IX

AGRICULTURE.

CLIMATE AND PRODUCTIONS

The Northern part of the Mexican territory is included in the Temperate Zone, whilst the Southern part is in the Torrid Zone. These two general divisions that determine the average distribution of temperature, combined with the different altitudes of the ground, contribute to the diversity of climates which are found in the country, and in the three extensive regions which are known under the names of hot, temperate and cold country. The respective limits of these regions cannot be determined in a precise and exact manner, as the transition from one to the other is hardly felt, either in degrees of heat, or in the vegetation of the country.

From the coast up to an elevation of about 1,000 metres, the highest temperature is about 30° to 31° C., and the vegetation is entirely tropical indicating the Torrid Zone. These lands are excessively fertile and productive, on account of the constant humidity which is caused by the abundance of water and the continual dews, but on the other hand, these same elements of richness, contribute with the hot climate and other local circumstances, to the unhealthiness of these districts.

The N. E and S. W. winds on the western coasts and the heavy Northers which blow on the eastern coasts from Octo-

ber to March, modify the temperature, and lower the thermometer down to 22° C., and even more, during the time that these winds prevail. The unhealthiness of this zone is always increased in those places which are well sheltered from the prevailing winds, and in the neigborhood of swamps. On the slopes of the mountains, and at an elevation of 1,000 to 1,600 metres, the country enjoys a perpetual spring, the changes in temperature not exceeding 4° to 5°, the mean temperature of this zone being 23° to 25° C. In this privileged region, the extremes of cold and heat are unknown, as can be observed in Jalapa and Huatusco in the state of Veracruz, in Chilpancingo of the State of Guerrero, in Ameca, Jalisco, and in many other places which could be mentioned for the mildness of their climate, and their extreme salubrity. It frequently happens, that the clouds, floated along by the winds, and detained by the crests of the mountains cover these districts with heavy fog.

This privileged zone does not present the difficulties to the acclimatation of the European that are found in the first mentioned zone, because on both coasts, it is situated above the limit of the endemic diseases which are found in both, whilst it offers to the intelligent and hardworking agriculturist or manufacturer, all the elements he could desire for prosperous undertakings.

The third zone embraces all those lands which lie at an elevation of more than 1,600 meters over the sea, and includes a very large proportion of the great central table-land, whose mean temperature throughout the year is from 15° to 17°, with the exception of those places, where deep depressions and valleys exist, in which the temperature is higher and the vegetation acquires the vigor and exuberance, which clearly belong to the hot country, affording examples of the strange circumstance that can frequently be observed in Mexico, of a person passing during a journey of a few hours from one climate to another, and from one class of vegetable productions to another.

In the elevated valleys such as those of Toluca and Mexico, the depression of the mercury often shows a great lowering in the temperature, even as far as below zero, during winter when frosts are frequent, but as a general thing the winters are mild and the mean temperature is from 13° to 14° C.

I have above indicated the circumstances that have a direct influence on the remarkable difference in climate between the three zones above mentioned. The cold that is felt on the elevated mountains and in a less degree on the high table lands, even when it is not to be compared with the extreme cold of Siberia, is very different to the delicious climate which is hardly altered by the summer heats and winter colds of the Temperate Zone, and which is in still greater contrast with that of the coasts, always burning and at times suffocating. This climate on the other hand, although excessively hot, is very far from being comparable to that of Senegal or other parts of Central Africa.

Such are the general divisions of climate in this country, deduced from their own nature and without taking into consideration those of other countries.

In this manner, and speaking only of what is observed within the country, the hot zone includes: The Peninsula of Yucatan and Tabasco, as well as Veracruz, and Tamaulipas on the coast, the limits of this zone being Fortin to the West of Cordoba, the Encero, on the road from Jalapa to Veracruz, and Santa Barbara, in Tamaulipas. On the Pacific Coast, the same zone includes the territory of Lower California in which the highest peaks of the mountains de not reach above 1,000 meters, the districts of Altar, Magdalena, Hermosillo, Guaymas and Alamos, in Sonora; the western parts of Sinaloa and Jalisco, stretching inland through the great valleys of the Rivers Marqués, Tacámbaro, Zitácuaro, Cutzamala, Tepecoacuilco, Tenango and its branches, the Amacusac and others, all of which take their origin in the mountains in Michoacan; Mexico, Federal District and Puebla, on the Central Table land. The

Southern portions of all these States, and the entire State of Morelos, both on account of their lower altitude and of their southern aspect, belong to the Torrid Zone, which is interrupted by the Sierra Madre, traversing the States of Guerrero and Michoacan, as well as by other mountain ranges in the interior, which, elevating certain districts, places them in the Temperate Region, as can be observed in Chilpancingo and Tasco. The Torrid Zone also extends over the Mixteca country, the coasts and the valleys which traverse the southern portions of the States of Oaxaca and Chiapas.

