About 1 p.m. today, we left San Francisco on board the Pacific Mail SS Acapulco (Capt. Potts) for Manzanillo, Mexico. Only a few cabin passengers are on board.

The sea was very smooth and we steamed quietly off to the south and into a bank of fog before dark. The last sound as I lost myself in sleep was the hoarse note of the fog-whistle.

The smooth sea and fog kept with us until we were south of San Diego when it became less and less, until off Cerros Island we had a clear sky. From San Francisco to this point, *Larus argentatus smithsonianus*, *L. californicus* and *L. glaucoscens* have been common. As we passed the high rocky island, a single pair of Frigate Birds came circling about in our neighborhood but without paying any attention to us. *Diodora brachyura* was with us until we were off Cape St. Lucas. The *Larus glaucoscens* did not follow us south of Cerros Island.

A few petrels and fulmars were seen at too great distance to identify.

Cerros Island was passed at some distance, so I could only make out a mass of high rocky and broken surface rising to 2000 or 3000 feet, and apparently very barren.

The next day ( ) we passed Magdalena Bay which seems to be surrounded by high hills or low mountains on the seaward side.

The range of mountains on the mainland south of Cerros Island is low and barren, not appearing to rise over 1500 or 2000 feet.

Early this morning we were rounding Cape St. Lucas. Scarcely a bird was seen except a few *Larus calif.* and *L. heermanni*. The mountains appear to occupy most of the southern point of the peninsula, the Cape being a low rocky headland with two jutting rocks just off.
Cape San Lucas (L. Calif.)
Jan. 20

1892

shore in the sea.

The SW side of point is rolling and rises to the high mountains toward the interior a few miles. The hills along the shore are sandy but covered with a generally distributed growth of bushes. This bushy growth extends all around the end as far as I could see. The town at the Cape is a small one of slight importance, but 12 miles further around on the gulf side is San Jose del Cabo which is quite a place at the mouth of a small river that flows southward for some 60 miles through a fertile valley several miles lying along the eastern base of the main range of mountains.

We soon left the Cape behind and steamed slowly off across the gulf, passing a schooner becalmed on the gulf.

Oddly enough, among the few cabin passengers on board, I find two who know friends of mine. One, a Mr. Chestnut of Oakland, California, is a friend of Mr. Bryant’s of the Calif. Acad. of Science, and of Dikeman and Palmer of the Biol. Survey. Four of the passengers are en route to mines in which they are interested, and another is a coffee planter going to his place in Chiapas.

Early in the morning we dropped anchor at this place in an open harbor.

The town is about a couple of miles from the anchorage and is marked by a fringe of cocomut palms along a curving line of sandy beach.

The low houses peeping out from this shelter give the first view of the town a decidedly tropical air. The entrance to the harbor is marked by some rocky islets from 100 to 200 feet high on which are located a lighthouse and a small battery of guns taken from an old warship now lying at the head of the harbor and used as a naval training ship. We landed and strolled about town for a short time.

- 2 -
The place is the principal port on the Mexican west coast at present, excepting only Acapulco. The buildings are of the Mexican type. One story adobes built with plain flat fronts, barred windows and low parapets about the flat, or gently sloping tiled roofs.

The Custom House at the landing has its front built up into a series of arches supported by columns fronting the street and forming a broad porch or veranda. The customs inspector was very lenient in his examination of the baggage of passengers landing here.

I had a $50.00 bank note to get exchanged for silver here,—the note being on the London and Mexican Bank, the best bank of the country, yet I had to pay a discount of 3% to get silver for it. The friend who was with me had a letter to mail which cost him 5 cents per 5 ounce to send it to the United States, yet to have mailed his letter to any port of the Mexican Republic, the same letter would have cost just double that amount. These are instances of almost Chinese methods by which Mexico is held back.

All of the carrying of cargo is made by lighters from ship to the small wharf and thence it is taken on the backs of Indian porters who handle heavy boxes and barrels of merchandise with remarkable activity. Packages not exceeding about 200 pounds each either in bale, barrel, or box are carried upon the head and shoulders of one man. Heavier packages are taken by enough men to carry them.

The porters wear a heavy, braided, oval-shaped shoulder pad held in place by a fillet about the brow. These porters are well muscled about back and legs and work very actively. Small boats are frequently run up to the beach and the trunks and other baggage of passengers is taken off by the porters wading out, often waist deep.
Mazatlan faces an open bay with a low rocky headland and some small rocky islets forming a point beyond the town. The town fronts a fine sandy beach on both sides of this point. On the inside of the point a broken row of coconut palms grow in a line following the sweep of the beach and sheltering a row of low, pointed roofed, thatched huts giving a remarkable resemblance to the views the books of travellers have given us of villages on coral islands of the south Pacific.

A small but effective lighthouse caps the highest islet off the point and a pigmy fort commands the bay and town on the ridge of the point itself. We visited the market where a generous display of garden truck was the main feature. We felt the unusual heat and went aboard early and the steamer left port in the evening, heading down the coast again.

Birds noted at Mazatlan:

- Helminthophila lutescens
- Dend. auduboni
- Ardea herodias
- Egretta alba
- Nyctanthes violacea
- Larus delawarensis
  - calif.
- Pelecanus fuscus
- Frigate Bird
- Quiscalus sp.

Did not go ashore here as I will return in a couple of months or so, and I had a chance to see some of the people on board from whom I obtained some desired information.

Groups of cocoanut trees shading low white buildings give the same effect here as noted at Mazatlan. This is a very open harbor with something the appearance of Mazatlan harbor but even less sheltered and forming a dangerous landing in rough weather. A number of lives have
1892
San Blas
Jan. 22

been lost here in the surf. Fortunately our weather has been very fine and perfectly smooth at the landing place.

1892
Manzanillo (Colima)
Jan. 23

From near Mazatlan to San Blas the coast country is mainly low with hills and mountains rising in the interior. From San Blas to Manzanillo the hills border immediately on the coast nearly all the way with rocky islets in places and at the Bay at Manzanillo are rocky headlands. This place is situated on a narrow strip of sand beach at the base of low, steeply inclined, and brush-covered hills. The town extends back through a small gap which leads to the long lagoon which lies just the other side of the village to the south, and extends nearly to the mouth of the Armeria R. This lagoon is shallow and is a favorite resort for many water birds and crocodiles.

We anchored off the town in the evening and I remained on board till the next morning so to get my baggage through the Custom House.

Jan. 24

Took my traps ashore and delivered my letter from the Mexican Minister at W. to the head of Custom House here, and the letter at once passed my baggage without examination, - a courtesy I appreciated as it would be a great job to open up my numberless parcels.

Found quarters in a miserable hotel, the best the town affords. It is a rude board structure with open cracks out of the sleeping rooms. Some ladies of easy virtue en route to Colima occupied adjoining quarters and made night hideous with their wrangling and drunken admirers.

Jan. 25

Our traps which were set along the side of the lagoon near trails contained one coon and two opossums this morning. The coon almost
1892
Manzanillo
(Colima)
Jan. 25

The country about here on all the flats and hillsides is covered with a more or less abundant growth of bushes and low trees, with a large amount of small mesquite trees on the flats. Many of the trees and bushes are thorn bearers. Along the lagoons of brackish water is a narrow belt of mangroves on which several species of herons and a cormorant are fond of perching. Under this shelter the crocodiles crawl ashore.

A law protects the buzzards and as a consequence they are very abundant and careless about presence of people. The Black Vulture is most numerous, then the Turkey Buzzard and the Caracara Eagle come next.

On flats and southerly hillslopes the trails of a large rufous-backed Neotoma are everywhere like a network. On a broad belt of low land adjacent to shore of sea and lagoons and extending some distance up the hillsides, the land crabs abound. Hermit crabs also occur near shore. Spermophilus annulatus, and a dark gray Sciurus are found on hillsides. The weather is warm, but not too much so for one to work.

The main effect of the heat so far upon both myself and man is to render us very nervous so that at night we find it very difficult to sleep.

Jan. 26

Continued collecting about the immediate vicinity of the town.

Took a fine leopard cat called Mecocuan by the people here. It was trapped within half a mile of town. The town contains only some 400 people and is supported by the traffic with Colima, for which place it is the seaport.

The police here walk about day and night armed with a large 45 cal. revolver hung to their belt in addition to the orthodox club. Nearly everyone coming to town from the country either carries a rifle or a
a revolver and the heavy bush knife (machete) like a short sword is also commonly slung to the saddle bow on the left side.

The town is a sleepy little place which shows a little activity in the early morning when the women are out marketing with small baskets about sunrise and in the cool hours from sunset to 9 p.m. when people stroll about chattering, laughing, and apparently enjoying life in a happy-go-lucky way.

The porters engaged in loading or unloading vessels here earn considerable money during their short periods of occupation so that this place is better supplied with money among the lower classes than most small places.

There appears to be very little drunkenness though the fiery Tequila or mezcual brandy is abundantly supplied at 3¢ a glass at very many shops and booths.

A curious thing to a person accustomed to the large signs displayed by stores and shops in our country is the almost entire absence of signs here. In this town the only places where there are signs are over the doors of the municipal offices.

A pretty, neatly kept little square grown up with cocoanut palms and various flowering plants is an unexpected sight here in a town of this size. No American village of the same size that I have ever seen has its equal. Each morning the cross-walks are swept by a man whose duty it is to attend to it. Prisoners from the jail under guard sweep the streets every morning and the refuse is taken out of town in a cart.

The streets are paved with cobble stones wedged together and presenting a roughly plane surface sloping to the middle to form a drainage way to the sea. Slightly raised sidewalks are found paved in the same way, or with flagging. The cobble stones are sometimes divided into bands by regular lines of stones laid in parallel rows across the
Manzanillo (Colima)

Jan. 26 to Jan. 31

Feb. 1 to Feb. 3

street about every 2 feet. As nearly all traffic is by pack mule or porters such pavement is very durable.

The houses are mainly one story; with gently sloping, double-pitched roofs covered with oval tiles.

The common people either go barefooted or wear sandals. The men wear shirts and overalls, with a broad-rimmed high-crowned straw hat, and a serape is commonly carried thrown over one shoulder morning or evening. The women wear a chemise cut square across the upper part of bust, leaving shoulders and arms exposed except for the narrow shoulder bands, a petticoat and shawl thrown over shoulders or drawn about head for a street costume completes the costume unless sandals or sometimes shoes are added.

The town is supplied with water by burros carrying 6 water jars in a frame, 3 on a side, or by a tank wagon. Street vendors of cakes have small tables spread at times or walk about with their wares balanced on their heads. Vendors of cocoanut milk walk slowly about carrying their ware. My work has proved a source of never failing interest to them and they seem very willing to give me all they possess in the way of information. This place is a fine one for an ornithologist as it is very rich in birds and also in reptiles.

Last Saturday I went a couple of miles out of town to a ranch where I heard that I would find an American (Mr. Stadden). It proved to be so and I was cordially received by him and we established a relationship on the fact of both coming from Illinois. I enjoyed his hospitality for two days and while there helped take a large Iguana over 4 feet long and also saw a pair of the pretty little Acapulco deer. They made their way up a steep hillside through a dense tangle of
undergrowth by holding their noses straight out and creeping slowly ahead.

On Sunday, I ran across a drove of about a dozen animals called Tejon by the people here. They live to a great extent on land crabs and insects, but eat birds, eggs, corn, and are extremely fond of sweets of all kinds.

The bunch I saw was straying along through a low growth of small trees into which they all climbed when they heard me coming. I crept through the bushes and before I knew it was among them and they sprang down all about me and scampered away to a rocky ledge on a hillside where they disappeared. I wounded a large one and killed a small one, only securing the latter. Until it died, the latter uttered a sharp squealing cry.

On the 2nd inst. I made all preparations to cross the bay to work at a point there for a week or so, but when I went out to secure a boatman I was met by the announcement that every boat had gone off to a fiesta somewhere, and would not return for several days. One of the customary pleasures of Mexican travel - wait while everyone celebrates the feasts. Pasted on the walls of houses in the poorer quarters of the town here are posters banded with the national colors, red, white, green, and printed with announcements of the virtues of the virgin of Guadalupe. "Maria de Guadalupe es la madre de los Mexicanos." In others, Marie de Guadalupe is the faith, hope, and salvation of the Mexicans. Others ask her to protect the household, etc., etc.

The half-caste character of the lower class is very evident in their features and very often curly black hair, thick lips, etc., and show the presence of Negro blood.

About the hotel or Pasada where I am stopping, a number of women
are employed and sing many songs while at work, with very pleasing voices.

At the hotel table some curious manners are exhibited,—or rather their lack. One day at noon, a man sat at table with his wife, and wore his huge sombrero throughout the meal as did another man at the other end of table. Both men appeared to belong to the middle classes here.

At the close of a meal, it is a common thing for the men (who are clerks, etc., in stores and offices here) to take a mouthful of water and after rinsing their mouth to spit it out upon the floor while they sometimes complete their toilet by wiping their teeth and gums on the border of the tablesloth. Cigarettes are smoked at will by the guests while at table.

As an offset to this may be mentioned the common custom of guests on entering the dining room to pass the compliments of the hour to the guests preceding him, to which all reply politely; and the first guests to leave the room bid the others good-day, which salute is returned.

At the hotel, one woman is occupied most of the time in grinding wheat on a stone mortar by hand, while another stands before a kneading trough and makes tortillas by the hour. These leathery cakes are the main bread used though a variety of small sweet cakes are used with coffee and chocolate. Pure Colima coffee of very fine flavor is used here.

Vicinity of Manzanillo. On the 14th I arranged matters and took the train out about 8 miles south of town to Tepelate, a small ranch by the R.R. track on the border of the lagoon. The train stopped and let us off in the midst of the tangle of thorny brush which borders the track all along this strip of flat country on the
narrow peninsula between sea and lagoon. I followed a trail leading back into the bushes and soon came to a couple of palm-leaf thatched houses built of wattled sticks woven into upright posts. By some shouting and hurrying out, the people rescued me from a pack of half-starved curs and I was able to arrange to stop here with the ranch man, Eusebio Rosario. My effects were soon brought up and we put out some traps about there. That night we slept on a couple of benches and I was nearly devoured by fleas.

We ate inside the house which has an uneven earthen floor. A wicker, or hurdle-worked partition divided the family sleeping room from the larger general apartment over which the high, steeply pitched roof made a dim and smoke-blackened cap. The light streaming in through innumerable chinks in the walls served to give everything a dark and shaded air even at midday.

At the end of the room a stand supported a stone metate and long grinding stone beside which a larger stand supported an earthen-coated fire place where a small fire of dry wood was used to cook by. During several hours each day, a woman stood behind the metate laboriously grinding corn that had been soaked until it made a kind of paste as ground. Then, when a supply of this was prepared, the woman spent other hours patting small lumps of this paste into small, round, thin cakes which were baked on a metal plate over the fire and are called tortillas, and form the staple bread of the country. Everywhere one goes, the steady pat-pat-pat of the tortilla makers' hands may be heard, and wherever a family is large or six or eight persons are fed, a large part of one woman's time is occupied in the manufacture of this bread. At our hotel in Manzanillo, from before daylight till after dark, this sound is heard almost constantly.

The morning after our arrival, we found that our traps gave us
but a small yield, I took 3 badly damaged specimens of Hesperomys from my traps, and this was all. The next day we caught a coyote on the seashore where the tracks of these animals were common where they ran along the beach and dug up the land crabs.

The one taken is darker and more reddish than the coyote north of the U. S. border. Ever since coming to Manzanillo I have heard of the Tejon, an animal said to be common in the woods here, and Eusebio said he would take us out and show us some.

With a half dozen dogs, we sallied out early one morning and after going a couple of miles through the thickets along a maze of cattle trails, the dogs suddenly pricked up their ears and started into the bushes. A moment later, I caught sight of several dark-colored animals running away into the bushes and fired at one without effect.

At the same time the dogs forced one into a tree and as we came up it crept into a dense mass of vines and we could not see it, so we were forced to go on, as the tree being hung full of thorny vines was too difficult to climb.

We resumed the hunt and went on cautiously through the dusky shade of the dense overhanging bushes and trees, peering to right and to left. In a short time we found two other bunches of the animals and secured one from each. These were measured and skinned on the spot, and then we returned home by the shore of the lagoon where I shot a large Caiman.

The next day we went out again and secured 5 Tejones. We struck a large old male at first digging into the ground by a trail, and I killed him by a rifle shot. A few moments later, the dogs ran into a bunch of them and put several up trees and we secured 4 of them almost as quickly as we could fire. These were skinned, and we returned to camp.
Always in going out, Eusebio carries a carbine in one hand and has a machete slung over his other (left) shoulder in its scabbard. In going home, we often left the trails and he would draw his machete and walk ahead, lopping the branches of the thorny bushes in our way with surprising dexterity. His clothing consists of a white cotton shirt, broad cotton trousers (white), sandals, and a high straw hat.

Finding game scarce on this peninsula, I decided to take our traps across to the mainland side of the lagoon. This we did after Eusebio had procured a written permission for us to go on the land there, as it is the property of Ponciano Ruiz, and it seems that the people here are very strict not to permit unlicensed trespassing on their land.

We trapped there a few days and secured 3 Tiger Cats, a number of opossums and coons, and Sperm. annulatus which latter is very abundant. A beautiful belt of cocoanut palms grows along the mainland here,—the species on which the small oil-bearing nuts grow. Some lovely vistas and nooks where perpetual twilight is found occur in these groves, and it is like wandering down the aisles of a noble high-pillared cathedral to walk in their shadow.

The Tezno abounds there, as do also the Acapulco deer, Jabalin, and other animals.

The drawback to enjoyment here, however, is in the myriads of small ticks which swarm on the bushes and cover one from head to foot in a few minutes. The young fellow with me after a day or two became a mass of small pimples from their bites, and neither of us could sleep at night from the nervous irritation brought on by them.

At length we took up our traps and loading them into a dugout canoe, we paddled back to Manzanillo. On the way we saw from 6 to 10
1892

Vicinity
Manzanillo
(Colima)

Feb. 3
to
Feb. 14

beautiful spoonbills besides many other water-birds. In a little
marshy bay of the lagoon near Tepeloate a spur-winged Jacana is quite
common. I saw 5 or 6 at a time feeding along the border of the water.

Cattle are numerous and seem to do very well on the brushy country
here. The tigers get a few at times, but their natural enemies seem
to be few and the animals seen were in good condition. When the
rancheros here wish to drive cattle here they put a rope about the
neck of the one to be driven and then make it fast to the horn of a
tame ox or bull and so take the animal along trails through a dense
thicket of thorny bushes where no one could drive unruly animals.

Everyone goes armed with rifle or revolver here, and all carry the
machete slung to the saddle bow on left hand side. A broad leather
apron is fitted over the horn of saddle and hangs down to the feet
and extends back over the legs and hips so to protect the person from
thorns in riding through the dense thorny brush that is everywhere here.

I found Eusebio and his wife very simple, good-natured people.
When I went there, he told me to pay what I liked and expressed him¬
self perfectly satisfied with what I gave him.

I stayed here 3 days drying and packing skins and was fortunate
enough to get a fine lot of bats (*Sacconteryx*) from the roof of the
steamship company's warehouse. The bats were hanging from the roof
by the hundred, each one by itself, and if another lit close by one
it would walk quickly to one side 2 or 3 inches.

At an old storehouse of the R.R. Co., I found a half dozen leaf¬
nosed bats hanging together in a cluster. On the 18th, I took the
train and moved up to Armeria, a small place on the Armeria River,
where I found quarters in the house of a small storekeeper there.
List of birds noted about Manzanillo, of which no specimens were taken, January 25th to February 18th.

<table>
<thead>
<tr>
<th>Jan. 25 to Feb. 18</th>
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<tbody>
<tr>
<td>Pelicanus calif.</td>
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<tr>
<td>Taedypeta aquila</td>
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<tr>
<td>Phaethon aetherus</td>
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<tr>
<td>Larus delawarensis</td>
</tr>
<tr>
<td>Forster's Tern</td>
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<tr>
<td>Caspian Tern</td>
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<tr>
<td>Flotus anhinga</td>
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<tr>
<td>Dark bodied Gannets</td>
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<tr>
<td>Ring-necked &quot;</td>
</tr>
<tr>
<td>Large and small white egrets</td>
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<tr>
<td>Reddish Egret</td>
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<tr>
<td>Black and Yellow Cr. Night Herons</td>
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<tr>
<td>Glossy (green) White and Wood Ibis</td>
</tr>
<tr>
<td>Black-necked Stilt</td>
</tr>
<tr>
<td>Least, Spotted and Semipalmated Sandpiper</td>
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<tr>
<td>Wilson's Snipe</td>
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<tr>
<td>Godwit</td>
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<tr>
<td>Killdeer</td>
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<tr>
<td>Carolina Rail</td>
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<tr>
<td>Coot</td>
</tr>
<tr>
<td>Pintail, Mallard, Bl. Wg. Teal, Spoonbill, Redhead, Widgeon, Erismatura</td>
</tr>
<tr>
<td>Tree Duck (White speculum)</td>
</tr>
<tr>
<td>Fulix collaris</td>
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<tr>
<td>Asturina plagiata = Marsh hawk</td>
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<tr>
<td>Turkey and Blk. and Caracara buzzards</td>
</tr>
<tr>
<td>Grand Dove = Inca Dove</td>
</tr>
<tr>
<td>Belted and Cabanis Kingfishers</td>
</tr>
<tr>
<td>Bank, Rough Wg., and Wh. bel. Swallows</td>
</tr>
<tr>
<td>Agelaius gubernator</td>
</tr>
<tr>
<td>Cardinalis var.?</td>
</tr>
<tr>
<td>Crotophaga sp.?</td>
</tr>
<tr>
<td>Yellow Warb.</td>
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<tr>
<td>Myiobioctus pusillus</td>
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<tr>
<td>Blk. and Wh. Creeper</td>
</tr>
<tr>
<td>Mocking Bird</td>
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</tbody>
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Colima (Colima)

Feb. 19

In the evening, I presented a letter I had to a Mr. Clark here and found him just preparing to leave town, but he soon made me acquainted with the small American colony here. All of these are employed on the steam or street car lines except a druggist. The business here is mainly in the hands of Germans outside of the native dealers.

- 15 -
Feb. 20

Met a Mr. Noakes from Corpus Christi, Texas this a.m. He has just come in from Guadalajara and is on route to Manzanillo to collect birds.

This is a town of one story, tile-roofed houses with a pretty garden and plaza. Fine gardens of cocoanut trees and other tropical fruits are scattered about the outskirts of the town and several plantations of bananas and cocoanuts were passed between here and Armeria.

To the north of the town rising up 10,000 feet from the plain is the grand bulk of the volcano, about whose head a group of cumulus clouds hang most of the time although the volcano is quiet at present. For several thousand feet from the summit, the volcano is a bare gray cone of ashes and lava; below this is a pine forest becoming more abundant as the east and north flanks of the adjacent and higher peak is reached.

A broad plain sweeps down along the course of the Armeria River from base of volcano by Colima to the sea. It is covered with a growth of low trees and thorny bushes with scattered and irregular open grassy areas.

Feb. 21

Sunday. The markets and stores keep open and do a rushing business all day till 3 p.m., which is the general closing hour.

In the evening walking about the plaza I was interested in the odd etiquette of the place. Ladies promenaded about the walk next the wall going from right to left about the square. Outside of this, the gentlemen promenaded in the opposite direction. In a still outer circle is a space allotted to the poorer classes and all not dressed well enough to be classed as gentlemen or ladies. The police see that this line is preserved, and are strict in preventing any disorder or unseemly conduct in any of the circles.
Gentlemen are not supposed to speak to any but their most intimate
lady friends and then only the briefest formality. Only near relatives
are supposed to promenade with a lady and this is not usual, even for
a husband to go with his wife.

I returned to Armeria this morning. Found that my assistant had
secured but a few possums and a coon in his traps here.

Remained here during this period securring the country for mammals.

Feb. 23 to
Feb. 29

Secured 4 fine specimens of the wild hog (Peccary) and a deer (male)
with one antler crippled. The only way to get these animals here in
the dense undergrowth where they are found is to find a "Moho" tree
where some of the nuts have fallen and sit down there and wait
patiently for hours till some animal comes along. By doing this,
once morning I secured a fine male pig. He led a small drove of his
companions along through the brush and came in sight 40 yards off,
quite unsuspiciously. He stopped there an instant, in a position
where I could see about half of the middle of his body between the
trees, and I fired cutting him down in the loins and killing him in¬
stantly. His companions instantly vanished in the brush and although
I waited there until evening, not another animal showed up except
ground pigeons and chachalacas. The latter are extremely common here
and are very noisy. Their call note is heard the entire day and if
one goes through the woods with the utmost silence he will be assailed
every hundred yards or so by a series of discordant shrieks and clatter¬
ering notes from the densely vine-matted top of adjacent tree tops.
Four to 6 or 8 are commonly together, and while sitting under the Moho
trees waiting for game, these birds were seen feeding about on the
ground with much the habits of turkeys.
The people here have found out that we have traps out, and as a consequence they have begun to steal them, so that I have been obliged to take them up. Four were taken one night.

On the 26th, I went down to Cuyutlan on the seashore to get some bats from the hotel building there which is now deserted. I found the *Saccopteryx* like that found at Manzanillo to be very common.

Cuyutlan is a pleasure resort for the people of Colima during April and May. The hotel is near a fine strip of sea beach for bathing, but is a long, roughly made barn-like building of boards.

The rest of the town is built of wattle brush and grass. The season is now approaching when the people will be here and 20 or 30 people were busy bringing in brush and huge packs of grass to rebuild the roofs and walls of the houses.

The amusing description I had received of the place came to mind. A man at Manzanillo told me that this was a watering place where people lived 2 months each year and then they left and the cattle came in and ate up the town which was rebuilt each season.

On the trains running from Colima to Manzanillo are two armed guards at all times. The prevalence of weapons among all classes is very striking. Nearly all wear revolvers (Colts), but when too poor for this then they carry about the machete. This is slung from the saddle bow and is intended for service among the thickets as well as a weapon, but when travelling the more well-to-do classes have the machete replaced on the saddle by a light saber or sometimes a straight sword.

At Armeria I am stopping at the principal store and Tequila bar in the place, and it is a common custom for the people to come and stay about the place drinking and talking for hours, carrying a naked machete in the hand when they have no revolver.
While waiting at the depot or shed for the train at Cuyutlan, I saw gather there, as is a common custom, nearly the entire population of the place to see the train arrive.

We had to wait long, and I noticed a scene that was characteristic of the country,—three women of the common class were seated on the platform with several children under 8 years of age. Two of the women were mothers of the children and the other a girl of about 18. The latter spent more than an hour teaching a boy about 4 years old a string of vile epithets. She whispered in his ear and he would shout the names at the other children at which the 3 women would shriek with laughter. She also taught him several obscene actions at all of which the child’s mother seemed greatly amused, as were the children.

The people about seemed to not give the matter the least notice, though it must have been apparent to all.

The language abounds in a swarm of vile terms and names, to which the English cannot compare.

A notice on the wall of the Cuyutlan hotel announces a grand ball for May 5, 1890, to wind up the celebration of the national holiday, and winds up its flamboyant periods with the statement in large type that "the best decency consistent with a good education will be preserved." — A good comment on the state of society when it is known that this is a resort of the best society of Colima, the state capital.

The almost universal courtesy observed among the people is almost exactly that of the middle ages when everyone went armed and was ready to resent an insult, real or fancied.

Although my host at Armeria is worth quite a sum of money, he lives in a wattled house with but slightly better surroundings than
the other people, and a constant succession of pigs, chickens, donkeys, and 2 tame deer is found in the house,—the animals passing through it to a corral in the rear, or out again, as they like.

March 4

I was prepared to leave here some days ago when some mouse traps set at the mouth of the river in some low land grown up to canes, grass, and weeds gave a return of two species of mice. I then stayed over and the next day two other species were taken, and I have a fine lot now as a reward for perseveringly setting traps in all kinds of localities.

Have secured 3 deer here also and a species of squirrel differing from Allen's *cervicalis*, but having rusty rump and neck patches. They are very rare, as I have had men in the woods here day after day and these are the only two that have been obtained,—and two others were seen. The people here, or several at least, have told me that there were plenty of squirrels here, and on questioning them they thought they might see 2 in a day's hunting. The actual results have been one squirrel for a week's work by 2 or 3 hunters who, while looking for other game also watched for them.

A fine *Felis* was brought in the night of the second. It was killed among the cocoanut palms a few miles from here, and is a different species from the ones taken near Manzanillo.

The deer here have very small antlers in proportion to the body judging from the 2 bucks I have and the antlers I have seen.

Last evening we took the first skunk of the trip. It is called
Zorrillo by the people here and is one of the badger-like animals having long claws on the front feet like a badger, and a long tail not more bushy than the tail of a fox if so much so. The tail and a broad band from ears to tail along back are white, rest of body black. The people tell me that these animals will climb trees after chickens roosting there. They have a remarkably long cartilaginous snout projecting $\frac{3}{4}$ of an inch beyond the teeth in front, with a soft joint at base and strong muscles on the sides of the nose attached to molar bones to move the snout exactly like the muscles on the sides of nose of the Pecaries I obtained, and proportionally they are equally large in these skunks, so it would seem that the latter must use their nose to root with.

The nasal passage on each side in front and just below the external opening is opened out into a conch-like expansion or chamber which is constricted at the nostril.

Among the mice taken near the mouth of the Armeria is one like a Perognathus without the large auditory bullae seen in that genus. Possums are extremely common here as many as 5 or 6 leaving their tracks along a single trail during the night.

The "Tienda" where I am stopping fronts the plaza in Armeria and all the life of the town passes before one here. I have sat by the hour and watched the movement going on there with never failing interest. The people are early risers and at first sign of dawn the pat-pat-pat of the tortilla makers' hands comes from the adjacent houses. The loud crowing of the cocks is incessant for an hour and then they march abroad and spend the day in company with a host of pigs and a goodly supply of dogs in skirmishing about for food, making raids into the houses at frequent intervals as do also their four-footed companions. Every morning just after daylight, the people send
children or come themselves for sweet coffee bread, corn, or other things needed in the household for starting in the day.

Then also begins the procession to and from the public well where the women and girls carrying large red earthen jars carry water for the household uses both morning and evening for an hour or two.

The water is sometimes carried by boys who use a pole on the shoulder with a jar at each end, but it is almost always the women of the house who carry the water. The jar is carried on the left shoulder and held in place by the up-raised left hand, and at times by the right hand thrown over the top of head.

The usual dark colored shawl is thrown about the head and adds to the graceful outlines of the figure draped in the single straight gown and waist. The customs from childhood here of carrying burdens on the shoulders and head and going barefooted or with sandals and with no superfluous clothing to impede the movements unite to produce a remarkably graceful carriage of the body in walking. The motion is wholly from the hips down, and the body is held erect in an easy pose with the head well up and producing an effect very pleasing. Even quite old women have this and it is much more noticeable among the lower classes or burden carriers than among the higher class.

As a rule, the women have very common features, but there are several exceptions here, and one in particular whose face has attracted my notice. She comes to the store morning and evening for corn, etc., and it is a pleasure to watch the sweet expression of mild dignity that seems habitual with her albeit she is merely the daughter of a poor woodcutter living in a palm-thatched hut across the plaza. One afternoon, I took my camera and as she stood by herself for a moment by the door I asked her if I might take her picture. She was standing with her side toward me as I spoke, and
as I finished she turned her face over her shoulder and flashed a smile at me that showed a set of even and beautifully white teeth and was like a sudden ray of light, and with a laughing and softly spoken "Adios", she picked up her measure of corn and was gone on the instant.

The next morning she did not come to market and I told Senora Leobarda, the woman of the house where I am stopping, of my desire to get the girl's picture and she saw her and told the girl, but the latter said she was too poorly dressed, having none but old clothing unworthy to be taken in a picture.

In the afternoon, however, I waited for her again, and as she came for corn I was ready and secured an instantaneous view of her as she came to the store.

It seems that all the village knew I desired the girl's picture, and when I secured it as she came up several of her friends in the store laughed at her in great enjoyment of her confusion. The next morning I watched for her to go to the well and then taking Senora Leobarda to explain what I wished, I went there and secured a couple of other pictures of her and others with their water jars. Her name is Andrea.

The voices of the women here are remarkably soft and while I sit by the door of the store in the evening they pass by each one saying "Buenas tardes" in a tone that is like a caress, so soft and sweet is it.

The children have fewer toys and games than any that I have ever seen. They seem like smaller editions of the grown people, going to market, carrying wood and water, and performing other work with all the quiet deliberation of their elders.

Wages are from 37½ to 50 cents per day here; corn 1½ cents a pound; wheat flour is 6 cents a pound and used only as made up by
bakers into small loaves or into coffee cakes. The coffee made here
even by the poorest people is remarkably fragrant. It is a luxury
here which the poor do not commonly enjoy, being worth 25 cents a
pound in current coin,—18¢ U.S.

Vicinity of
Colima
(Colima)

March 5

Took the train today and moved camp up to Colima, stopping at
the "Balcon Rancho" about 3 miles west of town by the R.R. track.
The place is occupied and owned by Mr. A. Morrill, an American born
near Manchester, N. H., but who has lived many years here and in
Colima where he has a drug store.

We embarked on the train today in the midst of quite a sharp
shower of rain that continued for a couple of hours. Every day for
several days past, the sky has become obscured and every indication
of rain given. The ride across the cactus-strewn llano is interest-
ing from the number of species of cacti strewn over it in every
direction. The open ground is covered with a thin sod of grass
which the soil is too sandy to make very heavy.

I went into Colima for mail in the evening, but got nothing but
a mainspring for my gun. This is considerable, however, as one barrel
has been useless for a month or over owing to a broken spring.

Birds seen at Balcon Rancho, near Colima, Mexico.

- Circus hudsonius - a few
- Falco sparverius - common
- Helminthophila selata - common
- Dendreina aestiva - common
- Melospiza lincolnii - abundant
- Pipilo chlorurus - common
- Guiraca acuilea - common
- Zenaidura macroura - abundant
- Mockingbird - common
- Pyrocephalus rubinus - common

(cf. notes on following page)
Balcón Rancho, near Colima, Mexico.

