lower course in the same northwesterly direction.

The Grijalva and Usumacinta rivers, rising in the State of Chiapas, after being joined by many others, some of them coming from Guatemala, empty into the Gulf of Mexico by one of its mouths at the city of Frontera in the State of Tabasco. The Papaloapam River rises in the State of Oaxaca, passes through the State of Veracruz, and empties into the Gulf of Mexico at the town of Alvarado, a few miles south of Veracruz.

The rains increase considerably the amount of water in the rivers, but as their duration is not very long this soon subsides. When the streams rise near the sea, as is the case on the coast of Chiapas on the Pacific, they become so swollen immediately after the rains that it is impossible to ford them, and as there are no bridges, it is necessary to wait until early the next day when the freshet has subsided.

Springs are rare, and some of the rivers run in deep mountain beds, without receiving smaller tributaries, while the rapid evaporation on a light soil, covering porous rocks, leaves the surface dry and hot and unable to support much vegetation beyond the cactus and low grasses.

We are blessed with quite a number of mineral springs, although very few of them are used, most of them being at places not easily accessible; but in this regard I do not think we have any cause to envy any other country.

## CLIMATE.

By looking at the map it will be perceived that Mexico, being intersected by the Tropic of Cancer and stretching across eighteen parallels of latitude, must, from its position alone, necessarily enjoy a great diversity of climate. But from its peculiar configuration this feature is affected far more by the altitude of the land than by its distance from the pole or the equator. This is especially true of the more fertile and populous section lying within the torrid zone, where three distinct climatic regions are distinguished, not according to their horizontal, but according to their vertical position. The warm climate has the heat of the torrid zone and prevails on the sea-coast in the sandy and marshy tracts fringing the Gulf of Mexico and the Pacific Ocean, in other low places below 3000 feet above the level of the sea, and in some of the valleys higher than that, but protected entirely from the winds. But the night breezes refresh the temperature in the evening and make it bearable during the day, the heat never being so oppressive as it is in summer in the more northern latitudes. This region is also much refreshed in summer by the rains, which are abundant and fall regularly during that season. The heat of the sun increases considerably the evaporation from the sea, and when the evaporation reaches the cool atmosphere of the sky, it is naturally condensed into water and falls in this region. The rains begin generally in June, increase considerably in July, and end in November, although this varies in different regions, the rains lasting longer in those near the sea than in the inland districts. They are so abundant that they form the main reliance of the agricultural industry, and there are few regions which use water for irrigation, depending entirely upon the rainfall; therefore, when in a year by some atmospheric phenomena, the rains are late or very scarce, we had a famine in Mexico, which can now be averted by importing cereals through our railroads, as was the case in 1893. The rains fall regularly and at fixed intervals, that is, about from one to three hours every day, and after the rain is over, the atmosphere is clear and pleasant, and in well drained places the ground becomes dry, so that it causes no inconvenience to the inhabitants.

The rains have such a decided effect on the atmosphere that in most of the country the seasons are divided into the rainy and dry season, and very few realize what spring and fall mean. As our climate is so even, the trees do not lose their leaves at any given time, but one



by one as they grow old and die; and as the leaves die they are replaced gradually and imperceptibly by new ones, so that the phenomenon familiar to northern latitudes, of trees losing all their leaves in the autumn and regaining them in the spring, is quite new to anybody going to a temperature that has both extremes.

The differences of climate depending upon the different degrees of altitude are so great in Mexico that the vegetable products of this vast country include almost all that are to be found between the equator and the polar circle.

The mean temperature in the hot region varies from 77 to 82 degrees, Fahrenheit, seldom falling below 60, but often rising to 100 degrees, and in the sultry districts of Veracruz and Acapulco occasionally to 104 degrees, although the heat is not oppressive as is the summer heat of the eastern portions of the United States. The vegetation is, of course, in consequence entirely tropical. In the southern region the climate on both seaboards may be described as humid, hot, and rather unhealthy, and in places where stagnant water and marshes exist—which are often found on the coast on account of the sea water flowing in and remaining there—intermittent and remittent fevers prevail, and in some localities during the summer yellow fever and black vomit are endemic. These conditions could easily be remedied by proper drainage of the swamps and marshy districts.