The central table land, which is almost entirely in the cold zone, includes the plains in the northern part of the States of Michoacan and Mexico, the Federal District, the north and eastern parts of Puebla, the plains of Perote, and the States of Tlaxcala, Hidalgo, Querétaro and Guanajuato, the part of Jalisco adjoining the last named State, San Luis Potosí, with the exception of the eastern part, Aguascalientes, Zacatecas, except the Southern part, which includes the valleys of Juchipila and Tlaltenango, and lastly, the plains of Durango, which extend into the western part of Chihuahua.

This zone, which is also interrupted in numerous places by the depressions of the ground, is bounded by the great Cordilleras of the *Sierra Madre*, the crest of which forming the brow of the central tableland, is in many places crossable through great passes which are situated at an elevation more or less of 1,400 metres above the sea-level. We find examples of this in Boca del Monte, the pass by which the Mexican Railway climbs to the table-land; in Barranca Honda, on the railroad from Jalapa to Perote; in the pass of Oyameles, on the road from Teziutlán to Huamantla, and in El Salto, on the way from Mazatlan to Durango.

The zone which is intermediate betweent hose above described, is the Temperate, and mostly includes the slopes of the Sierra Madre towards either coast, extending itself over the plains of Chiapas, the northern part of Oaxaca, the Tuxtla and

Zongolica districts in Veracruz, and in the interior of the country over the valleys of Zacatlán, Huachinango, Rio Grande or Guadalupe in Hidalgo, the centre of Jalisco, the valley of the river Nieves in Zacatecas, the Nazas valley in Durango, the plains of Chihuahua, Coahuila and Nuevo León that slope gently towards the bed of the Rio Bravo, and lastly over all those low and sheltered districts which extend from the borders of these valleys and are covered with cereals.

The changes of the seasons are not so much felt in the places within the Torrid Zone, as in those that are outside of it; so much so that, the first named has only two real seasons which can be called the dry and the rainy season.

During the Summer, the most abundant rains refresh the ground, and this is another cause for the modification of the climate that generally would be expected in the geographical position of this Republic. The tropical rains commence in June, acquire their greatest intensity in July, and in the autumn equinox of September, and finally terminate at the begining of November, when the dry season begins. During the rainy season, the cumulus clouds appear on the horizon, with a brilliant white reflection, and of collossal proportions. These enormous masses of floating vapor generally unite after midday, and changing their character into that of nimbus clouds, precipitate themselves in heavy rainfalls which convert the streams into torrents, and cause the larger rivers to overflow their banks. The rapid play of lightning, and the thunder at frequent intervals in the clouds announce a fall of hail, accompanied generally with a fierce tempest. The water-spouts, whose mere presence threatens devastation, rapidly cross the atmosphere, and the hurricane which throws off continuous and deafening discharges of electricity makes one of these tropical rainstorms a sight fearful to man. Once the tempest has passed, the sky reappears beautiful and serene, the atmosphere being extremely limpid and transparent. The mornings are very beautiful, and were it not understood that they are

the precursors of the storms as above described, nobody would see the threat that they contain.

Under the influence of its varied climes, the vegetable products of the Republic have a variety unknown to other countries. From the intensely hot coasts of the ocean nearly up to the snows that crown the mountain peaks, the country presents with very few exceptions, a fertile and varied surface, developing in its three zones the most exuberant vegetation.

In the hot region, the country between the coast and the foot of the Cordillera, consist mostly of what are called *sabanas*, which are grazing grounds of more or less extent, with excellent pasture, varied by groups of trees amongst which predominate the ficus, the begonias, and the terebinto, whilst in many other places are found isolated groups of gigantic bamboos forming beautiful arches, which relieve the monotony of the plain.