Have remained here at work during the past 8 days and have secured a nice lot of mammals. A very long, slender-bodied Urocyon and a large, heavy-bodied, chestnut-brown Thomomys, besides a species of Perognathus, a Hesperomys, Sigaodon, and two species of mice I cannot place.

I have also secured 10 specimens of the nine-banded Armadillo, and two species of skunks,- one, the badger-skunk with long claws on fore feet and short-haired tail; and the other like ordinary Mephitis except for having a narrow white stripe from side of head back along flank nearly to tail below a white area along the dorsum. On the opposite page (cf. page 24) is a list of northern birds seen here during the past week. All were apparently migrating. The dove here with white wing bars is nesting and about ready to hatch, as one set of eggs showed very plainly.

Birds are excessively abundant here now, probably owing in great part to the fact that the northward migration is at hand.

It seems rather odd in our present situation, geographically speaking, to see regular American corn-bread and pumpkin pie come to the table, and today (Mar. 14) we had strawberries and cream. The berries are grown in the colder climate on side of the mountains 20 miles or so from here and brought down on pack mule.

Before Colima attained the luxury of an ice machine, snow was brought some 25 or 30 miles from the top of the Sierra Nevada on pack animals that started so to journey across the plain at night.

The Thomomys taken here is dark chestnut-brown and is most common in a field where there is quite a cocoanut grove. The Armadillos are very common all over the upper end of the llano and especially about Colima. They live in burrows in banks and sides of arroyos,- or on
the level plain also, but less frequently. They are nocturnal and are easily caught at night by going out with dogs in their haunts if it is cloudy, or by going quietly about and watching for them in the moonlight. As soon as one is seen, a quick rush must be made and it must be caught and held by the tail. They cannot run as fast as a man, but if near their hole they often escape. When knocked about they coil up in a ball but watch for an opportunity to make a sudden attempt to escape. They cannot see but very poorly in daytime and when they venture out - as they do at times - are easily caught. They come out often at dusk.

Colima is 1750 feet above sea level. Many species of birds which were plentiful in the low coast country are not found here, but many occur in both places. The chachalaca is not found here, and the quail found here is not there. The ticks which swarm there are scarce here also.

The volcano is constantly emitting a small amount of whitish vapor-like steam from top of crater and also from a vent on side of cone below the top. Yesterday (13th) a large volume of whitish vapor rolled up from the crater and finally settled as a cloud cap over the summit. No sign of an eruption proper is to be seen nor has there been this past 12 months, despite the sensational articles in the papers all over the U.S. in the fall.

Wages here at Colima run as follows: For farm hands, 25 cents a day with board; house servant (male), about 32 cents a day. Without board, common labor is from 35 to 37½ cents.

This evening, March 14th, I chanced to step out at sunset and had a beautiful view of the volcano out of which arose a heavy cloud of white vapor more extensive than any I have yet seen. The view across the plain of Colima dotted with the plume-like heads of cocoa groves
already in shadow of coming night changed through smoky blue to soft purplish shades about the tops of the mountains where the sun still lingered and, ever rising in changing form, the cap of vapor on barren cone. From Colima plain the country sweeps up rapidly in series of abrupt but rounded contours broken by deep barrancas and shaded deep, dark green by a heavy growth of pines and oaks until the base of the bare gray cone is reached. This occupies 4,000 or 5,000 feet of top of mountain.

Back beyond this fire cone is the still higher snowy peak up which timber seems to climb almost to the summit.

Morril Rancho, near Colima, Mexico.

Shot 2 fine species of Nyctinomus tonight (16th). One was pale cinnamon and the other nearly black-brown. They were taken while circling over the cattle corral.

On the afternoon of the 16th, I rode about 5 miles to examine some small bat caves on the bank of Colima River. Found a few bats belonging to the two species found at Manzanillo, viz. Sacopteryx and the leaf-nosed bat. Killed a few with sticks. Found two Barn Owls in one of the caves, and saw the familiar form of a spotted sandpiper flitting along the rocky channel of the stream.

In the afternoon of the 16th, I took my boxes of specimens into Colima to ship them. The man started ahead of me in the wagon, and when I rode into the outskirts of town I found him stopped at the city's limit by a custom officer who asked for the permit or order allowing them to be passed into the city.

This was the first I had heard of the necessity for such a document, and as a consequence - it being late - I had to leave
them in the guardhouse all night and arrange with the shipping
agents to have them passed in the morning.

I then investigated the matter and find that the state custom
service requires that a permit be taken out by anyone shipping any
packages, from one point to another. This permit being issued at a
nominal cost of about 30 odd cents per 300 pounds, or carga. (Carga
being a mule load).

This permit is issued when the shipper guarantees to pay any
custom duty there may be on his goods according to the state tariff.
This is a small tax but it is collected on everything going into
Colima.

I desired to get a pair of trousers, but found that I could not
get any except by having them made so a servant went out from the
Boutique Americana where I was at the time and called the tailor. The
latter came and, finding what I desired, went to a store and brought
me samples of cloth. One of these I chose, paid him the price, and
he took my measure and agreed to have them done at a certain time.
When one wishes a pair of shoes, it is done in the same way; the
shoemaker comes to you and you give him the money necessary to buy
the material and he measures you and brings your shoes when done,
and you pay for the work when the article is delivered.

Cloths of all kinds are expensive here, even the domestic
cassimeres being not less than $4.00 per yard of 36 inches in local
coin, or $3.00 in U.S. coin.

The country is so hampered by local laws, customs duties of
various kinds (national and inter-state), and a variety of taxes
that business must be done with little of the ease and facility we
are accustomed to in the U.S. Everything is cumbersome and requires
a large amount of red-tape and deliberation.
Birds noted March 15th to March 16th.

Barn Owl - 2
Spotted Sandpiper - 1
Chondestes grammacus - abundant
Zonotrichia leucophrys - 1
Asturina plagiata - common
Small kingfisher

(cof. notes on pages 27 and 28)

Hacienda Magdalena, 18 miles west of Colima, Mexico.

Armed with a letter from the proprietor of this place to his foreman (Senor Gutierrez to Senor Gonzales), I came out here today.

This is a cattle and sugar Hacienda located about 18 miles in a westerly direction from Colima.

We crossed the bed of the Armaria River in a diagonal course and were at least an hour winding about among and over the rock strewn washes and channels of this stream that has a bed of wash over two miles across at this point. We found the hacienda to be a large building enclosing a square with a well and the usual surroundings of an inner courtyard.

The building has its windows heavily barred with iron outside and heavy wooden shutters within. The walls of the building are 2 feet thick and the place has the appearance of having been built in times when the houses of the wealthy classes were forts.

About the plaza fronting the hacienda are scattered the houses or wattled huts of the laborers.

The administrador received us hospitably and we were soon installed in a large room which was swept and made ready for us.

March 18th. Taking a guide this morning, I rode about 4 miles to a cave in a large vein of marble on the hillside near the hacienda. This cave is about 50 feet deep inclining at an angle of 45° with a
cracked and irregular roof 4 to 7 feet from a floor of loose fragments of rock. The bottom of the incline is filled with water, and the rumbling of a subterranean stream can be heard. Close to the cave a very large spring breaks out of the hillside. In the lower part of this cave, hundreds of bats were hanging to the roof and it was for them that I came to the cave.

By the aid of a stick, a large number (over 100) bats were killed as they flew in a swarm about the cave when disturbed. On gaining the surface I found that my captures included 11 bats of one species and over 90 of another. The latter are very curious creatures being without a tail and having long slender heads with a tongue almost exactly like a woodpecker’s. The tongue is subcylindrical, broadest laterally, with a slender tip which is armed along both sides by a row of spines like the tongue of a woodpecker, thus and the likeness is still further in the glutinous secretion covering the tongue which is readily extensible 1-7/16 inches or 37mm, beyond the tip of the nose, as I found by actual measurement.

The tip of the nose has a small, upright, leaf-like appendage.

I cannot account for the use of this peculiar tongue except that the animals feed on the insects which abound in the flowers of the numerous species of cacti found all over the country here.

These flowers are usually filled with stamens and leaflets about the bases of which various insects feed and find shelter, and to secure these the tongue of this bat would be a perfect instrument. In the traps put out last night were secured a Hesperomys and 2 specs. of another mouse of a genus unknown to me. In the afternoon a Lepus insolitus and Sciurus were obtained.

March 19. The mouse traps yielded quite a harvest last night,
among the things taken being a mouse very similar to *Vesperimus leucopus sonoricensis*. Also the smooth-tailed *Vesperimus* such as I took at Tepelecate. A deer, white-backed skunk, a couple of squirrels, and tejons, made up a good day's haul.

March 20. I visited another cave which I heard of, about a mile from the one where I went the other day. In it I found about 20 bats of a larger species than those taken before. All but 1 of the lot taken were females, and contained a single embryo nearly ready for birth.

In the afternoon, some boys brought me still another species of bat that lives in the plantain or banana orchards. It is an odd species, with two white face-stripes.

A Peccary, deer, and several *Lepus insolitus* were brought in by the hunters,—also 6 large Tejons.

March 21. Made another trip to the bat cave, with small returns. Various animals were brought in by the people today, among which the only one of note was a pigmy opossum. It is the size of a large house mouse, but is the young of a species about the size of a large squirrel according to the people here, and is called the com-o-dré-ja. It is a beautiful little animal with very large eyes and a dark area about each eye,—the rest of body being pale brown.

I have had a standing offer of cash for various kinds of animals ever since I have been here and it has resulted in many things being brought in which I should have missed otherwise.

March 22-23. Two additional species of bats have come in on the 23rd, raising the number of species to 13 to date. A fine male bat with a sooty black back down which passes 2 dark buffy stripes.
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Vic, of Colima (Colima)

Mar. 17 to Mar. 23

extending from shoulders to limit of hairs on tail membrane,- one stripe on each side of median line and about ½ in. apart. In front of each fore-arm is a deep, well-developed sac with filamentous processes growing on the interior. A bat brought in on the 22nd had a soft fur on all the body except from shoulders back; on dorsum to border of tail membrane the skin is perfectly bare and black.

In the middle of the day of 23rd, the volcano of Colima was hidden in dense clouds and a great umbrella-shaped mass of cloud formed above the lower strata topping a cloud column and showing that quite an active eruption is in progress.

Mar. 24

March 24. Returned to Ranch near Colima today.

Mar. 25

Rancho del Balcón. Took two fine specimens of large-eared bats on last two evenings in my room,—the first I have seen.

Mar. 26

A small reddish Vespertilio and a small species of Nyctinomus came in for first time today.

Mar. 27

Took 6 more Thomomys in same locality as others came from.

Hacienda San Antonio (Colima)

Mar. 28 to Mar. 29

With one pack mule I came out here today, 29 or 30 miles from starting point. I supposed it to be not over 20 when I started.

Leaving Colima for some miles, the road led to the NE toward the volcano for some miles up a gradual and slightly broken slope of open grassy country with but few areas of cacti and mesquite, acacia and other thorny plants. At about 2500 feet altitude, the cacti became scarce and the country arose more rapidly and was more broken and rolling.

About 20 miles from Colima as we came near the ridge the grass
Hacienda San Antonio (Colima)

Mar. 28 to Mar. 29

became much more rank and dense growth of bushes on the south slope gave evidence of a much heavier rainfall than is found at Colima.

Coming to the summit of the rise the country descends abruptly in a series of very steep and deep gulches divided by broken, sharp-backed ridges to the narrow, rocky valley of the stream where the Hacienda is located. The slopes of these hills and their bases and narrow intervening gulches are heavily clothed with a fine growth of large trees, bushes and many vines which extend down to the bottom of the valley.

About 3 p.m., we reached the Hacienda which is a fine series of buildings made of volcanic Tufa laid up in a series of large stones each surrounded by a series of small thin-edged stones all set in cement. This is a common style of building in this country both in old and new buildings and is also used in stone walls.

I found the same arrangement of stone work once in an ancient ruined Indian pueblo at head of San Francisco R., in New Mexico (Baca Plaza). The Hacienda is mainly devoted to coffee, but sugar and alcohol (80°) or Aguardiente are made from cane. The latter being made from the molasses left after the sugar is made.

The coffee is brought in by the pickers (men, women, or children) in baskets holding about a bushel, for which they get 15 cents. The berries are dark red, usually paler on one side, and at a short distance a basket full of them looks exactly like so many cranberries both in size and color. These berries are soaked in a tank and then run through a cylinder with brushes pressing against the sides so that the tough outer skin is broken and comes off leaving the two kernels lying, flat sides together, exposed. Each kernel is
surrounded by a hard chitinous shell which in turn is covered by a thin layer of sweetish pulp.

The two kernels come apart readily and, after a further soaking to loosen the soft pulp, they are spread in the sun on large cement floors to dry. Then they go into a cylinder in which the translucent shelly cover is broken and freed from the kernel. From here the kernels pass into a revolving cylindrical sifting screen which separates the kernels into 4 sizes or classes. Each class is then placed on a series of tables and hand-picked by women and girls to remove black or otherwise imperfect grains. Then the coffee is run through a cylindrical revolving polisher which, by friction, gives the seed a smooth surface and removes the thin, rough scale that is found over about one-third of it at one end before this process.

The coffee is then sacked, marked, and ready for market.

Note: The small round berry which is separated from the others is called Caracolillo. It is found scattered among the other coffee and is simply a union of the two ordinary berries into a single smaller berry which is said to be much stronger than the ordinary coffee and brings a better price. (It is supposed to contain the strength due to the two much larger ordinary berries).

March 29. Today I rode over the coffee plantation with the Superintendent and was greatly pleased with the extreme natural beauty of the place. The Hacienda is situated on the south bank of the main branch of the Armeria River, about 8 miles west from the base of the volcano which rises up in full view looking up the valley. Up and down the stream on the south bank the country rises very sharply to a higher district of bench land 200 feet above. The intermediate area is a north slope, and is very heavily wooded with a variety of large and small trees, bushes, and other vegeta-
tion making by far the finest piece of woods I have found in Colima.

The Hacienda is at an altitude of about 3000 feet and a portion of the larger trees here on north slopes are fine ash trees, 2 to 4 feet at butt and some of them 80 or more feet high. Near the upper end of the ranch is a beautiful little lake called "Javalin" from the wild pigs found there.

This coffee ranch is remarkable for the fact that it is planted under the natural shade of the forest,—the only thing done to prepare the ground being to cut out the sparse undergrowth and clear away any fallen timber there may be. The coffee was first planted on some flats near the river and shaded by plantains but this was old land where corn had been grown and the coffee was a failure. By accident it was learned that the coffee plants grew vigorously on the hillslopes under the trees and the hint was taken and now the plantation numbering some 160,000 trees extends along the lower slopes of the hill for some 5 miles, and water for irrigating every plant is brought by means of tunnels and ditches, at heavy expense, from the river above the upper field. The coffee is planted wherever a little ground can be found with slight enough pitch so that the plant can be grown and in many places little semi-circular walls of stone were built up on the lower side of plants to prevent them sliding down the hill, soil and all, when irrigated.

The plants are set 6 feet apart and in the oldest parts of the plantation (10 years or so) the trees were about 10 feet high and the branches made almost a thicket. The berries grow scattered along the branch on short stems in clusters of from 2 to 5 or 6. They are almost exactly like cranberries in size and color when ripe and are picked by twisting each berry from its stalk so not to break the stalk, as the base of main berry stalk will give out
Hacienda San Antonio (Colima)

Mar. 28 to Mar. 29

Tie of Colima (Colima)

Mar. 30

1892

another set of flowers if the stems are left in place. The picking is done mainly by women and girls who get 15 cents for a basket holding about a bushel. This is a good day's work to judge by the lots brought in at night. Ladders are used to pick berries on the larger trees. The tree blossoms at 2nd year, and requires a year to mature fruit. Coffee can be grown here without irrigation, but the plants do better and make a heavier yield when irrigated during the dry season.

The soil on this plantation is wholly of volcanic origin, tufa, ashes and lavas forming a finely disintegrated mass on which is the surface element of decayed vegetation from the vigorous growth of trees and plants.

The coffee bushes have dark, glossy, green leaves contrasting beautifully with the red berries.

Rancho del Balcon. Returned to Rancho del Balcon. On the way back to town I passed through a small Indian settlement where they live exactly as do the poorer classes of Mexicans. At one place they had some kind of a dance in progress in honor of a birthday. It consisted of a shuffling of the feet in time to the music of a couple of guitars and a harp, all of the rudest construction. The men stood in a row 4 or 5 facing several women at a yard or so distant, and both sides stood with arms hanging loosely down while the only motion of the body was when a dancer would at times turn around in his place. Otherwise, the whole affair was extremely lifeless and wanting in expression. The faces of the dancers all wore a solemn unsniling expression. The dancing was going on under a little grass shelter in front of a grass hut and the dancers feet clad in
sandals were shuffling in 2 to 3 inches of dust. The host came out when I stopped a moment to look on and invited me to come in with a very hospitable air, but I had to go on. Reached town in the evening.

Near Colima. Busy at work getting ready for my trip to Guadalajara.

Left Colima early in the morning and after 12 hours on the road made a station house at the village of Conejo on the Hda. San Marcos, over 35 miles from our starting point. The country rises in a series of gradual, slightly rolling elevations all the way from Colima and the road swings around the base of the volcano to the east and is close to its base at San Marcos whence a beautiful view is to be had of the pine-clad base extending up to where the desolate slopes of ashy-gray blot out all life.

Thin white vapor can be seen coming out of the sides of the cone in many places. Off to the south and east can be seen the canon of the Coahuayana River rising north of Zapotlan and flowing south to the coast. San Marcos must be at about 4500 to 5000 feet elevation, and is a large sugar plantation, sugar cane being grown by irrigation close up to the lower edge of the pines.

The Hacienda buildings are white-washed and stand out in bold relief against the green of the pine slopes behind them. Several small water courses leading from base of volcano down toward the river were crossed. The country rock was limestone for a part of the way east of Colima and then gave way to a fine sandstone conglomerate with much surface wash of volcanic boulders from the volcano's base.

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The road houses along the main trails such as we are on are called Meson's. We stopped at the meson de San Marcos. It had evidently once served as the hacienda buildings and enclosed a large court where the burros, mules, and horses of several pack-trains were now penned and being fed on corn stalks which were sold at 1½ cents for each small bundle. Twenty of these were necessary to feed our 5 animals. Corn was also bought at 9¢ an almad, packs of fruit, sugar, flour, salt, corn, coconuts, and other commodities were arranged neatly in separate lots—the owner on a trading trip, or man in charge for some merchant sleeping by his goods. I obtained a room fronting the court in which were 3 board benches for beds, a table, and 2 chairs. Into this they brought a light and some water and our quarters were furnished. I ordered everything the place afforded for supper and we had chocolate with cinnamon, boiled eggs, bread, and beans.

Found one of my mules very lame this morning so was obliged to pack one of the saddle animals and my packer went on foot.

The road continued on around the mountains parallel to the river mentioned yesterday. A few miles from San Marcos we crossed the large Barranca de Bettran which is about 500 feet deep with steep sides along which a good zig-zag trail paved with large cobble stones has been built. This barranca presents many places where it would be very difficult for two pack trains to pass, if not impossible. In former years, the packers had many bloody fights with machetes here in order to secure precedence, and at one time the government had to have a soldier guard here to stop this. This and several other smaller barrancas along this road have been favorite places for bandits to attack their victims and this has continued up to the
Agosto
Vic. of
Plantinar
(Jalisco)
Apr. 3
to
Apr. 5

present time it might be said as one bandit has been shot near Tonila about 6 or 8 miles south of San Marcos since I came to Colima in February, and last year 2 were shot just south of Agosto, and four others a few miles north of that place.

April 4th and 5th. This place is in the lower border of the pines at about 5000 feet altitude on the edge of a slope leading down from east base of the Sierra Nevada Mountains. Below, the bench drops down a couple of hundred feet to a lower bench on which is located Plantinar where a small plantain garden is located in a sheltered spot. This bench is cut through by the river which is at a still deeper level. The country all about is a fine sandy conglomerate. The day of my arrival I visited a bat cave about 1½ miles from Agosto by trail, but much nearer in a line. The cave is 8 to 15 feet high and about 100 yards deep and is located just under the brow of the bench on which Agosto is placed and faces the lower bench.

Formerly the road to Zapotlan led along this lower bench and a large rock on top of bluff over the mouth of this cave served as a lookout station for the robbers who lived here. From this stone, the road can be seen half a league each way, and a trail leads down to intercept it from near the cave. The roof of the cave is thoroughly blackened with smoke from fires that must have been built for a long time well back in the cave.

Bats are numerous here now and the road has been changed so to avoid this vicinity. The government is working vigorously to suppress the banditti, with good success. I was told at Colima that the common people say to one another now "We better behave now and not do any mischief for people disappear now and no one knows what becomes of them." This indicating the way in which the rapid taking
The road from Agosto (formerly one of the main centers of robbery on the road) to Tonila is patrolled by 5 soldiers (mounted) and another squad of 5 ride from Agosto to Zapotlan.

The people through this section of country are very poor and depend on the corn grown on the thin layer of poor soil on the underlying bed of conglomerate.

The east slope of the Sierras de Colima is very dry only 3 or 4 streams coming down in deep barrancas while springs are almost unknown even high up. Animal life is consequently scarce. A peculiar thing about the distribution of plants here is the fact that the pines grow down to 5000 feet, while the oaks on east slope are only found high up.

Curiously enough, I find a large number of mammals and birds ranging from the hot coast country up to the pines. These are mainly the following species: Deer, Peccaries, Tejones, Sciurus, Lepus insolitus, Armadillo, Ursus, Procyon, Didelphys, and several mice.

The fine large Spermophilus macrourus reaches its lower limit a few hundred feet below the pine belt.

The following birds noted on road from near Tonila to Agosto, April 2 to April 5.

Meadow Lark (neglecta)
Raven
Yel.-head, blk, bd.
Cowbirds
Chondestes grammaca
Violet - gr., and Rough wg. Swal.
Spotted Sandpiper
Audubon and Yellow Warbler
Blek-cap, Flycatcher
Lanius exsibitorcides
I left Agosto for Zapotlan, passed through some miles of small pines extending down from the Sierra Nevada and off across the Conahuayana or Tupan River and away into Michoacan. Within a couple of leagues of Zapotlan, we crossed a very rough bed of broken lava extending out from a low volcanic cone which rises near the base of the main Sierra on the south end of the valley of Zapotlan. This place is a town of some 18,000 or 20,000 people situated on the east side of a basin or valley some 15 or 18 miles N and S by 12 E and W. It is open prairie-like country and devoted mainly to corn fields. The town is old as shown by its Indian name and has been christened Ciudad Gusman in honor of one of Mexico's generals. Officially it is known by the latter name, but in common usage the old name still holds its own.

The town has several churches and chapels and among the latter are some 3 or 8 Indian chapels that are rather curious.

The chapels have a life-size figure of Saint Sebastian with bloody wounds on his body. This Saint was killed by South Sea islanders years ago and the Indians here have adopted him as their special saint for that reason,—hoping by doing him honor to do away with the sin shown by their fathers against the church.

In small glass cases beside the altar are small figures of the Virgin dressed in very highly ornamented costume upon the outside of which are hung dozens of little silver images of pigs, horses, cattle, feet, legs, hands, arms, etc., etc., all being hung there by Indian worshippers to assist in securing the special assistance of the Virgin in securing answer to prayers. The image usually indicates the desire of the petitioner whether for animal, or for the curing of bodily ills.

Each Indian chapel has an Indian in charge who is chief of the
chapel and the priests only come to them on special invitation to perform services of any kind for which they always receive pay.

There are still some considerable Indian villages about here, the Indians being only little, if any, less civilized than the peon class of Mexicans.

The large Indian villages have a governor or chief of their own selection and he, with his advisers, rules the village or tribe if there are smaller dependant villages, and appoints the chiefs of the chapels. He is applied to by the authorities to keep peace in his community and to capture and turn over to the law any offenders in his tribe at the request of the proper officials. This they do, and the Indians give very little trouble and are in all practical ways self-governing.

On April 9th I left town for the Sierra Nevada on a 4 days' trip. The pines come down to about 5000 feet on the border of the western side of the valley and the mountain slopes up gradually to 6500 ft. and thence the rise is continuous and very steep up to the top at about 14000 feet. The last 1000 feet is in the form of a pinnacle or rocky point difficult to climb for the final 600 feet. The mountain on the north slope is heavily wooded in a series of belts. First, a lower pine; 2nd, oaks and pines; 3rd, firs, pines, and birches; and 4th, the barren summit.

The most interesting animals taken were some Arvicola which swarm in the dense grass growing in the pines and firs from 9000 to 12500 ft.

In this same belt on a subsequent visit, I found a shrew to be common. Also a form of the Sitemya leucopus group with very heavy
hair occurs in this belt. A small crimson titmouse with silky white auriculars was common among the firs and pines in this belt and Junco caniceps with Merula migratoria were common.

On a sheltered part of the summit about 12,500 feet high are some small beds of snow from which a supply is packed on burros down to Zapotlan constantly during the summer.

The men had their camp in the bottom of the basin-like head of Atenquiqui Barranca. These men came up here and pack the ice-like snow in grass and pack it down to Zapotlan, 25 miles, half of which is on steep mountain trails, for 50 cents per load.

It is used mainly to make ice-cream in town. It is also taken as far as Sayula, 50 miles beyond and was formerly taken even to Guadalajara. It was surprising to see these men accustomed to the warm low country coming up here in their ordinary clothing of thin cotton trousers, shirt, and sandals. They manage to sleep a little at night by keeping a fire going.

We camped in a grass-roofed hut of the snow gatherers and our men shivered and built fires all night to keep themselves warm. In the morning a thin sheet of ice had formed over a pool of water by our camp.

Two Mexicans volunteered to go up on the mountain with me from Zapotlan, the secretary of the Jefe Politico and a Haciendado. Both spent hours trying to give me a favorable view of Mexican life and people by telling me of the good qualities of their soldiers and the reputed action of Colonel Martinez in refusing an enormous bribe to permit Maximilian to escape. They added that after the close of the war, Col. Martinez resigned his command and returned to his home refusing all offers of office or reward for his services, and being a poor man he gained his livelihood by burning charcoal and
selling it. However, among other things, one of them told me that there were very many young ladies in Zapotlan who would like to get married and on my asking why the young men did not marry them, he replied that none of the young men in Zapotlan cared to get married, adding that the young men were too dissipated and had no confidence in the faithfulness of the girls. Enough in itself to offset any favorable impression they might have otherwise raised.

The morning after we reached the snow gatherers' camp we rode up on a high ridge at the base of the peak at the summit, reaching an altitude of about 13,500 feet from which, across a gulf of 6 or 8 miles, we saw the cones of the Volcan de Fuego and got a slight view of its crater, as it is only about 12,000 feet high.

The summit where we stood is covered, on all slopes where loose matter can rest, by a deep layer of volcanic ashes and fragments of pumice thrown over here by the volcano. The main mountain shows no sign of ever having been a crater, although of volcanic origin.

A strange thing was my finding signs of a hare above timberline on the summit of this mountain. Whether this is a relative of the northern Lepus washingtoni or not is hard to say, but there is no animal of this genus living in the adjacent wooded belts lower down the mountain.

It now drew near good Friday and my Mexican friends and the servants insisted on returning to Zapotlan, so I was forced to re-turn there and leave the work unfinished to be completed on another trip. Thus paying for the volunteer companionship,—a lesson I am not likely to need a second time. I found Scirius cervicalis common in the oaks about the lower half of the mountain.
Kept about Zapotlan working in the valley and writing reports in town.

About 2 a.m. on Good Friday, everyone in town was awakened by the din of large fire crackers and the hiss and detonation of bombs which were fired to notify people of the approaching church feast day. I was told that this was the custom on the approach of all feast days.

On Good Friday, the 15th, I saw the church processions in the courtyard of the church. The law has prohibited the carrying of the great cross bearing the figure of Christ through the streets with other similar religious processions, so it is now done inside the church enclosure. With some misgivings I took my camera and worked my way through the dense crowd into the church court and secured some views of the cross. The people were perfectly good-natured about it and even cleared a space so I could get a better view.

A striking contrast with the fanaticism I would have met with 10 years ago when the mere presence of a heretic on such an occasion would have been dangerous to the intruder.

In the late afternoon, the crosses were carried slowly around the enclosure by 40 or 50 men followed and preceded by a dense crowd, with a band of music just ahead of the cross. Then the cross was lowered to lie almost horizontally and carried about while a man followed playing a shrill wailing note on a small kind of pipe and when the cross was taken to the church door the figure was removed to the church and the cross dismantled in the evening.

Returned to the mountain and took a trail that led around to the NW side.

Base of Sierra Nevada (April 21). On the morning of April 21 when we arose we found that there had been an eruption of the
volcano and the trees and ground were covered with a thin coating of fine pale gray ashes which gave the scene a strange, uncanny air. Trees, rocks, and earth all one uniform pale gray with which the light of early morning cast a glamour of unreality over the mountainside.

Camped at about 10,000 feet in the firs. Found Arvicola very abundant, but the most interesting thing taken this trip were five shrews (Sorex) found in Arvicola runways.

Robins (T. migratoria), Sialia sialis, and Setophaga petra were the most common birds high up.

In the grassy fir belt a species of Sitomys like sonoriensis but with long heavy ashy fur was common with thousands of Arvicola.

In the oaks are many of a larger species of Sitomys like melanophrys. Found many Geomys of the mountain to be different from those of Zapotlan plain as they are dull chocolate in color like those of Colima, and this color becomes more intense as the mountains are ascended up to about 10,000 feet which is this animal's limit.

The heavy oak belt on the north slope of the mountain where my work was done is a fine forest growth of large trees with many parasitic plants and mossy growths. Scattered about were pines and other trees making a pleasing variety of form and foliage. Above this belt came the firs and birches in irregular growth with scattered areas of open slopes between and a luxuriant growth of bunch grass between, making a picturesque and characteristic scene. Among this grass are the runways of the Arvicola which are also used by the shrews and Sitomys found there.

On the 23rd, I returned to Zapotlan. A curious white-sided jack-rabbit and a cotton-tail were found on the plain of Zapotlan.
Remained here working on reports and doing a little collecting.

A single *Nasua* was secured here that was very much paler than those from the coast and considerably paler than those from near Colima.

During this week in Zapotlan another church festival was ushered in by a great din of rockets and fire crackers, and in the evening the entire square of the large plaza was lighted up by a series of iron cressets on stakes in which pitch-pine was burned. At the large gateway of the churchyard on each side stood a couple of men playing on a long, slender drum and a curious wailing, fife-like instrument. The people crowded into the church and services were held until nearly 11 p.m. During all the evening there was a continual firing of rockets from the roof of the new church just in front of the one where the services were being held.

At 10 p.m. on the night of the first, nine of us were packed into a stage or "diligencia" and nine mules were put on, 2 at wheel, 4 in front, and 3 in front again. The driver gathered up his reins and his assistant scrambled up beside him holding aloft a large prepared torch of pitch and maguey fiber and so we went at a gallop out of the town, the torch casting a wild flickering light and shade over the house fronts showing momentary glimpses of faces at windows or doors and an occasional wayfarer flattened against a wall to let us by in the narrow street. Then we plunged into the great void of the night and for hours went bumping and jolting over the rocks and deep ruts of the road. For about an hour we were on the descent of a very steep hill and the torch-bearer went slowly ahead to light the way. At Sayula we changed animals and then away again through the night until we came to Zacoalco where we stopped for breakfast and I remained over for a couple of nights.
This is a town of 2,000 or 3,000 people, at the border of a small lake, one of the series located in this part of Jalisco. Volcanic hills rise from 200 to 1200 or more feet above the lakes and narrow valleys lying between them. Salt grass, Distichlis, and mesquites grow about the borders of the lakes, and the pear-leaved and candelabra cacti are common, the latter being specially common on the rocky hillsides where a low, scrubby growth of bushes occurs. A small fish about 2 inches long is found in the lake near town (but no large species), which is without outlet or inlet and is alkaline. Great numbers of Nyctinomus abound here and some were shot in the evening. These with coons, Spermophilus macourus, and Sigmodon were about the only mammals.

At 9 a.m. we left here on the stage and for four hours drove through the same district of scattered lakes among black, bush-grown volcanic hills, to Santa Ana — a quaint little town where we took dinner. On our way we passed a long, narrow lake which was strongly impregnated with minerals so that where a wide mud flat had been left bare by the receding water a thin deposit of borate of soda was left. A large number of men and boys were at work scraping this deposit into little heaps which were hauled away by bullock carts, to be treated for soda and borax. The dust arose in heavy white clouds and the sun poured down steadily with a bright, glaring light.

About Santa Ana are many remains of ancient people and many clay pots, images, etc., are dug up in the fields. The fine Hacienda of Bella Vista, one of the largest sugar plantations in Mexico, being located here.

Just north of Santa Ana on the road toward Guadalajara, a lime-
stone formation crops up through a layer of fine conglomerate or coarse grit over which lies the general capping of lava which covers all this district. This is the only point along the road where I saw any sign of the lower rocks and here occur many springs and small streams of water which appear to come from the limestone and furnish the water for irrigating the cane fields.

In this vicinity are found many clay images and pottery of ancient pattern in graves and mounds, showing that the ancients were in possession here about the water.

After leaving Santa Ana, the country gradually opened out until the road finally came out on the rolling plain about Guadalajara with hills scattered here and there over its surface. On the way a number of wheatfields were passed none of which showed a very vigorous growth.

From Santa Ana to Guadalajara a number of mounted soldiers were seen patrolling the road singly or in pairs, and at one point a small grass-covered hut had been built on a knoll overlooking the road where a broad, dry wash crossed it, and there two soldiers were stationed. As the stage toiled through the deep sand of the wash, one of the soldiers ran alongside and handed the driver 10 cents and asked him to bring out a bottle of Tequila on his return in the morning. All along the road from Zacoaleo to Guadalajara, we passed pack-trains of mules or burros,—some loaded and some going light; and long trains of bullock carts or carts drawn by 6 to 8 mules. Besides these, many people were passed who were tramping one way or another, all carrying bundles of various sizes and often families of men, women, and children were stringing along carrying all their household effects on their backs. The better class who travelled mounted on horseback were all armed with sword hung to the saddle bow on left—
Zacatecas to
Guadalajara (Jalisco)
May 4

hand side, and pistol on belt.

