magnitude of the enterprise. There are steam-ploughs, steam-threshers for the wheat, and steam corn-shellers. In addition there are over seven thousand ploughs, cultivators, etc., including planters, as well as cultivators for cotton, corn, and wheat.

The company now has about four million five hundred thousand dollars invested in its property. The enterprise pays a handsome profit, although these profits are to a great extent used in the erection of the industrial plant, the operation of which forms a by no means insignificant part of the business of the company.

The agricultural development of the land, as previously stated, is not the sole business of the Tlahualilo Company. The industrial branch of its business is much larger than one would expect to find in so remote a district. Two years ago the company erected an oil-factory, a soap-factory, and a cotton-gin, in which may be seen the most improved machinery for ginning and baling the cotton. An electric dynamo furnishes facilities for lighting the various buildings.

The company provides to the utmost extent for the benefit of its work-people. There is a resident physician for those who need medical attendance. There are a large and well-appointed school-house and teachers for the instruction of the children. No intoxicating liquors are sold on the property, and so important is this regulation deemed, not only here but on the other haciendas in that section of the country, that when the Mexican International Railroad was granted the right of way to build the branch road from Matamoros to Zaragoza it was stipulated in the contracts that the railroad company should not permit the sale of intoxicating liquor of any kind on any part of the property ceded for railroad purposes. When the barrenness of the adjoining territory is seen, then are fully understood the difficulties which this company has battled with and overcome; and then, too, is realized the fact that to secure the results mentioned above it was necessary that the owners and managers should possess an immense amount of energy, intelligence, and business ability.

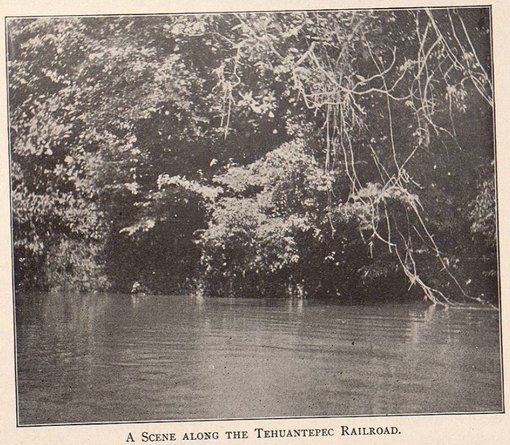
The cotton consumed by the manufacturers of the country amounts to about two hundred and sixty thousand quintals per year, half of this coming from abroad. The annual production in cotton cloth, coutils, percales, and calicos reaches about three million eight hundred thousand pieces of cotton cloth, two hundred and eighty thousand of calico and percales, and two million seven hundred and thirty-five thousand of cotton in hanks, consumed by manufacturers of rebozos, sheets, napkins, stockings, and other articles. More than fifty thousand families live by the cotton industry.

Among the profit-bearing plants should be placed in the first rank the henequin.

Henequin, of all the textile plants which abound in Mexico, is the one which is the most assiduously cultivated. It seems to have originated in the peninsula of Yucatán, of which it has made the fortune, and appears to have been created especially for that desolate country, which before having undertaken culture on any scale was considered the most worthless district of the republic, fit only to receive exiled convicts. The henequin of Yucatán—which, by the way, must not be confounded with the plant of the same name which grows at Manila, and which is of another family—specially grows on stony ground, and particularly on rocks. It is even asserted that it draws all its nourishment from the atmosphere, and that its roots serve only to fix it to the soil. The henequin is produced by drageons. It receives two cultivations the first year and another each successive year. It arrives at its complete development at the end of four years. At the end of this time there are annually cut a certain number of leaves. The duration of the exploitation of the plant averages from six to eight years, and sometimes extends as long as fifteen or twenty years. Its fibre is very fine, finer than that of hemp, does not harden under the influence of moisture, nor even stiffen under the lowest temperatures, and does not call for the care necessary to be bestowed on flax and hemp. The cultivation of this plant is constantly increasing in Yucatán. It occupies the first place in the agricultural products.

Henequin began to be seriously worked in Yucatán in 1860, before which it was exported only manufactured in the shape of hammocks, ropes, etc., the whiteness and suppleness of which articles had attracted the attention of foreign merchants. The United States commenced to import the raw material, and the agriculturists of Yucatán were therefore forced to make their products known to European markets.