Rising above these pasture lands to a height of 1,000 meters, above the sea level, we find that the vegetation has acquired a richness and development proper to these regions. The woods and forests are full of trees, highly esteemed for their fine woods, or for their dyeing qualities, whilst others are valuable for their fruits or medicinal properties; numerous herbs and parasitic plans interlace in the branches of the larger trees, and give a beauty to the scene difficult to describe.

Throughout these forests we find the following trees: Mahogony *(Swietenia)*, Tron-wood *(Robinia)*, Seibas *(Eriodendron Anfractusum)*, the Bombax Ceiba or Tepeguaje *(Acacia Acapulcensis)*, Ebony *(Dyospiros Ebenum)*, Taray *(Varennea Polystachia)*, Veracruz Copal *(Heliocarpus Americano)*, Copal Chino *(Amyris Bipinnata)*, Mulatto Wood *(Zantoxilon Clava-herculi)*, Oak *(Quercus?)*, Arrayan *(Myrtus arrayan)*, Guaco *(Aristolochia Grandiflora)*, Cascalote *(Cæsalpinia Cacalaco)* Mangle *(Rhisophora Mangle)*, Linoleum *(Anyris Lignaloe)*, Cuauteco-

mate *(Cresentia alata)*, Cedars *(Cedrela Odorata)*, Brasil Wood *(Cæsalpinia Echinata)*, Campeachy Wood *(Hæmatoxylon Campechianum)*, Dragon's Blood *(Pterocarpus Draco)*, Golden Hairs *(Carolina Fastuosa)*, Blue Wood *(Hæmatoxylon)*, Magnolias, amongst which are found the Mexican species or Yoloxochitl, Mimosas, and many other trees and plants too numerous to mention.

The rubber tree *(Castitlloa Elastica)*, and the Anacahuita *(Cordia Boissieri)*, have to-day acquired a very great importance, the first for the application of its gum to so many branches of industry, and the second for its medicinal properties.

Amongst the fruit bearing trees and plants, the following may be enumerated:

The Mamey *(Lucuma Bomplandi)*, Chico zapote *(Achras Zapota)*, Zapote prieto *(Diospyros Obtusifolius)*, Zapote borracho *(Lucuma Salicifolia)*; oranges, limes, citrons and lemons; coco palms *(Cocos nucifera)*, date palms *(Phenix dactylifera)*, coyol palms *(Cocos Guacuyule)*, and the Oil coco *(Elais melanococca)*, which abounds in the coasts of Colima, and Guerrero; Guavas *(Psidium Pyriferum)*, Jinicuiles *(Inga jinicuyle)*, Cherries *(Spondia purpurea)*, Sour cherries *(Spondin nombin)*, and Bromelia, amongst which are found the Pine-apple *(Bromelia anana)*, Chirimoya *(Anona chirimoya)*, the Alligator pear *(Persea gratissima)*, Tamarind *(Tamarindus Occidentalis)*; different kinds of the *Musa genus*, such as the long Plantain *(Musa paradisiaca)*, the Guinea plantain *(Musa sapientum)*, the Dominican or Costa Rica plantain *(Musa regia)*, The China or Manilla red plantain *(Musa coccinea)*, and lastly the common mangle *(Mangifera indica)*, and the so-called Manilla Mangle Melons *(Cucumis melo)*, and Water-melons *(Cucurbita citrullus)*.

PRINCIPAL PRODUCTS CULTIVATED.

The vanilla *(Epeidendrum Vainilla)*, grows wild, but that which is cultivated in the districts of Papantla, Mizantla and Jalacingo in the State of Veracruz is of the very best class. Its cultivation costs little in either work or expense, but its manimulation and preparation are very difficult, although well recompensed by the returns.

The annual products are:

Chiapas.....	2,000 beans, value	$	25 00
Jalisco.....	9,000	„	227 00
Oaxaca.....	462,000	„	4,587 00
Puebla.....	228,000	„	3,210 00
Veracruz.....	10,055	„	399,250 00
Total.....	711,055	„	$ 407,299 00

The production of this precious plant is much greater than that indicated in the above data, and can be fairly estimated according to other and more reliable reports, at two million eight hundred thousand beans, worth one million dollars.

Jalap root [*Ipomea and Convolvulus Jalapa*] also grows wild and is found very abundantly in the State of Veracruz. It is largely exported to Germany, United States, France and England.