The sun was low in the sky when we swung up to the top of a low
ridge and came in view of the city some 3 miles away. The long line
of flat-roofed houses were dominated by the proudly rising spires of
the cathedral 260 feet high, which looked down upon the town like a
feudal castle of old. Here and there arose the lower and more mass-
ive stone belfrys of the numerous churches that dot the town with
their quaint and characteristic structures,—some of which are hand-
somely ornamented externally with stonework patterns. One in
particular is the church of Santa Monica of which I secured a photo.
We entered the city just before sundown and, rattling over the cobble-
stone pavement with deafening clatter, dashed around San Francisco
Jardín, where a military band was playing to a motley crowd, and then
into the narrow portal of the Hotel Nuevo Mundo and drew up in a
broad courtyard.

Getting rid of some of the deep layer of alkaline dust that
covered me, I hunted up my friend P. L. Jony, who is living here with
his wife for a short time. They insisted on my stopping with them
while in town,—which I was very glad to do. So I took my traps to
their house, or rather their flat, at #7 Calle de San Francisco.

During these days, I remained in the city with the exception of
a trip to the end of the street car line at San Pedro.

The 5th of May, although a national holiday, was very tamely ob-
served in Guadalajara. The authorities had the Plaza de Armes orna-
mented with bunting in the national colors and the public buildings
were hung with the same and illuminated at night as were the public
plazas and gardens,—but a large share of the places of business
were open all day and the people seemed to take very little interest
Guadalajara
(Jalisco)
May 5 to May 11

in the day. This is in keeping with the peculiarities of the Jalisco-
censese who are noted for being among the most turbulent and difficult
citizens of the country, ever ready to oppose themselves to estab-
ished authority.

Among other things may be mentioned the fact that the national
air of Mexico is only played by the bands on occasions of the
president's visits here. My friends heard it almost nightly in the
Plaza concerts at San Luis Potosi, but have not heard it once in some
months here in Guadalajara.

It is known throughout Mexico that Jalisco is one of the most
bigoted Catholic states of the country and in it also has been the
greatest amount of brigandage so that to this day it is necessary to
keep the public roads patrolled and a heavy military force on hand.
The Post Office and various buildings including the court and build-
ings of the churches at the San Francisco garden which are used as
quarters for the 20th Regiment of soldiers are part of the church
properties taken by the government and thus the church in its shorn
strength looks with futile and bitter hatred upon its spoiler and is
ever ready to make use of its ancient tactics of underground work-
ings to keep alive any hostile feeling against the government that
lies in its power.

The city is well supplied with fine gardens and plazas among
which the Plaza de Armes in front of the palace and beside the
cathedral is the finest. The military bands play every night in
some of the principal plazas and during the hours the music continues
the broad walks about the plazas are thronged with the people. There
are two promenades, a broad inner and narrow outer one, separated by
a line of settlers facing inward. The outer walk is used by the poorer
people and servants. The inner walk by the better classes. At
Colima and Zapotlan the ladies walked on the inside of the walk in one direction and the gentlemen on the outside in another, but here the gentlemen take the inside and the ladies the outside of the walk despite the fact that it is street etiquette to give ladies the wall. Despite the claims that I have heard of the beauty of the ladies of Guadalajara, I fail to find it. It is very rare to find a girl or young lady of the higher class who knows how to walk and carry herself gracefully.

After being in town a couple of days, Jony, myself, and my assistant went out to San Pedro on the street cars to see what the country might afford. At dusk we shot a few common bats near the town and as we sat waiting for a car about 7 p.m. several policemen came up and told us we were wanted at the town building. We appreciated the fact that we were arrested, and walked across the street to the jail where they told us that we were arrested for carrying arms without a license, and they took our guns.

Fortunately, Jony had a letter from the governor of the state recommending him to all officials, etc., and this was produced and sent to the Jefe Politico who soon sent back word that we were to be released and the jail officials then handed us back our guns with great politeness and bowed us back into the street.

We lost no time the next day in getting our licenses from the Jefe in Guadalajara, who granted them to us free of charge.

The states of Mexico require all persons except officials to take out a license to carry arms for their defense. These licenses are good for 6 months and as almost everyone in the community carries arms, it is a source of considerable revenue.

May 11th. Jony and myself, with my assistant, secured horses and a pack animal and went out to the barranca Ibarra today. This is the
Guadalajara (Jalisco)

May 3 to May 11

The canon of the Santiago River about 6 or 7 miles north of Guadalajara and is a magnificent piece of scenery. The canon is cut down some 1500 feet from the rolling plain on which Guadalajara stands, and is not over 2500 or 3000 feet across at the top in many places. The sides are precipitous at first and then slope abruptly down to the vicinity of the river bank where there is a very narrow margin of level or gently sloping land. The descent into the canon is along a steep, rubble-paved mule trail which follows the side of a tributary canon down to the river. A fine stream of water flows down this canon and near its head are several very pretty falls. The Santiago River is about 150 yards across and has a rough, rocky bed. The Hacienda Ibarra is located here and, at the gate of the hacienda buildings, is located the main ford of the river in a stretch of still water. A couple of flat boats are worked back and forth along a rope to carry cargo, and all animals are forced to swim across. Hundreds of burros loaded with charcoal come to this ford daily and cross on their way to Guadalajara.

The people working about the ford are good swimmers and frequently swam out to assist some bewildered or drowning animal. Under the fine growth of wild fig trees by the Hacienda landing bordering both sides of the trail are the grass-roofed huts of the workmen in picturesque irregularity. For some distance up and down the river, on the north slope (South side of River) plantain orchards are grown from just above high-water mark up to the base of the cliff wherever water can be brought to them. Several ditches have been brought out from the stream in the tributary creek mentioned and led around the precipitous slope by great labor to the main canon, and sometimes the ditches are carried in cemented walls on narrow ledges about the edge of cliffs high up from the river, and wherever exists soil enough to
give foothold the glossy green of the plantains grow thriftily.

On the lower slopes near the river and about the Hacienda, mangoes are common and loaded with fruit, and a few large coffee plants among the plantains seem to do well.

The Hacienda is the usual square adobe structure with rooms opening on a pillared corridor fronting on an open court with a central fountain shaded by orange and mango trees. We rode up and dismounted and learned that no one was at home but the Major Demo. He informed us surly enough that the rooms were all occupied, and walked away. He was one of the peon class and appeared to enjoy the opportunity to be rude. We decided to remain, however, and so moved our effects into the court and took possession of one end of the corridor. The rooms were occupied by a priest and several young people. Mr. Jony coughed incessantly all night owing to the damp air, and in the morning the priest told him that he ought not to sleep outside, and in the afternoon one of the young men stopping here came to us and invited us to occupy a room which they had made ready for us. We accepted this offer with great pleasure. Our meals we have had brought in by the people who keep a small "posada" or eating house for the workmen, near the gate of the Hacienda.

Our success in trapping was not very great at this place, though we secured a curious Spilogale, some foxes, a Nasua, and Sitomys melanophrys. In one place I set two traps about a foot apart and caught a pair of foxes in them.

The proprietor of the Hacienda came out from Guadalajara on Saturday and, after reading my letter of recommendation from the governor, gave us permission to remain as long as we wished. The trees along the river gave us quite a harvest of birds, among which was the beautiful red-bellied trogon called the "Pajara National."
On the plains about Atemajac, I took 2 species of Sitomyza and
found Sigmadon, Spermophilus macrourus, and Spermophilus spilosoma common. Also Procyon, Urocyon, and Didelphys. In the canon near its upper wall of cliff, a Necturus, Sigmadon, and 2 other species of Spermophilus were common.

The Barranca has a small representation of the coast fauna, such as the Spermophilus melanophrys, Trogon, etc., but on the plain about Guadalajara it is essentially a part of the great central plain of Mexico.

On the 20th and 21st, the first signs of the rainy season were noted in heavy thunder-head clouds, rolling thunder, and a sprinkle of rain in the afternoon.

The country is now stirred up over the approaching election of a president, and President Dias and his party are using every effort for his re-election, while the anti-Dias party consisting mainly of the clericals and their supporters are working to defeat him.

Curiously enough, the students of the State College here are anti-Dias and have been holding meetings to air their ideas. When they began to show their leaning, the President of the College, with the Jefe Politico, called them together and gave them a talk to try and put an end to this feeling, but without avail. The students appointed a meeting on the Alemada, but when they reached the spot they found the place occupied by police, so they moved out to beyond one of the garitas. This meeting was a failure, and another was called to meet outside the city gates in a small canon.

While waiting here I made a visit to the Hospicio situated just on the eastern border of town. This is one of the finest charitable institutions to be found anywhere. It contains 400 orphans (100 boys and 300 girls) of all ages from infants to girls of 18 or 20.
Guadalajara (Jalisco)

May 21 to May 31

boys are sent to the state school of arts at 12, but the girls are kept here until they are 20. Four-hundred children have been reared and found outside employment from this fine institution.

The girls learn typesetting, drawing, lithographing, photography, embroidery, and other kinds of needle work. The place is kept very clean and orderly and is a model school in every way. It is the pride of Guadalajara, and is a model institution. It is a large building containing 20 courts or patios, the largest one being full of fruit trees and having a central fountain. The black-birds and other birds were singing loudly and busying themselves about nest-building in the mango trees.

The 3 Protestant missions here have schools and various Mexican assistant preachers, but they labor at an up-hill business owing to the opposition of the priests and the indifference of the people. When missions were first put here the opposition was very bitter and incited by fanaticism and priests a mob assassinated two missionaries. At a later period the missionaries were notified that the mob was coming to destroy them at a certain time, so the missionary in charge barricaded his doors, armed himself and a few supporters with rifles and awaited the attack. At the appointed time, the mob appeared in large numbers and as they were about to begin the attack a sharp earthquake shock was felt. The mob became panic-stricken and fled at once, and it was afterwards given out that the heretics had been aided by the devil. The "heretics", on the other hand, attributed to another source.

However the thing occurred, the effect was such upon the fanatics that they have never made any serious disturbance since. At times someone throws a stone into the room where a service is being held and at once takes to his heels, but beyond such petty annoyances
nothing is done actively. Still the priests keep up a constant undertow of feeling and missionaries have trouble in renting houses, as many fanatics will let a house remain unoccupied rather than rent to a Protestant,—sometimes even refusing to rent to anyone, Protestant missionary or not.

In one small town near Guadalajara where a small congregation of converts was established, the people mobbed the heretics and finally forced them to move away. The local authorities paying no heed to protests and complaints.

At another place, a mob gathered to stone the congregation in a house one Sunday while service was in progress, but the American clergyman who was officiating walked to the door with a revolver in each hand and announced the fact that he proposed to shoot the first man who broke in upon the meeting with violence. The mob halted, considered the new attitude of affairs for a moment, and slowly dispersed and the missionary returned to his sermon with the pistols on the table before him.

Such little events go to spice the life of a missionary down here and it certainly requires persistence and considerable courage to do good work in the face of such obstacles.

Mrs. Howland, wife of the Congregational missionary here, is a fine example of what a true woman can be to her husband. She is a slight, delicate appearing woman, with 3 small children and the care of the household, yet she assists in the editing of the small Spanish church paper published by her husband, doing all of the editorial work when her husband is away. In addition, she is studying Greek and Hebrew in order to be able to accompany her husband and join with him in his studies. United in their work and seeing the straightforward earnestness of her husband, one cannot but feel a
In connection with Mr. Howland's mission is a mission school, and quite a number of young ladies are being taught there. All manner of absurd reports are spread among the people about the missionaries, and Mrs. Howland told of a characteristic instance where a father brought his daughter to their house to see about her entering the school and the girl appeared terror-stricken all the time as though fearful of some great calamity.

Another instance was given of a son who had become a convert and who wished his mother to attend one of the meetings. She persistently refused, fearing to go, and one night when a service was being held the son searched for her and found her hidden under her bed. He thereupon tied her feet together and, taking her up in his arms, carried her into the meeting where he kept her till it closed. After this she came to the meetings voluntarily and finally became a convert.

Despite their opposition to the Protestant missions, some of the priests have been seen to raise their hats as they passed the entrance of the mission, with the same respect that they show invariably when passing the doors of the front of their own church. All men and boys of the Catholic faith who wish to appear good churchmen raise their hats as they pass the main portals of the churches or chapels; and also when the great bell of the cathedral sounds vespers every hat is raised and a hush seems to fall on the street as the
brass notes sound solemnly over the twilight shadows.

The common people also raise their hats when the large bells ring at noon and 3 o'clock.

Under the present government in Mexico, missionaries need have little fear except in very isolated places, as the authorities will be very prompt in affording protection and stopping disturbances; while, at the same time, they do not care to interfere unless obliged to do so, as they do not desire to give any deeper offence to the clericals than is necessary.

During Lent each year, the Catholics of Guadalajara have what they term "exercises" (ejercicios). The men go to the old church of San Sebastian, and the women mainly to the church of the "Santuario". The custom of the devout is to go to one of these churches, pay a certain sum for the rent of a cell for a period of 8 days, and then to retire there for that time from all intercourse with the world. It is during this time that the "disciplinas" or scourges are used upon the bare back. Formerly the scourges were made of a handle and several strands of barbed links.

At present scourges of small, hard ropes of maguey fiber are used. And I was credibly informed that by listening as the churches of the ejercicios are passed in lent, the swish of these scourges can be plainly heard through the open windows. Pieces of leather in the form of bands are covered with a chain of iron wire netting with a barb projecting inwardly from each link or corner of the mesh. These are worn on the arms, wrists, legs, or as waist belts, and drawn tight so that the slightest motion causes the barbs to irritate the flesh of the wearer. Others are worn around the feet inside the shoes and I have seen one in the shape of a cross to be worn on the breast.
I was told of cases of women taking up these penitential exercises so vigorously that the resulting mental and physical exhaustion caused their death, and it frequently results in illness.

Servants are required to attend some of these exercises in many cases, and it is at this time that every influence is brought to bear upon those who are thought to be in danger of forsaking their church for the Protestant.

The streets of Guadalajara are full of sidewalk peddlers of every conceivable thing,—matches, candies, cakes, fruits, ice-cream, strawberries, pulque, second-hand pistols, birds, and dozens of other things.

Among the most curious of all is roasted pig skin. When a pig is killed, the hair is removed in the ordinary way and then it is skinned like other animals and the skin is washed and then baked or rather roasted until it is a large rough sheet of succulent crispness. A string is tied about this and boy or man walks about the street shouting some unintelligible cry, and the common people buy of him. He cuts off fragments according to the demand of the customer until the skin is used up. Every evening these peddlers are out with a new stock.

The main market is a fine, well ventilated stone structure occupying an entire square, with the roof supported by arches raised in a large number of pillars. The stalls and aisles radiate from a small central railed circle where the flower dealers gather, and early in the morning the display of tropical fruits is gorgeous and bewildering. The market belongs to the city and hucksters are charged by the front foot of their stalls.

Almost everyone goes to market, and licensed boys with baskets are at hand to carry home the purchases for 3 cents. Like the
street porters who are found everywhere, these boys wear a large brass plate with their number. These numbers are issued, on payment of license tax, by the Jefe Politico.

Occasionally a lady, usually some foreigner, takes a boy without a badge and frequently the boy and basket of supplies vanish together at some crowded place on the way home,—as I knew of one instance in particular and heard of others.

Three or four times weekly a military band plays on the Plaza de Armes,—the main plaza of the city, and electric lights, or brilliant moonlight on favorable nights, illumines a display of the youth of the town. The young men from 15 to 22 or 23 are given to derby hats and huge canes with a crook at end of handle. Instead of emulating the effort to swallow the heads of their canes, as is the case with some of our fops, they hook the cane over the right shoulder and, grasping the stick by the middle, draw down on it as if for support with the right hand. This is supposed to be a particularly graceful maneuver.

Seeing the relative size of youth and canes, one cannot blame them very often for wishing to shoulder them. Dudes in Guadalajara are called "pollos",—chickens!

The utmost decorum is preserved and the gentlemen and ladies keep strictly separated,—ladies going around outside of inner circle from right to left, and gentlemen from left to right. Outside of this, on the outer walk, a mixed crowd of men and women of the lower classes walk about. On the streets during the day the ladies and common women alike wear rebozos over their heads, but in the evening the ladies are usually distinguished by wearing hats with the rebozo thrown over their shoulders.

At about 8 to 9 p.m., the plaza is deserted by a large part of
Guadalajara (Jalisco)

June

The promenaders who go home to a light supper and then return or are replaced by others. The foreign colonies are seen in all their glory on these exhibition nights, but in Guadalajara at least they are quiet and not noticeable except for an indefinable difference in general appearance.

With the exception of the railroad men and families there are but few Americans in Guadalajara.

Along the creek of San Juan de Dios flowing in a northerly course through Guadalajara is a broad drive shaded by trees where the people drive or ride on Sunday afternoons with great pomp. The riders with great gilt or silver trimmed hats, short jackets and trousers strung with silver buttons in double rows often connected by little chains down outside seams, huge spurs and saddle a mass of handsome ornamental silver embroidery and ornamental bridle, ride proudly up and down with all the pride of a child newly decked out in spangled clothes. In order to attract still more notice their horses are kept prancing and mincing about and show to advantage the excellent horsemanship of the riders.

The common custom is to have a curved sword hung to left side of saddle-bow with scabbard passing back under left leg and very often the butts of a pair of ivory or pearl-handled revolvers show above their scabbards one on each side of the saddle skirt.

It is a matter of personal security to carry these weapons in the country and a fashion of the dandies to wear them when riding in the city. Ladies do not ride but drive in carriages.

The matter of courtship is carried on in the old style in Guadalajara. The young man sees a young lady he desires to marry and writes her a letter avowing his regard. Then he proceeds to take his stand every evening in the street opposite her house either just in front
or usually on the farther side in shadow of a doorway.

It is customary for ladies to sit in balconies a story above the street on pleasant evenings and the suitor remains silent and shadow-like for 2 or 3 hours until the ladies retire and then he leaves his post. This is kept up by the month until at last when the proper amount of endurance is shown some relative of the latter interviews the parents of the girl and the marriage is arranged. The young man must furnish the bride's trousseau, but her people make the wedding feast.

If the suitor is not considered suitable, it is made evident to him soon after he writes his letter and he usually abandons his pursuit. Next door to where I stopped in Guadalajara, a young man was seen night after night in the shadow of a doorway usually from about 7:30 or 8 p.m. to 10 or 10:30, looking up to a balcony 2 stories above the street where a girl was accustomed to sit with her mother.

At times the girl gets a chance to talk with her lover through the iron bars which cover all of the lower windows of the houses and at times when they are concealed by the shadows the sound of a stolen kiss may be heard if one is so unfeeling as to permit himself to hear it. I was told of one case in which a young man of fine family was riding down the street in which his inamorata lived and saw a young man talking with this girl. He at once drew his pistol and fired, killing the rival on the spot. He then rode rapidly away while his brother, with drawn revolver, prevented pursuit. The murderer escaped and after a long absence he returned quietly and tried to see the young lady, but she refused to have anything to do with him and he closed the tragedy by shooting himself.

(The story of the daughter of the early governor and ancient palace comes in here.)
June

Marriage Among Lower Classes

Religious Vows

The duenna is a necessity in society and the rules of etiquette surrounding the intercourse between young people of the two sexes is so restricted that it is impossible for young persons to know anything of each other before marriage.

The fact that divorce is unknown by virtue of the prevailing religious belief prevents any very available knowledge being secured as to whether marriage is a failure or not under this lottery system of getting partners for life. The marriage announcements usually state that the bride is "sympático".

In the state of Colima, I was credibly informed that over half the common people were living together in an unmarried state owing to the priesthood charging about $15.00 for the marriage ceremony, an almost impossible sum to most of them, and at the same time preaching that it was better to live together without marriage than to be married only by the civil service provided by law at no expense.

As a consequence, the poor class is all paired at an early age without the formality of a service. These unions are usually permanent (where there are children especially) but, as a natural consequence of such a state of affairs, a considerable amount of exchanging partners is going on.

This condition of affairs goes on in Jalisco as well. The civil marriage is performed free of charge at the office of the Judges.

One afternoon in Guadalajara, I wandered into the cathedral and saw a man kneeling before one of the images with his left arm held up thus and on inquiry found it was to fulfill a vow. Thus like a fakir of India.

Afterwards, on a feast day in Itsatlan, I saw the church filled with kneeling people extending out on the steps in front, many of the men with one or both hands raised (or ), giving
1892

Guadalajara
(Jalisco)

June

On June 10th, I left Guadalajara for a trip to the west. About 30 miles west we crossed a ridge extending southerly, rising in hills on both sides of the stage road. These hills were overgrown with small pines and oaks, the latter being remarkable for their extremely large rounded leaves. A few miles beyond this, we reached the small and miserable town of Tenchitlan where I remained several days.

In the vicinity of this town are many old Indian graves which can be found by the small, oval pile of stones heaped up over the spot. Three to 4 feet below the surface in such places are often found clay vessels, idols (often a number of varying size in a place), metates, stone celts, obsidian flakes, or articles — and human bones in a bad state of decay. Occasionally the places are without any deposit.

These burial places are usually along the base of the low volcanic mountain. On the side of this mountain, about a mile in a northeasterly direction from town, I was shown 3 curious mounds built of rough fragments of lava with a small amount of earth mixed in. These mounds were on a rough, lava-strewn hillside on a small bench. They were in a northerly and southerly line with the largest about 35 ft. high at north, then one about 18 or 20 ft., and one about 9 or 10 ft. high in succession. They were about a half larger across base than their altitude. The rocks had been cleaned away in a circle about...
Tenochitlan
(Jalisco)
June

Ruins near Tenochitlan

50 ft. broad around these mounds and the ground made very level. This circle was bordered by a low rough stone wall with openings as marked in the following rough diagram. These rings were separated by a passageway cleared of stones, as was a space fronting the circles on the E and SE.

I was told in town that a couple of brothers spent much money in having an excavation made in the largest cone. I saw that a hole had been dug from summit down to base and the material thrown out through a cut or open breach which cut the east side down half way. At the bottom of the excavation, which was made for treasure, were found several clay images like those found in burial places and also an obsidian lance-head. I bought a few articles in town, including a bowl and few obsidian articles.

In the circles surrounding these cones are planted magueys for tequila, and all the hillside is covered with same, and the cones and surrounding walls are grown over with bushes and small trees.

The people here tell me that they find the deposits of idols, etc., usually under small heaps of stones at a depth of 3 or 4 ft. These three mounds or cones are probably simply larger forms of the same thing, covering the remains of notable persons.

The town of Tenochitlan is remarkable for the evidences it con-
Tenehitlan (Jalisco) June

Market.

Tenehitlan is a miserable place where everyone seems to be too lifeless to get up an interest in anything. On Sunday, however, the country people flocked in and all along one side of the plaza the street was filled with booths or awnings of cotton cloth or mats raised on sticks under which mats were spread on the ground and upon them were displayed a great variety of fruits, vegetables, and food.

The men in their clean white cotton trousers and blouses, with scarlet blanket or varied serape thrown over one shoulder and broad-rimmed sombrero, with an occasional ranchero or baquero with ornamental buckskin clothing, the women in calico with a black or plainly colored rebozo over their heads, all made a sight worth seeing. Under a portal of the stores fronting the plaza next the booths was a striking display of the dull, brick-red pottery made and used throughout the country. The fruits, etc., were arranged in little piles placed with fantastic regularity on the mats and usually valued at 1 cent, but often a quartilla or medio's worth are put in a pile.

Others sold cigarettes, called "cigarros", and little boxes of wax matches. The people were very plain-featured, and are mainly of the mixed or Mestizo blood.

Itzatlan (Jalisco) June

On Monday I took the diligencia for Itzatlan and passing down the valley through miles of tequila fields passed the town of Ahualulco and finally swung around the point of some low mountains and entered Itzatlan. As we entered Ahualulco, we passed a long train of mules loaded with mescal plants taking them to the tequila still, the plants halved, and 4 halves on each mule.
The diligencia landed us by a stable in a by-street and I was told that there was a meson at the plaza,—getting this from a bystander, as the driver of the stage said he did not know whether there was a meson or not, and his manner indicated that he considered that his having landed us in town was all he could be expected to do. I sallied out and soon found the Meson de San Jose fronting the plaza and kept by a young man who was a remarkable exception to the innkeepers I have found in the country so far. He began at once to arrange my quarters and during the entire time of my stay exerted himself in every way to assist me in my work.

I remained at this place until the 24th inst., working about the vicinity.

This is the centre of a small mining district and two sets of works are running silver ores through by the patio process. At one place a large enclosure has a set of 10 or a dozen arrastras at work with mules. Machinery of a clumsy style is used for motive power with the others.

Just to the north of the town is the long shallow Laguna Magdalena, some 5 to 8 miles broad and 20 or more long, and but a few fathoms deep. It contains a couple of islands near its eastern shore and one of these was the refuge of the Indians when beaten by the early Spaniards. On this island they fought the invaders for a long time but were conquered and a church built in the midst of the village which was built on the top of the knob-like summit of the islet. During the Mexican revolution this islet again served as a refuge for descendants of the Indians and some of the Spaniards.

I was shown a number of caves dug back into the face of a cliff of soft loose rock near the water's edge where the people slept during the time of the revolution.
The hillside of the island facing the shore is covered with an enormous amount of obsidian chips and many cores are scattered about. In places the soil is half made up of these chips and blocks of this material are numerous on the island as well as on the adjacent shore.

On the shore is now located the village of San Juanito where live the descendants of the Indians with a number of the mixed race. Many of the Indians are pure-blooded and still speak the tongue, although they have lost or greatly modified their ancient habits and are counted as good Catholics. I secured several photographs of typical faces.

The village of Oconagua west of Itzatlan is also occupied by the descendants of this same tribe which was once a powerful one known as the .

Their costume at present is the same as that of the Mexicans here. There are also many Indians in Itzatlan and this is one of the most devout places I have heard of. The church is provided with several bells and these are rung in the aggregate at least 2 hours each day beginning at daybreak and keeping it up all day with special periods at 6, 9, and 12 a.m., and 3 and 6 p.m. when all the bells are clanged together for 10 or 15 minutes at a stretch, enough to deafen one. On Sundays and feast days they ring almost continually.

On Sunday morning the people came in by the hundred to early mass and filled the body of the church, the steps, and out into the muddy street, all kneeling with bared heads. Nearly all outside were men dressed in the usual white clothing and with a bright-colored serape or scarlet blanket over their shoulders, making a magnificent display of colors.

During a part of this same service I saw ten or twelve who were kneeling on the broad, stone steps before the church door, hold both
In doing this their serape would slip down so their flowing white costume showed out picturesquely among the brilliantly colored forms about and against the open portal of the church which looked black as night with a few faintly glimmering candles by the altar. Out over the hushed mass came the notes of the organ at first low, but gradually rising to full power and completing the spell of an impressive scene.

It chanced that the morning was a specially bright one after a torrent of rain and the freshness of the air was specially exalting to the spirits and put one in a mood to appreciate the strange romantic scene.

In this church are hung two old pictures, portraits of two of the first priests who attempted to convert these Indians and were killed by them. The portraits have a broad background on which are represented various episodes of their work among the Indians with their death all in the crudest style, but recall the fascinating story of the early conquerors.

Joining on this church as a long extension at one side are the old cloisters of the Franciscan monks, who owned the place before the drums of the revolutionists beat the funeral march of all such organizations in Mexico.

The law also steps in to prohibit the passage of religious processions through the public streets, thus depriving the church of half its display. I attended service held to honor the raising of the corpus which was once carried through the streets and every knee bent, be it of believer or unbeliever. This day it was carried around inside the walls of the cloister patio through a dense mass of kneeling women and a sprinkling of men.

These Indians speak the ó-tó-mí-tí language.
On my visit to the Indian village of San Juanito by the lake, an old man showed me a couple of coins that had been plowed up by the lake. One of copper and the other of silver. Both are without date and belong to the first coins struck by the Spanish conquerors in America by a royal decree of May 11, 1535, by the Queen. The coining being begun in about 1537.

When the Spaniards first occupied Mexico they had no coined money and gold or silver was used being valued by the weight peso, and afterwards the use of this word became fixed to the unit of value known as the peso, or dollar. The coining of gold was forbidden by the decree. As these two pieces represent the first coins struck in America by Europeans of which we have knowledge, I give the following description of their inscriptions.

The silver piece is of 2 reales and bears the following stamp:

2 Real piece in silver. On one side bordered by words Hispanicorum et Indiarum † with two crowned columns standing in the sea with Plus Ultra across them, (Plus Ultra = the King's motto) and above this two round dots between columns showing value 2 reales. On the obverse side: Encircled by letters, Carolus et Johannes Regs, with one on each side of shield in centre bearing lions and castles with a pomegranite in lower point.

The copper piece is 4 maravedis and has on one side 2 circles between which the inscription Hispanicorum et Indiarum and in centre a large I with crown above — castle on left and lion to right and "4" below. On the obverse side: Carolus et Johannes Reges †. In centre a large K with crown above castle and lion left and right as before, and below a pomegranite and . The pieces are rude and apparently hand struck.

Back of Itsatlan are several old mines.—some idle and others be-
Bat hunting in old mines

Old Miners

1892
Itzatlan (Jalisco)
June

Bat hunting in old mines. I went back into several of them after bats. In one mine that had been deserted a long time there were quite a number of the flesh and blood eating bats that attack the cattle horses, etc., on the neck and back.

We crawled back over great masses of fallen rock from the roof and finally penetrated to the extremity of the galleries, hearing the wings of the bats all the time as they flew on ahead and secreted themselves in inaccessible crevices. I only secured one here. Then we went into another old mine being worked and after climbing down notched logs and inclined passages for several hundred feet to the lower levels we found quite a number of these vampires (# 2787 and # 2788) which were living in the extreme lower levels.

As we drew near, the whirring of their wings could be heard very distinctly as they flew ahead and secreted themselves in the timbers.

My guides were two of the miners who were well adapted to hunt bats in the intense gloom of these depths. One was an old grizzled fellow with an enormous goitre under his chin, and the other had a powerful, rounded back and shoulders, with head set forward by long bearing burdens of ore up through these tortuous ways. His face was of repulsive paleness and his dead, fishy eyes looked out from a countenance like that of a corpse.

He burrowed among the timbers and secured a number of the vampires in his hands, each time the vicious brutes bit a piece of skin off so that his hands were streaming with blood. The female bats had each a single young one clinging to her attached to the teat on one side with their bodies stretched across the body of the mother and holding on firmly to the fur on the other side under her wing by means of their hind claws. When pulled off they searched for
something to cling to and grasped a finger or other object and clung to it instinctively. Even when quite small they squeaked and bit viciously when handled. On skinning one of the females, I found the teat to which the young one was fastened had a well-developed set of milk glands.

Several females flew heavily away carrying their young, 3 of which were afterward found secreted in the rocks a few yards away where they had been carried by the parent. These however were nearly large enough to fly.

These vampires are very abundant near Ameca and I was told that they kill great numbers of cattle by biting and making wounds which are then soon filled with maggots and the animal soon dies. One district near there is so infested by them that the cattle are driven out at beginning of rainy season to prevent their all being killed in this way. From these mines I secured two other bats, one being a smaller species of the extensive tongue kind.

The morning of the 23rd, finding that I could not take all my outfit in the diligencia, I hired a man with 2 saddle animals and pack mule and started for Guadalajara. A late start brought us to Ahualulco at 1 p.m. and to Tenochtitlan at 6 p.m. with a lame pack mule. Some days ago 2 violent hail showers visited Ahualulco and a messenger was sent posthaste for a priest and the image of the Virgin in the church at Itzatlan. She was taken in a carriage with the priest to Ahualulco followed by a long procession of men and women on foot while the bell in the church at Itzatlan tolled slowly like a knell to express the sorrow over her departure. She was kept in Ahualulco while 3 masses were said to secure against further hail. Today, less than a week later, while on the road east of Ahualulco, a terrific storm of rain and hail fell from a cloud at the foot of
the mountains and swept out over the plain like a dim, gray wall enveloping Ahualulco as though no Virgin had been there so recently. We were just at the outer edge of it but the blast of icy air driven from its center chilled us and gave me a severe cold as a change of over 20° in temperature occurred in less than 5 minutes.

After this storm passed I was riding along the plain when I saw a Caracara eagle chasing a half-grown hare with great spirit. The hare avoided the casts of the eagle by doubling and little bursts of speed, but the eagle was keeping in dogged pursuit and would have worn out the hare very soon but the latter took refuge in a hole dug in a small bank under a small bush. This hole ran back about 15 in. and then turned abruptly to the right and was enlarged and 18 inches deep and must have been the form where this hare was born, as the entrance was too obscure for it to have seen it otherwise. I rode over and captured the hare for a specimen.

In the morning I got my men off for Guadalajara at 5 a.m. and then I went a mile above town on the lava strewn hillside to the "Guachimonton" or ancient mounds there are there. This vicinity is noted for having yielded quite a number of clay images and other articles of clay, obsidian, and stone. So far as I could learn, these things were usually found under small conical piles of stones found on the hillsides or at edge of the level valley.

They are usually accompanied by badly decayed fragments of human bones and are at a depth of 3 to 4 feet below the surface.

The "Guachimonton" consists of 3 mounds of stones and earth situated on a bench-like part of the rocky hillslope above the town of Tenchitlan. They are overgrown with small trees and bushes except where the circular area about base of each is cleared and planted to mescal. I made a rough but approximately accurate series of
measurements of these mounds and surrounding work and plot them as shown on next pages. I may add that a large excavation was made into the top side of largest mound two years ago for treasure.

Near the bottom a number of clay images, like those found in burial places described, and some obsidian implements were found and the work abandoned. The mound seems to be about half earth and half rough, loose lava rock of the locality intermixed. Externally the mounds show only the loose lava rocks. The mounds are nearly circular (as are the surrounding rings and walls) and are rounded cones.

To the N and NE rises the rough, rocky hillslope covered with bushes. To E is a smooth area cleared of stones and a smaller area of same on W. To W and S the hillslopes rapidly from the monuments to the valley. I give the measurements on the sketch and make no effort to draw to scale. The walls about ring are ruinous and overgrown with vegetation hard to distinguish and never more than roughly formed of the rough loose boulders of lava. No sign of sculptured stone of any kind is visible.

The wall of ring in second circle is thickened to form 5 chambers on SE side, as shown.