The heat of the Gulf of Mexico when the atmosphere begins to cool in the polar regions causes a depression in the barometer, and consequently very strong north winds, which sweep over the coast with terrible force, causing great havoc. They generally begin in September and last until the winter season sets in about December. As the country is narrow, the effect of the north wind is felt all over it and that is the prevailing wind. In the City of Mexico, for instance, notwithstanding its altitude and that it is protected by high mountains from the northern winds, the temperature falls when the northerns prevail on the Gulf coast, and it becomes cloudy and drizzly, and the same effect is felt, more or less, in other portions of the country. As the country narrows towards the southeast, especially at Tehuantepec, the northern wind blows with but small obstacles, and its force and effects are felt all over it. The districts in the mountains bordering the Pacific are affected in the same way as the City of Mexico.

From 3000 to 5000 feet above the level of the sea is located our temperate zone, which succeeds the hot zone in a verticle position, and embraces all the higher terraces, and portions of the central plateaus themselves. The mean temperature is from 62 to 70 degrees, Fahrenheit, varying not more than 4 to 5 degrees during the season, thus making one of the very finest climates on the face of the earth. In this privileged region both extremes of heat and cold are unknown,

and it has several cities—Jalapa and Huatusco in the State of Veracruz, Chilpancingo in Guerrero, Ameca in Jalisco, and many others too numerous to mention here. As these places are generally located on the slopes of mountains and not far removed from the ocean, the evaporations from the sea form clouds which are detained in their course by the high peaks and are precipitated into rain. In this region the semi-tropical productions are abundant, and with them are often combined the products of tropical and cold regions. I have seen in my own native place, the city of Oaxaca, located in the temperate region, a farm where wheat and sugar-cane were growing on the same piece of ground.

The cold region is located from 7000 feet above the sea-level upwards, and has a mean temperature of from 59 to 63 degrees, Fahrenheit. Most of the grand central plateau is located in this region, except in such places as are in a great depression of ground and in deep ravines, where a warm temperature and tropical products are found. The rainfall is about five times less than in the temperate zone. This region, of course, produces all the growths of the cold latitudes, as wheat, oats, apples, etc., etc.

The portion of the country that is most thickly inhabited lies in the central plateau, and is quite high above the level of the sea, and so sheltered from the winds and storms by the mountains as to make the climate even, temperate, and delightful. The impression prevails in the United States that Mexico, lying to the south and running towards the equator, must be much warmer than this country; but this is not so. Even in warm places, like the lowlands on the coast, we do not have the extreme hot weather that is experienced in summer in the United States. The sea breezes refresh the atmosphere at night and cool it considerably, making, therefore, a very great contrast with the summer heat in this country. The medium climate of the Valley of Mexico, for instance, which is the one that has been best observed and understood, varies comparatively little between summer and winter, its greatest variations being between day and night on the same day.

The climatic conditions of Mexico are undergoing great changes on account of the destruction of the forests. The country had formerly a great deal of rain and much humidity in the atmosphere, being covered with thick forests; but with the difficulty of transporting the coal already found, the population has had to depend entirely for their supply of fuel upon charcoal, and this has in the course of time denuded the mountains, changing very materially the climatic conditions of some regions in the country. But in the lowlands, being thinly inhabited, the case is different, and the country is still so thickly wooded that it is impossible to pass through it, unless an open path



is made with a great deal of difficulty, by felling very high trees and low brush and weeds. In this region abound forests of mahogany, cedar, rosewood, etc. I will later state more in detail the conditions of the fuel question in Mexico.