Sugar cane [*Saccarum Officinarum*]. This is abundantly cultivated throughout the entire hot region, and in a large part of the Temperate, especially in the State of Morelos. There is an extensive region which has become noted as being the principal producer of this valuable plant, extending from East to West, and including the State of Colima, the Southern part of Jalisco, Michoacan, México and Puebla, the State of Morelos, and part of Guerrero, the States of Veracruz, Oaxaca Tabasco, Chiapas, Campeche and Yucatan; the State of Morelos being more or less in the center of this sugar-producing

zone. The cultivation of the sugar-cane was first introduced by Cortés shortly after the completion of the conquest, the first trials being made in the Tuxtlas of the Veracruz coast, and afterwards on his own properties in what is now the State of Morelos.

The annual products of this crop throughout the country are as follows.

WHITE SUGAR.

	Kilograms.	Value.
Campeche	690,680	$ 108,025
Chiapas	336,856	54,627
Colima	362,445	62,625
Guerrero	871,019	208,150
Hidalgo	3,452	750
Jalisco	5.475,225	916,163
México	239,329	41,800
Michoacán	5.601,242	797,500
Morelos	15.376,885	2.341,550
Nuevo Leon	110,460	17,394
Oaxaca	1.403,996	296,510
Puebla	3.689,953	496,510
Querétaro	25,889	4,500
San Luis Potosí	659.535	125,460
Sinaloa	632,841	150,000
Tabasco	1.098,888	161,875
Tamaulipas	23,012	4,000
Tepic	698,923	136,525
Veracruz	2.112,099	340,900
Yucatan	1.632,740	210,208
	41.045,469	$ 6.471,232

COARSE BROWN SUGAR (PANOCHA).

Aguascalientes	2,761	$ 160
Lower California	1.536,768	109,603
Campeche	289,381	17,262
Carried forward	1.828,910	127,025

	Kilograms.	Value.
Brought forward	1.828,910	127,025
Chiapas	1.847,606	140,874
Chihuahua	241,261	39,907
Coahuila	1.564,843	136,000
Colima	138,650	2,730
Durango	342,091	45,290
Guanajuato	541,482	41,500
Guerrero	1.873,533	109,090
Hidalgo	1.436,916	119,601
Jalisco	3.416,076	225,975
México	953,705	62,779
Michoacan	8.955,128	519,427
Morelos	381,545	34,175
Nuevo Leon	6.035,256	388,012
Oaxaca	1.847,874	111,934
Puebla	4.893,121	283,579
San Luis Potosí	5.260,405	322,178
Sinaloa	2.039,243	148,247
Sonora	1.970,690	233,250
Tabasco	279,601	30,700
Tamaulipas	3.102,762	111,855
Tepic	382,006	32,550
Veracruz	7.834,433	543,334
Yucatan	3.733,474	299,126
Zacatecas	2.091,827	151,494
	62.992,438	$ 4.260,632

SPIRITS.

Campeche	5,950	$ 66,100
Chiapas	21,525	292,975
Colima	1,163	16,800
Guanajuato	2,713	31,300
Guerrero	2,888	40,480
Hidalgo	5,378	47,792
Carried forward	39,617	495,417

	Kilograms.	Value.
Brought forwerd.....	77,778	88,880
Jalisco.....	6,635	95,600
México.....	5,352	78,845
Michoacan.....	27,561	384,220
Morelos.....	41,731	727,122
Nuevo Leon.....	622	2,790
Oaxaca.....	7,898	118,974
Puebla.....	27,805	417,060
Querétaro.....	1,105	16,808
San Luis Potosí.....	7,176	93,016
Sinaloa.....	212	5,000
Sonora.....	241	6,180
Tabasco.....	26,352	161,365
Tamaulipas.....	5,204	54,160
Tepic.....	356	3,640
Tlaxcala.....	3,598	47,680
Veracruz.....	52,818	770,725
Yucatan.....	42,292	561,240
Zacatecas.....	48	640
	296,623	$ 4.057,512
Total value of sugar cane products.....		$ 14.789,376

Coffee [*Coffea Arabica*] is produced throughout the Torrid Zone of the Republic. Forty years ago, the cultivation of coffee was limited to the District of Cuernavaca of the State of Morelos and the neighborhood of Córdoba in that of Veracruz. Since that time the plant has been extensively propagated in other parts of the country and the cultivation has been highly developed, until now this berry forms one of most important productions in many States of the Republic, as can be seen from the following table of production.