Legend: 1, 2, 3, and 4 are rather flat-topped piles of stone of shape indicated. 1 is about 10 ft. across and 4 ft. high; 3 and 4 are 6 ft. across and same height; 2 is 12 ft. across and 7 ft. high; 5 is apparently a new mound started and abandoned at height of 4 ft.

The passageways between outer walls of circles are 40 ft. across (≈ #6) and between #1 and walls (≈ #7) 20 ft. wide. The circles are about 4 to 5 ft. below tops of surrounding ruined walls. The exits marked // across circles are cleared passageways through walls on level with floor of circle and about 10 ft. wide.

The starting point for measuring these is at passageway next to
Tenchitlan (Jalisco)

June

adjacent circle.

As a rule the walls appear 4 to 6 ft. thick, but on SE of middle circle as indicated are 5 chambers in the wall which is thickened there to some 12 ft. Below is plan given of the arrangement of stones on upper surface of first chamber, marked "a" in plot.

The figures show no. of feet between the indicated points. The parallel lines and circle were formed apparently by a single line of stones.

A similar arrangement was seen on some of others but they were more overgrown and less easily accessible for measurement. At least 3 of the 5 chambers had these lines and circles in this pattern and probably all. From this point is a fine view for miles up and down the valley. The passageways between 2 largest circles and small piles are beautifully smoothed especially the main one between two circles 40 ft. wide which is perfectly straight with evenly levelled bottom and well marked sides.
Plot of Indian Mounds at Tenchitlan:

Tenchitlan (Jalisco)

June

Indian Mounds
As soon as I concluded my measurements I mounted and started for Guadalajara. At noon I overtook my men and, passing them, took dinner at a wayside posada and then on to town, making 49 miles from Tenehitlan in 8½ hours without turning a hair of my horse. Three hours later my men came in. For the last 12 miles of road I found a soldier patrol every mile or so and passed several of the little grass huts they have built on prominent hillocks by the road where they can be sheltered from rain or the midday sun and still keep an eye on the road.

The necessity for this is evident from the occurrence at Itsatlan just before I got there. Word was taken to town by a boy that a notorious robber was near a certain place so about 40 of the men armed themselves and sallied out. His horse was seen by a solitary house and before he knew it he was surrounded. He dashed out with a revolver in each hand and broke through the posse and fought the entire lot while retreating for about a league when a chance shot killed him. For some 15 years this fellow has raided the country from Ameca and adjacent parts living in the mountains. On one occasion he came into Ameca alone one night during a ball and suddenly entering the ballroom caught a young girl by the hair and dragged her swiftly out of doors and throwing her across his horse’s neck leaped into the saddle as a crowd of young men came rushing out to the rescue.

Turning, he emptied a revolver into the crowd killing 3 of them and escaping into the hills with the girl. Afterwards he was attacked by a party of soldiers and killed five of them and escaped.

One afternoon I wandered into the cathedral and a small fee to an attendant took me into the Sacristy where I had a view of the beautiful Murillo representing the Assumption of the Virgin. During the French invasion this picture was taken from its frame and rolled up and con-
Guadalajara
(Jalisco)
June 24 to June 30

First Governors’ Palace and Romantic History

1682

Gaia offered $30,000 for it, but without success.

Among the interesting buildings of the city is the ruin of the ancient palace of the governors. This site is now occupied by the Meson de Medrano.

One of the first governors, Don Francisco Parja, had a beautiful daughter who loved a young man whose hopes the father refused to sanction and swore he would prevent the union. The young couple agreed upon an elopement. One dark night he concealed horses near at hand and ascended to the bed-chamber of the girl by means of a ladder which she had fastened to the balcony. Before they had a chance to descend, however, the girl’s brother having heard some noise burst into the room, sword in hand. A duel on the spot followed between the two young men, and the brother fell. At this, the sister was filled with horror and refused to follow the lover, saying that her brother’s blood lay between them forever. The unfortunate lover then fled by himself. The girl, wild with the terrible occurrences, untied a rope from the ladder and hung herself from the balcony.

The father was ill in bed, and when he was told of the death of his two children, he uttered a cry and fell back lifeless. The following afternoon the remains of the father and children were buried in the same grave.

Thenceforth the Palacio de Medrano was looked upon with horror and it was whispered about that the ghosts of the father and children had been seen there and the place was abandoned for a new building on the present site.
Among the odd signs one encounters here such as bear historical names are noticeable and one tells us that the sons of Ponce de Leon are professors of dentistry, and Cortes, Alvarado, and Munoz are following more peaceful occupations than their epoch-making namesakes.

In the State of Jalisco in 1890-91 the State schools had 58,130 children of both sexes in 456 schools. Even in out of the way Indian villages I was often surprised to see a large sign "Escuela Oficial para ninos", showing that the government is actively at work trying to raise the standing of the poor.

The priests among other things have a lottery of souls that they practice as follows: A Gregorian mass is supposed to take a soul out of purgatory but is expensive, ranging from 60 to 100 dollars, so is beyond reach of poor people. In order to get around this, a notice is stuck on church doors now and then announcing that one of these masses is to be said and that a certain number of tickets will be sold for it at $1.00 each. These tickets are sold and before the mass begins a drawing is made by the priest and whoever holds the lucky number has mass said for the soul of his relative.

The Virgin of Zapopan (a small village near Guadalajara) is a favorite local patroness. I saw posted on the church doors in Guadalajara handbills announcing that "Our Lady of Zapopan" would visit the churches of Guadalajara in the following order, and then followed a programme of dates giving the various churches from 2 to 6 or 8 days each according to their importance. In the churches services are held in her honor and she remains in Guadalajara till the end of the rainy season. The small image is then hauled back to Zapopan in a carriage and a church service and general celebration of the event follows.
In 1886 a sumptuary law was published at Guadalajara ordering that "no male should appear in the streets without pants". Thereby prohibiting the wearing in town of the loose, wide, cotton (white) trousers or calzones as they are called in distinction to the pantalones. The common people therefore put on some kind of a garment over the calzones when they get to the garita or city gate. This law was passed because the calzones were supposed to be immodest. They are in general use in the country and smaller towns by the poor people.

Religious exercises are practiced at all seasons of the year and the person who takes them goes into seclusion on Saturday night and remains until a week from the next Monday morning. Easter week is the time when they are more largely and generally practiced than at any other time. At this time a state of excitement is worked up that sometimes results in insanity and one instance was told me of a young lady's death resulting from it.

While sitting in my hotel today, I saw a man leading a young Nasua by with a string. I bought it and was amused by its odd performances. It was very gentle, not offering to bite but trying to pull away when on the floor, and when picked up - by grasping it about the back by one hand - it would at once clap its paws over its eyes and hold them there until put down, almost exactly like a frightened child and when hurt accidentally it uttered a shrill screech but made no other sound.

The Mexicans are very fond of cage and singing birds and parrots. The mocking bird is a favorite and also the Zinzontle, Hyadestes unicolor. This latter is a small slate-colored bird about the size of a bluebird and well earns its title of the "Mexican nightingale". Its song is short but high, clear, and mellow with such a liquid,
piercing tenderness in it that only the pen of a Keats could do it justice. It carries in it the very soul of a woodland spirit and conjures up a nameless sweet melancholy such as falls to the portion of a nature-lover when far away in some cloister-like shade of heavy woodland where he forgets that he is of humanity and its petty ills, a part, but merely sinks into forgetfulness of all except that he too is a part of this nature-soul wherein dwells beauty and rest past mortal reach. The note rises and falls in its melody telling of wild, wild things in remote forest depths and vine-hung canon walls where all alone for time unimaginable have gone on the beautiful changes of the flowering seasons under a sky that is never harsh in its severest moods.

(The Tzintsontle is the mocking-bird and this name is said to mean bird of a hundred songs. The common name for humming-bird is chupa rosa = rose sucker.)

On the 1st of July, I left Guadalajara and travelled by rail to Celaya in Guanajuato. The road follows up the valley of the Rio Grande de Santiago all of this way and runs over a magnificently fertile region of rich black soil. The rains have made the country a mass of vivid green except where the farmers are working in the crops with their rude tools. About Irapuato are great strawberry fields where fine berries are raised, and here at Celaya also. In the market here are now sold small apples, peaches, pomegranites, pears, quinces, melons, mangos, and a variety of other fruits. They are mainly small and of very poor quality since the fruits of the temperate zone require more care than they get here to give good results.
The market here in Celaya is held in the open street about the principal church. Holes are made in wooden blocks which are set in the stone pavement and in these a wooden framework like a huge umbrella is raised and covered with white cotton cloth and under this shade the vendors of every imaginable thing squat. Men, women, and children and a ceaseless swarm of purchasers swarm back and forth buying and chaffering in a slow deliberate low-voiced manner over 3 or 6 cents worth of this or that. Women go about with little baskets buying 5 cents worth of meat, several kinds of vegetables in minute quantity for the same sum. Two or 3 cents of bread, and a few cents of bananas or other fruit and her day's marketing is done. Some women are doing a good business roasting green corn over a clay brasier with a charcoal fire and selling it for a cent an ear; others are selling it boiled.

Several of the umbrellas shelter dealers in old iron, bottles, and other junk and it is a motley collection of the most absurd odds and ends. One man was going about trying to sell 3 large hand-made iron spikes. And hundreds of men and women in picturesque but filthy rags were wandering about or sitting crouched up in corners. This was Sunday, July 3, and a specially busy market day.

This place (Celaya) is located in the central plain or table-land of Mexico and has suffered like the rest of that region from 2 to 3 years of drought so that large quantities of corn is being imported from the U.S. and sold at cost to the poor.

On the night of July 4th, Mr. Pringle came in on train and on consultation with him I decided to give up the trip to Chihuahua the present season and to continue work in central Mexico till fall.

Got my assistant over from Erapuato and took him down to Acambaro where I left him until my return from Mexico City where I went
with Mr. Pringle.

Acenbarto is also on the central table-land on the banks of the Lerma. The Mex. Nat. R.R. follows in a general way up the course of this, the largest of Mexican rivers, and crosses its source, Lake Lerma, just east of Toluca.

For hours before we reach the valley of Toluca wherein lies this lake we rise through a series of open, rolling hills beautifully green, dotted with hacienda buildings and broken by numerous square areas of corn newly started or just planted. To the west and ahead of us rise by gradual elevations the mountains forming the western border of the central table-land.

After entering the valley of Toluca, the volcano of this name is seen rising to the SW with a dark green belt of pine timber clothing its sides from the open cultivated foothills up to the rugged barren lava covered summit rising above timber line. As we swept through the valley a heavy leaden storm cloud enveloped the peak and through occasional rifts glimpses of snow could be seen in the angles of the cliffs and chasms of the high summit. After crossing the Lake of Lerma, we wound and twisted our way up the high mountain sides and, crossing a divide at an elevation of over 10,000 feet near Salazar station, descended through a series of sharp curves and grades down into the beautiful valley of Mexico.

Far in the distance could be seen the sheen of the world-famed lakes about whose shores were enacted the stirring drama of Cortez and Moctezuma. The sun was shining brightly as we steamed out into the brilliantly green valley beyond which arose the massive wall of mountains among whose cloud-hidden summits arise Popocatepetl and her companion, the "White Lady".

From both sides while crossing this mountain rim between the
valleys of Toluca and Mexico a series of very beautiful and inspiring views are obtained such as are rarely afforded from a car window.

The great elevation, however, renders the air so cool that a light overcoat is very useful in the open observation car that is run across these mountains.

Descending the eastern or Valley of Mexico slope, the hillsides are covered with pulque or maguey plantations which are arranged in patches with long rows of the plants following the curves of the hill contours in parallel rows and giving a very odd appearance to the slopes.

Several little towns are passed lying below the track so that the view is made up of a small sea of brick-colored tiles cut by irregular streets along which wander broad-hatted, serape-wrapped men and women with rebozos drawn tightly about them.

Viewed thus from above, the objects are dwarfed until the scene seems almost like a dream filled in with toy people and houses to which the little fields of stiff magueys all about add to the unreality. Early in the afternoon we ran into the city through an evil smelling street that gives a poor opinion of the sanitary regulations in force.

On the morning of the 6th, I called upon the American Minister, Hon. Thos. Ryan, and explained my desire to obtain letters from Senor Romero, Minister of the Treasury, to the governors of Michoacan and San Luis Potosi. Armed with a card of introduction from Mr. Ryan, I called upon Mr. Romero and was courteously received and my request granted at once.

Mr. Romero is a slight, thin, gray-haired man apparently suffering from overwork and poor health. His ante-room was crowded with
people waiting for an interview and a swarm of clerks and officials were going in and out with books and documents for the Minister's signature and attention.

This department of the government is in a state of confusion and Mr. Romero has been recalled from his long term as Minister at Washington to straighten out matters and evidently has a heavy task before him.

In all matters that I have become familiar with in business, both public and private, in Mexico the lack of an effective system is very apparent.

One of the most striking and familiar illustrations is in the arrangements of letter lists at the post office. A list alphabetically arranged and numbered is hung up containing the arrivals by each mail from each direction and the letters are kept in apartments by days in place of by letters, so that unless you search through a long series of lists very carefully and give the exact number of your letter to a clerk you cannot hope to get a letter.

As frequently occurs, a letter or package will be overlooked and not entered on the list,- in which case it is sheer accident if the owner ever hears of it again. At Guadalajara I had a half dozen packages lying in the office for over a month that were not entered on the list, and the clerks all said there were no such packages for me; yet when I had ordered another set of articles, thinking the first were lost, the latter were produced with the last arrivals but bearing post mark showing that they had been lying in the office for about 5 weeks while I had been almost a daily caller for mail and had become quite well-known to the clerks. There is an excessive amount of stupidity among the clerks that is hard to understand by anyone familiar with the alertness required of postal clerks in
the U.S. and I think this accounts to a great extent to the deep-rooted distrust of the P.O. I find among people in Mexico. When a bright, intelligent postal official is encountered, even in the large cities, it is always a startled surprise.

After attending to my business with Senor Romero, I paid a visit to the National Museum which was undergoing repairs in the Archaeological Hall. Above, in company with the botanist Mr. Pringle, I found the Zoological and Botanical parts of the Museum in charge of a professor of botany with a zoological assistant, Senor Professor Alfonso L. Herrera, Hijo. The collection contains a poor series of mounted birds and mammals of the country with alcoholics of fishes and reptiles. The collection is very badly labelled with almost a total lack of data as to locality, date, and collector, which are generally considered indispensable.

In the birds and mammals, not a tithe of the common species are represented and the Museum is wholly without any study specimens except those mounted and on exhibition.

The library is also extremely scanty so that the naturalists in charge labor under the greatest difficulty in identifying their material. Some additions are being made to the Archaeological series and the botanical department is taking a series of plants from Mr. Pringle, but the zoological department appears to be at a standstill. The gentlemen in charge are very cordial and polite in their reception of visiting naturalists, but their work is sadly hampered by their isolation from centers of scientific work and their lack of appreciation of the value of field work in developing the rich field they occupy. As a result the publications of a scientific character in Mexico are very largely given to a reproduction of the results published by foreign naturalists, of work in Mexico.
I am also assured that this is also a failing in other branches of sciences outside those with which I am more or less familiar. This comes to a great extent, in the natural sciences at least, from the national distaste of the higher or educated classes for rough work of any kind such as is a necessity in doing field-work. There is a general tendency toward a fossilization or red-tapeism that assumes a satisfaction with the work as already accomplished. As a consequence, Mexico is a field which yields abundant harvest to the foreign naturalist while the resident naturalists accept their results and reiterate them in their publications with but few additions of value. However, the people are awakening to a feeling of their lack in many ways, and under the present enlightened government much may be hoped for in the advance of the country toward the position in the world's progress occupied by other civilized nations.

From the tower of the cathedral fronting the main plaza, we looked out in all directions over the green expanse of the valley with its marshy lakes, and enjoyed one of the most beautiful views of the world.

The cathedral is built upon the site of the Temple of Sun where the Aztecs made their sacrifices to their blood-demanding gods. Today the plaza below where once congregated the people to view the sacrificial processions of flower-decked victims, is the central point of the great network of horse-car lines that extend out from this point in every direction, and is a busy scene of activity from morning until night.

The familiar appearance of cars bearing the name of John Stephenson or The Brill Co. serve to modernize the plaza and detract from its picturesqueness, although they are very convenient adjuncts to travel about the city, as the lines run out in various directions for some miles to suburban towns.
In Guadalajara and Colima and Morelia, the main stores of the town are gathered in the portals about the central plaza, but in Mexico they have left the portals to a cheaper grade, and the finest establishments and main offices of large business houses and banks are along San Francisco Street, extending west from the plaza.

Passing a railed enclosure at the edge of the plaza near the cathedral, I saw a beautiful showing of flowers, roses, tube-roses, hyacinths, gladioli, etc., etc., made up into great bouquets very temptingly arrayed. Mr. Pringle suggested that I price some of them, so I asked one of the Indian flower-sellers how much he wanted for a large bouquet he had before him. "Three Reales, Senor" he replied. I turned away, but before I got out of earshot he had reduced the price to 2 and then to one real, and then asked what I would give. While a host of other bouquets were held up before me in bewildering array - as to a prima donna's first night - and at ridiculously low prices.

In the City of Mexico the number of fine-looking though small-sized policemen seen is quite striking, and it is evidently a systematic choosing of such men to make a favorable showing for the police force of the capital. Soldiers are on regular guard duty at the entrances of the government buildings and uniforms are to be seen at frequent intervals on the streets.

The police and gendarme system of this country is very effective in restoring and preserving public tranquility. The escape law applied to prisoners of an obnoxious class which is in active force not only serves as a rapid process of weeding out old malefactors but has a salutary influence on would-be criminals.

On Sunday morning, July 90, I left Mexico City with Mr. Pringle.
1892

En Route from Mexico City (Mexico)

July

and we stopped over for half a day between trains at the summit station Salazar on ridge west of the City of Mexico. This point is about 10,000 feet altitude and is in the region of pines and firs between the Toluca Valley and Valley of Mexico. It is a cold place, given to hail and cold rains in summer and occasionally a few inches of snow in winter. Arvicola are abundant. In the afternoon, Mr. Pringle having secured a number of plants, we boarded another north-bound train and arrived at Acambaro at middle of night. Thence early in the morning we took a train for lake and town of Patzcuaro, stopping over at Morelia, the capital of Michoacan, to see the governor and secure letters from him to the Jefe Politicos of the districts we wish to visit.

We found the governor, Señor Don Aristeo Mercado, a very affable gentleman who furnished us the letters we desired and then desired information concerning the scale-insect or Aphids which is destroying the coffee trees in the central part of this state. I left instructions for writing the Secretary of Agriculture of the U.S. in reference to the matter.

Having some time at our disposal, we visited the public garden at the east side of town and were charmed and surprised at the novelty of the place.

Crossing the low ground to reach the knoll on which stands the city is a large aqueduct supported on massive stone arches, the work of many years ago in the good old days of peon labor. The same effect at a tithe of the cost could be had now by means of iron pipe laid underground, but by this would be lost a picturesque and striking monument.

The main garden is a beautiful piece of wild woodland in almost a state of nature, level and overgrown with various trees and some smaller growths traversed by footpaths which are neglected enough so
that one almost forgets he is on the border of a city within a few minutes walk of its centre. Passing back under the aqueduct, we came to a small square with a fountain and full of flowers and small trees and bushes of many fine indigenous varieties. This is called the Aztec Garden from a number of grotesque images and statuettes cut from stone that are made in rude imitation of the ancient Aztec work.

A considerable variety of native plants are scattered tastefully throughout this garden and with artistic picturesqueness refreshing to see. We were told that this had been done under the direction of the governor of the State, who had recently died.

Afterwards we visited "The School of Arts", a State school where boys are taught blacksmithing, carpentry, wood-carving, and iron-working. Schools of this character are supported by the state governments at capitals of states throughout the country and are one of the many ways in which an effort is being made by the liberal government to raise the standard of education and usefulness of its citizens. When seeing such efforts, one cannot but heartily say "Long life to the administration that has made such things possible in a country so rent and torn by warring factions but a few years ago!"

There is a museum started in the government palace at Morelia, but after spending 2 or 3 hours in trying to find the man who had the key, we gave up the task.

From Acambaro to Morelia the R.R. is very crooked as it rises a stiff grade and passes through a series of rolling cactus-strewn hills between Acambaro and Lake Quitzeo. The latter is a brackish lake between 20 and 30 miles long and the sink of a river flowing in from Mount San Andres beyond Morelia. On the flat shore of the lake is a deposit of saline earth which is scraped into little heaps.
by the Indians and Mexicans of the vicinity and then leached by a rude process to obtain the salt it contains.

On a part of this flat stands a large, roofless, stone building surrounded by the foundations of other stone structures. I was informed that this building had been erected by a Frenchman some years ago who proposed establishing a plant here for the proper manufacturing of salt in an improved manner. The people worked for him until the works were well on toward completion and then, for fear that their crude method of salt making would be superseded, they assassinated the newcomer and the abandoned works are his monument.

Near the shore of this lake, a mile or so beyond the station of Querendaro in a marshy flat, is a series of a dozen or more hot springs from which flow streams of almost boiling water impregnated slightly with lime and sulphur. The water is so hot that it instantly kills insects that drop in it, and I found a dead field rat lying in the edge of one stream where it had evidently stumbled and been killed at once.

Mr. Pringle took advantage of some of these hot springs to dip in them certain fleshy-leaved plants to scald them and so hasten their drying.

Some of these hot springs are utilized by the women for washing clothes,—the hot water being led into a pool made to one side of the outlet where the water cools enough to be used. At one such place where a number of smooth washing stones were ranged about the border, scores of rude little wooden crosses made by tying together two small pieces of twigs or sticks with fiber of the maguey. These were hung in the branches of an overhanging mesquite tree or stuck into the earth about the water and on the bank formed by throwing up the earth.
Extending back from this lake are some small flats covered with
mesquites, acacias, pepper-trees, and a dozen or more other small
trees beside a large number of large tree-like Opuntias with flat
leaves. Pelicans, cormorants, grebes, wood ibis, herons, and
bitterns were conspicuous birds on this lake and I secured several
species of fishes from it at Querendaro.

On my return from Patzcuaro the first of August, I stopped here
at Querendaro for a few days and was hospitably taken care of by
the agent of the R.R. at this place, setting up my cot in the depot
baggage room.

Stopping here at this time was a young Mexican gentleman who
came here from the City of Mexico to see if he could not be ben¬
fitted by the air for his weak lungs. He had a quick intelligence
and had with him several scientific works which he was studying and
had quite a good knowledge of the genera of plants. He was very
liberal in his sentiments politically, but was very bitter against
the present government, speaking of General Diaz as "that tiger".
He expressed great admiration for the Americans because they were
educated and intelligent enough to govern themselves in a democratic
way, and considered it due to the character of the people who first
colonized the country. To the Spaniards he laid most of the fail¬
ings of the Mexican people and their ignorance, and said that all
their misery and bad government came from the ignorance of the
masses.

While quite right in many of his deductions, he showed the
unreasoning impulsiveness of his race in his rabid denial of all
good in the present government and claimed that a state of revolu¬
tion was better than the present dictatorship under the guise of a
republic.
To a foreigner, however, the relative security to life and property throughout Mexico is a very pleasant thing as compared with the condition of affairs a few years ago.

Juarez is regarded by this same man and others of his same feeling as Mexico's greatest man.

Among other things I could not but notice the characteristic failing of his countrymen in his studying at the same time 3 or 4 branches of science and speaking of some of the leading scientific men of Mexico as being very intelligent,—knowing all branches as he put it. This is the greatest failing of the men of ability in a scientific way; they get a little of various branches of science and become proficient in none.

The work of the scientific exploration of Mexico is being done now, as heretofore, by foreigners who appreciate the richness of the field.

In nearly every capital in the country exists a scientific society and the beginning of a museum which continues to remain a beginning.

My friend at Querendaro asked me if I had not met the members of the scientific society in Guadalajara, and I said that I had not, as I did not know of its existence at the time of my visit there. "That is a pity" he said, "for they are very intelligent men and very active. Why they are in correspondence with nearly every state in the republic." "It is strange", I remarked "that the zoology and botany, etc., of the state remains so unknown, for Mr. Pringle and I find its botany and zoology almost unknown." "Oh!" he exclaimed, "They do not attempt field-work. They are closet naturalists."

In other words, there exists what is considered a group of so-called very active scientific men in one of the largest cities of the
 republic at whose very door are many interesting matters for investi-
gation lying awaiting the research of someone from a foreign country
while these "scientists" carry on voluminous correspondence with
societies of a similar character throughout the republic.

This light and scattering character of the Mexicans inherited
from the Spaniards is shown in many ways beside their unstable de-
votion to science. I have so frequently had them say, "I will see
you again tomorrow" mentioning the hour,— and when tomorrow came,
they had forgotten all about it and were probably making similar en-
gagements elsewhere.

Emilio Castañer, in his article upon Columbus in the Century
for August '92, gives an apt characterization of this mental trait
in the Spaniards that it is worth repetition in this connection. He
remarks that the Spaniards are an impulsive people who jump at hasty
conclusions from a statement of the first principles and that if one
thinks of doing a thing his mind at once leaps from its inception to
the finish and he sees it mentally as already done,— impatient and
often utterly ignoring the frequently laborious means for its accomplish-
ishment.

From Morelia, the R.R. goes on gradually ascending among green
hills until it reaches its terminus on the shore of Lake Patzcuaro
at an altitude of about 6800 feet. Here I presented my letter to
the Jefe Politico and then settled down to work at the Hotel Ibarra
near the station on the lake shore. This is one of the worst hotels
I found in Mexico, while it is situated in one of the most beautiful
spots in the republic.

An irregular lake winding about in bays among the hills for
15 miles or so and not over about 200 feet deep in deepest place.
Here and there along shore are areas of rushes and flag, with a
broad belt of a yellow water-lily (*Nymphaea mexicana*) in the open spaces along shore.

From the shore of the lake the hills rise in sweeping contours, nowhere forming cliffs but ever in harmonious slopes and rounded buttresses of volcanic soil over which is spread a cover of vivid green along the lower slopes, broken by areas of corn land or the roofs and walls of the numerous towns and villages that lie close to the water's edge. Back of this the slopes rise to the tops of round-topped hills and long ridges from a few hundred up to 1500 feet above the water. The higher slopes are dark green from the growth of pines and oaks of several species which begin some 200 feet above the water and cover all the hilltops with few exceptions.

Over these hills sweep a wonderful variety of cloud formations. Now that the rainy season is in progress these vapor masses afford a source of great interest. Now sweeping in voluminous masses, one piling on the other blotting out all the landscape, and dashing down torrents of water into the ruffled bosom of the lake, while a forbidding gloom as of approaching night shuts us in. Then again, a cloud comes silently over the hilllorests and marches across the horizon with a trailing gray veil of falling water reaching down to the earth, while all about a vivid sunshine and patches of brilliantly blue sky aloft and reflected below in the lake make the scene worthy a poet's praise.

About this lake and in the surrounding districts live the numerous tribe of Tarasco Indians who are an industrious and remarkably rough, ugly-featured people, still retaining much of their primitive customs and dress.

These people were one of the most powerful of the Indian tribes inhabiting the country at the time of the conquistadores. (There are
about 200,000 Indians in Michoacan according to recent government reports.)

These people occupy numerous villages about Lake Patzcuaro and cross the lake in considerable numbers every day in canoes to bring stuff to market in Patzcuaro. Among one of the main articles brought is the root of the saccoton grass which they dig up and clean of its bark and it is then done up in small bundles and baled. This is shipped to the U.S. and is used for making small, stiff brushes.

On Fridays is the main market day in Patzcuaro, and the two plazas are filled with these Indians who have for sale a great variety of fruits, vegetables, fish from the lake, and maguey fiber ropes, bags, etc., besides a handsomely made variety of rich reddish brown pottery. Also grass mats.

The people bring their stuff up to market in packs on their backs with the strap crossing the chest in place of the forehead as I have seen the common custom in Jalisco and Colima.

The women bear heavy burdens up the hill to town in this way as well as very often a heavy child in a serape on the back. In the plaza they are ranged in double rows across the open ground and each seller is required to pay a tax of one or two cents for the privilege of the market space. The women wear a handwoven skirt of a dark color with small plain longitudinal pattern. The material is brought together at the waist behind in a multitude of folds 3 to 4 inches wide which have their ends against the back of wearer and all held in place by a broad woven belt or sash wrapped about the waist a couple of times in the fringed ends hanging down at the sides. A white cotton shirt cut low across the throat and short-sleeved with a regular square pattern embroidered about the opening at neck in front makes up the costume of women except for a dark-colored serape that
may be worn coiled about the head or thrown about the person.

As a rule, the women carry the round bladed paddles used in the canoes up to town with them and walk at a remarkable gait with a peculiar hitching motion from being pigeon-toed and having burdens upon their hips. At the same time, their arms hang down straight in front and swing together from side to side with a quick motion at each step. On Sundays they come to town in swarms and at night return home, many of them in a state of almost helpless intoxication. At such times the women are generally somewhat more sober than the men and often bundle the latter into the canoes like so many logs, and paddle away over the water.

The main landing place is at the Hacienda Ibarra. This place is now a small body of land bordering the lake near the town of Patzcuaro which is about 1 1/2 miles back from the shore. It is said that some 25 or 30 years since, an earthquake here caused a large part of the Hacienda lands to sink. The lake is without outlet and surrounded by volcanic hills and many old craters to be found in the neighborhood.

The Hacienda Ibarra is owned by an old man who, with his family, is fanatically religious. A chapel occupies a corner room of their building (which is a hotel) and morning and evening prayers are said there by all the household.

I could not help connecting the miserable flea-infested quarters and niggardly table (one of the worst I have seen in Mexico for the money) with this excess of religious form. In a missionary of the Episcopal Church I also found in Mexico that an excess of form did not go with practice, as he managed to get the best of me a few dollars by a wilful misstatement which I discovered in less than an hour later. He was not a fair sample of missionaries that I met, how-
Patzcuaro is a sleepy old town that, until the advent of the R.R., was buried in the heart of Michoacan and lived in itself. The people are still fanatically religious and the one or two attempts made to establish Protestant missions here have failed owing to the pleasure taken by their neighbors in taking frequent shots at them with old muskets or other weapons of ancient design but sometimes deadly effect.

The streets of the town run up and down small hills and are paved with cobblestones through which quite a growth of bright green grass is to be seen in many places. Wagons and carts are very rarely seen. Beyond the first part of the lake lies the old town of Sinsun, one of the early mission stations, where a still sleepier town than Patzcuaro lies. There in a rude old church, amid some exceptionally primitive pictures done by local artists in the early days, hangs a beautiful Murillo of the burial of Christ,—hangs there with hand-hewed beams and flooring of a frontier Franciscan chapel. The day of my visit, I was taken into the deserted chapel by the sacristan, closely followed by 6 or 8 half-breed Indians who jealously watched every movement and squatted against the wall behind me while I was viewing the picture. It is quite startling to find such a beautiful object of art hanging amid such surroundings and, as might be supposed, offers of considerable sums have been made for this picture but its beauty is so apparent that it has impressed itself upon even the ignorant people where it hangs and they have a superstitious regard for it which would render it a dangerous matter for anyone to try and take it away under any pretext.

I obtained a rude stone idol made by these Tarascos of ancient times and, on inquiry for others at Sinsun, was told that they can be obtained at times but that the Indians, when they find one in a

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field, leave it buried there saying that if they take it away the
crop will fail. The road to Sinsuntsun is across a causeway built
over the eastern end of the lake.

Back of the town of Patzcuaro, extending for many miles is the
"Pedregal" as it is called. This is a wilderness of rough, broken
lava beds covered with a small but dense growth of oaks and other
deciduous trees interspersed with pines on the greater portion. In
this excessively broken country, like a mass of petrified waves of
huge irregular size, are some deer and the large species of rabbits
called "chapass". These rabbits are also found up to the summits of
the high hills or mountains in this district always in the timber.
East of the town a few miles living among the broken rocks at base of
cliffs and in dense undergrowth were secured the very small rabbit
taken here, while still another species was common about the fields
below the oak timber. At the eastern end of the lake the jackrabbit
is found and between it and the summit of an adjacent mountain in a
distance of 3 or 4 miles occur all 4 species of Lepus.

In the old craters about the summits of these peaks are many
flowers and a great variety of humming birds and other birds occur.
A fine pair of Picus imperialis was taken in the pedregal back of
Patzcuaro.

This pedregal leads back toward the low coast country and was the
resort of numerous banditti a few years since, but the present govern-
ment has pretty thoroughly disposed of them so that at present the
Jefe Politico informed me that if two or three persons were together
well-armed there was no danger.

We hunted there without any sign of danger. It is a maze of
paths which require careful watching to avoid being lost. Over be-
yond, to the west, lie the famous coffee plantations of Uruapan.
An American has a saw mill at the shore of lake by Pátzcuaro and the logs are rafted across the lake from the far shore, making a picturesque addition to the view.

Heavy rains have made the country brilliantly green here, and hosts of wild flowers cover the ground in many places. But finally the rains proved too much and I was forced to give up trying to complete the work on the high mountains at present and so we took train and ran down to Acambaro and thence to San Luis Potosí. The rains grew less frequent as we left Michoacán and the country more and more dry until we found at San Luis Potosí a desert where the ground was thirsting after three years of failing crops.

I found this city filled with a host of the most wretched, ragged specimens of miserable humanity that I have seen in the country. The three years drought here has reduced many of the people to utter misery so that they are being fed by the authorities, and charitable contributions of citizens. Among these, the Masonic fraternity have established a kitchen where they fed all comers at midday, until recently a few rains encouraged farmers to begin to plant corn thus giving work when the feeding was restricted to women and children.

In Mexico the Masonic fraternity is an object of hatred to the Catholic powers and has come to be joined by most of the government officials so that it represents the liberal or party in power, as the church or conservative party forms the opposition. There is no love lost between the two and it is only the firm hand and wise policy of President Díaz that the peace is not broken.

This governing power uses all the arts of a politician to keep on his side men who might be troublesome. Some generals who might be troublesome if in command are retired on full pay; other men who are
ambitious are given high positions and by thus making it a matter of self-interest to preserve the peace, the risk of plots is lessened.