As a whole, the Mexican climate, if not of the most invigorating nature, is certainly one of the most delightful in the world. The zone of temperate lands, oceanic slopes, enjoy an everlasting spring, being exposed neither to severe winter, nor to intolerable summer heats; in every glen flows a rippling stream; every human abode is embowered in leafy vegetation; and here the native plants are intermingled with those of Europe and Africa. Each traveller in his turn describes the valley in which he has tarried longest as the loveliest in the world; nowhere else do the snowy crests or smoking volcanic cones rise in more imposing grandeur above the surrounding sea of verdure, all carpeted with the brightest flowers. In these enchanting regions there is still room for millions and millions of human beings.

The following table prepared by the Meteorological Observatory of the City of Mexico shows the meteorological conditions of the principal Mexican cities during several years, their elevation upon the sea-level being marked in metres and the temperature under the Centigrade scale.

SUMMARY OF THE METEOROLOGICAL OBSERVATIONS TAKEN IN SEVERAL CITIES OF MEXICO DURING SEVERAL YEARS.

LOCALITIES.	N. Lat.	Height above sea-level.	Number of years of observation.	Mean barometrical pressure.	TEMPERATURES IN THE SHADE.			Relative humidity.	CLOUDS.		WIND.		Rainfall. Average for a year.
					Max.	Min.	Mean.		Average.	Prevailing direction.	Prevailing direction.	Mean velocity.	
Monterey, N. L.	25 40	495.6	1	709.1	33.2	11.7	21.0	..	..	S.E.	..	3413.5	
Saltillo, Coah.	25 25	1633.0	4	632.1	34.0	-2.8	16.8	61	4.4	N.	..	527.3	
Culiacan, Sin.	24 48	34.2	1	754.9	35.9	12.5	25.6	62	..	..	..	125.2	
Mazatlan, Sin.	24 11	4.0	4	759.3	34.1	10.3	25.2	3.4	3.4	N.W.	N.W.	519.2	
Zacatecas, Zac.	22 46	2496.0	10	573.4	21.8	6.1	13.2	4.4	3.2	S.E.	S.E.	819.1	
San Luis Potosí, S. L. P.	22 9	1890.0	9	613.4	33.9	-1.8	17.4	60	4.4	W.	E.	389.0	
Pabellon, Ag.	22 4	1924.0	10	607.8	24.0	12.2	18.2	57	4.0	S.S.E.	W.S.W.	537.0	
Aguascalientes, Ag.	21 53	1861.0	1	605.1	29.5	2.8	18.6	..	..	N.	N.	542.2	
Huejutla, Hid.	21 41	376.0	1	705.1	34.0	10.0	23.0	81	..	..	..	729.3	
Leon, Gto.	21 7	1798.0	14	617.4	35.6	-1.1	18.9	66	4.9	S.W.	N.N.W.	601.0	
Guanajuato, Gto.	21 1	2060.0	5	601.3	30.7	1.3	17.6	58	5.3	..	..	664.5	
Tuxpam, Ver.	20 59	..	2	763.0	..	..	24.5	82	4.3	N.W.	W.	1594.3	
Guadalajara, Jal.	20 41	1567.0	7	636.2	35.5	-4.5	19.7	53	..	..	..	861.9	
Queretaro, Que.	20 35	1850.0	3	613.8	33.1	..	18.1	59	4.1	..	E.	602.2	
Pachuca, Hid.	20 7	2460.0	1	574.8	27.2	0.6	13.7	59	4.8	S.W.	N.E.	436.8	
San Juan del Rio, Que.	19 49	1976.0	1	..	..	..	18.3	60	3.5	E.	N.E.	567.1	
Patzcuaro, Mich.	19 31	2138.0	1	..	..	..	16.1	..	4.3	E.	W.	1110.4	
Mexico, D. F.	19 26	2282.5	15	586.4	31.6	-1.7	15.4	60	5.0	S.W.	N.W.	674.8	
Tacubaya, D. F.	19 12	2322.6	9	583.6	28.6	0.8	15.5	62	..	..	N.W.	668.1	
Puebla, Pue.	19 03	2172.0	14	593.2	31.9	-1.1	15.7	63	4.7	E.N.E.	N.E.	926.0	
Tlaxotalpam, Ver.	18 36	3.5	1	760.4	..	..	25.3	80	4.8	N.	N.E.	2264.0	
Oaxaca, Oax.	17 04	1541.0	1	636.6	32.9	6.2	20.6	80	..	..	W.	646.3	