The general conditions of climate and the latitude of Mexico are as favorable as they could possibly be to the culture of the ramie-plant. In fact, latitude is one of the most important factors in its development. The length of the fibre varies under this influence from three to six feet, and a difference of two degrees of latitude may cause the length to vary one hundred per cent.



A Scene along the Tehuantepec Railroad.

Nothing is simpler or more economic than the culture of ramie. As the plant is perennial, once developed it can give crops through several years, and the fibre not only loses none of its good qualities in growing old, but gains, on the contrary, in fineness, and, above all, in strength, to such a degree that the first crop is scarcely ever utilized. The number of crops per year varies with the climate. In the hot districts there can usually be made at least three.

The zacatón, or dog's-tooth, is a wild plant found in abundance at Huamantla and in several other districts. Its root is highly esteemed in European and American markets for the manufacture of brushes, brooms, etc. Not only does it require no cultivation, but, on the contrary, is an undesirable weed, cumbering the ground, which otherwise cannot be utilized for any other crop.

The maguey manso, already referred to as the source of pulque, produces a fibre which has received the name of ixtle and which serves for the manufacture of ropes and coarse canvas. This fibre, as well as that from the leaves of the same plant, employed in the manufacture of paper, gives a product of remarkable fineness and solidity. All attempts at manufacture which have been tried with ixtle have succeeded admirably, and it is astonishing that they have not been followed by a more systematic development.

The pita, which abounds in a wild state in Oaxaca, gives a fibre resembling that of the ramie and answering the same purposes. Ropes made with Oaxaca pita are four times stronger than those of hemp.

The question of cultivating the india-rubber-tree in Mexico has been agitated considerably by private parties, as well as by the federal authorities of the republic, as the supply of

rubber in the accessible regions is diminishing steadily, while the demand for it increases. Practical experiments in the cultivation of these trees, according to the officials of the Bureau of Agriculture, have demonstrated beyond doubt that this industry can be established with profit.

Young trees transplanted from a forest to a cultivated field in Soconusco have yielded rubber for more than thirty-five years, the present annual product averaging more than fifty pounds of gum for each tree.

Up to the present time the production of india-rubber in Mexico has consisted in the extraction of the gum collected by the Indians in a very primitive manner in the forests, where they find the trees which produce it. The plants themselves have not been cultivated, nor has the extraction of the juice been carried out in a scientific manner. The Indians tap the trees, gather the sap in the hollow of a piece of bark or in a pot and boil it, and the gum, formed in crude balls, is carried to market.

The Mexican gum deserves to be taken into consideration. The plants which produce it are found in considerable quantities in all the forests of the hot districts, and especially in those of the states of Vera Cruz, Tamaulipas, and Tabasco, and on the Pacific slope, on the coasts of the states of Guerrero, Oaxaca, Tepic, Chiapas, etc.

It is stated that in Tuxpán the milk drawn from rubber-trees is placed in earthenware vessels and whipped with a weed called *coyuntla*, which is an astringent that causes the milk to curdle, making the crude rubber.

The mulberry-tree, to which place is here given because it is the indispensable complement of the silk industry, grows in both hot and temperate climates. Under the colonial régime several successful attempts to plant mulberry-trees were made in Mexico.

The tree grows with great rapidity in this country. Besides the plantations of small shoots, there have been made considerable plantings of mulberry-seed, which have proved profitable.

The government has bought from both Japan and China eggs of the best class of silkworm and the seed of the more valuable kinds of mulberry. These last have been distributed in those districts where silkworm-raising has been carried to the highest development. The number of mulberry-trees cultivated in the republic at present exceeds two million.

Silkworm-raising has succeeded perfectly in several districts in the country, notably in the states of Puebla and Jalisco, in which latter there are already several silk-factories.

It is doubtful if there is any race of people—even the Irish or the French—who eat less meat than the Mexicans, and as to intemperance among respectable people, it is almost unknown. You will rarely see Mexican gentlemen drink anything stronger than claret wine; and they are equally temperate in eating.

The constant succession of fruits of every variety is in itself a resource which few other countries offer. It is not uncommon on the large estates to find that the climate gives a chance for every vegetable product to grow and flourish, the lowlands producing all the fruits and vegetables of the tropics, and the higher regions those of the temperate zone, according to their altitude.