One of these generals I chanced to meet as I had an interview with the governor. The latter, Gen. Carlos Diez Gutierrez, I found a fine-looking, affable gentleman who offered me whatever assistance lay in his power. He furnished me with an effective letter to the authorities of the State and also secured others from private parties, another instance of the uniform courtesy that I have met from officials ever since my coming to the country. All needed is for one to be provided with proper credentials at the outset.

The Governor has done much to beautify the city of San Luis since his term began and his recent re-election is probably as good a thing as could be done for the people of the State.

The General is a high Mason, in common with the generality of other of the ruling officials and most liberal men of the country.

The priests still have the women of the country in a state of subjection even in many of the families whose men are advanced liberals. In many cases, the men who are masons conceal the fact from their families in order to avoid the unpleasantness that might arise from this if it were known to the women. Women are regarded as an inferior class and are watched constantly and kept behind barred windows while young, and even when married they often gain but little more liberty.

I heard of one authentic instance in which a married woman never quitted the walls of her house for years, and various people told me that it was no uncommon thing for a husband to lock his wife in her rooms while he was out at night. The men are notoriously unfaithful, and this is well-known to their wives.

Near the Mex. Nat. R.R. depot is the Alameda,— a shaded park with
walks and a central monument capped by a statue of Hidalgo. This was moved here by Gen. Gutierrez in the course of his improvements, from the central Plaza de Armes fronting the palace. Upon the base of the monument in large gilded letters is the name of the Governor, but I could nowhere find any reference to the name of the man to whom the statue was erected.

The city of San Luis contains no modern buildings as we regard the term, except the two well-made stone R.R. stations. The Government palace is a large, well-built stone structure, 2 stories high, fronting the Plaza de Armes in the centre of the town. Its principal historic interest lies in the fact that Juarez had his headquarters there when Maximilian was sentenced and there came to intercede for the unfortunate Austrian all the suitors for clemency to the stern Indian who had liberated his country.

There are many two-story houses of the ordinary type of architecture. There are also many churches whose massive towers can be seen from afar as they stand in commanding eminence over the low roofs of the surrounding city. In its prime, the church must have gained much influence over its followers by the magnificence of its architecture as compared with that of even the wealthiest of its followers. One church with fine double towers near the southern border of the town is particularly handsome.

The markets of San Luis are very interesting particularly the market Porfiria Diaz. In the building where this market is held there are not many things of special note except perhaps the grain sellers who are located about the outside along under the broad portico that extends about the market. But in the streets about this market, particularly near its northern end, gather the poor people who have something to sell and under rude booths and shelters
or even in the open air along the sides of the streets are vendors
of all manner of odds and ends.

The characteristic feature of this place is the "tuna" sellers.
The tuna is the fruit of the cactus (Opuntia ficus-indica). By
cultivation in a rude way on these dry plains several varieties of
the fruit have been produced known as white, yellow, crystalline,
etc., all with distinct size, shape, color, and flavor. The three
kinds named are especially delicious. They are filled with a deli-
crate meat full of succulent juice that is very refreshing. They are
sold very cheaply, several for a cent, and almost everyone, native
and foreigner enjoys them.

The junk dealer is here with his motley assortment of odd frag-
ments of every conceivable article of iron so apparently past the
days of its usefulness that it is a mystery what use can be made of
it, yet these queer fragments must serve someone or they would not
be found for sale. One man had a square yard or more covered with
a variety of knives. Under a rude awning an old woman sold little
packets of dried herbs for medicines, and near by were the wood
sellers who sat behind small piles of fagots, a cent's worth in some
and a quartilla (3¢) in others. On a corner, a dried up old man
with a pair of antiquated balances sold a griny quality of salt.

Along a wide open space by the market were ranged dozens of
women who squatted in line with their heads wrapped in shawls and
sold tortillas which they kept in small baskets under a clean white
cloth or held on their laps.

At one corner of the market building on the ground were the
sellers of game,—3 or 4 women who day after day disposed of rabbits,
hares, quail, field rats (Hectoma), or whatever other game the
season afforded. The rats were brought in regularly and I saw
hundreds of them exposed for sale at different times. They are dug out of their burrows under cacti and maguey plants on the plains about San Luis, and are sold for 6d each and considered a delicacy by the common people. When a cotton-tail only brings from 9 to 12 cents and a hare from 15 to 18 cents, it is evident that these rats must be held in peculiar estimation. They are also said to be beneficial as blood-purifiers, as well as a savory morsel. I found it a common practice for the hunters to bring in the rats alive in sacks after breaking the front teeth in the lower jaws so to prevent them from gnawing their way out. These rats are killed and dressed at the market, and the women hold them up and praise the whiteness of their flesh to the passers to draw customers. The game sells rapidly and is usually gone by 9 o'clock.

Passing back and forth at short intervals are the water-carriers with huge wheelbarrows bearing 4 large, curiously-shaped water jars. Back and forth among all this is a constantly changing crowd in a variety of picturesque costumes with hundreds of half-clad wretches whose tattered apologies for garments show the effect of the last three years of famine and drought.

The prevailing misery among these people has caused a host of beggars of all ages and sexes to congregate in San Luis, and they importune one constantly upon the streets, day and night. Owing to the excellent police system, however, robbery or other crimes of violence are very rare here despite the pressing poverty.

San Luis has street car and electric light systems. Several times a week the military bands play in the afternoons or evenings in some of the plazas,—mainly in the Plaza de Armes.

As the national holiday of September 16th was approached, the plazas, all public buildings, and many private establishments were
San Luis Potosi (S.L.Potosi)

1892

decorated with flags and drapery showing the national colors of red, white, and green. The Plaza de Armes was festooned with lanterns and the streets just about were gay with the bright colors, and at night the buildings were brilliantly illuminated with small lanterns. Hundreds of people came in from the surrounding country, and the walls about town were placarded with posters giving the programme of exercises, over the Governor's signature. In the proclamation, the Governor invited the members of the foreign colony to take part in the celebration "thereby showing their well-known goodwill toward the Republic." Speeches, music and military parades with the reading of the constitution made up the bulk of the show,- with fireworks at the close each evening.

At 11 p.m. on the 16th, the Plaza was filled with the people in front of the Palace. The Governor appeared on a balcony overlooking the people, and his aide read the constitution by the light of two bengal lights held overhead. At the close of this, the Governor stepped to the edge of the balcony and, waving a small flag, shouted the "Grito de Dolores", or the cry which the Cura Hidalgo is supposed to have uttered at this hour and date years ago when he stirred up the revolution against the Spaniards that was to free his country and make a martyr of himself.

This custom is observed at the close of the festivities each year and is greeted with a loud shout by the people. It is a dramatic finish to the celebrations.

During these three days and until the end of the month a double row of canvas and matting booths were erected along the sides of a small open square in the city where a variety of games of chance were played on long tables in some, while in others a counter in front was utilized to sell pulque and aguardiente across. In all, music was to
be heard from morning till late at night and, in many, dancing women were seated at the back ready to join with whoever might come in dancing on the earthen floor to the music of a harp and one or two guitars.

In one booth a favorite dancer was a woman who glided about in time to the music with a bottle of beer balanced upon her head. Flaring torches and many lamps made this place bright at night and it was crowded until midnight with a host of the poorer classes who found great pleasure in these simple amusements. A considerable number of policemen were scattered among the throng, but I saw no trouble needing their interference in the many visits I made to the place.

Outside the booths there were many sellers of fruit and various kinds of cooked food, with a liberal sprinkling of men or women with a small table and dice-box at which one could gamble a cent at a time, betting on the throw of the dice.

Roulette, faro, and monte were favorite games in the booths.

The only corn to be had in San Luis, as in most of central Mexico, is such as is brought in from the U.S.

From San Luis I went out to La Parada, an Hacienda some 20 miles N.W. of the city where I passed a week and secured a series of desert mammals and birds very similar in general character to the desert species of the S.W. United States. Larrhea mexicana, Artemesia mex., Prospis juliflora, Agave americana, and Acacia, and various cacti and other desert plants characterized the arid barren region as a part of the central desert. Wherever water can be utilized for irrigation, the soil shows great fertility. On some of the dry land the mescal is grown extensively and also up and down in the valley about San Luis it
San Luis is situated in a N. and S. valley from 10 to 20 miles across extending almost across the state. In its early history, it was the city of mining wealth, but the ancient mines have been abandoned so long that they have caved in and are almost forgotten.

Another trip was about 15 miles south of the city and to the R.R. station of Jesus Maria and thence west into the heart of the San Luis Potosi Mountains that extend N. and S. west of the city. About Jesus Maria is the San Luis Valley where Perognathus, Dipodomys, Peromyscus, and other desert mammals and birds occur numerously and with almost the same vegetation as at La Parada.

The mountains present a bare, rocky front to the valley, but when they are penetrated and one rises from about 6000 feet in the valley to 7500 or 8000 feet in the mountains, a striking change occurs in the vegetation as well as animal-life.

(See Report to Department of Agriculture).

A race of Cariusius virg., was found there living among the oaks on the highest part of the range. The first morning I was in the hills I found two fine bucks standing on a hillside above me and dropped one where he stood and then fired three shots at the other as he dashed away without touching him, and suddenly found my magazine empty by an unfortunate chance. I then mounted my mule and rode up toward the one I had shot. As I came close to him, he made several violent efforts and finally staggered to his feet and moved away at a slow trot showing a bullet hole in his shoulder just below the heart. My mule refused to get out of a slow walk and so I was forced to see my prize vanish before my eyes and was unable to trail him later on when I had gone to camp and secured more cartridges. A few days later I found a couple
of does among the oaks on a hillside and, taking my stand on a rocky
point overlooking them, sent my man around behind them. They were
some 300 yards from me and as my man drew near them they listened to
him with upraised heads and when he was within about 30 steps among
the dense brush they bounded away in my direction. Taking advantage
of the openings, I broke one’s foreleg and she fell in the bushes at
about 250 yards. The other came on and I also broke its leg, but it
kept on and finally ran close up to the rocks where I stood and look-
ed back toward the first cause of alarm. By leaning over the edge
of the rocks I was able to bring it down by a shot through the hips.

A search for the first one showed where it had fallen and a
bloody trail for a short distance after which the rocky soil gave no
further trace. All over the tops of these mountains I found the
ground dug up in spots by a species of Conepatus but failed to catch
any in my traps. Aphelocoma ocushi, a Junco, and Pipilo mexicanus
were the most common birds.

These mountains are very steep and are little more than a series
of high, narrow, rocky ridges between deep canons. A few charcoal
burners and some gatherers of Saccaton grass stalks for brooms were
the only people we saw except the monteros of the Hacienda of Jesus
Maria who were sent with me by the owner of the Hacienda and who ex-
erted themselves to be useful. Senor Cabrera, the owner, furnished
me with the entire outfit and generously refused to permit me to
repay him in any way.

Several interesting snakes and lizards were secured in these
hills,—one rattlesnake I found coiled up on an oak branch about 4 ft.
from the ground. These people have a great terror of the short-
legged lizards I took, saying that they are poisonous. When I skinned
the deer, the blood was carefully saved by the people who said that
it was good for the heart and stomach as a medicine.

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At San Luis Potosi I was informed that the dogs from the outskirts of town range out into the country at night and make such havoc in the cornfields, by eating the green ears, that the owners of the fields are obliged to exercise great ingenuity in making traps to capture them. Cactus or maguey hedges surround the fields and at some weak places nooses are set with a vertically swinging lever, so that on attempting to pass, a dog is swung high in air to strangle or be dispatched by the owner of the field.

My next trip from San Luis was to the east to Villar station on the Mex. Central R.R. This place is on the summit of a mountain pass about 300 feet above the plain of San Luis. The hills only rise some 1000 to 1200 feet above the plain and are devoid of pines. Oaks, walnuts, and madronos occur, mainly as low bushy thickets except on north slopes where they become good-sized trees. In such places, the trees are hung with long Spanish moss, and a dwarf palm 2 to 3 feet high grows abundantly.

I found here *Apheloconia couchi* and the same deer as at Jesus Maria, but from the palms and the Spanish moss and the large oak and walnut trees in the canons it was evident that this range which extends N and S along the eastern border of a small secondary valley (which is separated from the valley of San Luis by some low hills) and forms an intermediate range between the coast climate and the arid valley of San Luis. East of this range extending away for many miles is a broad open and fertile but rather arid plain apparently very similar to that west of the mountains.

The season has again passed, for the third time in succession, without rain enough to make a crop. Deaths from a severe form of cholera mortus are very common among the very poor in San Luis and it
October 5. I left San Luis and returned to Patzcuaro to complete some work I had in hand there. On route I heard of a recent bread riot that took place the last of September in the State capital, Morelia.

The Government has been supplying the people with U.S. corn at 9¢ a quarter on the cost price of imported corn, but the supply became exhausted and then some local parties who had corn at once put the price at 36¢ a quarter. The poor people thereupon arose en masse and, as it was supposed that the corn was held by agents of the Catholic clergy, a cry of "Death to the Clergy" was raised and the mob swept down the street. The Governor and Jefe Politico did their best to quiet the people, and the usurers in fear of their lives opened their warehouses and their corn was quickly distributed among the people at the former price of 9¢. The people, numbering several thousand, then dispersed quietly to their homes without a single act of violence so far as I could learn.

The Governor soon after caused a law to be passed by the State legislature compelling everyone who held corn beyond a small amount necessary for his personal use to report the amount of the same to the authorities, giving his reason for holding it. In default of such report, the holder of all excess corn is to be fined $2.00 for each fanega of corn so held. In this way the Government will know the available supply and can avoid any further danger of riots by compelling the sale of surplus corn.

When I came to Patzcuaro early in July, the people were just
planting corn some of which was just coming up. Now the corn is full
grown and almost ready to pick.

After considerable chaffering with the owner, I secured an outfit
of pack- and saddle-animals for a trip to the village of Nahuatzen,
about 30 miles NW of Patzcuarro in the heart of the mountains. In the
early morning we were astir but had hard work to get away. The owner
of the animals demanded part of his pay in advance, some of which he
handed over to the servant who was to go with us. We started out of town
all right, but missing the man, sent my assistant back to find him.
The pack-animals were found on a street corner and the mose had gone
off to spend some of his wages on mescal and was finally hunted out
and put on the road.

From then on during the entire day he was a source of constant
annoyance to us. In two villages that we passed he stopped and we
were obliged to send back to get him started again.

Our route from Patzcuaro lay along the lake for about 15 miles
giving us a succession of beautiful scenes of mountain and water as
the change in our course opened new portions of the shore.

Fields of corn walled in with stone (or frequently adobes) along
the lanes we followed with small adobe houses and occasional villages
with their antiquated church buildings were of continual interest.
Several gigantic specimens of Yucca filiformis were passed, one of
which I photographed and measured rudely. It had a base covering
20 feet in diameter at the ground and 6 feet above the ground at
smallest part the trunk was 8 ft. in diameter. The tree then gradu¬
ally enlarged up to about 12 ft. where the huge branches forked.
Its altitude was at least 50 ft. Several others were seen of similar
size.

Near the shore of Lake Patzcuaro we passed several gigantic trees

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of Yucca filiformis. One of these I photographed. The tree stood about
50 ft. high and branched at some 15 ft. from the ground. The base
spread so to measure about 16 ft. in diameter just above ground and in
the narrowest part midway to the branches was 7 ft. in diameter.

Near the village of Naranjaro we turned to the left and, leav¬
ing the lake, crossed a divide some 800 ft. high and entered a beauti¬
ful valley surrounded by hills covered with a fine growth of Pinus
montezumae. The valley and many rectangular spaces on the hillslopes
are cleared and covered with corn. In a few fields winter wheat is
being sowed. In the middle of this valley is a thrifty village of the
Tarasco Indians who are living in well-finished wooden houses. The
original Tarasco is spoken here almost to the exclusion of Spanish.
The houses are made of remarkably well-hewed planks of pine which are
notched and fitted at the ends and so well hewed at the edges that the
joints could not be closer with well-sawed lumber. Many of the planks
have their surfaces so well finished that a close inspection is neces¬
sary to show that it was done with an ax.

The roofs are gabled and covered with shakes that are held in place
by wooden pins driven through holes into the cross pieces of the roof
that in turn are pinned to rafters. The houses are finished by a good
plank floor and ceiling, a panelled door and a broad porch with pillars
along its outer edge. In all cases, the steep roof projects far over
the walls and is carried still farther to form the porch. The latter
covered with a plank floor, is the favorite place for both men and
women to carry on their work. The pillars of the porches are either
round or square and are often worked into ornamental patterns of scroll
or beaded outline.

Each house usually has a yard in front with a gateway through the
adobe, stone, or plank wall. A heavy, single-leaved gate swings be¬
tween two posts over which is erected a small double pitched roof to protect it from the weather.

The gables of the houses are covered with shakes and the course in the apex are often set in rose pattern thus

The walls along the streets are overgrown with mosses, ferns, orchids, and various other plants and an occasional glimpse was had of great untrained white and crimson roses reaching above the walls, or the blaze of scarlet geraniums flashed out as we passed.

Elevations from Geog. Com. at:

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The first week of October, 1892, when en route between Acambaro and Patzcuaro, Michoacan, I was surprised and delighted with the excessive abundance of wild flowers which were out in excessive abundance and great beauty. Great areas of hillslope and meadowland were shaded with the delicate colors and Mr. Pringle admitted that he had never before witnessed such a floral wealth even on an American prairie in spring. The most abundant species was a lovely flower of varying shades of pale pink and rose tints growing abundantly on tall gracefully swaying stems and forming exquisite masses of color.

October 8.—several small orchards of apples and pears occupied plots of ground in the midst of the village, but the trees were planted close together and left totally unpruned so that the branches
En route to Nahuatzin (Michoacan)

Intermingled and reach up in tall slender shoots after the sun and resembling a jungle growth more than cultivated plants. The luxuriant growth and abundance of inferior fruit the trees contained show how well such fruits would do here with proper cultivation.

In several yards at the outskirts of the village the Indians were busy threshing wheat with horses driven about over it on enclosed circular threshing floors. Others were winnowing the grain.

Following the trail, we passed on out of the town crossing a field where a farmer was scratching the soil with one of the primitive plows and then up into a beautiful open pine forest. The pines are all of *Pinus montezumae* and grow to from 100 to 150 ft. high with clean trunks often 50 ft. up to the first branch. The ground over this divide is covered with luxuriantly growing Saseatn grass wherever the forest is most open and on the summit of the divide is a beautiful open basin or park surrounded by forest-covered hills. As we came to the border of this, I heard an odd bird note off to the left and a hasty look revealed a pair of Imperial Ivory-billed Woodpeckers near the top of a large dead pine. My assistant was far in the rear with the shot-gun, but my companion, Mr. G. B. Winton, was quickly on the ground and stalked the birds within easy shot and fired at the nearest one. Both left the tree apparently unhurt and as one of them made off through the high tree tops a long shot with a charge of 5's brought it to the ground. These were the first living birds I had ever seen of this species, and they are fine birds. Near sunset we came to the border of the forest on the rim of a fine basin-like open valley in which lies the Indian (Tarasco) town of Nahuatzin, and several smaller villages.

The valley is very fertile and surrounded by more or less heavily wooded hills. Owing to the altitude, some 8000 ft., and its being
surrounded by still higher peaks, the climate is cool, and fall and winter frosts occur. A small-eared corn with small sharp pointed kernels, something like large popcorn, does well here. A large proportion of the ears are bluish. Wheat also does well here as do pears and apples. In fact, any crops suitable to a temperate climate. This district was once a noted robbers' range and the peaceable inhabitants still dislike being out at night.

Only a few years since the soldiers raided one of the neighboring villages and captured twenty-five men accused of being robbers, all of whom were sentenced to prison or more summary punishment.

The valley is largely devoted to the cultivation of corn, and long open roads are left crossing the fields at right angles so that at their intersection a person can command a view to the borders of the fields. In such places and also so to command the borders are erected platforms, on 2 or 4 upright posts, some ten or 15 ft. from the ground. From these places, watch is kept day and night over the fields to keep out thieves and predatory animals, dogs, coons, opossums, and deer. Frequently a small straw or thatch-walled hut with a sloping thatched roof is erected on these posts to shelter the watchmen. In addition to these, small huts are usually found erected on slopes at the borders of fields to shelter watchmen. The night shut down on us as we rode down into the valley which looked like a deep black pit as we descended into it.

At length we came into the narrow cobble-paved streets of Nahuatzin and, winding about for some time in the darkness, finally found a man who guided us to the house of one of the protestant converts here, my companion on the road having been Mr. G. B. Winton who is a Methodist missionary on a visit to this part of his field.

Ere long we brought up by a wooden fence before a house from which
came fitful flashes of light from a small fire on the ground inside. As soon as our arrival became known, men and women came out and welcomed us heartily and quickly cleared out a one-roomed house for us to occupy. However, some others living nearby insisted that Mr. W. and I should occupy their house so we let our assistants remain in the first house and we went to the new quarters.

We found the houses used for living purposes made of hewn planks with plank floors and usually plank platforms about 3 ft. from floor for sleeping upon. A smaller building of planks to one side or in front of this house across the yard has a dirt floor with a fireplace in the centre. This fireplace is surrounded by 3 or 4 stones and at one side is the earthen pan on which tortillas are cooked, which is supported by stones at its edges with place for putting fire beneath. The rest of the cooking is done in red earthen pots placed on the coals.

After a time our supper was prepared and a small table placed near the fire in this kitchen and we did justice to some meat, tortillas, and coffee. I was much pleased with the frank, good-humored hospitality shown by these poor people who seemed to take a hearty pleasure in trying to make us comfortable.

Soon after, we retired to the platform assigned us and, under a heavy covering of blankets rendered necessary by the frosty night air, were quickly asleep.

Early in the morning I set about engaging men to take me up to the summit of the hills to the south of the valley where I proposed camping for a few days. In a short time I had agreed with a man with a pack-animal to take my outfit up to the hills. I also bargained with a local hunter to go with me and hunt large game for me. The men then disappeared as I supposed to get ready for the trip. I waited until
nearly midday and finally sent for the men again. The packer came reluctantly and evidently considered that the effort of making a bargain was enough for one day and it was only after an hour’s effort that I managed to get the men started in earnest to pack up. Then I learned that the hunter refused to go because if he went with a Protestant the Bishop would excommunicate him—the Bishop chanceing to be in town at that time.

With the exception of the articles carried on one small burro, the remainder of my goods were packed on the backs of a couple of men and a boy who carried the heavy burdens up the steep mountainside without difficulty.

It was well along in the afternoon when I pitched camp under some pines at the border of a grassy glade near a small spring. The tent being put up, I sent my assistant out to set some traps while I arranged the camp and prepared some specimens I had in hand. The people who had come up with us left before dark, leaving us to ourselves.

During the night and in the early morning as long as we stayed here occasional gunshots were fired and the most hideous whoops and howls were uttered by the watchmen in the cornfields scattered over the steep mountainsides in the forest where cleared areas were cultivated. This was to keep the wild animals out of the corn, I was told by people from the village. The effect of these wild cries was wild in the extreme and the authors of the noise looked wild and unkempt as they came to visit our solitary camp and stare at us and our work in stupid wonderment. Few of them could talk Spanish, but they conversed together in Tarasco.

On the third day of our stay, we were visited by a couple of mounted and armed messengers from the President of the Council in the town of Nahuatzin. They bore a formidably worded document setting forth
that it had been learned that strangers were said to be encamped upon
the community lands and as their business was unknown, he commanded
the duly commissioned bearer to come and investigate the motives of
our presence. I explained the object of our visit and showed them the
specimens at hand and informed them that I had a letter in my baggage
left at town from the Governor of the State recommending me to the
local authorities. This was evidently satisfactory, and we were
troubled no further.

This visit was a precautionary one, as I learned afterwards, as
the lands here are held by the community under the direction of the
Ayuntamiento or council elected in the village and under certain laws
of the country unoccupied lands held in this way by communities may
be surveyed, denounced, and bought of the Government. As a consequence,
the communities of Indians who hold lands under such uncertain tenure
are very suspicious of the presence of foreigners whose purposes are
not known. I have heard of instances in which surveyors have been
shot for attempting surveys in such places.

In this locality, I found deer to be very scarce owing to the in-
cessant noise kept up by the watchmen in the fields, but was gratified
to find the great ivory-bill (C. imperialis) common.

Our camp was at the foot of a very sharply rising ridge covered with
an abundant growth of pines. Every morning at dawn the querulous notes
of these birds could be heard as they greeted the sun from trees about
the summit. I found that they made a practice at this time of feeding
on insects found by chipping away the tops of rotten logs on the hill-
side. Then, as the sun ascended, they flew out and spent the day
wandering about among the scattered and often dead pines over a partly
cultivated bench a mile or so across and the adjacent hillslopes.
They were not particularly shy and 7 were killed on this bench during
1892
Nahuatzin
(Michoaean)

our stay. They seemed to be much attached to one another, and if one was killed its companion would not leave the locality. They were excessively tenacious of life, and were very difficult to kill as a consequence.

Our camp was at about 8500 ft., and I found an Arvicola, a Sorex, Cricetmys, Sitosmys, and Reithrodonzmys common, as were also the Geomyys common to the high pine belt. A large Mephitis was found in a cornfield and else a Procyon. A few squirrels (Sciurus) were found here ranging up to 9500 ft. They and the same large Lepus found in the woods at Patzcuaro occur sparingly here.

Having completed my work at this camp, we packed up and descended to the town. Mr. Winton and I took a hunt on the way down and, as it chanced, I got on the slope of a canyon which was so steep and covered with pine needles that my shoes soon became so slippery that I fell repeatedly and could only progress by making a sliding run from one tree to another diagonally down the slope. In several instances where I missed my goal by falling I would bring up some distance down the slope pretty thoroughly shaken up. After over an hour of this, I reached a trail and soon joined my companion as he descended the point on an easy trail.

In the midst of the second-growth pines near the summit by the border of an old field, he had found a magnificent white rose bush growing up among the foliage of a pine and marking the site of an old watch hut. The strange presence of this flower is an illustration of the love of flowers which is characteristic of the Indians in most of the country I have visited. I saw large, fine, white and magnificent deep red roses growing in wild luxuriat beauty in yards in Nahuatzin and other villages and the bush on the hill had undoubtedly been planted there by the people who cultivated the field.
From this same hill came an ancient copper ax (of the same pattern as those of iron in use today) which I bought in Nahuatzin. From a native silver-smith in Nahuatzin I bought several ear-rings of the patterns in common use among the people. The smith works with a rude bellows and charcoal fire— a pair of scissors, tweezers, hammer and one or two other small, rude implements producing remarkably skillful results.

The houses at Nahuatzin are like those in the village already described. During my trip in the hills, one of the men of the village had returned from a trip to Uruapan bringing from there a stock of wooden trays of various sizes lacquered and painted with flowers by the Indians of that locality. Several were bought by me. He was on his way to Morelia with them.

The priests of this district are peculiarly oppressive; to judge by the tales I heard. Still, I got most of my information from a missionary, and I find that this is not the best source to go for such notes if one wishes to be reliable.

The Valley of Nahuatzin is a long, irregular basin among the wooded hills and its drainage is to a small stream flowing down by Uruapan. The hills rise to a height of from 9000 to 9800 ft. about this basin and are covered by a fine growth of *Pinus montezumae*. On north slopes of the higher hills are some *Abies religiosa* and *Alnus*, and abundant lupins of rank growth under their shade.

On October 15th we returned to Patzcuaro, taking a large canoe with 4 paddlers from the shore of the lake next Nahuatzin. The trip across the lake was an enjoyable one with the changing effects of the evening skies on the surrounding hills making a most fairy-like scene as the rich colors of the sunset lit up the eastern shores and hills with

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purple light, slowly fading to the deep black of the night on the forest-clad hills. It soon became so dark that we were isolated on the water and the swaying white-clad forms of our paddlers moving dimly in unison seemed to emphasize our isolation. Finally the lights of the Hacienda showed up and we were soon ashore.

The canoes of the Tarasco Indians on Lake Patzcuaro are of peculiar shape. Instead of the sheer being from bottom to top, it is reversed so that the top of the canoe is several inches narrower than the bottom. A cross-section giving an outline about as follows: They have a long sheer at bow and shorter one at stern. They are dug out of single tree trunks and often are 30 or 35 ft. long and carry a ton or more of freight. The outside measurements of a canoe 18 ft. long and with walls from 2 - 3 inches thick were as follows: The bow and taking a measurement every 3 ft., with an extra one at stern:

At both ends the canoe has the thickness of the timber about 4 inches. In stern the bottom is nearly a foot thick and a small narrow seat is cut inside a foot below rail for steersman.

Small, round-bladed paddles are used with blades from 3 - 10 inches across and almost round or slightly oval on end of a round handle about 6 to 7 ft. long.

Many of the Tarasco Indians about this lake gain a living by fishing. They go out singly in small canoes with a large dip net some 8 or 9 ft. across, with a slender handle about 15 to 18 ft. in length. They thrust the net down to the bottom and hold the handle in an upright position for several minutes and then slowly lift the net with any fish in the
shallow bag that may have swam into its vicinity. In this way a limited quantity of small fish are taken daily. The handle crosses the hoop of the net and is lashed to each side giving the wooden frame stability. They are shaped thus:

Or thus:

with cross-bar near upper border.

A few *Larus delewarensis* were seen on the lake, and about the border on the dense growth of submerged water plants at any season of the year may be seen Jacanas,—with many Coots by the patches of rushes. The Jacanas have a curious habit of raising their wings high over their backs and after holding them thus for a short time fold them very deliberately,—thus showing off the handsome yellow markings of their quills. This is a very shallow lake with no outlet, but only separated from the drainage of the river flowing by Morelia by a low ridge a few feet above the lake and evidently of volcanic origin so that this lake is of recent geological origin like those seen in Jalisco. This is a very rich locality for the genus *Lepus* as no less than 4 species occurring within a distance of 4 miles and a vertical range of 400 or 500 ft.

About the border of the lake at Patscuaro the cattle make a practice of wading out in the shallow water to feed on lily pads and young shoots of rushes, etc., and it is common to see several walking about feeding in this manner with the body entirely submerged, or only the upper half of the outstretched head (nose and ears) above water.

The Armadillo ranges up to 8500 ft. here and the Coon and Possum, *Lynx, Urocyon, Spermophilus macrurus*, 2 species of *Geomys, Sciurus*, and other mammals are more or less common.

The birds are still more varied and rich in unexpected forms. In July I found 5 species of humming among the pines with particular predilection for the flower-strown basins of old craters among the forests.
In fall and winter about Patzcuaro the *Salvia purpurea* is the main food plant for hummers as it is in blossom for months and abounds in woods on the hills. In summer in the old craters *Lithospermum strigosum* is the main food plant for these birds and also for *Diglossa baritula*.

These hummers are *Eugenes fulgens*, *Amauilia beryllina*, *Basilima leueotus*, *Coeliqua eleamaccina*, *Petasphora thalassina*. Here join such species as *Campophius imperialis*, *Aphelacma sieberi*, *Atlapetes nilentus*, *Buarrows tarentinaea*, *Diglossa baritula*, *Picolactes leucopaster*, and various more northern forms, *Corvus cryptoleucus*, *Sayornis saya*, and *S. nigricans*, etc., etc.

In the lake, *Hymphea mexicana*, *Syrph latifolia*, a *Sacittaria* and a *Scirpus*, 2 or 3 species of *Pinus*, 4 of *Quercus*, a *Cornus*, *Arbutus*, *Salix*, *Fraxinus*, and *Alnus* make up the main tree growths.

An American engaged in the lumber business at Lake Patzcuaro informed me that the *Pinus montezumae* which is the lumber tree there will yield about an average of 1000 ft. of good lumber.

The Tarascos are the ancient holders of this soil and today exist in the State of Michoacan to the extent of over 200,000 individuals. About the shores of Lake Patzcuaro they have numerous villages and supply the market at Patzcuaro with fish and all kinds of garden vegetables, apples, pears, and peaches, etc.; dig the stiff roots of the *Saccaton* grass which are exported for brush-making, and make rush mats and a variety of articles from the fiber of the maguey. On market days at Patzcuaro they come swarming across the lake,—men and women, in hundreds of their oddly shaped canoes and occupy the plaza of the town with their wares which they pack up the two miles between the lake and the town on their backs,—men and women alike carrying heavy loads and each with their paddle in hand. They carry their backloads resting their burdens on their hips with a band across the chest in place of
on the forehead as is the case with some Indians. They are usually bareheaded but many have the common conical straw hats.

The men have nothing distinctive in their costume, wearing a white cotton shirt and trousers with sandals or not. The women wear a white chemise with short sleeves and commonly ornamented with crossed pattern of embroidery in blue or red on shoulders and breast. A heavy petticoat of home manufactured cloth of dark, black, blue, and white longitudinal stripes is worn. This is a long strip of cloth about 3 or 4 feet wide which is wrapped about the waist hanging down near the ankles; then the surplus, which is often very considerable, is made into a series of folds 3 or 4 inches deep and bunched against the back and all held in place by a long woven belt with fringed ends usually of blue or black and white colors, woven in a pattern like a series of

The number of folds of superfluous cloth in the folds of the petticoat is said to evidence the wealth of the wearer. A hand-woven shawl, somewhat similar to the petticoat in pattern, is thrown in folds about the head or over the shoulders and completes the costume. They wear the ear-rings of crescent pattern already mentioned and braid their hair in a couple of short queues back of the ears with ends joined at back of neck. As a rule they are barefooted.

As a rule, the Tarascos of this district are short, and rather stoutly built, with long black hair; their faces are dark and very plain, square, coarse and heavily modelled, with a dull stolid look rarely showing vivacity in speech or gesture.

The Aztecs carried on long unsuccessful wars against the Tarascos in ancient times. Their principal town in former times was at Tzin-
tzuntsan, on the shore of the lake where exists a considerable town of this people now. In many of their villages the community is pure-blooded, although in most places a mixture with the conquerors can be
traced. Many of the pure-blooded people know little or no Spanish and they retain many of their old beliefs, although nominally Catholics.

From Patzcuaro I went by Mex. Nat. R.R. to Toluca where I stopped to secure a letter from the Governor to the local authorities.

Near Morelia on the way I saw 23 yoke of oxen each with its driver and a wooden plow at work on a field of not over 10 acres. A man on horseback stood at one side overseeing the work.