SUMMARY OF THE METEOROLOGICAL OBSERVATIONS TAKEN IN SEVERAL LOCALITIES OF MEXICO, DURING THE YEAR 1896.

LOCALITIES.	N. Lat.	Altitude above the sea.	BAROMETRICAL PRESSURE REDUCED TO 0°.		TEMPERATURE IN THE SHADE.		Humidity.	RAIN.			CLOUDS. Dominant direction.	Average velocity per second.	WINDS. Prevailing direction.	EVAPORATION.		
			mean.	max.	min.	m'n mx.		°	°	°				mm.	mm.	mm.
Aguascalientes	21° 49'	1939.0	601.1	601.1	34.4	-0.8	53	107	82.9	July	17.6	5.1	E. & N.W.	16.7	4.2	
Collina (Seminario)	19° 11'	487.7	718.3	718.3	24.8	37.2	9.4	69	749.2	Oct.	266.7	5.2	S.W.	6.7	4.2	
Guadalajara	20° 9'	1580.8	634.7	634.7	36.1	-1.2	82	112	1597.8	Aug.	379.0	4.8	E. & N.E.	10.5	4.6	
Jalapa	19° 31'	1450.0	609.3	609.3	18.4	34.1	2.9	48	107	594.2	June	100.3	4.0	N.E.	7.7	4.0
Lagos	21° 21'	1912.5	613.5	613.5	18.5	33.5	5.6	202	1779.4	June	366.4	6.2	N.E.	10.5	4.0	
Leon	21° 7'	1798.6	617.2	617.2	19.1	34.7	2.4	58	109	395.1	Oct.	87.8	3.9	N.E.	3.2	3.2
Magdalena	30° 38'	1508.0	..	..	22.0	40.0	1.1	47	117	314.0	July	113.4	4.9	S.W.	15.6	3.9
Mazatlan	23° 13'	7.5	759.8	764.9	25.4	33.5	11.7	75	70	594.2	Aug.	437.0	..	W.	22.0	2.3
Merida	20° 55'	15.3	760.5	769.9	25.8	40.5	12.1	72	118	914.7	June	294.0	4.9	N. & N.W.	6.2	2.0
Mexico (Central Observat.)	19° 26'	2277.5	586.2	591.9	16.8	31.8	1.5	57	143	482.0	Oct.	105.0	5.1	N.E.	15.0	2.3
Mexico (National School of Young Ladies)	19° 26'	2277.5	586.2	591.9	16.8	31.8	1.5	57	143	482.0	Oct.	105.0	5.1	N.E.	15.0	2.3
Monterey	25° 40'	495.6	714.9	728.7	22.9	43.3	3.5	60	94	628.0	July	106.0	..	N.W.	..	4.8
Morelia	19° 42'	1951.0	638.3	638.3	16.8	31.5	1.5	63	159	619.9	July	131.9	4.0	S.W.	18.3	6.9
Oaxaca	17° 2'	1574.1	636.9	642.2	21.2	36.0	3.1	66	128	700.2	Sept.	82.7	5.0	N.E.	18.7	6.1
Puebla	20° 7'	2425.0	573.5	576.9	14.1	30.7	0.2	73	57	626.5	Sept.	89.7	7.1	N.E.	28.0	..
Puebla (Catholic College)	19° 46'	2467.7	594.0	598.0	17.5	31.5	1.8	58	88	687.3	June	146.7	3.7	E.	28.0	..
Real del Monte	20° 36'	1650.0	616.0	621.4	18.4	34.5	1.0	54	88	289.7	Sept.	74.5	4.1	N.E.	20.0	3.3
Saltillo	25° 38'	1772.2	548.0	552.3	13.1	26.5	0.1	62	82	435.0	Oct.	216.0	..	N. & N.E.	..	9.7
San Luis Potosí	22° 5'	1645.5	632.3	636.5	18.5	38.3	4.8	69	96	618.8	Oct.	16.0	..	N.E.	12.2	4.1
Silao	22° 9'	1848.3	566.1	569.3	15.2	28.2	3.8	53	146	618.8	Sept.	11.4	..	S.E.	12.2	4.1
Toluca	20° 50'	1848.0	616.2	621.9	19.8	36.4	4.0	59	99	618.8	July	86.4	..	S.W.	10.7	2.7
Toluca (estate of)	20° 50'	1848.0	616.2	621.9	19.8	36.4	4.0	59	99	618.8	July	86.4	..	S.W.	10.7	2.7
Zacatecas	20° 46'	2443.0	577.4	581.9	13.8	28.7	3.8	58	140	627.8	Sept.	153.4	..	W. & S.W.	16.7	1.7
Zapotlan	19° 36'	1562.0	633.6	640.4	20.5	35.9	6.0	51	151	616.0	July	266.5	..	S.E.	17.1	1.0



