

is completed. The plate is washed carefully and dried, and a protective coat of paint, composed of minium, siccative oil, and spirits of turpentine is applied. After 4 or 5 hours the mirror can be delivered to the buyer. Galvanoplasty can be applied to coat this silver with a surface of copper as a substitute for the paint.

It has been noticed that an old solution of tartaric acid acts with more rapidity than a fresh one.

As it is, this process is still far from satisfying all requirements. The metallic surface of the silver is finer than that of the mercury tinning, but very often the operation fails without any assignable cause for the accident. Another great inconvenience is the action of the hydro-sulphureted vapors blackening the shining surface of the silver and destroying its reflecting property in a very little time. The locomotive headlight reflectors, manufactured by this process, being in constant contact with the smoke of coal, are generally destroyed with very great rapidity, even when protected by the minium paint and the copper coating.

As these defects manifested themselves, Mr. Dode, who for a few years had devoted his time and a small fortune to this important question, announced that his researches had met with success.

For twenty years this inventor has pursued his work with perseverance. Then the idea struck him to apply platina on glass. It is already known that the chloride of platina renders immense services in the arts. By its use porcelain manufacturers already coat wares requiring a metallic luster intermediate between silver white and steel gray. In order to obtain these results a concentrated solution of chloride of platina, mixed with essence of lavender, is applied on the varnish of the china to be coated. The object is then placed in the oven, very soon the platina appears with its metallic appearance, covering all the places where the composition has been applied, hiding the original color of the object, and possessing a brilliancy equal to that obtained by the burnisher.

It was a Prussian chemist, Klaproth, who in 1793 made this process known for decorating porcelain wares. Up to the past year platina had only been applied to decorate china and the application to coat glass in order to obtain a reflecting surface is due to Mr. Dode. Either the front or back of a platinized mirror is a perfect reflector.

Mr. Dode has adopted this metal as the one offering every advantage as it resists all the actions which destroy other metals. At first Mr. Dode platinized his glasses on the posterior surface; to this end he dissolved the platina in an equal mixture of nitric acid and hydrochloric acid. This solution evaporated to dryness was treated by diluted acetic acid; in this solution a certain quantity of amylic alcohol was added. The latter substance precipitates the platina and thus separates it from its aqueous part. The precipitate was then washed and this composition was then applied in a very thin layer on the back of the glass in the usual way. After a little while, exposing this glass in a dryer heated sufficiently to evaporate all the traces of amylic alcohol, the glass possessed a perfect brilliancy; but, unhappily, this coating had no more adherence to the glass than the old amalgam, and a varnish was necessary to prevent accidents that might happen by friction.

[For the Scientific American.]

#### GUATEMALA, ITS INHABITANTS AND PRODUCTS--- ADVICE TO EMIGRANTS.

BY I. CANTINI.

Since the great civil war of America, the emigration from the Southern States to Central America, and especially to Guatemala, has been quite considerable, although the great expectations of the immigrants were not always realized.

Guatemala, which, under the government of its actual president, General Xerna, has enjoyed several years of peace and quietude, blessings which are but little known throughout the Spanish American countries, has been chosen by many for their new adopted country; these people having bought land and property with the intention of carrying on the sugar, coffee, and tobacco culture. Indeed, the laws of that state have, ever since the reign of Rafael Carrera, been so much in favor of foreigners, that there are several instances on record in which natives have acquired the citizenship of some other state, and thus lived as foreigners in their own country in order to enjoy the privileges of such, and to be exempt from military and other duties.

These advantages are, however, of value only as long as the country is not in a state of revolution; but if the latter should take place, it would be fortunate for the settler if he could pack up his coffee or sugar plantation and leave the country, for he will find but little protection on the part of the government from the herds of roving outlaws and revolutionists who swarm over the country, and take or destroy all they can lay hold of. This fact the immigrant ought not to lose sight of.

For some time past, and at present, peace and prosperity are reigning throughout the republic; and there is every prospect for a happy future. Providence has emptied its cornucopia in a full measure all over the country, and an improving civilization and cultivation combine to make it a most desirable country for immigration. Those who intend to settle down in Guatemala, would do well, if time and money will permit them, to take a look at the country first before they buy any land. Many have gone there with the intention of cultivating coffee, sugar, or tobacco, without any knowledge as to the soil or climate. They have almost all failed in their attempts, and some of them have left again in disgust, if not wiser, certainly much poorer than when they came