Passing Lake Quitzco, Mr. Pringle told of the odd species of corn peculiar to that locality, Zea canina, or the "Mais coyote" of the residents. The corn grows commonly about the foothills near Queretaro and even mixes in the fields with the common cultivated species. It reaches a height of 6 or 7 feet on cultivated ground, but is much smaller on wild land where it has to battle for its own existence. Its most striking peculiarity is in possessing one or more ears in the axil of every leaf from base to top of stalk.

Having secured my letter from the Governor's office in Toluca, I went on across Toluca Valley to the Station of Salazar at an altitude of 10,500 ft. on the pass between Toluca and Mexico. This is a miserable little settlement of woodcutters on the summit of the mountain. After some trouble, I found a small hut in which we arranged our material and began work on October 21st.

The weather during all of our stay in this locality was cold and damp with numerous cold rains during the first week. Every morning at daybreak, the clouds shut in over the mountains here enclosing us in a heavy vapor that made the grass and bushes wet. At 8 or 9 o'clock the clouds would dissipate or drift away to reform again in the afternoon. Whenever the nights were clear, a sharp frost occurred.
The pass in which Salazar is located is an open park-like slope two miles across, surrounded by heavily wooded hills rising from 200 to 1200 feet higher. The park-like open country is covered by a close sod and watered by many springs near its upper border. These flow with the main slope to the west into Lerma Valley. The smoke of the charcoal pits rises everywhere about on the dark wooded hillsides, showing pale against the sombre foliage of Abies religiosa and Pinus montezumae which are the most abundant trees.

Notwithstanding the cold, raw climate on these ridges, mice abound here in greatest abundance and seven species were secured including one Sorex, 1 Blarina, 1 Arvicola, 1 Reithrodontomys, 1 Ouraymys, and 2 Sitomyys. A Neotoma, Sciurus; and 3 species of Geomys make up the main list of small species.

I was surprised to get here a specimen of the common opossum as well as a Mephitis and a Conepatus. These mammals were all most abundant on the wooded hillsides where the large timber did not form too heavy a shade so that a good growth of smaller plants could thrive. From 9000 to 11,000 ft. seemed to be the most populous area. Birds were more scarce, as the summer residents had migrated. Small flocks of Opororis and Anthus with larger ones of a large species of Aimophila frequented the park.

From a high ridge fully 11,000 feet, a couple of Dendroctyxs maurocorus were brought me by a hunter. From the summit at this point a fine view is to be had out over the Lerma or Toluca Valley which has an altitude of 8630 ft., and containing the large, shallow grass and rush-covered Lerma Lake, the head of the Lerma or Rio Grande the longest in the republic.

Beyond this to the west rises the Volcano of Toluca (Xinantecatl, or naked man), 15,015 feet high. To the east, the slope is longer to
the valley of Mexico which is about 700 feet lower.

On the summit of Salazar, in the open park, was fought one of the early battles of the Mexican independence, and the spot is marked by a monument.

These mountains are noted as being the former haunt of bands of brigands. The highway from Mexico to Toluca crosses here and, even as little traffic as passes over it today, it is necessary to keep a company of soldiers at Salazar who picket the road at several points daily.

The people living at Salazar Station occupy small, filthy, wooden huts and swarm out at the passing of every passenger train. The women sell pulque and a variety of cooked food to the passengers and several professional beggars gain their subsistence by the charity of the passengers. In addition, a number of men are working here loading cars with fire-wood and timbers.

There is quite a business in sending out ties from fir timber which only lasts a very short time when laid.

From Salazar, I made a short trip back to San Luis Potosi to secure some specimens of P. bilineata and Callipepla squamata.

November 7th: Returned to Salazar today and learned that last evening while returning to camp my assistant had been set upon by 5 robbers who met him in the road at dark and, knocking him down with a stone, took his gun, watch, and other small articles he had upon his person. He saw 3 men coming toward him in the road and as they drew near saw that they intended mischief, so he dropped his gun into position at which moment he was seized from behind and struck. After the robbery, the men ran off into the bushes. Early the morning of the 7th, the Prefect of this district passed Salazar in the train and was notified of the robbery. That evening I received a telegram from the Prefect
saying that the robbers had been caught and articles recovered. The next morning (8th) I went to Lerma with Goldman to make our depositions in the matter. There we found nearly all the articles, and after the depositions were told that Goldman must remain here under charge of the doctor called in by the local judge until the cut in his forehead had healed. My protests against this useless proceeding only brought a shrug of the shoulders and the intimation that if I came back in a week he might be permitted to leave. At the end of a week, I was there again, but was again put off for another period. At end of this latter time when awaiting Goldman's arrival in Mexico, he telegraphed that they refused to let him go without paying the doctor for his services.

As these had been forced upon him by the judge and neither asked nor required by us, I considered this a palpable imposition and at once laid the matter before the American Charge d'affairs (Mr. C. A. Dougherty), and he laid the matter before the Secretary of the State here (Senor Mariscal) who said that while the law authorized a wounded person being kept within jurisdiction of the judge, it did not authorize any bills for services to be enforced against the victim. In a couple of days, Goldman was permitted to leave and on his arrival here he told me that the local authorities were quite decided that he should pay the bill of the doctor before they would permit him to leave, and were rather indignant when he showed them my telegram telling him not to pay the doctor. Two days later when they had heard from the Secretary of State he says that they suddenly became very polite and, returning him the articles, told him that they had nothing to do with the doctor's bill and that he could leave whenever he liked. Two of the men who robbed Goldman confessed and claimed that they were the only ones engaged in the affair.

While I was in Lerma on the 8th attending to this matter, I heard
several recent robberies in that vicinity spoken of and the Prefect told me that two others had taken place on the Salazar Mountains the same day Goldman was robbed. One of the victims, a miserably poor old man, was in the judge's office while I was there and said he had been robbed of a few little articles he had bought at market. The robbers had struck him on the head with a machete, cutting his scalp open. All of this on the main public thoroughfares between Toluca and the City of Mexico shows how absolutely essential to even partial security is the patrol guards of soldiers that are seen almost everywhere. This same week, the papers in the city published an account of a party of armed robbers attacking some merchants on the road about 9 miles out of the City of Mexico near Tlalpam, but the travellers beat off their foes by a stout resistance with their firearms.

Although the country is in a state of safety and quiet as compared with its former condition, yet there are robberies going on continually not a tithe of which ever get to the ears of the public even here in the vicinity of the occurrences. The authorities are not communicative and only cases that are notorious from their boldness or other causes come to the notice of the public.

As most of the foreigners live in towns or, when they travel, go in a way that gives but little risk of molestation, they are not aware of the really dangerous state of the country. My work, requiring residence for weeks in the remoter districts and solitary hunts among the hills, lays the matter in a different light, and the continual warnings that are given me by the Prefects wherever we go of the danger a single person is in when going about in the country shows the true state of affairs. The authorities do all in their power to insure safety, but it is difficult to curb the spirit of rapine that decades of bandit-life has inculcated in the half savage inhabitants of Indian villages in
wild hills and mountains, to whom human life would not weigh for a
moment against the value of a day's drunken indulgence if the fear
of a speedy detection was removed.

While waiting for the release of my assistant from his virtual arrest
in Lerma, I visited the Museum of the Geographical Exp. Com. at Tacu¬
ba on high ground west of Chapulatepec and should have been the location of the City of Mexico when
rebuilt by Cortez, but for a curious blindness on the part of the Con¬
quistadores who rebuilt the city on the old marshy foundations with a
beautiful site at the border of the marsh close by. Indeed, when the
new city suffered disastrous floods from the waters of the lakes about
it in later years, the Spanish kings suggested its removal to the high¬
er ground but it was then so late that the vested interests in property
were too great to abandon even in the face of flooded streets. Today
the descendants of these short-sighted founders are hard at work ex¬
pending many millions of dollars upon the most enormous system of
local drainage in the world to try and preserve the city from danger of ruinous floods. As the land on which the city is built is the soil of the old marshy lake and its increment by the accumulation thereon of debris and vegetable growth and decay, it is saturated everywhere with water to within from one to four or five feet of the surface. This is abundantly evidenced by the ditches full of stagnant water that border the city in all the suburbs.

There is considerable difference of opinion regarding the effect of this drainage upon the city. Some claim that to draw the water out of the soil on which the heavy buildings stand will cause the foundations to sink and do great damage and others contend that the buildings will not be effected. At any rate, the drainage if a success will render the city much healthier by enabling the improvement of the sewer system. The city is becoming rapidly modernized and the new quarters along the western border of the town are building up with handsome two-story stone front houses that show an attractive union between the old style of architecture and the more modern one. It is in evidence of the greater feeling of security for life and property that prevails at present that many fine houses are now built with large windows on the street which are only protected by a light iron railing across their lower half to serve as a balcony rail, where heretofore every window has had a strong iron railing from top to bottom.

The city is beautified by a fine Alemada and a beautiful avenue or drive and promenade, the Paseo de la Reforma, which leads straight out to the Castle of Chapultepec on the west of the city.

There are several markets in the city where one may see a curious and interesting conglomeration of people from the pure-blooded Spaniard and the various degrees of the mixed race down to pure-blooded Indians who still wear their characteristic costume and speak little or no
Spanish. It is a common thing to find Indians living about the valley and its neighborhood who do not talk Spanish, and their own tongues are used habitually among themselves. There are various tribes about here,—the Aztecs, Otomies, etc., etc. At the market of San Juan de Dios a number of women of the "Otomi" (?) tribe in their peculiar costume of hand-woven clothes may be seen selling tortillas or other small articles.

At the market of the Mercedes (?), SE of the main plaza by the border of the canal and in the midst of the poorer quarter of the town, surrounded by hundreds of pulque shops with gaudily ornamented fronts and interiors, there is a great gathering place of Indians of Aztec descent from the valley who bring in here wild ducks by the thousand from the marshy lakes of the valley where they are snared and killed by the ancient methods practiced before the conquest. Fruits and vegetables from the cool tablelands and down the slopes to the tropics are also sold here on mats spread under the shade of other mats spread on umbrella-like wooden frames. At the same time, the vendors of all manner of cooked food do a thriving trade. Tortillas fried in oil, chile sauce, or rolled and filled with a chile salad,—meats of various kinds. Sheep and goat heads boiled or roasted with the hair still on and just as they were cut from the carcass are a favorite morsel. Long rows of women are busy on the pavement picking ducks or chaffering over the sale of their wares. Here the squalor of both buyers and sellers is often revolting at the same time that it has a fascinating picturesqueness. Brown, naked infants sprawl about blinking in the sun or tugging at the freely exposed maternal founts. Currish dogs prowl cringingly about to snap up stray morsels, and at slack moments the women squatted by their wares gossip with one another or search for vermin in the heads of their offspring. Amid the bustle
and stir of a constantly moving crowd of purchasers bearing baskets or
sacks for purchases rise the calls of the vendors. The interior of
the market is divided into stalls and is more orderly while less pic-
turesque. At same time the show of fruits etc. is an attractive one.

In all the adjacent streets are great numbers of pulque shops
where men and women drink pulque all day long and at night the streets
are blocked by a teeming mass of the lower classes who become drunk
upon this wine of the maguey as they call it in paraphrase. The outer
walls of these shops are usually gaudily painted and ornamented and
bear various fanciful names such as La Coronacion de Baco, - La Reforma
del Portin, - El Sueño de Xochitl, - Cabine de Aseo, - El Invierno,-
La Hija de los Leones, - El Arbol de Paraiso, - La Careta Roja, etc., etc.
Very often with gaudily colored symbolical painted figures. Within
there is a wooden counter with shelves behind on which are drinking
vessels some of glass, clay, and gourds, and frequently the wall be-
hind this bar has various brilliantly colored scenes painted thereon.
Shops and stores of all kinds are usually known by some name, one of
the most absurd being that borne by a meat shop where pork was sold.
This bore the suggestive legend, over its front, of "La Trichina".

Turning to the higher class of society, it is interesting to note
the almost universal adoption of foreign fashions. Government offi-
cials and professional men wear silk hats and the derby is also in
very general use. The old broad-rimmed sombrero, tightly fitting
trousers with silver ornaments while attracting little attention are
going out of use rapidly in town and are mainly worn by visitors from
the country and often by coachmen of wealthy people who keep up this
costume for effect.

The ladies are nearly all dressed in hats or bonnets and it is
unusual that the mantilla is in use except among elderly ladies who
As noted of the dandies in Guadalajara, so here the cane is carried by all who wish to be considered in the mode. Here the cane most affected is one with a large head or knob and is held by the middle with the head down and behind and the small end up and projecting at an angle of 45° in front of its owner who walks with short jerking motions of the hand that is likely to cause some apprehension for one's eyes along crowded streets. As a rule, the smaller and more insignificant the bearer the larger the cane and knob, until at times I have been greatly entertained by the amount of wood carried by some self-satisfied youth of very slender physique.

There is a considerable colony of Americans in the City of Mexico. They are mainly railroad men and are, as a class, the same men that one finds throughout the newer west,- young, bold, hardy, and adventurous.

There are a great number of beggars everywhere in the streets. Deformed or crippled beggars are given a license on application to the city authorities, but the law prohibits unlicensed begging and arrests are continually made of such beggars but still they persist.

The lottery ticket sellers also swarm on the main thoroughfares and importune one on every hand to purchase tickets. These "billetesos" are licensed and each wears a number. They are men, women, and children, and many cripples gain a livelihood by this means.

There is a shameless persistency among many of the beggars who are abundantly able to work that is not likely to create much sympathy.

It is noticeable among the lower classes of the tableland region that there is but little evidence of self respect among them. They cheat, lie, and beg with utter shamelessness and seem to feel that to get a penny by such means is a commendable action. This must arise
from the state of peonage they occupied so long and the position they
now occupy of ignorant, hopeless servitude.

In a recent report of Senor M. Romero, Secretary of the Treasury,
he states that, owing to the cheapness of labor and other causes,
Mexico cannot expect to draw to itself foreign immigration such as
goes to the U.S.A., but must educate its Indian population to become
citizens of intelligence enough to build up the state. This is a fine
conception but puts a herculean task before them. The efforts of the
government, however, are directed toward popular education and every
friend of the country must wish them success worthy of the enlightened
desires of the rulers.

The last of November I rented a couple of rooms at the town of
Tlalpam, 9 miles south of the City of Mexico, at the foot of the mount-
ains of Ajusco and moved out there to work that locality.

The town is located at the border of an extensive lava bed known
as the "pedregal". It extends from the Volcano of Ajusco down the
mountain slope and out upon the plain or valley to the town of San
Angel some 10 miles or so. Its surface is extremely rough and broken
with deep pits and cracks here and there. Wherever the surface has a
little soil, various plants have sprung up among which the largest are:
Schinus molle and Opuntia sp.? Others are Prunus salicifolia, Eupot-
erium petiolare, Stevia paniculata, S. salicifolia, Notolaena ferrucia-
nea, Hook. (fern), Cheilanthes microphylla (fern), Stevia subpubesens,
Stevia tomentosa, Loeselia glaudulosa, L. occinea, Verbesina salicifo-
lia, Piquiera trinervia, Senecio salignis, Baccharis pteronioides,
Asclepias linaria, Senecio praeceps, Montanoa tomentosa, Brickellia
cervantesii, B. veronicafolia, Salix bonplandiina, Almus acuminata,
Populus alba, P. negra.
The mammals found among this area of broken rock were a couple of species of Sitomys, a Neotoma, civet cats, a Mephitus, and a Spilogale, and 2 Lepus. Along the eastern border of this lava bed is an almost equally extensive bed of fine volcanic sand which extends down the slope from the vicinity of the volcano and out upon the flat covering, to a depth of from a few inches to several feet, the old lake bed deposit of vegetable mould.

In this sand at the border of the plain are great numbers of a small Dipodomys, with a few Sitomys sonoriensis, Spermophilus mexicanus, and S. macrourus, and great numbers of a small, yellow Perognathus.

Tlalpam, like all of the small towns in the valley of Mexico, is largely made up of Indians and mixed bloods. The market day is Sunday and the people who bring in the fruit, vegetables, etc., etc., are all Indians, some from various parts of the valley and others from Morelos.

Among other things for sale I saw one man who had some 30 or 40 spindles and whorls of baked clay. The spindles were about 15 inches long and the size of a lead pencil and were thrust through the whorl the latter being fastened about 1/3 the distance up from the butt of spindle. Among other things for sale were great quantities of a species of water bug, ________, which is caught in the shallow water of the lakes and canals, dried and brought to market here and elsewhere about the valley by bushels in sacks. (Coryza punctata and Hotomesta glauca are two species of bugs found in the lakes of the valley.) With the adult insects they were at the same time selling the small, grayish white eggs of this insect in almost equal numbers.

The people told me that the insects are sold for bird feed, but that the eggs are cooked and eaten by themselves as a delicacy. "Son bueno para nosotros, cristianos" as the Indian market man put it.

The nights and mornings were sharp and frosty all through December.
at Tlalpan and the leaves of *Alnus acuminata*, *Populus albus*, and *E. nigra* fell by the middle of the month except in sheltered spots.

The common people here dress in the usual cotton cloth costume and a serape and, on several occasions when my assistant or I were up an hour or more before daybreak, several men were found each time sitting in the cold benches of the Plaza, silent and closely wrapped in their serapes waiting for the rising sun to warm them up.

The houses of the peon class are chilly and often damp and the owners are out early in the morning to take a warming from the earliest rays of the sun. In the City of Mexico, as well as in the smaller towns, the houses of this class are, as a rule, mere dungeon-like adobe boxes with only a heavy plank door for admission of air and light. When the owner has advanced ideas, he may have a window cut in the wall with wooden bars across. These houses have earthen floors and are very often damp from the moisture of the soil as well as from the constant wetting that the people are in the habit of giving them.

While at Tlalpan I made a trip up to the village of Ajusco which lies at the NE base of the mountain of the same name. The village is a rambling affair of adobe houses roofed with pointed-shape covered roofs. The people live by cultivating fields of corn on the loose, sandy, and very poor soil up to an altitude of 10,000 feet and by cutting wood on the adjacent mountain-side.

The maguey grows to a large size up to about 10,000 feet at this place, but little else is found that does not show the effect of the poverty of the soil. The people of the village and vicinity are Indians and have not a good reputation.

They showed their interest in our work by trying to follow my assistant on several occasions while he was setting traps. Their tracks were seen where they had followed the trail on the mountain.
but had lost it on a rocky hillside. Three of them started to go up to my assistant in a suspicious manner on the mountain one day and he threw the muzzle of his gun in their faces whereupon they took to their heels.

Above the village of Ajusco, at at least 10,000 feet, I was surprised to find Dipodomys philippaei not uncommon in the sandy ground close up to the main base of the mountain.

The country was much drier than at the same altitude on Las Cruces at Salazar.

The Volcano of Ajusco is a crater situated at about the same altitude as the village just at north base of the mountain proper which rises some 2,000 feet above it and is not a volcano at all. This is another example of the fact that I noted at the volcano of Colima.

The Sierra Nevada of Colima is the main mountain and is not a volcano.
The volcano rising on the southern base of the main mountain at an altitude of about 7,000 feet and has built up a cone to over 12,000 feet being still a couple of thousand feet below summit of main mountain. At Ajusco the volcano cone and crater are at north base of mountain and its energy was mainly spent in pouring out the great lava bed which flows down to Tlalpan and San Angel, with the ashes that lie along the eastern border of the upper part of the lava bed.

In further illustration of this subsidiary character of volcanoes is the fact that Iztaccihuatl is not a volcano but is a rugged mass of porphyry rising to an altitude of a little over 17,000 feet with the cone of Popocatepetl lying just at the southern end of the long, high porphyry ridge of which Iztaccihuatl is the culmination. The summit of Popocatepetl has built itself up by successive eruptions from a considerably lower elevation than the peak of Iztaccihuatl until it is now some 700 feet higher.
We returned to Tlalpam just before Christmas and found everyone preparing to celebrate the night. For nine (?) nights before Christmas Eve the Mexican families celebrate what is called "Hacer Posada". A kind of altar is built up on a table at one side of the room and covered with moss, fir twigs, etc., forming a bower of greenery. Over this are scattered little images of various domestic animals besides tinsel wire, paper flowers, and other bright decorations, and before this candles are kept burning in the evening. Each evening a small cradle-like litter with an image of the Virgin and a small porcelain doll representing an infant are carried about the room by the women and children of the family, - the procession led by lighted candles, and what are called posada songs are sung. Short halts are made in front of doors while the singing is kept up and then the procession moves on around the room. This is supposed to represent the fruitless efforts of Joseph and Mary to find an Inn (Posada). On Christmas Eve, the making Posada is wound up by the placing the Virgin and child in the bower already described and which represents the stable.

This is followed by merry making, distribution of presents, and the breaking of a large gilded and ornamented clay pot of candies which has been hung from the ceiling.

The main Plaza of the City of Mexico the week preceding Christmas is a curious sight. The broad streets are crowded with wood and canvas booths while hundreds of open-air vendors encircle these and the display of huge, absurd paper dolls made to represent, usually in caricature, various classes of people; boys or men marching about with rows of these hung by their heads along a pole resting at each end on the shoulders of a bearer. Others carry one or two dolls at the end of a long pole held high in air.
The brilliantly ornamented Posada jars are carried in the same way. Fruit, nuts, and sweetmeats from all parts of the country are here in profusion and toys without number. The vendors are continually shouting their wares and a crowd of thousands of spectators and purchasers with eager and wide-eyed children of all classes of society fill the space about this fair until it is only by considerable effort that one can get about. In the evening the scene is still more fascinating as it is brilliantly lighted with lamps, and pitch pine burning on iron braziers or on the ground throwing a fantastic glare over the strange assembly. The multitude is good-natured and all seem imbued with the spirit of the occasion.

The open air vendors are all of the poorer classes of Indians, Aztecs and Otomies, and deal in fruits, peanuts, sugar cane, paper dolls, sweet cakes, candies, and are ragged, dirty, and unkempt. Their half-naked children sprawling about on the pavement by their sides or suckling infants tugging at their mothers' breasts in calm unconcern of the multitude.

Thousands of people, men, women, and children, of all classes, gather about these booths and a lively traffic, in all manner of Christmas toys and gaudy ornaments, is carried on. All are good-natured and smiling, the children with wide-eyed delight gazing at the multitude of toys etc., made to please their fancy.

In the evening, a band playing in the centre of the Plaza adds another feature to the scene.

On December 12th occurs the annual pilgrimage of Indians to the shrine of the Virgin of Guadalupe on a hill about 3 miles north of the City of Mexico.

I found the Plaza des las Armas lively with hundreds of people embarking on the street cars for the village of Guadalupe. Taking one of
the cars, I joined the throng. A broad road leads from the city straight out to the hill of the Virgin. It was thronged with wayfarers, on foot with numerous mule carts loaded to overflowing. These were covered with a tilt but from under the lifted edges many bright eyes peered out at the lively scene as they rumbled slowly along. Everyone had the gay air of a holiday maker and jokes and laughter were heard on all sides. These pilgrims were dressed in their holiday best,—the men in snowy white relieved usually by brilliantly-colored serapes. At the border of the village of Guadalupe all teams are stopped and thence on one has to work a slow passage through a dense but good-natured mass of people. The town was decorated with colored cloths, etc., hanging from windows and the main street extending about the base of the hill, on the brow of which is perched the chapel, or shrine of the Virgin, is filled with booths, for the sale of sweetmeats, icecream made from snow of the volcano, small eating booths, peep-shows, a merry-go-round with its hand organ, numerous sellers of holy pictures consisting of glaring chromos of the Virgin and other personages, vendors of silver jewelry of barbaric patterns with hosts of the little silver images of various parts of the human frame or of domestic animals to be used to hang on the dresses of the saint or Virgin to whom prayers are made for relief.

Around the foot of the hill and about the church, wherever a nook offered shelter from the crowd, were Indian women squatting about little fires cooking for their families,—the small array of clay pots about them showing that they had brought along all of their household goods. Scattered everywhere in the crowd squatted other women with a small, clay brasier in which burned a charcoal fire before them, over which they made, cooked, and sold various peppery dishes dear to the hearts of these people.
About the door of a chapel built over the spring at the foot of the hill struggled a dense mass of people with bottles and clay jugs and gourds all striving to get a supply of this holy water to take home with them.

A little beyond this, I noticed a crowd gathered in a circle and on approaching found that about a dozen Indians, men and women, were at work executing a dance in honor of the Virgin. These Indians were dressed in tunic and trousers and sandals with a high crown-like headdress of plumes stuck around the border of a stiff cap set all around with little square mirrors that flashed in the sunlight. The plumes were dyed red, green, and yellow. A number of the Indians had a quiver of panther skin with bow and arrows thrown over their shoulders and wands in their hands.

The dance was in time to a small drum and consisted of stamping the feet, facing about from time to time, and certain changes of places to effect obscure figures. It was under the direction of an old man who also took part, and is undoubtedly a survival of some ancient Aztec rite once exercised before the bloody altar of the god whose shrine was on this hill.

A little later, when the dance was concluded below, these dancers mounted to the broad stone-paved platform before the entrance of the shrine and there, forming in a double line extending out from the door of the chapel, they performed another dance. These performers were all of rather strikingly Indian features, somewhat curved noses, and had a stern earnestness of expression characteristic of the deepest fanaticism and such as might well have been worn by the thousands of their ancestors who went down into darkness under the blows of the Spaniards while trying to capture the latter alive for an offering to their god.

The Catholic church is a kind mother to all paganism as long as it
shall be disguised under the name of her saints.

Inside the chapel a constant procession of the faithful went on with bending knees and fervent kisses bestowed on the floor, the glass covers to images, etc. From the wall of the stairway, a picturesque view of the city and valley with its surrounding mountains and the surging multitude below is well worth a pilgrimage for one of the outer world.

Tnalpam Notes: The woman keeping fonda wanted skunk bodies, saying that their flesh was very good for bad blood. In Irolo, a young soldier wanted skunk bodies because the meat was a good remedy for syphilis.

I was told that a couple of Spaniards hunting near Ajusco in fall before we came there were robbed by the Indians who came up pretending to wish to see their game and suddenly seized the men and took their guns, etc. The Indians here have the name of being great thieves, but rarely commit murder.

On December 8th and 9th, clouds gathered about tops of Popocatapetl and Iztaccihuatl and concealed them while the wind blew in gusts in the valley. On the latter date, the clouds drifted in fragments across the valley, torn from the mass on the mountains. In early morning while the sun is shining on east side of Iztaccihuatl, the vast mass of west side of mountain is a deep black contrasted with the ghostly form of the white woman. At intervals long, filmy strata of fleecy white clouds drift athwart the mountain below timber line, showing in brilliant contrast to the dark, wooded, shadow-brooded mountain side.

Huiztilac (Morelos) December 27: After various aggravating delays, this morning we got off on horseback to cross the mountains to the State of Morelos.

According to our custom in travelling over dangerous roads, I went ahead with my rifle conveniently at hand while my assistant rode about
20 to 25 yards behind with a couple of charges of buckshot in his gun. In this way we hope to make any attempt to take us in rather difficult work.

We soon left the valley of Mexico and ascended to the broad summit of the Ajusco range. The road then took a nearly due south course across a rolling country partly covered with handsome groups of firs and partly a series of grassy parks and slopes. Along the road we passed, in travelling ten miles across the summit, six permanent picket stations of from 5 to 6 or 8 soldiers. These pickets are on hills close to the road and so situated that almost all of the road is in view from one station or another. This is to prevent the bandits from infesting this district, since the wide stretch of wooded country on this mountain made it a favorite place for robbers at one time. Here, as in nearly every part of the country I have visited, it is only by the constant presence of soldiers at suspected points that the robbers are kept in check as much as they are. Should the soldiers be removed, the country would at once relapse into its former state of lawlessness.

On the southern border of the mountain top, we came to the large, gray, stone cross erected here to mark the line of Cortez ancient marquisate in Morelos. It is known as the Cruz del Marguey. From it we descended a few miles through a beautiful pine forest to the little, unkempt village of Huitzilac where we put up in a meson, occupying the usual tomb-like room, lighted only by opening the door.

In this place we put in several days working in the surrounding country, which is very mountainous. Huitzilac is situated at an altitude of 8,000 feet, in the pine belt, but just west of the village rises a high ridge which has, along its east slope up to 9000 feet, a magnificent growth of oaks with some madrons, and a great variety of undergrowth of deciduous bushes.

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The vegetation of this hill is like an intrusive point thrust up through the pines. Below, at about 6,000 feet, the pines end abruptly and the road leads out over the green grassy slope to the small city of Cuernavaca, capital of Morelos.

On the Valley of Mexico side of the range (Ajusco), the country is very volcanic, but on the southern slope, although there are also various small craters and some lava beds, the main formation extending down from the mountains from 8,000 to about 4500 feet the barrancas are cut through a deep formation of coarse conglomerate of rounded fragments of volcanic stone.

The city of Cuernavaca contains about 12,000 or 15,000 people and is built on an arid open grassy plain sloping to the south with deep barrancas cutting their way down from the mountains following the slope. The blood-sucking bats (Desmodus) are common close to the town in a damp cave, with a perilously loose crumbling roof, where I secured some. Many small, blue, -winged bats were also found in dry caves near here and living behind the huge carved back to the altar in a church. Under the guidance of the sacristan we hunted out some of these latter with cane rods but, as I had many of them already, I took no more.

Cuernavaca is a rather picturesque place as it is built on uneven ground between two deep gulches. The old castle of Cortez stands on the brow of one slope and is a large square building now occupied by the local authorities for various purposes.

Aside from the fortress-like character of this building, it has few striking features. It lends itself in the forming of a beautiful picture that I went to gaze out upon several bright evenings during my stay in this town.

From the corner of the old palace, across a loop-holed bastion and
the low, tile-roofed houses covering the slopes of the small valley-like gulch, one's eye passes over the waving fronds of a fine palm tree rising on the top of the opposite bank to range across miles of dun, brown rolling plains and hills to the dark, pine-covered base of Popocatapetl and thence up to the gleaming white crest of this mighty peak.

Just at twilight, while the fading light of day brightens with a vanishing glow all the salient points of the landscape and the eastern sky is taking on its sable night hues a few stars twinkling forth uncertainly, the beauty of the "Smoking Mountain" is marvelous to see and its loveliness drew me back here evening after evening.

The combination of a gracefully spreading palm with a background of a snow-capped volcanic peak recalled a picture that I remember embellished one of my earlier geographies.

There are many memories connected with this town, for here Cortes made a favorite resort and in this was imitated by Maximilian in his unfortunate filibustering expedition.

From all I could see and learn, I was not favorably impressed with the officials of this State, although the Governor was not there and I only saw the Secretary of State whom I found singularly devoid of courtesy. Presenting to him my letter from the Secretary of State in Mexico, I explained among other things, being a stranger there, I would be greatly indebted to him if he could inform me of someone who had horses to hire and a good guide to take me to see the ruins of Xochicalco. To this he replied by asking if I could not find them myself! To this I made answer that if I had supposed I need expect no assistance from the authorities I need not have presented my letter of recommendation. He then agreed to find the outfit for me and sent out one of his messengers for the purpose. The result was that the man
provided was one of the surliest fellows I have employed in the country, and my horse was one of the worst beasts I have ridden. The guide lied to me at the ruin and prevented my seeing one of the most interesting parts.

Coming after the almost universal politeness with which I have been received and assisted by the governors of various other states, I was very disagreeably impressed by the inhospitable character of the officials of this state. During my stay at Xantepec a little later, I had additional cause to complain of a very similar treatment on the part of smaller officials and, combined with a peculiarly tricky set of Indian inhabitants, I found Morelos a State of no very pleasant character.

Leaving Cuernavaca in the morning, I rode across the country for about 10 or 12 miles to the ruin of Xochicalco. The route was across a sloping plain of scanty soil and much lava broken by numerous steep-sided canons. Scattered over the surface of the country were many lava boulders of small size.

Several large, white-sided Jack Rabbits were seen which made use of their dark back patches in a curious way. When undisturbed, they hopped about among the lava rocks, their white sides flashing in the sun, but if alarmed they faced away from the danger and squatted so to present their backs and were instantly lost to sight. Then they would quietly steal away 100 yards or so, and one would be surprised to see his game suddenly begin zig-zagging among the rocks at a distance from where he supposed he had marked it down. This is a curious case of directive and protective coloration in the same animal.

Xochicalco is on a hill rising on the slope and overlooking the low country to the south, east, and west. Near it I passed through an Indian village whose inhabitants are undoubtedly the descendants of
the builders of the temple on the hill. They now occupy grass-thatched huts with curious clay storehouses for corn, built like inverted ovens and thatched with steep conical straw roofs.

The sides of the hill on whose top the temple is built are terraced with the slopes from one terrace to the other cut down to a steep regular incline and faced with a wall of irregular stones. Some of the upper terraces at least were floored by a hard smooth mortar finish, as shown in one place where it has been bared. The temple is on extreme top of the hill commanding a magnificent view. It is a rectangular structure enclosed in the centre of a levelled and paved court surrounded by the debris of an old stone wall.

The temple measures 57 feet along its east and west faces, midway from ground to top of standing wall. The north and south faces are 65 feet long. On top two pits in the centre with a cross wall between show that the temple had two interior rooms at base.

The only entrance to temple was by means of a broad stone stairway leading to summit. The steps are 15 inches high and 12 inches broad. This stairway occupies all of west face except for 13 feet at each end. The low surrounding wall of rubble that enclosed the court was only a few yards from the temple wall and was built partly of hewn blocks and partly of rubble. It had an entrance or gateway in front of the stairs leading to top of temple.

The upper part of the temple wall has been partly destroyed to furnish material for a dam at a reservoir built for irrigating below the hill. This vandalism is not permitted by the present government, and I was informed that a local official is charged with the protection of the ruin. This protection is a nominal affair however, since several large cacti and young trees growing on the summit are forcing their roots between the blocks of stone and tumbling them down.
1892

I made the following measurements of the ruin on one of its most perfect faces. It had the same plan on all sides.

Guernavaca (Morelos)

The entire facade of this structure is covered with large, grotesque figures carved in high relief on the stone which is carefully dressed and fitted with smooth faces and made of large blocks of lava. The stones of the top course are 24x28 and considerably longer than wide or thick. Stones 3 to 4 feet long are common. A number of photographs taken will show the character of the figures. In Humboldt's travels, he gives a large plate supposed to represent one face of this ruin, but it is wholly fanciful and does not convey the slightest idea of its real character. There are said to be extensive subterranean chambers in the hill beneath the ruin, but my guide misled me so that I failed to see them.