The apples and peaches of Mexico, except in the colder portions, are not of the highest excellence, but the pears are very fine; indeed, there is one species of this fruit which is decidedly the best I have ever seen. It is not only very large, but its flavor is as delicious as that of the finest pear ever grown in the United States.

All the tropical fruits are produced in Mexico, and in fact the most exquisite fruits are grown in all the states.

In the hot country the most delicious fruits are the oranges, limes, guavas, anonas, chirimoyas, melons, zapotes, bananas, pineapples, watermelons, mameyes, and mangoes; in the colder and temperate regions, aguacates, apples, pears, peaches, apricots, plums, strawberries, and blackberries. Grapes, from which excellent wines are made, are cultivated in Sonora, Lower California, Puebla, and Oaxaca.

The entire Mexican coast produces these fruits spontaneously and in great abundance, the banana and the orange being the characteristic flora of these regions.

Baron Humboldt wrote at the beginning of the present century of the remarkable productiveness of the banana in Mexico, saying that the same spot of ground which planted with wheat would support one man, if planted with bananas would support twenty-five. In the districts near the sea, at from six hundred to seven hundred metres of altitude, great plantations of bananas may be made at about five cents per plant, including all expenses up to the day of bearing. At the end of the first year each banana-plant produces a crop.

Rice, one of the most precious gifts of nature, is produced in hot and moist places, and especially in Sonoma, the southern part of Morelia, Tamaulipas, Jalisco, Guerrero, Vera Cruz, Morelos, Colima, and Tepic.

Indigo is cultivated in Vera Cruz, Oaxaca, Colima, and Chiapas, and on almost all the coast-lands.

The potato is raised in nearly all parts of the republic.

In Oaxaca the nopal (cactus) is cultivated especially for the cochineal, an insect from which is produced a fine and brilliant red dye.

The jalap (*Convolvulus Jalapa*) grows in a wild state, and is very abundant in the state of Vera Cruz.

The coasts of the hot district produce many other useful plants, among which may be mentioned sarsaparilla (*Smilax medica*), Tabasco pepper (*Eugenia Pimenta*), and the manioc (*Jatropha Manihot*), which produces starch, rice, and arrowroot.

But of all the fruits of Mexico I have eaten nothing finer than the tuna. It is both refreshing and exquisite in flavor. It is the product of one of the infinite varieties of cactus, of which I have seen as many as twenty on a single acre of land. One of these varieties grows to a height of from thirty to forty feet in the form of a beautiful fluted column, and is used to enclose gardens by planting close together.

The cactus which produces the tuna grows to a height of thirty feet and covers an area of twenty feet in circumference, with the leaves (if they may be called so) drooping over one another exactly like the shingles on a house. These leaves are from twelve to eighteen inches in breadth, and shaped like those of the smaller prickly pear of the North.

The fruit is about the size and very much the shape of a duck's egg. The combined flavor of a cucumber, a watermelon, and a lump of sugar will give some idea of this delicious fruit, which literally melts in the mouth.

In the valley of Mexico, toward Querétaro, the white tuna is found. Alfajayucán is noted for a very superior variety of this fruit, and from Querétaro on to Guanajuato, San Luis Potosí, and Zacatecas, is found the *Tuna cardona*, or red tuna, from which is made a most refreshing drink.

The chirimoya is a larger fruit than the tuna, and altogether delicious. The idea which occurs to every one on eating it for the first time is that it is a vegetable custard. Every American makes that comparison, thinking to say something original; but I have heard it at least a hundred times.

The "May-apple" also abounds in Mexico, or at least something very much like it. It is of the same size as the same fruit in the United States, and the flavor has all the peculiarities of the passion-flower. The fruit is exactly the same, except that it has a yellow rind like a lemon. It grows on a vine which is something like a grape-vine, instead of trailing on the ground as in more northern countries.