Traveling throughout these Central American states is not expensive, though not always comfortable. What we understand by roads here, is there an object of illusion, and what might be called a good cattle-path here in the North, is there termed a "camino real," a royal road. The mountainous soil and the tropical rains are two great obstacles to the building of good roads. The ascents and descents through the range of the Cordilleras are precipitous and dangerous, the roads rough and narrow, and the privations often great. These "royal roads" do not permit any traveling in vehicles, except in the immediate neighborhood of the larger cities. Mules and horses are the only mode of conveyance. Ladies, or even men sometimes prefer to be carried on a chair by an Indian. This mode of traveling is, however, not advisable to very lively or fidgety persons. Imagine yourself sitting on a common chair, the back of which is attached by a strap, made from the bark of a tree, to the shoulders and forehead of the Indian who is to carry you, and who weighs not more than a hundred and twenty pounds, while his burden weighs a hundred and fifty, and often more; and yet he will carry you for four or five hours successively. You must, however, sit perfectly still in your chair; you may take a look at the passing scenery, but without turning your body or even your head; never attempt to sneeze or cough, else you or your carrier or both together will lose your equilibrium.

The natives possess a great strength for carrying, yet their strength lies only in the head, shoulders, and legs, and never in their arms.

While traveling through the country you are often startled by the sudden appearance of a caravan of these bare-footed Indians, each one carrying a heavy load of maize, cigars, indigo, cheese, or some other article of their commerce. They always travel in single file, one closely following the heels of the other; it is the same whether they are on the narrow mountain path or on the wider "camino real." Should you happen to be in want of any of their goods—which is but too often the case, especially articles of food—you will in vain offer them double the price which they will get in the capital of Guatemala, or other large city they are bound for; they prefer to get less for it and carry the heavy load of four hundred and more pounds a few days longer on their shoulders, in order to go to a city and there have a good time or spree on the few shillings which they get for their goods. They spend all the money on the spot, and then return to their mountain villages, talk over the good time they had during their visit to the city, until another crop has grown, and then the same journey with the same result is made over again. Happy people! they do not care to accumulate riches.

The coffee sugar and indigo planters of the interior have the greater part of their products carried to the sea-ports by the Indians. Their imported machines and agricultural implements are mostly landed at Ystapa, the main sea-port of Guatemala on the Pacific coast, whence they are transported on carts as far as the roads will permit such travel, and then they are carried over the mountains by the natives in a journey of one or more weeks. The Pacific sea-ports are preferred to those of the Atlantic; the roads leading from the latter coast are steep and difficult to pass, especially during the rainy season, while the Pacific coast, or "Costa Grande," is more sloping and much better adapted to the coffee culture than the former.

An impulse is given to the trade of this state by an annual fair, which is held in January in the town of Esquipulas. It is a place of pilgrimage, not only for the states of Central America but also of Mexico, and even South America; it is a "Holy Sepulchre of Palestina," a "Caaba of Mecca." A large crucifix in the principal aisle of the spacious church is the wonder-working effigy which vouchsafes to operate in behalf of true believers; and more than 80,000 persons have been known to assemble, some to assist at the solemnities others to attend the great fair, which is held at the same time, as is the case in all Eastern places of pilgrimage. The church of "our Lord of Esquipulas," is very rich, as many thank-offerings are given by the penitents, and when the government is in want of money, the "Lord of Esquipulas" is ready to make a loan, if the conditions are favorable. Those who have committed some great sin are ordered by the priests to make the journey to Esquipulas on foot, and the hardships of a pilgrimage to Mecca cannot excel those of Esquipulas.

The approach to the capital of New Guatemala is, to the traveler, a most imposing sight. The road leads through deep mountain gorges, that remind us vividly of some scenes in Switzerland; as we descend the mountain ridge, we see far before us the extensive fruitful plains and valleys, with here and there a modest-looking, one story dwelling house.

The never-dying verdure of the tropics is particularly charming on these heights. Whoever travels through these countries must be a lover of the beautiful in nature, otherwise he will find but little compensation for his laborious journey. He certainly should not be a "gourmand," for all he finds to eat are eggs, tortillas, some country made cheese, and beans cooked with garlic, the national dish of all the natives. The frugality of the natives is exemplary, and the stranger is more or less compelled to follow their example, which he will also find is much better for his health.

The houses in the city are only one story high, and built to resist as much as possible the frequent shocks of earthquakes. The streets all bear a look of desolation; the windows of the dwellings all open into the spacious courtyards, after the old Spanish fashion, which imparts a dismal aspect to the streets.