	Kilógrams.	Value.
Veracruz.....	12.500,000	$ 5.000,000
Oaxaca.....	2.000,000	800,000
Chiapas.....	1.300,000	520,000
Puebla.....	1.200,000	360,000
San Luis Potosí.....	600,000	180,000
Michoacan.....	500,000	200,000
Colima.....	450,000	170,000
Morelos.....	200,000	80,000
Tabasco.....	200,000	80,000
México.....	150,000	45,000
Hidalgo.....	125,000	37,500
Tepic.....	76,000	22,800
Jalisco.....	53,000	15,900
Guerrero.....	10,000	4,200
Querétaro.....	5,000	1,500
	19.369,000	$ 7.516,900

The most celebrated coffee is that which is cultivated in the neighborhood of Córdoba, that of Villa Alta in Oaxaca, that from Uruapan and Apatzingan in Michoacan, that from Colima and from Morelos.

Tobacco [*Nicotiana Tabacum*]. An excelent quality of this plant is cultivated in the hot country. During the time of the colonial government of Spain, and the first years of Mexican independence, the cultivation of tobacco was limited to one district in the State of Veracruz, from which the Government received the crop, of which it had the exclusive sale. This inconvenient proceding lasted until the National Government raised the monopoly of tobacco, since which date the freedom of cultivation and sale of this important plant developed the industry and allowed the cultivators the splendid profits that they now make. As before stated, tobacco is cultivated all through the hot country, but the districts that have acquired the highest reputation for the excellent class of their products are the Tuxtlas, Valle Nacional, Tlapacoyan, Huimanguillo,

Campeche and Simojovel on the Atlantic coast, Tepic and Compostela on the Pacific coast.

The following table shows the annual production.

	Kilograms.	Value.
Lower California	20,711	$ 5,177
Campeche	4,602	1,150
Chiapas	107,907	43,163
Chihuahua	164,389	65,756
Colima	25,314	10,000
Durango	63,965	25,586
Guanajuato	236,360	94,544
Guerrero	155,908	21,450
Hidalgo	30,158	6,030
Jalisco	437,520	109,380
México	9,366	3,450
Michoacan	237,022	29,255
Nuevo Leon	12,657	3,164
Oaxaca	557,057	272,235
Puebla	226,787	56,697
Querétaro	28,765	6,000
San Luis Potosí	48,441	12,810
Sinaloa	62,305	15,000
Sonora	401,335	80,334
Tabasco	125,130	82,216
Tepic	372,741	93,190
Veracruz	2.325,620	930,248
Yucatan	24,379	7,065
Zacatecas	33,529	6.015
	5.711,968	$ 1.979,915

In this table, as in most of the same class, the value given represents the price at which the cultivator sells, without showing the different classes of tobaccos, or the value which they acquire after being selected and separated. In some cases, the value of the arroba (11.5 kilograms) of the superior classes from the Valle Nacional, reaches forty dollars, and the second

class twenty-five dollars, those of Tuxtla being twenty two dollars and ten dollars.

Rice [*Oriza sativa*] is cultivated in the hot and damp regions of the country, ripening about six or seven months after being sown. It multiplies at the rate of forty or fifty to one. The principal producers of this crop are the States of Colima and Morelos.

Its annual production is as follows:

	Kilograms.	Value.
Campeche	218,605	$ 25,230
Chiapas	981,249	46,062
Colima	2.541,746	136,083
Guerrero	583,907	60,168
Hidalgo	23,318	2,030
Jalisco	237,718	16,828
Michoacan	250,605	98,916
Morelos	2.366,595	172,932
Oaxaca	174,373	17,484
Puebla	484,756	43,413
San Luis Potosí	56,380	3,950
Sinaloa	34,519	4,875
Tabasco	573,019	56,338
Tamaulipas	598,322	50,000
Tepic	682,087	63,480
Veracruz	886,971	80,424
Total	10.694,170	$ 878,213

Cotton [*Gossypium*]. This textile gives a large crop of good class on the coasts, and is largely cultivated with the best results in Sonora, Sinaloa, Guerrero, Yucatan, Oaxaca, Jalisco, Michoacan and Veracruz; but the region which can be pointed to as the principal producer of this useful crop is that which extends from Santa Rosalía and Rio Florido in Chihuahua, to the districts of Viezca, Parras and Monclova in Coahuila, including the fertile valley of the Nazas in the State of Durango.