On a hill about the same height as one with the temple and just east from latter, separated by a low gap from it, is another hill with a walled lane leading from the gap between the two hills up to its summit where there is a walled enclosure. This hill must have served as a fortification. I was feeling the effect of the intense sun at
After my return to Cuernavaca from this trip, I had an attack of diarrhea which kept with me for some weeks and ran me down very rapidly. This was due to the long, hard ride in the intense sun and drinking the water of streams here which are not healthy.

On one short tramp I made out of Cuernavaca, I was just at the border of the town when a white-necked raven flew over. I shot it and it fell into the hedge by the roadside. While I was extricating it, a woman (a mestizo) came hurriedly out of the small house just inside the hedge and begged me to sell her the bird. I asked what she wished to do with it and she said she wished to eat its heart for a remedy. I told her I would give her the heart, so I cut the bird open and took out its heart and the woman, having secured a small cup with a little brandy, put the still warm heart in it and swallowed it. She said it was an excellent "remedio" for palpitation of the heart from which she suffered, and was profuse in her thanks. I left the raven in her care until my return and went on with my companion to some bat caves about three miles out of town where I secured 3 species of bats in a dry cave at the upper border of the canon wall.

In the bottom of this canon near this point are some high stone piers for a bridge ordered built by Santa Ana, but which was never completed owing to his fall from power.

From Cuernavaca I hired saddle animals and proceeded in a south-easterly direction about 12 or 14 miles to Yautepec. The route led across the grassy sloping plain from Cuernavaca a few miles passing various small Indian villages built mainly of wattles and mud or adobe brick.

The country is strewn with lava boulders from which walls are built.
about the fields. Midway in the course, we crossed a large lava bed which is several miles wide and proceeds from the volcanic cones at base of mountains about 6 or 8 miles to the north. The rough, broken surface of the lava stream would be quite impossible for animals but for a rudely made trail. Its surface is covered with a dense thicket of large cacti (Opuntias and Cereus) with acacias and various other desert plants. The crevices of the loose rocks retain moisture much better than the hard soil of the plain, hence the abundant growth of the vegetation that is commonly found in such places.

Midway in the lava bed I was startled for a moment to see 4 men with muskets under a tree by the trail, but a moment later saw they were "vecinos" or country guards from some neighboring village. The rough surface of lava beds are excellent places for robbers to catch a victim since it is impossible to go faster than a walk and in such places once frequented by robbers it is now common to find guards posted.

Leaving the lava bed we crossed a series of limestone hills that form a low north and south range here and are covered with palmettoes. On the east side of this range, we descended abruptly in the valley where Yautepec lies at an altitude of about 4,000 feet. This is a large village of a few thousand people, mainly Indians or Indian descent. The place is full of orange orchards and surrounded by sugar cane fields. It is hotter than Cuernavaca owing to its 1,000 feet less altitude. The oranges here are sweet and well-flavored but suffer from attacks of a fly which pierces the rind of the ripening orange and deposits from one to half a dozen or more eggs. The eggs hatch and the larvae feed on the pulp of the fruit causing it to decay and fall from the tree. The oranges of southern Puebla (Attixco, etc.) suffer from this same pest. The flies are so numerous in some orchards that the
entire crop is thus lost. I saw the flies at work. They deposit their eggs on the lower or shady side of the fruit, as it is becoming yellow. These wormy oranges are sold to Indian peddlers who take them to all of the towns of this region as well as to the cities of Puebla and Mexico, and sell them. The fly is one of the flat, triangular winged species about the dimensions of a common house-fly.

One of the orchard owners told me that he thought this pest was due to the custom of planting corn, alfalfa and other crops in the orchards.

The vegetation and birds about Yauteppec are more nearly of a tropical character than at Cuernavaca, but there is but little change in mammals. The fever I contracted at Cuernavaca became worse here until it began to run me down rather alarmingly and I finally decided to return to the City of Mexico to recuperate.

1888
City of Mexico
(Mexico)
January

Reached City of Mexico January 18, and for the next 11 days remained there. On the 30th had recovered sufficiently to go out to Ameca at NE corner of Valley of Mexico at base of Popocatapetl and Istaccihuatl where my assistant has been staying.

Ameca is the seat of a chapel situated on a curious hill rising about 400 feet from plain at border of town. This hill is covered with oaks, and madrones, with some cypress trees at its northern base.

February 8: Yesterday left Ameca for Yecapixtla, Morelos, and spent a large part of the day hunting horses to take me to Tetela del Volcan at south base of Popocatapetl. This was finally accomplished and on the 9th we proceeded to our destination.

Tetela del Volcan turns out to be a miserable little Indian town among the pines at between 7,000 and 8,000 feet elevation on the south slope of the Volcano. There was no house where we could find accommodations, so we were taken into the local court room and office of the
Alcalde where we spread out our effects and got to work. For the next four days we lived here, having our meals brought in by a woman from one of the houses of the vicinity. Had it not been for the official letter I carried, it would have been very difficult for us to have got along here owing to the indifference of the people. The only exception was the secretary of the local judge or alcalde.

He was a fairly intelligent fellow, but with education enough to read and write fairly well, seemed utterly ignorant of outside life. He asked various childlike questions about my country and among other things that he told me as being strange to him was the putting of manure on land. He could not understand what sense there was in buying fertilizers and putting on land as he had heard people did sometimes in the valleys. One of the villagers recalled the fact that all "Yenkos" (Yankees) live on raw meat and are very tall men (6 feet or more). To this I replied that I was a Yenki and was less than 6 feet and ate the same food as he did as he had seen. But to this he objected, saying that I could not be a Yenki for he knew that they were all very big men who live on raw meat for he had seen one once and he ate raw meat and was very big. To this his companions assented and evidently discomfited my claim to being a member of the raw meat eating nation. They decided that I was a Frenchman after due consultation, when I asked them what countryman I was if not a Yenki.

One end of the building where I stayed was divided off into a calaboose and a guard room. The vecinos were on guard here all the time. At 3 a.m. the new guard came in and relieved the guard of the day before and then at first sign of dawn sets of guards armed with muskets or carabines went out in 3 different directions along the roads and spent the day in patrolling and watching roads and paths through the forest, to the limits of the community line at border
of lands belonging to neighboring village.

The larger towns have their police regularly employed, but the small towns are forced to do voluntary guard duty. The community own arms and every able-bodied man among the villagers is on a list. The community is then divided into guard sections which are each given their regular day of duty and are required to be on hand as noted.

These "vecinos", as they are called, are met in all sorts of out-of-the-way places and undoubtedly do much to make robbery difficult. They are held in strict accountability for the good order of their districts by the higher authorities. These vecinos wear no uniform but the everyday costume of the laboring classes so that it is a little unpleasant to come upon them suddenly in out-of-the-way places. Robberies occur despite them at no great intervals, and my assistant had a narrow escape near this place. He left a trail and descended into a narrow, wooded canon on the mountainside one afternoon and was surprised to see 3 men follow him,—one with a lasso, one with a stout cudgel, and the other with a large knife in his hand. My assistant at once faced them and, levelling his gun at the foremost, told him to stop which he did very promptly and began to abuse my man with all the epithets he could command. To this the latter paid no attention, but quietly moved off leaving the discomfitted rascals in their tracks. It is a regular trick for these mountain Indians to pretend to wish to see what game a hunter has and the moment they get within reach they seize the hunter and rob and maltreat, or kill him.

While we were at this place, a pilgrimage of the Indians from Tlacala and Puebla began,—to a fiesta of some saint in southwestern Morelos.

Hundreds of them streamed by for two days; men, women, and children. The men and women nearly all carried a little roll of long wax candles.
to burn before the altar. At night the portico of the public building
where we lodged was crowded to its utmost capacity by a motley gathering
of pilgrims of all sexes and ages. The nights were sharp and almost
frosty yet they rolled down a rush mat and, covered with a thin
serape, seemed to sleep comfortably. At early dawn all were up and off.
When travelling even when carrying a heavy load, these people and, in
fact, most of the Indians of the country, have a short trot that they
seem to keep up indefinitely. They carry a back-load of garden truck
or fruit to market 20 to 40 or 50 miles in this way, sleeping wherever
night overtakes them, and I have seen them returning in a contented
frame of mind with the entire proceeds of their trip invested in little
rockets to be let off at the next feast day.

One night the crowd in front of our quarters united in singing a
hymn in praise of the saint they were to visit, and the effect was wild
and picturesque. The voices arose and fell in the rhythmic, chant-like
effect so often the character of Indian music. About 200 of these fan-
tatical people united in this song.

Sunday at this village was a day of general gathering from all the
vicinity. In the morning a mass was said in the church. Under the
trees in the small square were ranged a few market women selling fruits,
sweetmeats, nuts, and vegetables. The pulque shops and cantinas were
thronged and the men stood about in groups or squatted in the shade.
The solitary amusement appeared to be to get drunk. In the evening a
fantastical firework exhibit was given in the churchyard. The most
amusing part of this show was toward the end when a large framework
covered with wheels, squibs and serpents, was fastened on the head and
shoulders of an active young fellow who, when the thing was lighted,
began a wild career among the crowds of people leaping about and rush-
ing head foremost into the midst of the thickest crowds causing shrieks
from the women and children and roars of laughter from the crowd in general. In the midst of the blackness of the night, intensified by the gloom of the forest background, this figure of erotic fiery sparks was diabolical enough.

The most interesting result of this trip was the finding of *Ortalis poliocephala* on the slope of the mountain above Tetela.

On February 13 I engaged horses and made a short cut back to Ameca where I continued for the next 3 days, including a trip to the City of Mexico, preparing for a trip up the Volcano of Popocatepetl. On the evening of the 16th, I had a hemorrhage of the lungs, the sequel to the illness I had in Morelos. From the 17th to 21st, I kept quiet at Ameca and had no return of hemorrhages.

On February 22nd, left Ameca with pack outfit and ascended to about 11,000 feet on north slope of Popocatepetl where I camped under a rock shelter on side of a steep canon amid the pines and firs.

For rest of this trip and ascent of Volcano Popocatepetl see notes following p. of this copy.

Remained at Ameca recuperating from trip to Istaccihuatl, and by cold compresses managed to allay the inflammation from our snowblind eyes.

March 6th to 8th was in the City of Mexico attending to various items of business.

March 9th: Went to Tula, the ancient capital of Hidalgo. It is situated about 45 miles north of City of Mexico just north of the low ridge of lava that forms the north rim of the Valley of Mexico. The town is a sleepy place with some curious old houses. It is in the
upper part of the Lower Sonoran Zone at about 6,400 feet. A few large cypresses grow along the small stream here, but the surrounding low hills are covered with cacti, acacias, pepper trees, and other desert species. Found little of interest.

The low bluff facing the town just east of the river here is crowned by the ruins of old mud and stone walled houses and buildings of the ancient town of the Indians where the legend says the first use of pulque was discovered and introduced,—a day of poor promise for the people.

March 13th: 8,200 feet. Today proceeded on to Pachuca the present capital of Hidalgo. This is the busiest town I have seen in the country. In the bare porphyritic hills back of the town are numerous rich silver mines which have yielded hundreds of millions of dollars and still produce a great amount of silver. The hillslopes are dotted with the high-walled, castle-like mining buildings over the shafts and in the town are several very extensive yards for treating the ore by the patio process. From the hillside one can look down into these works and see the horses being driven slowly around and around in the fine mud to which the ore is reduced. All white horses are stained a bright green up to the flanks from the sulphate of copper used in the process, and present an absurd spectacle. Long pack trains of mules loaded with ore in sacks for the works or returning to the mines join with heavy wagons drawn by long trains of mules or horses 4 abreast and hundreds of women and men hurrying along on one errand or another to make a sufficiently busy spectacle to be very interesting after passing through so many deadly sleepy towns.

After a few days about this place, I made a trip by the stage up to the neighboring mining town of Real del Monte,—3 miles to the east.
in the mountains. This is the centre of another but smaller group of
mines and is very interesting from the remarkably picturesque character
of its streets and houses. Their sharp sloping roofs with far over-
hanging eaves, projecting balconies, and most wonderfully erratic
streets zig-zagging up and down the steep slopes were an interesting
spectacle.

Here, as at Pachuca, the people have more life and purpose in their
movements than is usual in Mexican towns. I was fortunate in visiting
this town on a day when I had the opportunity to witness a spectacle
that is rather characteristic of the country.

When I reached the place in the midst of a fog, at 10 a.m., I noticed
a display of small banners along the main street and in front of
the local customs and tax offices. I saw them setting up a row of small
green bushes along the border of the sidewalk and several ropes of
colored papers were hung across the street. Turning to one of the offi-
cials who was overseeing the progress of this ornamentation, I inquired
what saint day they were celebrating. "Oh, no" he replied, "it is not a
saint day, but the Governor passes through here today on his way to
Pachuca." Further inquiry revealed the fact that the Governor had been
out for a few days at a hacienda he owns a few miles beyond R. del Monte
and to celebrate his return this decoration of the town enroute was pre-
pared. Wishing to see this joyful event, I stood about the entrance to
the official building for an hour longer. Gradually a little crowd
gathered and I recognized among them the Secretary of State and ten or
a dozen of the principal officials from Pachuca. Presently someone
announced that the Governor was coming up a road to the left and all
walked down this way headed by a band of music. They had been gone some
five minutes in the drizzling rain and muddy road when someone rushed up
breathlessly to say that the Governor was coming by another road.- and
away he went to call back the officials. After a time they returned and started down another road and soon the welcome sound of numerous salves of guns and pistols at the border of the town announced his approach. The music struck up and then the procession came in view. On the step of the Governor's carriage hung one enterprising courtier talking volubly to an invisible occupant while the carriage wheel deliberately transferred a broad stripe of mud from the street to the coat of the hangeron's best black suit of clothes.

On the step of the Governor's family carriage hung another person eager to express his joy at the general return.

At the head of the procession now appeared the school children waving paper banners and marshalled by the teachers, and led off by the music. Behind tramped the now warm but undiscouraged band of high state officials whose clothing was beginning to show the effects of their tramp through the mud. Up the steep streets and round about town moved the procession and, at its return to the official building, the footworn officials had a little rest and took carriages for the three miles back to Pachuca where I am happy to say they arrived safely under a heavy escort of cavalry that same afternoon.

March 21st: Today I left Pachuca and, riding up over the summit of the mountains to the north of town, descended the remarkably steep north slope to the town which lies at nearly the same altitude as Pachuca and about 10 miles north on the opposite slope of the mountains. A fine forest of firs, pines, and oaks occupy the north slope from summit to the town. A little below this the open country sweeps down several thousand feet to the bottom of a deep barranca along which flows a small river. A broken and rolling plain extends far away to the N, NW, and NE from these mountains of Pachuca which are an isolated group.
Above El Chico the crests of the hills are ornamented by some strange huge columns and spurs of porphyry that rise in boldly jutting spurs 100 to 250 feet sheer above the surrounding land and form a most remarkable series of natural monuments that remind me of the sandstone spurs of the Garden of the Gods in Colorado. The top of this curious mountain group is a rolling and broken tableland at about 9500 feet elevation and covered with a varied growth of pines, firs, and low juniper thickets with a few small park-like grassy openings.

Nothing of special interest was taken here and on the 26th of March we returned to Pachuca.

While in El Chico, which is a small mining town, I saw several small pack trains loaded with silver bullion start out for Pachuca. They were all attended by several heavily armed guards,—a proceeding quite necessary from the fact that this region has been one of the most notorious robber roosts of Mexico; but, the efforts of the recent governors have been exerted with the aid of the "ley fuga" so successfully that the roads are becoming pretty safe.

While working about El Chico I had a chance to note the manner in which the wood-cutting is governed here. The forest is on the community land and a license is given certain persons who cut the wood and deliver it at the mining works. A part of the returns as tax goes into the municipal treasury,—the cutters getting a stipulated price for the delivered wood. The trees which are to be cut are designated by monteros or overseers of the forest and no small trees are allowed cut. I saw some of the wives and children of the poorer woodcutters packing single heavy oak sticks for 2 miles down the mountain to the woodpile at the mining works in town. The sticks were carried in a loop of cord with a strap about the forehead. By such work as this, the family combined
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El Chico
(Hidalgo)

Irolo
(Hidalgo)

Puebla

May make 50 cents a day. The workmen in the mines make from 50 cents to $1.00 a day.

March 29: I came on to this place which is on the western border of the Plain of Anapam, the centre of a great pulque making district. It is just east of Valley of Mexico and in the same general climatic zone. I found here a species of Perodipus common besides other common tableland birds and mammals.

April 4th: I sent my assistant on to Apixaco in Tlaxcala while I went on to the City of Puebla to get a circular letter from the Governor or to the local authorities. Found the Governor formally polite and was turned by him over to the Secretary of State, who talks English, and who was directed to prepare me the letter I desired and furnish me such other assistance in the way of information, etc., as he could.

Learning from the Secretary that the State College possesses a small museum I had him give me a letter to the Director of the College and paid it a visit.

It contains various badly labelled or unmarked Mexican and North American birds. A few local mammals and a number of expensive imported mammals such as a Bengal tiger and other species bearing the tag of a Paris taxidermist. In a country full of interesting birds and mammals the local authorities in Mexico seem possessed with the idea that they must spend thousands of dollars on a lot of foreign stuff when a small part of such expense would make a creditable showing. To a great extent this is due to lack of knowledge but more cannot be expected where there are scarcely any naturalists and few of the naturalists who are in the country have knowledge enough to form or label a collection in the proper manner. They follow slavishly after the work
of foreign naturalists who explore their country and publish the results and complain of their inability to do field work because it is so expensive and yet botanists and zoologists come to their very doors and secure new things. They lack energy and the ability to go ahead on their own lines. They like to dabble in this, that, and the other branch of science,- read a lot of foreign works and re-hash and publish it in local periodicals. Or carry on voluminous correspondence with others engaged in the same style of work in other cities and imagine that they are investigators.

On April 6th I went up to Apixaco which I found to be situated in a cold belt extending to the northeast from Istac, across Puebla and Tlax. into Hidalgo. All of the surrounding hills even down almost on a level with the town are covered with a growth of small pines.

April 7th, Esperanza Puebla. Went on to this place today where I obtained my mail and on the 8th (April) went to the small town of San Andres Chalchicomula a few miles to the northwest, lying near the west base of the peak of Orizaba.

The low hills all about Esperanza were covered with many wild Agaves of large size and their tall straight spikes stood out in relief all about the horizon.

April 9th to 13th. I remained at Chalchicomula working up the locality. In all the vicinity and over the surrounding plains covered with volcanic sand are many Dip. phillipssii. The base of the Volcano here and the low hills just east of Esperanza form the eastern limits of the tableland here.

Chalchicomula is a small sleepy agricultural town of mestizos and Indians. Barley, wheat, chickpeas, corn, and a few small vegetables
and pulque are grown here.

The morning (April 18th) was occupied in arranging with the men buying ropes, rush mats, and provisions for the trip up the peak. At 8 a.m., we were ready to go but the man charged to have horses on hand yesterday failed to show up and I had the pleasure of exercising some of the necessary virtue of patience. About noon it became evident that it would be impossible to get horses to start today so I had my outfit carried back into the room and sent the men I had employed back home instructed to be on hand early tomorrow morning.

Although I started in by seeing the Jefe Politico yesterday morning and getting his word that he would send and get the outfit I do not seem to be much advanced toward it. The day is the finest one since I have been here,—clear, calm and bright and the snow peak stands up brilliantly white in the sunshine.

April 19. Mt. Orizaba. Last evening I went to the Jefe Politico and told him of my failure to secure horses and he promised to have a couple of saddle animals on hand for me at 7:30 this morning. My men were on hand at 6 a.m. and I started the camp outfit off on the pack animals. At the time agreed upon the two saddle animals promised by the Jefe were on hand. They were about the sorriest beasts I have used in the country but we were not in a position to object so mounted and set off with two of our Indian companions keeping us company on foot. We found it necessary to employ 4 men,—two guides to make the ascent with us, one man to look after the horses and another to keep charge of camp and our outfit during our absence. All were Indians who live in a small Pueblo a few miles out of San Andres at base of foothills. The two guides were men who have worked gathering sulphur on the peak.

We were soon outside of the town and passed for miles along a winding road that led through sandy fields covered with starting wheat.
Poor thatched huts of the Indian peasants were scattered along in irregular conjunction to form the Barrio de San Francisco, about a league from San Andres.

Here and there the white groups of Hacienda buildings were to be seen and patches and points of pine timber not yet cut away. As we left San Andres we ascended a sharp slope, the bluff-like drop from a higher bench. In this were to be seen sections of deposits of fine slaty black volcanic sand that had been thrown out by the volcano. Other layers of a paler grayish yellow sand of coarser material alternated and a deposit of finely broken white pumice stone, bearing crystals of iron pyrites is one of these beds. This layer of white pumice is almost wholly free from foreign matter and varies from 2 to 7 feet in thickness near Chalchicomula. Lying above this pumice, but at what distance I failed to determine, is a layer of fine bluish black volcanic sand which is only from 1 to 2 feet thick near Chalchicomula, but near the base of the mountain it is from 10 to 20 feet thick. This layer lies near the surface of the ground and was deposited after the contour of the country became practically the same as it has today. It follows the slopes of the hills down to the washes and deep drainageways both on the border of the plain and all up the side of the mountain to about 10,000 feet; beyond this I saw no exposures where it could be traced, probably due to glacial obliteration above that point.

Above this black layer is the surface soil varying from a foot or two up to 20 feet or more according to the situation. This surface soil is a fine yellowish sand at the top with fine intermixed gravel of pumice and scoriae below. This is apparently the result of denudation and disintegration of the higher peaks.

A few miles out of Chalchicomula we crossed a small cemented aqueduct carrying the brilliantly clear water of a large spring near the
foot of the mountain down to Chalchicomula. In the trees and bushes (oaks and alders) along the roadside here were great numbers of birds evidently drawn here by the water in the open flume. A drink from the sparkling stream and we went on, winding up among the starting wheat fields and soon reached the border of the pine timbers at about 9000 ft. Up to this point the Geomys and Dipodomys of the plains follow the cultivator but stop abruptly with the border of the unbroken forest.

At first, after the end of the fields, the road led up a broad gentle slope covered with slender pines forming an open forest. The ground was covered with fallen needles, but of grass and other small vegetables there was almost none. Most of the lower branches of the pines were dead and the almost total absence of birds or other signs of animal life gave the wood a sad loneliness. Here and there a Junco flitted from the ground up into a tree or one sang its short unmusical ditty from a branch overhead.

Having passed the gradual slope, we came to the much more abrupt rise of the main base. There, dark firs and alders with curiously swollen, thick bark. Among the firs a plentiful growth of saccaton grass is found and here were scattered half naked Indians digging it up to obtain its stiff roots which are sold to make short brushes.

Here also we found various potato fields in cleared places among the firs and alders. The latter trees often attain 3 ft. in diameter, and 50 or 60 feet in height.

One of my guides was joined here by a couple of his sons who led us to a small spring in a fir shaded canon where a couple of tree trunks had been dug out for troughs for the accommodation of the cattle. By this a fire was quickly built and we had a lunch while the pigmy nut-hatches hammered away overhead on the dead branches of the firs and made a noise quite out of proportion to their bulk.
Moving on up the trail that was very steep along here, we left the firs at about 10,500 feet and entered a belt of large pines of two species both with heavy rugose, almost carinated bark. Still up over the slopes until, at about 11,000 feet, we entered the lower end of a draw which developed into the lower end of an ancient glacier bed as we advanced. There was the terminal moraine carrying large boulders on its back and the sweep of the hills on either side showing where the ice had curved its way down from the lofty heights of the volcano that towered up and was lost in the clouds to our left. As we continued the trees grew scattering and dwarfed and those in exposed places often leaned to the east as if to escape the fierce winds that must sweep across these high slopes. Here the hills raise smooth, grass covered slopes above the timber, and the broad bluff-like end of a great lava stream hangs above as we wind around its base. The sight of a marsh hawk soaring along the juniper-clad face of this lava slope above timber line was rather surprising.

A few small lizards scurrying over the warm faces of the lava blocks near the trail with scattered tracks of mice, rabbits, and a coyote were the only signs of life. The grass growing in scattered bunches with bare, sandy interspaces was the main vegetation—only in occasional places were to be seen flowers of one or two species of

We passed the end of the lava bed and going on for some three miles beyond descended into the head of a small pine grown canon and camped at a rock shelter formerly used by the Indians who were employed to gather sulphur at the border of the crater. The small spring of water which comes out here was the source of attraction. The altitude was about 13,200 feet but being on the SE side of the mountain was a few hundred feet below timber line. Our animals were turned down into the canon to graze and we prepared camp. Some Arctic blue birds, robins,
juncos, nuthatches and flickers were seen and heard here. Among the rocks I caught a Neotoma here and a Sorex, Arvicola, Oecolomys, and Sitomys were common in the tall grass on sides of the canon. As soon as night set in the clouds that had hung over the mountain nearly all day began to break away, but a high wind rushed through the sturdy pines creasing the canon walls and filled me with considerable anxiety for tomorrow. As the sky cleared the stars twinkled and flickered more than I had seen them before at this altitude and I feared a high wind tomorrow. My men assured me that it was an impossibility to climb the mountain if a heavy wind should be blowing as it would sweep one off the steep slope. Then they began discussing among themselves, for my benefit, the various animals claimed to live on the summit. All agreed as did my guides at Popocatapetl that a kind of pure white mouse lives about the summit of crater. Then a white snake was located there and, finally one of the men began to tell of a white skunk but this was too much and all of them began to laugh and ridicule him.

I soon had my bed down under the shelter of the smoke-blackened overhanging rocks. The men clustered up about the fire on the saddle blankets and their chatter soon ceased. The fire flickered low and across the canon I could see the dark swaying arms of the pines as they sighed and writhed under the lashing of the wind; the stars flickered and glittered mockingly, and then I forgot everything in sleep.

April 20th: Ascent of Orizaba. At 2 a.m. I stirred the men out and so slowly did they move that it was four before we finally got off. The wind was gone and the stars seemed to shine from a black void as we picked our cautious way out from the bright firelight into the inky depths of the canon. Finally we were out of it and leaving the trees behind wound silently up across the steady slope of sand, covered with scattered grass bunches, that leads to the foot of the volcano or final rise of the peak.
Before us was the loom of a great dark mass blotting out the stars far toward the zenith. As we reached the open slope a chill breeze moved the air enough to be unpleasant. We plodded slowly along and our horses by their frequent stops and hard breathing showed that we were getting well up. Finally a pale gray tinge in the east over the shoulder of a rugged spur of lava showed that the sun was nearing the horizon.

Then the figures of our men became more distinct—the pale yellow bunches of grass could be distinguished about us and the snowy sides of the volcano to come out of their enshrouding darkness. The gray east threw its cold, pale, mysterious light over the landscape until it had the same dead, ghastly effect that one gets on an Arctic landscape at summer midnight when the sky has lost its colors. The high ridge of lava with its ragged outline between us and the dawn now seemed to almost overhang us as we toiled along its base. Ahead gleamed out some small snow banks the lower ones of their kind. As we reached these the stars had been swallowed up by the gray dawn so that only a few large ones low down in the west could be seen. Looking back from here, it was evident that the valley-like basin sweeping down from the foot of the volcano where we stood, with the scattered boulders, often of great size, on the middle of its otherwise unbroken surface, was once a glacier bed leading down and ending somewhere near our camping place.

Passing up the old trail of the sulphur gatherers and snow gatherers we rounded the upper end of the high comb-like lava ridge and dismounted by a huge lava boulder deposited here in the gap by the dying glaciers. Other similar boulders were all about but most of them shivered into innumerable fragments, all with conchoidal fracture, by the weather.

The dead gray of the dawn began to be vivified by a saffron hue now and as we began to move up the sandy slope leading to the rugged line of dark lava up which our course lay. Soon a warm glow of color
tipped the snowy peak and the dark summit of Black Mountain to the south warmed up to a rich brown. The dead world seemed to breathe again and the faint note of a Junco was heard in a cheerful matin even up to the 16,000 feet where we were. Near 15,000 feet the grass ceased entirely but several mosses and lichens held their own even up to 16,500 feet where they were found sparingly scattered in sheltering crevices in the lava.

At 15,500 feet an Audubon's Warbler was seen flitting from rock to rock, - the highest point at which I saw any bird on this peak. At 15,400 feet, some hundreds of feet above the last blade of grass or flowering plant, I was surprised and interested to find the tracks of quite a number of Sitoca leucopus (?) in the fine, absolutely bare volcanic sand lying about huge boulders, and from these leading away to other boulders on all sides. What these little beasts could be doing up here was beyond my ability to surmise.

This is the highest point reached by any mammal in Mexico so far as my observations go on the three highest peaks. In its wide-spread distribution over North America this is one of the most remarkable little mammals of our fauna. It is very similar to the pretty little white-footed field mouse of all the eastern States. After we began climbing among the long line of loose rocks and spur-like points of the lava ridge leading up to the summit the way became very steep but not at all dangerous.

Far up above us stood out the knob-like, gray mass of rock just below the summit and known to the sulphur gatherers as the outlook, - Mirador. As usual, the leather-lunged Indians were in advance and evidently regarded with no small contempt the lack of ability to keep up with them. For every fifteen or twenty yards of advance I found it necessary to stop and regain my breath, - time not lost however as it
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Mount Orizaba

gave me the opportunity to look abroad over the panorama which the rising sun was changing in appearance at every moment. I noted on this mountain as on those near the City of Mexico that the vegetation ends without the appearance of any of those Arctic forms we find above timberline in the U.S. No red snow above this. The trees become shorter and stouter but merely struggle to an end with less of that dwarfing and none of the matted thickets of low bushes we find at timberline in most of our woods. No aspens. The low dense junipers at end of the lava bed at timberline on Orizaba and also on Int. at timberline were the nearest approach.

As day dawned I noted that the lower hills about us seemed obscured in fog or clouds and that it appeared to extend out over the valleys and blot them out entirely. With my greater elevation and the aid of the sun I was now able to see that what I had mistaken for fog or cloud was nothing but the great dust stratum overlying the earth.

At 8 o'clock only 2 or 3 cumulus clouds were to be seen far away toward the horizon. At 9 o'clock I had reached an elevation a little above 16,000 feet and found, what I had noted both on Popocatepetl and Int., that the heavy dust and smoke bearing stratum of the lower air was abruptly limited at about 16,000 feet. Above spread a sky of the most intense turquoise blue I have ever seen, except on the summits of the other two peaks. This brilliant sky extended down unchanged in brilliancy almost to the very horizon of the dust layer. Far away to the west, gleaming white in the sun, I could see the crests of Popocatepetl and Int. rising into the clear air above the layer of dust, but with all their bases below 16,000 feet concealed as effectually as though they were snowy islands rising in the midst of a dun brown sea.

As on my former climbs, this strange limitation of the earth's dusty air at 16,000 feet formed an upper horizon unbroken except by the white,
rounded backs of cumuli in the distance. Looking down through this atmosphere the faint, uncertain details of the larger features of the landscape could be made out exactly as one might see the bottom of a pond through slightly murky waters.

Below this limit of 16,000 feet is the place of all earthly life in this region, and above it the realm of stars and sun and purity. Like snowy islands of an Arctic sea rise the peaks of the 3 mountains in a little group. No companion peaks pierce this sea of air until one journeys far away to the Andes of South America or high up along our northwest coast where a single fellow is found in St. Elias.

Here and there over the surface of this dusty sea I began to see newly forming cumulus clouds, their upper borders resting along the surface of the sea like the foam of breakers on a shoal. At 10 a.m. the upward currents of warm air from the plains began to climb along the mountain sides and I was disappointed to see ragged gray clouds begin to form here and there along the mountain and drive along its sides below us as though by their own volition, for the breeze accompanying them had not yet come to effect the air at our altitude.

These clouds now rapidly multiplied and out on the surface of the dusty sea was forming a host of beautiful cumuli. Their upper surfaces floating above the smoke rounded and billowy and snowy white but the sunken parts softened by the smoke through warm grays to the almost blue black under surfaces. Thousands of feet overhead now began to form a lace-like filmy gauze of cirrus that could not have been less than 25,000 feet in altitude.

When we were within a few hundred feet of the top, we left the lines of bare lava along which we had been picking our way and worked over the sun-eaten surface of the thin layer of snow that encircles the crest. Then the misty cloud fragments that had been chasing one another about
the base of the peak came swirling up about the summit and the wind
blew fiercely. A severe headache that had been with me all the morning
now began to become especially painful and with it a nausea and feeling
of general shakiness that made the last part of the ascent very diffi-
cult. Several times I was forced to stop on the steep snowy slope and
lean heavily on my alpenstock to avoid a dangerous fall due to sheer
weakness or loss of control of my muscles. This would pass off and I
would work on a few yards further.

As I had no trouble of this kind on either of the other peaks, I
attributed it to the fact that I had been suffering from a severe cold
for a week previous to this ascent and, in consequence, was in a poor
physical condition to meet the exertion.

The men were awaiting me sheltered within the lip of the crater re-
clining on a narrow slope of sand and fine scoriae mixed with small
fragments of sulphur which descended a few feet below them and then
dropped into the abyss of the crater. The approach to the crater is
abrupt so that one is on its verge without warning and the effect is
rather startling.

The crater is a huge chasm several times greater than that on Popo-
catapetl, and much more effective for that reason. It must be 1800 ft.
deep from the side on which we approached, the southwest, - but is lower
on the opposite side. It is about 600x500 yards in diameter - its long-
est dimension in an easterly and westerly direction, and is irregular
in outline, being broken by small bays. The contour of its upper edge
is also irregular, the highest point on the west side being several
hundred feet above the eastern wall of the crater. The drop is perpend-
icular from the top down to the talus lying at the bottom. While I was
at the summit there was a constant dropping of fragments from the high
walls of the crater, - these making a faint rattling sound as they struck
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Mount Orizaba
among their fellows. At one point of the wall it is not very far down
to the talus and my men said that when they were sulphur-gathering here
some years ago one of the men was let down by ropes and gathered much
fine sulphur for them. While they returned to the base of the mountain
with it he remained to get more, but a fierce gale sprang up and blew
so hard for three days that no one dared go up the mountain. When the
gale ended they hurried up and to the border of the crater, calling the
name of the man below. They were surprised to hear him reply in a weak
voice and hastening to let down the ropes they drew him up. He was
very pale and weak but soon recovered, but sulphur gathering at the
bottom was not carried on after that.