Many foreigners have established themselves in this healthy locality, the temperature being greatly moderated by the cool mountain breeze. Though the depredations com-

mitted during the revolution under Morazan and Carrera are still fresh in the memory of the inhabitants, yet they have recovered from their heavy losses, and hasten to support all means for the development of education.

The agricultural implements of the natives and their mode of working the ground are somewhat primitive yet, and those who bring any innovations into the country are often laughed at; or if the novelty secures the approval of the Indians, they never fail to show their veneration.

Coffee and sugar are the staple articles of their commerce. The cultivation of indigo, once the main product of Guatemala, is annually decreasing. The coffee crop is often destroyed throughout large districts by night frosts. As the traveler advances from the coast towards the interior of the country, and ascends the range of the Cordilleras, he quite forgets that he is moving under a tropical sky. The temperature is moderate, the nights even cold. Everyone is supplied with a coarse, home-made blanket. The natives no longer sleep in hammocks as they do in the valleys and along the coast, and woolen clothes are worn by almost everybody. The climate is exceedingly healthy and invigorating, and this combined with the products and advantages of a tropical region, make some parts of the Central American states a perfect paradise.

The many languages spoken in the provinces are a great annoyance to the traveler through Guatemala. Twenty-seven separate dialects are known to exist, which differ so much from each other, that the members of one tribe are unable to understand those of their nearest neighboring province. Spanish is, however, the language of the law and government, and those who are able to speak it can easily make known their desires throughout the country. It is necessary, when arriving at a village or town, to seek the hospitality of the priests or *padres*, who, always kind and obliging, are here not only the spiritual advisers, but also the inn-keepers, guides, and provision-dealers. A word from the *padre* has a wonderful effect upon the natives, when often not even the money of the stranger could induce them to move a step to get him something to eat, or to serve him as a guide. Hospitality is, nevertheless, one of their redeeming virtues, yet it is but too often only an idle word; the people are poor, they have nothing to offer, not even a shelter. If they have two ears of corn, the stranger is always welcome to one. They never think of laying up provisions, even when the climate would permit it; nature is so abundant that all the year round fruit and blossoms are beside each other.

Two crops of maize can be gathered within one year. The bananas, which are the bread and potatoes of the tropics, are always blossoming, growing, and ripe on the same tree. Meat is a secondary article; the beef is tough, though cheap. The price of a pound of beef never exceeds six cents, while pork is nine cents, it being considered a greater delicacy. To a stranger this latter meat is particularly disgusting here. It seems as if the pigs were more omnivorous in the tropics than in the North. There is an abundance of game everywhere, though not always inviting to those unaccustomed to such delicacies; for example, a dish of monkey, or a stew of lizards or iguanas. But taste and dislike are often out of question, and the hungry traveler must generally take what is offered to him. A most excellent quality of cocoa beans grow throughout the country, which are hardly inferior to those of the Mexican province, Tabasco. In many places cocoa is a general article of food, taken to allay thirst and appease hunger, both at the same time.

The climate of the west coast is much more preferable to that on the Atlantic side, where malignant fevers are often fatal to the natives as well as the immigrants. The natives mostly object to our mode of curing fevers by the use of quinine. They agree that the medicine may be efficacious in the northern climate, but that it is too heating to the body in a tropical country. Their theory is not without some good foundation, and their own remedies are certainly less destructive to the human system than those over-doses of quinine, taken by foreigners to break off the fever.

It is essential for those who wish to make that country their home, to carefully select a place most adapted to their constitution, and above all things, to lead a life adapted to the climate. The natives give much good advice to newcomers, which, however, is not always followed; such as never to eat any kind of fruit after sundown, and never to expose one's self to the night air. On the other hand, the stranger should never, in his good nature, permit himself to offer good advice to a native; a last remnant of Spanish pride does not permit him to accept it without feeling insulted.

Americans go abroad to see the antiquities of Greece and Italy, or the ruins of Egypt; they are perhaps, ignorant of the fact that they possess works of ancient splendor on their own continent, which are not only as interesting as those of Egypt, but also quite similar in their construction. When the wonders of Italy and Greece, of Egypt and India, have become a little more hackneyed, then the curiosity-seekers may begin to turn their steps towards the ancient palaces of Central America, the sculptures and hieroglyphics of which speak of their former grandeur and magnificence.

A GENERAL order promulgated by the War Department provides that hereafter no volatile oils will be issued or used for illuminating purposes at military posts, and all varieties of coal oil will be regarded as volatile. In general, lard oil will be supplied for issues of oil authorized for the necessary illumination of military posts.

It is announced that all the disorder attending the strike of the workmen at La Creuzot, France, has been repressed by the troops, and that the strike is ended.