Spain, desirous of preserving for her wines the market of the American colonies and fearing rivalry, was always opposed to the cultivation of the vine (as of several other plants) in Mexico. If, after the declaration of independence, Mexico had not had so many struggles to

COFFEE PLANTATION ON THE INTEROCEANIC RAILROAD.

undergo and so many difficulties to conquer, it is almost sure that she would by this time have been counted among the richest of wine-growing countries. In fact, immediately after the conquest, and even before, there were timid essays in the plantation of vines, the results of which have always been encouraging. The vines of Parras, in the state of Coahuila, had and have still the highest reputation in the country; but the distance of Coahuila from the centres which would be able to consume her wines, added to the unfortunate economical situation of the country, prevented this industry from acquiring any importance.

As soon, however, as the complete pacification of the country was effected, and at the same time that improvements of all sorts were being pushed, the enterprising minister of public works bought vine-shoots in France, Spain, and Italy, and distributed them throughout the country to persons capable of undertaking their cultivation. Inspectors named by the government, and competent in this cultivation as well as in wine-making, were charged to aid with their counsels the inexperienced cultivators and wine-makers. These attempts were crowned with full success.

Not only did the plant not degenerate, but its development everywhere has been surprising. At Ixmuquilpán the development of the plant is most satisfactory, and at the end of two years bunches have been obtained weighing over two pounds each.

The reports rendered by the inspectors show that the results obtained in Chihuahua, Zacatecas, Aguas Calientes, Hidalgo, and Puebla are very satisfactory, but nowhere else have they been so stable as at Juarez (Chihuahua) and at Aguas Calientes; Juarez above all being destined for a brilliant future, not only by reason of the conditions of her soil and climate, but also because of her nearness to the great North American market.

Unhappily, though the grape crops are good as regards quantity and quality, the wines still leave much to desire. The wine-making industry demands a great amount of experience and special knowledge, which are lacking among Mexican growers. Here is an opportunity for foreigners to step in and finish with profit what has been begun with such excellent promise.

The magnificent arboreal vegetation of Mexico embraces one hundred and fourteen different species of building timber and cabinet woods, including oaks, pines, firs, cedars, mahogany, rosewood, etc., twelve species of dyewoods, eight of gum-trees, the india-rubber-tree, copal, liquidambar, camphor, turpentine pine, mezquite (yielding a substance similar to gum arabic), dragon-tree, and the almacogo, or *Callitris quadrivalvis*, from which sandarach is extracted.

Among the oil-bearing trees and plants there are seventeen varieties, including the olive, cocoa-palm, almond, sesame, flax, and the tree yielding the "balsam of Peru."

The exploitation of the immense Mexican forests, which stand thick with splendid timber of the richest and most varied kinds, is most pitiable. Cuttings are made in every conceivable way except the right one, without care, without replanting, without prior selection of trees, so that there has resulted an enormous waste of the raw material and of time and labor. About the centres of population, notably in the environs of the capital, which formerly was surrounded with forests of trees that had come down from the ages, the cutting away of the trees has been so complete that at present in the valley of Mexico there are but few standing. It is necessary to go far therefrom to find forests, which are confined at present to the slopes of the mountains surrounding the grand valley. But despite this remarkable waste, there yet remains a forest worthy to be worked, beside which the part already worked seems to be but a trifle. The establishment of railways has enabled the working of extended forests of enormous extent and almost fabulous value. Really, only the central plateau has been vandalized; but the coast, so rich and so populous, and all the regions of the interior far from the centres of population, have been spared.

Business in dye-woods is in a very satisfactory condition. In general, the cost of working is much less than in timber-cutting, because all that has to be done is to fell the trees; they have not to be sawed, and the smallest pieces have the same commercial value as the largest. The principal dye-woods exported are the *palo moral*, brazil-wood, and Campeche-wood.

The first, which contains two coloring principles, yielding red and green, is usually employed as a yellow dye for cotton and silk, and particularly for wool. Other shades can be obtained by combination with indigo, Campeche, brazil-wood, and salts of iron, copper, etc. The *palo moral* grows wild in the states of Guerrero, Michoacán, and Campeche, the most valuable being that of the islands of Carmen, Tuxpán, and Tampico.

Indigo is cultivated specially at Judistán, and the annual crop is from one hundred and ten thousand to one hundred and thirty thousand pounds, worth nearly fifty cents per pound. At Tonaba there is rather more than half as great a crop, selling at from fifty to one hundred per cent. higher. An inferior grade of indigo brings from thirty to thirty-five cents per pound.