The table on page 39 shows the results of the meteorological observations taken in the principal cities of Mexico during the year 1896.

Professor Mariano Barcena, director of our National Meteorological Observatory or Weather Bureau, furnished me the following data about the maximum and minimum of temperature and greatest oscillation both in summer and winter of several cities in Mexico, located both at the sea-level like Merida and Mazatlan, at different altitudes like Jalapa, San Luis Potosi, Oaxaca, and at the highest level like the cities of Mexico, Pachuca, and Zacatecas, showing the mildness of the Mexican climate.

## CITY OF MEXICO.

Maximum temperature in the shade in summer.....	84.9, May 5th.
Maximum temperature in winter.....	72.0, December.
Minimum temperature in winter.....	32.9, January and February.
Greatest oscillation in one day in winter.....	13.7
Greatest oscillation in one day in summer.....	32.9

## PUEBLA (STATE OF PUEBLA).

Maximum temperature in the shade in summer.....	83.8, April.
Maximum temperature in winter.....	74.7, February.
Minimum temperature in winter.....	32.9, January.
Greatest oscillation in one day in winter.....	36.3
Greatest oscillation in one day in summer.....	34.4

## OAXACA (STATE OF OAXACA).

Maximum temperature in the shade in summer.....	93.7, May.
Maximum temperature in winter.....	83.1, February.
Minimum temperature in winter.....	39.2, January and December.
Greatest oscillation in one day in winter.....	39.1
Greatest oscillation in one day in summer.....	37.8

## JALAPA (STATE OF VERACRUZ).

Maximum temperature in shade in summer.....	89.6, April.
Maximum temperature in winter.....	87.1, December.
Minimum temperature in winter.....	33.8, February.
Greatest oscillation in one day in winter.....	35.3
Greatest oscillation in one day in summer.....	32.0

## QUERETARO (STATE OF QUERETARO).

Maximum temperature in the shade in summer.....	90.1, April and June.
Maximum temperature in winter.....	80.4, December.
Minimum temperature in winter.....	32.9, January.
Greatest oscillation in one day in winter.....	39.4
Greatest oscillation in one day in summer.....	34.7

## GUANAJUATO (STATE OF GUANAJUATO).

Maximum temperature in the shade in summer.....	91.9, April.
Maximum temperature in winter.....	82.0, February.
Minimum temperature in winter.....	36.0, January.
Greatest oscillation in one day in winter.....	36.7
Greatest oscillation in one day in summer.....	36.7

## LEON (STATE OF GUANAJUATO).

Maximum temperature in the shade in summer.....	91.6, May and June.
Maximum temperature in winter.....	77.0, February.

## PACHUCA (STATE OF HIDALGO).

Maximum temperature in the shade in summer.....	80.2, May.
Maximum temperature in winter.....	77.0, December.
Minimum temperature in winter.....	32.4, December.
Greatest oscillation in one day in winter.....	33.3
Greatest oscillation in one day in summer.....	28.6

## REAL DEL MONTE (STATE OF HIDALGO).

Maximum temperature in the shade in summer.....	80.2, March.
Maximum temperature in winter.....	74.1, January.
Minimum temperature in winter.....	31.6, January.

## SALTILLO (STATE OF COAHUILA).

Maximum temperature in the shade in summer.....	89.6, April.
Maximum temperature in winter.....	75.7, January.
Minimum temperature in winter.....	12.2, February.
Greatest oscillation in one day in winter.....	32.8
Greatest oscillation in one day in summer.....	25.6

## MERIDA (STATE OF YUCATAN).

Maximum temperature in the shade in summer.....	103.6, April and June.
Maximum temperature in winter.....	92.8, January.
Minimum temperature in winter.....	47.8, February.
Greatest oscillation in one day in winter.....	37.1
Greatest oscillation in one day in summer.....	38.7

## MAZATLAN (STATE OF SINALOA).

Maximum temperature in the shade in summer.....	91.0, September.
Maximum temperature in winter.....	84.0, December.
Minimum temperature in winter.....	15.8, February.
Greatest oscillation in one day in winter.....	16.9
Greatest oscillation in one day in summer.....	17.5

## MEXICO AS A SANITARIUM.

Although the City of Mexico, on account of its present unsatisfactory sanitary conditions, of which I will treat in speaking of that city and which I am sure will be remedied before long, cannot be considered now as the best place for invalids, there are many other localities in the country presenting great advantages as sanitariums.



The mild nature and evenness of most of our climate is very favorable to certain diseases—especially pulmonary ones—and when that advantage becomes well known the central plateau of Mexico will be the best sanitarium for lung diseases, and especially for tuberculosis. Other lung diseases requiring a warmer climate could find desirable places in certain valleys in the temperate zone like Cuantla, Cuernavaca, Tasco, Iguala, and others. These very conditions, namely, the even and mild climate both in summer and winter, will make it a country visited by thousands of pleasure or health seekers who wish to escape both extremes of the northern climate. Even now we would have a much larger travel from this country if we had convenient accommodations for travellers, but our hotels are not yet as comfortable as those in the United States.

## FLORA.

The short and imperfect description of the climate of Mexico, made above, will show that we can raise all the products of the three different zones into which the earth is divided, and the most remarkable thing is that we can raise them almost on the same ground. By going only a few miles, for instance, travelling on horseback four or five hours from a low to a higher locality, we change from the torrid to the temperate zone, and therefore we can have the products of both with comparatively little trouble; and by going four or five hours higher still, we change from the temperate to the frigid zone, and these are advantages of our geographical position which can be appreciated only by those who have experienced them.<sup>1</sup>

<sup>1</sup>Mr. Charles Dudley Warner, editor of *Harper's Monthly Magazine*, in a brilliant article published in the July, 1897, number of that periodical, gives the following description of the rapid descent from the cold to the temperate and hot regions of Mexico, which may be considered as a specimen of the scenery in many other localities of that country. In many other places, where there are no wagon-roads, but only a footpath, the descent is a great deal more rapid, often 5000 feet in four or five miles, and then the contrast is still greater. At Maltrata for instance, an Indian town about 5000 feet above the level of the sea, the natives offer their tropical fruits to the passengers of the Mexican Railway going from Veracruz to the City of Mexico, and they leave with what they have left after the train starts to climb the mountains to the Central Plateau to an altitude of about 9000 feet, and they reach Esperanza, the first station on the Central Plateau far ahead of the train, which has to describe a long, zigzag course before getting there. I have selected the following extract from Mr. Warner's article because it relates to one of the historical places of Mexico:

"Cuernavaca is distinguished as the actual meeting-place of the pine and the palm. It lies only a little more than fifty miles south of the City of Mexico; but in order to reach it there is a mountain to be crossed which is at an elevation of over ten thousand feet. A railway climbs up this mountain, over the summit, to a wind-swept plain, in the midst of pine forests, called Tres Marias—marked by the sightly peaks of the Three Marys. By long loops and zigzags it is crawling down the mountain on

The Mexican Southern Railway, from Puebla to Oaxaca, descends in a few hours, by a series of fertile terraces, from an elevation of seven thousand feet to one of about seventeen hundred and fifty feet, when the wonderful Cañon de los Cues is reached, a region of cocoa-nuts and bananas. But all the valleys and terraces in March are green or yellow with wheat and corn and sugar-cane. It confuses one's ideas to pass a field of wheat, the green blades just springing from the ground, and then a field ripe for harvest, and then a threshing-floor where the grain is being trodden out by mules. This means that you can plant and reap every day in the year, if you can obtain water in the dry season, and do not wait for the regular and copious summer rains.

The magnificent arboreal vegetation embraces one hundred and fourteen different species of building timber and cabinet woods, including oaks, pines, firs, cedars, mahogany, and rosewood; twelve species of dyewoods; eight of gum trees: the cacao and india-rubber, copal, liquid-ambar, camphor, turpentine, pine, mezquite yielding a substance

the other side to Cuernavaca. Mexico City has an elevation of seven thousand five hundred feet, Tres Marias of about ten thousand, and Cuernavaca of five thousand. The descent by the wagon-road is in length only twelve miles, but the drop in that distance is five thousand feet, so that the traveller passes very quickly from temperate to tropical conditions. . . .

"From the heights Cuernavaca seems to lie in a plain, but it is really on a promontory between two barrancas, and the whole country beyond is broken, till the terraces fall off into more tropical places, where the view is bordered by purple mountains. Indeed, the little city in the midst of this tumultuous plain is surrounded by lofty mountains. The country around, and especially below to the south, is irrigated, and presents a dozen contrasts of color in the evergreen foliage, the ripening yellow crops of sugar-cane and grain, the clusters of big trees here and there about a village or a hacienda, and the frequent church-towers. All this is loveliness, a mixture of temperate and tropical grace, but there is grandeur besides. Looking to the east, say from the Palace of Cortez, over the fields of purple and green and yellow and brown, where the graceful palms place themselves just as an artist would have them in the foreground of his picture, the view is certainly one of the finest in the world. There is in the left the long mountain range with the peaks of Tres Marias, and along the foot of it haciendas and towers, cones of extinct volcanoes and noble rocky promontories. To form the middle-distance mountains come into the picture, sloping together to lead the eye along from one "value" to another, violet, purple, dark or shining as the sun strikes them, while on the left is a noble range of naked precipices of red rock, always startling in color. It is some two thousand feet up the side of one of these red cliffs that there is the remains of an ancient city of Cliff-dwellers—almost inaccessible now, but once the home of a race that understood architecture and knew how to carve. The lines of this natural picture, the fields, the intervening ledges, the lofty mountains, all converge to the spot the artist would choose for the eye to rest, and there, up in the heavens, are the snow-clad peaks of Popocatepetl and Iztaccihuatl, about seventeen thousand five hundred feet above the sea, volcanic creators of the region, and now undisputed lords of the landscape. In the evening these peaks are rosy in the sun; in the morning their white immobility is defined against the rosy sunshine."