The walls of the crater appear to be built up almost wholly of
scoriae and ashes and in this is mixed - where I saw it - with a con-
siderable percent of sulphur in small amorphous masses. The sulphur
gatherers mined this mixture at a point just outside and below the
border of the crater on the south side and carried it down to the cave
where I camped and there refined it in a crude way and took the product
down to San Andres where they sold it for $12.00 a hundred. In this
way they made about 75¢ a day. The main summit is at the SW edge of
the crater and just above where we reached its border. It rises in a
slight knoll just back from the rim of the crater and is surmounted
by a large wooden cross which some fanatic has brought up here on his
back and planted firmly.

While I lay idly resting on the ashes at the mouth of the crater,
the wind came tearing and rushing about over the summit now swooping
down cloud-laden until the whole crater was a boiling mass of tortured
mist and then swirling up and carrying the clouds away into space.

It was a fierce wild scene and up from the depths came the constant
rattle of dropping stones and in my ears the mingled sound of my heavily
laboring heart that seemed to refuse to rest with the remainder of my
At intervals the clouds would break away and the grateful warmth of the sun come out but only to be hidden a few moments later by the demon of unrestful wind. The clouds sweeping over the summit had a strange, dry, dusty odor as though they were made up of something beside vapor. I noticed this odor each time that the clouds enveloped us, after a temporary clear spell, all the time I was on the summit. The clouds were pale gray in color and no sign of mist or other precipitation came from them.

Below, on every hand, the clouds had multiplied until the earth was hidden and to the east lay a dead gray and white sea in billowy vastness over the land and sea. My men told me that on clear days many towns may be seen down in the hot country of Vera Cruz and far away a streak of silvery light tells of the Gulf. Today they do not exist, for we are on a desert island in the realms of the high, thin air.

Soon after noon we began the descent and, after picking our cautious way down over the snow to the loose slope of sand and small stones, had easy travelling. When there is a layer of soft fresh snow on this side of the mountain the men make what they call runs (corridas) from summit to base. They take a strong rush mat and drawing up the front and lashing it about their shoulders they get astride of a good iron-pointed alpenstock thrust through the mat into the snow and away they go for a glissade of 3000 feet to the bottom.

Our descent through the loose ashes (or sand) and small stones was by giant strides that often covered 12 or 15 feet at a step owing to the sliding of the loose material. Several times this surface material got to travelling with me so rapidly and to the amount of several hundred pounds, that I had to sit down in the midst of my miniature avalanche and dig my alpenstock into the surface until we came to a standstill.
Soon after noon the clouds that had hidden the summit for some hours broke away and mainly dispersed leaving visible a vast array of gigantic cumuli riding on the airy sea above the plains. It was now the heated part of the day on the plains of Puebla at 7,000 to 8,000 feet as well as on the eastern, hot, coast lowlands. This was shown by the fact that the cumuli that all during the morning hours had formed and spread out along the upper surface of the dust stratum at 16,000 feet and seemed limited by some mysterious power to that altitude, now gained power from the uprising columns of air and, bursting upward, arose in gigantic columnar masses of white rounded clouds rapidly growing until they far over-topped the summit of the peak itself. It was fascinating to watch the creation of these enormous aerial masses one after the other until, upon all sides, they towered up in an array of exquisitely and grandly beautiful forms. They did not form united masses but were so scattered that large interspaces of cloudless air from 16,000 feet up to their summits were left through which could be seen in beautiful contrast the clear brilliant color of the sky beyond.

Then I descended once more into the atmosphere of the earth and the beauties of that upper world were again enwrapped and colored by the shroud of dust hanging over it all.

Extending out to the south from the base of cone is a bed of lava with its border all around higher than its centre which is a basin-like depression as seen from the side of the peak. The border of this lava bed rises very abruptly, like a steep broken-down wall all around. Where we passed around its lower end at the foot of Black Mountain it is about 200 feet high. Its shape is about as follows:

Took photograph of this from side of peak.

The eastern side of this lava bed had evidently been worn down by a glacier that occupied a basin just along its eastern border. Another
Mount Orizaba

glacier flowed down its western border and a third flowed to the SE separated from the first mentioned one by a high, sharp and very rugged lava ridge (also photographed). It is down into the narrow basin of this last glacier that the long, bare slope of sand and stones leads along which we made our descent.

The afternoon had become quite pleasant by the time I reached the base of the peak and the clouds hanging about the summit were gradually becoming less dense.

We remained another night in our cave-shelter and on the morning of the 21st of April descended to about 11,000 feet to a potato ranch cleared on a north slope among the firs and alders.

There, in the hut of an Indian family, we spent six days working the birds and mammals. The Indians living here were a simple, dirty, good-natured lot who, although living in squalor and what would be wretchedness to one born to another fate, were apparently happy and contented.

Their cabin fronted a broad view across the pine forest out upon the tablelands of Puebla Maluche looming up in Tlaxcala and beyond, on clear days, Popocatepetl and Izt. A low hut of roughly split slabs of pine. A low, double-pitched roof of shakes held in place by blocks of wood on a framework of poles lashed together with maguey cord. The walls are of slabs set on end with lower end in a shallow trench filled with earth and their upper ends resting against the stringer. Dirt floor, fire in middle and no outlet for smoke except the wide cracks in the walls. Roof 6 to 8 feet high and shiny black from the smoke of the pine wood. A rude ax, hoe, and mattock and machete made up the tools of the man.

A small gourd, two clay saucers, 2 small clay bowls, 6 small clay jugs and pots, the largest holding about 2 quarts made up the culinary
outfit. Three or four small rush baskets formed store-house. A rude slab bench on one side served as general receptacle of food, etc., etc., and a single rough stool made up the furniture. On the bare ground upon a fragment of rush mat and less than a pound of dry grass slept the man, wife, and boy of 6 or 7, covered only by the cotton clothes they wear at day and a serape. Water is at a spring about 500 yards away and is brought up 2 or 3 quarts at a time as is absolutely necessary. Potatoes with a very few tortillas make up their food, with an occasional onion or dish of red pepper.

Looking back across the slopes of fir-clad hills one's eye was drawn to the magnificent snowy peak of the "Shining Star". During our stay at this cabin the 2nd day after our ascent came a fierce storm of hail and rain with us and on the peak down to timberline a heavy cover of snow. Before we left, a second storm occurred of similar character accompanied by muttering thunder and a few lightning flashes.

Game of all kinds except mice and birds was scarce. A few squirrels and two spo's, Lepus and the common deer of the southern end of the plateau, lynxes, and coyotes were the larger animals. Broad-tailed and white-eared hummers, flickers, robins, Mex. Bl, birds, white-bellied nuthatches, creepers, Pine Siskins, Mexican Crossbills, Mexican Whippoorwills, Pipilos, Chipping sparrows, ravens, and juncos made up a fauna quite similar to what one might find in the mountains of the western United States.

Cloud Notes: The round-backed cumuli over the plains were but a handful at 7 a.m., but grew and spread horizontally until much of the country was covered by them at 10 to 11 a.m. During all this time they kept along the level of 16,000 feet stratum. From 11 to 12, I was almost startled to see that they had suddenly shot up huge columns
Mount Orizaba
2,000, 3,000 or 5,000 feet high above the 16,000 feet level exactly like the column of steam ascending from the smoke-stack of a standing locomotive on a cold calm morning. The same rounded form and slightly larger top suggested a similar force from below.

It is at the time that these cloud columns form that the whirlwinds carrying high dust columns begin their fantastic marches across the sandy plain below and that the two are result of one and the same cause is certain.

The day that I ascended Popocatapetl and Orizaba a southwest wind was blowing. On Izt. a southeast wind blew and that day the dust columns and cloud columns were not observed. The other two days they were seen as noted.

On April 28th I returned to Chalchicomula and remained there packing and making ready until May 2nd.

On this latter date I left and proceeded by the mule-line R.R. from Esperanza to Tehuacan, Puebla. It is a distance of 30 miles nearly south and mainly downhill. The car was divided into compartments into which a lot of us were crowded and then away we went, the mules at a gallop. Finally the track spread and we were derailed; thereupon everyone had to get off and by lifting and pushing managed to get the machine back on the track again.

About 10 miles south of Esperanza we entered a canon between the limestone hills that we had skirted to the west thus far and the warmer climate of the descent was quickly shown by the appearance of large numbers of palmettoes with a species of tall slender-stemmed yucca that resembled the palm very closely at a distance. A little further down the canon and many remarkable barrel-shaped cacti began to appear in large scattered groups over the hillsides. These cacti are ribbed
Tehuacan (Puebla)  longitudinal and the trunks are 2 to 4 feet in diameter and 3 to 5 feet long and many bent and contorted into a variety of grotesque angles. This plant is sent to Orizaba and Cordoba where the fleshy pith is boiled in sugar and made into a sweetmeat that is sold all over the country. With this cactus appeared many large Opuntias and Cereus which, with the yuccas, agaves, palmettos, acacias, and other plants made a great luxuriance of thorny vegetation. This character of low rolling limestone mountains covered with this vegetation continued until just before we reached Tehuacan when the road entered a broad valley which descends at a regular slope thence to the south. This valley is a nearly level plain in a cross-section and lies between the limestone hills about 4 or 5 miles apart here. The soil is a scanty covering over a limestone basis.

In the hills to the east are some lava deposits showing that the volcanic action reached among these hills.

Wheat is the main crop on the plain here which has an altitude of about 5400 feet.

The plaza of this place (Tehuacan) is shaded by fine ash trees, as are some of the streets. In these a host of grackles were nesting and from the first break of day until dark their odd notes and awkward forms were the most conspicuous sight in the streets and gave them a liveliness that they otherwise lacked. I amused myself watching their antics about the public square. They quarrelled among the treetops or stalked about on the ground with watchful boldness.

Was disappointed to find this rather a poor locality.

Huamantla (Tlaxcala)  On the 9th of May I proceeded to Huamantla, Tlaxcala, close to the north slope of the old volcano of Malinche. Here I remained until the 17th. During this time we worked the vicinity of the town and found the same
Huamantla is composed of the usual admixture of Indians, Mestizos and a few Spaniards and their descendants. In the middle of the town is a horse-tank with a notice painted on the wall over it forbidding all persons from bathing therein as being "against public health and morality".

Then I went up on the mountain with my assistant one day but a dense fog covered everything so that it was impossible to do anything. I left my assistant at an Indian ranch at the foot of the mountain to spend two or three nights trapping while I returned to the town to do some writing. It was arranged that he should return to town on the third day. On that day I had arranged for a horse and intended going out for another trip to the mountain but the owner of the horse failed to turn up.

During the day the Jefe Politico sent for me to come to his office and said he would like to know my business in the town as he had to keep posted on the movements of strangers, etc., etc. My letters very soon satisfied him on that point and I left him after a few minutes talk.

Night came and my assistant did not turn up and I made arrangements for a horse and mounted servant to go out and look him up early the next morning. Just before I was ready to start in the morning (of the 16th) my assistant turned up looking badly used up and said that the previous morning as he was about ready to come in town a dozen armed Indians rode up and asked the Indian ranchman if the foreigner was there.

The old man at once replied no that he had gone hunting. The men said they had orders from the Jefe to arrest him but when the ranchman asked if they had a written order they said, "No." My man was inside the house and quickly prepared to defend himself. As soon as the men rode off to look for him on the mountain the ranchero told him that they were bad men and intended to do him mischief if they found him. Directly they
came back and said they had seen his fresh tracks coming down the hill but the ranchero again put them off by saying that those were tracks of the evening before. When the men went away and set guards along the trails near by the two sons of the ranchero went into the bushes behind the corral and dug a pit about 4 feet deep in which my assistant concealed himself covered with brush all day with no mishap beyond a pig falling in on him.

At night he was hidden in a neighboring house and at 2 a.m. he and one of the friendly Indians as guide started across the broken country for town. I looked up the Jefe Politico as soon as possible and told him of the affair and he sent the captain of his soldiers out with me on my way to the mountain. On the road we met the old ranchero and one son on his way to town. The latter continued alone and the former turned back. I asked both of these men then what the Indians would have done had they caught my assistant and they replied emphatically that they thought from the actions etc. of the men that they intended to do him mischief. I learned that the Indians were men from the borders of Huamantla led by the chief of the Indians of the Sierra who is recognized as the head man by the local authorities. I went on up the mountain where I secured some photographs and returned to town. There I found the son of the ranchero again and he told me that the Jefe had sent for him about the matter and wishing to get at the affair more closely I asked again what he thought the men intended to do with my man and he replied "Nothing,- only they wished to have him come back to town!" Evidently the Jefe had taught him quite a different story from what he had before the interview. From various sources in the town I learned that within a year past half a dozen dead men had been found lying shot on the mountain (Malinche) and no one could be found to fasten the crime on but in a general way said to be the "Indians". It appeared that the
Indians own a community interest in the land of the mountain and make a practice of disposing of whoever they may think would do them any harm. They probably became impressed with the idea that my man was looking over the land with some unknown object that might be injurious to their interest and so started out to remove him.

My guide and the captain of the local soldiers talked together about the Indians killing people on the mountain and seemed to think it quite justifiable for them to kill anyone on suspicion for "the land is all they have and they do not wish to risk losing it"; hence, they decided that it was quite proper to kill any stranger there on suspicion.

From what I saw and learned I am satisfied that the Jefe knew of the men going out for my man and if they had killed him he would have been as unsuccessful as in other cases in finding the assassins.

May 17th, left Huamantla and proceeded to Perote, Vera Cruz. This place is close to the northwest base of the Cofre de Perote, and is on the same plain as Chalchicomula, Huamantla, etc. There is less volcanic sand mixed with the clay of this vicinity but the same general character of country. There is evidence of a greater rainfall here, however, in the abundance of flowering plants. An Oxalis and a Taraxacum growing about the town,—the latter even along the sides of the streets, were familiar looking species, and a great variety of others was here.

Just back of the town is the pine-covered base of the Cofre. West of Perote are some shallow lakes or sinks, as this part of the plain forms a sink here as does the district just west of Chalchicomula.

About 6 or 8 miles west of Perote is an extensive, rough lava bed coming down over the plain from the north. In this shallow basin about Perote I found a new species of Spermophile living about the fields. Wheat, barley, corn, and chickpeas, with some pulque, are the crops here.
This is a part of the general treeless tableland region. All over the plain to the south and west rise volcanic hills and cones covered with a thin forest of pines that gives way to scrubby oaks and bushes about their bases, and then the open plain.

Having hired 2 hunters and an outfit of pack and saddle animals, I left Perote on May 23 for the Cofre de Perote.

We left the town about 8 a.m., and moved slowly up along a steep trail leading along the northwest slope by fields of wheat in spots where the land has been cleared. These fields ended at about 9500 ft, just below the firs. Above the wheat is a small deserted ranch at about 9500 feet where potatoes and barley have been grown along the lower border of the fir forest. In this vicinity were some small park-like flats covered with a rank growth of Saccatan and scattered alders with few pines. Above these the slopes again became steep and we followed a very indistinct trail up through a belt of dark, silent fir forest coming out into a more open belt of pines at about 11,000 feet. Stopped for luncheon in the firs where a Picus jardinii and a few pigmy nuthatches were noted.

The sky had gradually become overcast until now a fine rain set in and we groped our way through the dripping forest in a fog that constantly thickened. Finally we entered and crossed a canon at about 12,000 feet altitude and brought up before a rude hut of sticks placed upright against a framework and roofed with roughly split shingles. Stopping a little way from the house, my men called out in the manner they have when approaching a house in this country, as though afraid of being suddenly attacked if they go to the door first.

Soon the owner of the house came out and gave us permission to enter, which we did. We placed our saddles and outfit in a small shed at the
entrance and then entered the inner apartment which had for one side
the surface of a huge block of lava that had fallen from a neighboring
cliff. Against this the jacal had been built. The room was about
fifteen feet square and was used by the man and woman with four children
of various ages, and four men who had come after loads of snow and been
delayed by the storm. These, with my party of five, and several dogs
of the establishment, and an occasional invading goat from the herd that
occupied the shed in front, made the place pretty well crowded.

Fortunately there was a fair stock of pitch pine at hand and the
roof turned the rain for the present, although every gust of wind drove
it through the broad openings in the walls.

It appeared that the man here is in charge of a store of snow which
is gathered here in January and packed firmly in some half underground
sheds at the north base of a cliff here and is drawn on during the rest
of the year to supply ice or snow to Jalapa and other towns within 50
or 75 miles. The men assured me that they sometimes carried mule loads
of snow packed solidly in sacks and surrounded by dry grass to towns in
the hot country nearly one hundred miles away with only a comparatively
small loss by melting. They travel only at night and when the sun is
very low remaining in cool shady places during the day.

The place where we were confined was muddy and filthy from its long
occupation and the walls and ceiling were hung with a heavy coating of
soot from the pitch pine fires that were burning almost constantly in
the middle of the floor for cooking or warmth. The woman carried on
her household operations here during the day. These were of a very
simple character. Corn was put into a large earthen jar with water
and some burnt lime each day and allowed to remain for 12 or 15 hours
when it became soft and the tough skin was rendered easily frayed. The
corn was then taken out and ground on the metate with a long stone grind-
Cofre de Perote

or both made of porous lava. Both the woman and her daughter worked an hour or two daily at this. During this operation a couple of turkeys and a venerable billy goat made various onslaughts on the increasing dough pile. Usually each onslaught of this character was the cause of the woman calling her oldest boy a series of vile epithets because he did not attend to keeping the animals away.

After the wet corn dough had been prepared the woman placed a large flat stone on 3 supporting fire stones over the coals and then made tortillas and baked them on this improvised oven. These, with beans boiled in an earthen pot, made up the main food of the household although some meat was cooked and eaten with the broth once a day and a few potatoes. Each meal was seasoned with a sauce made of crushed chilies and tomatoes. Coffee with sugar was also prepared on a few occasions.

The people were quite hospitable and prepared food for my 3 men and offered some to myself and assistant, but fortunately we had a stock of our own.

The storm continued and became very cold as night shut down with a high north wind. We put our beds down as best we could on one side of the room in the mud and slept oblivious of the gale outside that soughed and roared through the tops of the sturdy pines. The next day the storm continued unabated, and streams of water began to trickle through places in the roof and were accompanied by frequent falls of clots of wet soot that soon rendered us all of the complexion of chimney-sweeps.

The owner of the animals went out to locate them in the morning and found one of them dying from exposure to the storm and the others were evidently not far from following suit. Soon after the mule died and the owner hurried his saddles on and departed down the mountain fearing that his other animals would also die. The floor of the hut now became very
muddy and the time passed miserably.

The following day the clouds opened a little and we could see out down the canon for a short time. I got out the hunters but they only killed a single squirrel. We have trapped here Arvicola, Sitemys, Geomys, and a Putorius despite the bad weather.

This afternoon the 3 neveros who went down yesterday came back and were evidently well stocked with aguardiente. After supper they showed their happy frame of mind by songs and broad jests with one another and finally two of them began a rhyming contest which they kept up in give and take couplets for several hours. Considering the fact that they were ignorant mestizo muleteers it was surprising the facility with which they kept up their fire of rhymed repartee. Each couplet was answered almost at once and the good hits were the source of great laughter in which the victim joined. The sport finally became rather maudlin and I turned in.

The following morning turned out to be clear and pleasant as the final effort of the storm of yesterday was to whiten the hilltops above timberline. This morning, however, no sign of the snow could be seen and, in company with my assistant, I ascended the mountain to the extreme summit. The "Cofre" from which the mountain takes its name is a huge oblong mass of lava about 3/4 of a mile long and 75 to 100 yards wide and from 150 to 250 feet high perched boldly on the extreme summit of the mountain. Its base at the surface of the ground rests on a deep layer of loose volcanic material such as forms the rims of craters in this region.

To the southeast is an abrupt deep descent of 1000 feet or more to an open level platform which is again succeeded by an abrupt descent into the surrounding pine forest. Everywhere on the summit and down to about 11,000 feet at least on the north side are visible the effects of
The entire summit must have been covered and the "Cofre" is the remains of the heavy lava cap that once covered the mountain, but was denuded by the ice cap to this relic. The absence of all talus about the base of this bold rocky fragment shows how cleanly the ice did its work.

The head of the canon in which the nevero's hut is situated is a fine glacial amphitheatre. After trying several places along the perpendicular walls of the "Cofre" I finally found a crevice up which we crept and reached the summit without further trouble. Several species of flowering plants and grasses were found growing on the extreme top of this rock at 14,000 feet altitude and numerous lizards were found living there of which a few were captured.

The entire top of the mountain above timberline is more or less covered with various species of plants showing the effect of abundance of moisture and a fertile soil.

The old crater here has evidently broken down to the east or SE. As we reached the top of the mountain a moist wind came sweeping up from the low country to the east and everything was shut out below us in that direction by a brilliantly white mass of vapor fragments of which swept up and covered the cap of the mountain at intervals.

Standing so to look down into the old crater 1200 feet below and watching the fantastically curling masses of cloud wrack that came boiling up the face of the yawning cliffs and chasms below. Occasional breaks through the sheet of vapor in the north and NW gave views of rolling pine covered hills stretching far away to the horizon.

Just below timberline in this forest various brilliantly green openings showed the presence of little glacier meadows apparently down to 10,000 feet or so.
The masses of dwarf juniper along the south sides of cliffs and rocky slopes at timberline here, with the numerous flowering plants and many mosses and lichens, give the summit of this mountain the most northern aspect of any of the high peaks in central Mexico. This is mainly due to the cool moist climate, as the mountain is situated where it gets the first and heaviest rainfall from the north and northeast storms.

Under the borders of the Cofre were several small rockshelters which had been partly walled up and used by sheep and goat herdsmen here. The boy who accompanied us from the hut drove along his goat herd to the base of the Cofre where he had a common pasture ground.

After some time on the top we returned to the neverde hut and after dinner got him to take our baggage down the mountain to the deserted ranch we passed on our way up. This was at about 9500 feet at the very lower border of the firs.

From the 27th to 31st of May we camped here under a still standing part of a hut. Fortunately the weather was fine and while my assistant was scouring the woods I prepared specimens and worked the vicinity of the camp which I did not dare leave unattended owing to the thievish habits of the people.

Returned to Perote and remained from 1st to 7th of June finishing work there by having my assistant and two hunters put in a few days on the lava bed to the west where he took many rabbits and other things of interest.

On June 8th I left for Las Vigas, 15 miles east on the extreme border of the slope leading down toward the hot country. There I made arrangements and stopped until the 19th. This is the type locality for *Sciurus melanotis*, and *Lepus veraeucris*, both of which I found rather common.
This place, although about the same altitude as Perote and only a few miles east along the same mountain base (north slope of Cofre), has a much damper climate than Perote. Day after day the clouds came rolling up the canons from the low country, swept over the crest and melted away on the adjacent plain leaving a cloudless sky at Perote. The added humidity of the locality is also shown by the presence of a species of pine with long drooping leaves not found before. In wet weather the branches and long slender needles hang down with much of the effect of a weeping willow. In addition, a great number of small flowering plants occur, far more than I have seen at any other place in the country. Outcropping stones are covered with large lichens, and mosses form a cushion on many banks and hill slopes under the trees.

Formerly all this border of the tableland here was covered by unbroken pine forest which extended from the wooded slopes of the Cofre away through northern Puebla and eastern Hidalgo. Much of it has now been cleared in the neighborhood of the town and corn, wheat, barley, and potatoes are raised, with some magueys. Almost daily rains occurred during my visit which was in the midst of the rainy season.

This locality is underlaid by lava and some craters are found in the vicinity. One called the Volcansillo opens on the border of the descent to the SE above Las Vigas. It is several hundred yards across and about 250 to 400 feet deep and almost inaccessible. From it a great outflow of lava poured over the surrounding slopes and the currents and wrinkles of the fluid lava still remain very evident on the surface which is covered with scattered pines.

A small, very irregular, tunnel-like cave leads from one side of the crater wall down the slope of the mountain. An entrance to this can be had just below the crater and I penetrated into it for some distance hoping to get some bats which have been found there at times. Unfortun-
ately the heavy rains have transformed the roof of the cave into a set of trickling streams of water and the bats had gone to drier quarters.

The walls and exposed stones on the bottom of this cave are smooth with a coating of gray silica dissolved above and transferred thus by the trickling water small stalactites and stalagmites 1 or 2 inches long were numerous.

While at this locality I was surprised to get a *Geococcyx californianus* and in its stomach was the following curious assortment of food: 1 18 inch Butania; 4 6 inch Butania; 2 5 inch lizards (*Sceloporus*); 3 horned toads from $\frac{2}{3}$ to 3 inches long; 4 grasshoppers, and several beetles.

I reached here at 10:30 a.m., today from Washington via Chicago and Laredo. The vicinity of Laredo is a sandy and dry desert lying in the Lower Sonoran Zone. Leaving there at dark, I saw none of the intervening region until daybreak the next morning when we were on the tableland just northeast of Saltillo. This place is on a dry, treeless plain within the Lower Sonoran Zone, but about at its upper border. Just south of Saltillo, at Carneros, the R.R. passes between some hills which afford one a chance at the Upper Sonoran while the plains of the village are treeless Lower Sonoran.

South of Carneros the road passes through the hills and descends on another broad open plain (treeless and with much *Larrhea mex.*). Mountains lying to the east and west in low barren ranges like those about City of San Luis Potosi. Just north of Vanegas (San Luis Potosi) on west side of R.R. is one of the largest prairie dog villages I have seen. It must be nearly 3 miles across and contains an enormous number of holes. The day I passed was cool and no "dogs" were seen. Near Charcas, on this line, the *Larrhea* disappeared and many large *Opuntias*, tree *Yuccas*, and *Schinus molle* came in and the country shows evidence of having a much
greater rainfall thence south than on the desert plains northward.

(There was surprisingly little bustle about the station at San Luis Potosi as compared with the year before. The hard times are also shown in the quietness about the R.R. station in the City of Mexico).

The day I arrived in the City of Mexico, I started for the post-office and near there encountered Professor Herrera of the National Museum with Professor Edwards and Halstead of the University of Texas, and the Baron Brackel-Welda, a German decayed nobleman long resident here, well-known and well-informed in all matters of local interest. He once taught French and German here but now lives on the strength of his social abilities and relatives in Germany, according to local accounts. One of those drifting pieces of old world wreckage we get in America at times. A man of pleasant address and a large amount of miscellaneous information; a great talker and valiant trencherman with a flow of good spirits, at the host's expense.

On the 30th of December, my assistant, Goldman, came in from Chihuahua where he has been during my three months trip to the U.S. He was in the City of Chihuahua during November and early December, while the recent outbreak of revolutionists was going on there. He knew of one American who was stopped and his rifle and horse taken although he was allowed to keep his pistol and other belongings. Goldman says that soon after the revolutionists began that one evening the military band was playing in the main plaza of the city and the usual considerable number of common workmen and loafers gathered to listen to it. Suddenly a squad of policemen with another squad of soldiers surrounded the plaza, the most of the men found there were arrested and herded away to the Cuartel where they were forced to enlist. Soon after this the troops were sent out and had a severe skirmish with the guerrillas. As a result of this, Goldman tells me, a large wagon-load of knapsacks and soldiers' clothing

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both shot-torn and bloody was brought up from the R.R. station to the town. From this it would appear that the dead must have been stripped by their own comrades. The trouble occurred near the town of Palomas. People had very little to say and it was generally understood and talked that it was not prudent to have much to say and whenever it was discussed by natives and many Americans it was in a subdued way.

One night in the City of Chihuahua Goldman had to stand off two men with his pistol in streets of the town. He found that there is a strong antagonism existing in Chihuahua between Americans and natives. There are many Americans there who have left the States under pressure and the entire community on both sides native and foreign is a hard one, taken as an average.

It is stated in the City here that the press of the "Democrat", confiscated last spring for its opposition to the government, has been given to the Orphan Asylum.

The last days of December this year have been raw and cloudy with showers in the Valley of Mexico. Clouds hang heavily over the volcanoes. Accounts are published in local papers saying that people living south of Popocatapetl in Morelos and Puebla have recently seen considerable smoke and flashes of light about summit of the volcano. Records at the meteorological Observatory show this to have been an unusually cold December.

The streets were full of well-dressed people, many of them carrying flowers or buying them of the street sellers. In the post office were others busy sending small New Year's cards. The stores were closed and the town had a generally holiday look. Many of the common people were found about the plaza embarking on the cars for Guadalupe, Santa Anita, and other suburban resorts for picknicking. They were a good-natured
crowd and were in family groups laden with the usual medley of bundles and bags.

Owing to the closing of all places of business today it has been impossible to get my baggage from the depot, keeping me here a day longer than I expected.

On application at freight office for the things sent there from Zacatecos by my assistant I learned that the things had been taken to the custom house. My assistant went there and found things run in such a haphazard way that it occupied him until afternoon to get our outfit although there were no dubitable articles in the lot. Finally he succeeded in securing them too late for us to get away today.

We got off this morning and came out to this place enroute for a trip up to timberline on Iztaccihuatl. The leaves on the willows were withered from the effects of the recent severe frosts. The waters of the lakes are swarming with ducks of many species, but no geese were seen. Near Amecameca much of the winter wheat now 2 or 3 inches high has been killed down to the ground. The Volcano of Popocatepetl was smoking at 8:30 a.m. so that a pale, thin column of smoke arose about 2,000 feet in the calm morning air and then was driven NE at a right angle by an upper current thus giving the following appearance:

The smoke has the appearance of a thin gray vapor.

The trees of the Valley of Mexico to and including Amecameca are Falix bonplanderi, cypresses, ash (fraxinus), eucalyptus, and Schinus molle, the last three probably imported. Many olive orchards are found in the southern end of the Valley from 7400 to 7600 or 7700 feet and within the line of the sharp frosty nights at this season. So far as I have noted no species of Prosopis occurs in the Valley and Packard's statement of its occurrence near Ameca must have been owing to his hav-
ing seen the pepper tree.

The volcano and Iztaccihuatl aresnowy, about as I saw them last February, and a careful study of the southwest slope of Iztaccihuatl shows that in addition to the glacier found by me last spring there is still another one lying on the southwest slope which descends from between the chin and breast first in a southwesterly course and then changing to a more westerly one. Like the one first noted, it has now retreated from its old limits so as to leave out in bold relief the lateral moraines of ground up lava. Like the lateral moraines of the other glacier, these have a southwest course and lie at the same altitude on the mountain side, just below permanent snow line. This last glacier is smaller and more nearly ended than the mate while near the feet (between hips and feet of the mountain) lies the basin of a third and smaller glacier now entirely gone and free from snow at certain seasons.

From this it becomes evident that the sculpturing of the mountain top to produce the outline known as the White Lady is wholly due to ice action. The extreme summit of the mountain is a slightly rounded table from which the ice once moved down on all sides to about 11,000 or 11,500 feet. Cutting its way down through the softest parts of the summit three glacier basins, of small extent, were produced there as well as numerous small basins lying somewhat lower down, including also the largest of all at the east end of the mountain just at timberline. After considerable study of the surface indications I cannot find any evidence to show that these glaciers ever descended below 10,500 feet on the southwest slope of Iztaccihuatl.

Mount Popocatapetl lies on the summit of the broad easterward extending ridge from Iztaccihuatl. This ridge at the time of the greatest glacial development was also covered by small thin glaciers much less heavy than those of Iztaccihuatl since the summit of this ridge is near
the lower border of the glaciers. Enough were present to cut out the
hills and round some of the summits while the detrital mud flowed down
and joined with that of Iztaccihuatl in the Valley of Ameoca or built up
the series of foothills which lie between 8,500 and 9,500 feet along the
west and northwest slope of this mountain. These detrital foothills
also flank the southwest base of Iztaccihuatl at the same altitude but
are much larger. They form rounded bosses along the base of the moun-
tains with occasional spurs and cliffs of lava or trachyte showing along
the canons cut through by the water. There is no sign of glacial action
of any kind on the sides of Popocatepetl above the level of the ridge on
which it is situated and it is evident that this peak has been built up
over the summit of the ridge since the time of the glacial action there.
The loose lava and ashes lie upon the mountain side and no signs of ero-
sion more than that caused by water are visible on the north and north-
west slopes at least.

The summit of Popocatepetl is very steep on the east, south, and
west sides and is nearly if not quite inaccessible there. On the north
and northeast sides is the least steep; for this I noted a reason when
making my descent. In early morning the surface of the slope of volcanic
ashes just below the snow was frozen solid. At midday the surface melted
a little and the water from lower border of snow trickled down slowly
until a large amount of the loose surface ashes and gravel and pumice be-
came liquified. It would then start suddenly down the slope with a
curious low hissing noise from the grinding together of the small rough
fragments of lava. Sometimes these miniature avalanches of mud ran only
a few yards but many of them ran down hundreds of feet and carried great
quantities of the ashes and gravel down the slope until the excess of
moisture being taken up by the ground over which it passed the mud finally
came to a standstill as a broad fan-shaped bed some inches thick. In a
short time the frozen ground below caused the overlying mass to freeze so that areas of newly deposited matter an hour or so old had already become a mass of ice nearly to the surface. This goes on day after day until a ridge is built up and the drainage thrown to one side in the hollow left. It in turn is built up. In this way is stored an enormous mass of accumulated water about the base of the snow-covered cone. The ashes from above being transferred lower down and held by the ice should a new eruption occur and a sudden intense heat occur in the sides of the cone this ice would be melted and an enormous mass of liquid mud be turned loose. At present this built up slope affords the only accessible road to the summit.

As the sun set this evening the few clouds that had been hanging all day about the mountains faded away. The shadow of coming night fell on the dark, pine-wooded base of Iztaccihuatl and a soft amethyst haze spread over the rugged slopes to the white mantle of the summit now becoming faintly golden tinted. Beyond lay the fathomless blue of the sky. A faint, gauzy gray veil of smoke arising from a forest fire at the eastern end arose slowly and spread out over the feet of the figure. Up crept the shadows and the misty amethyst changed to purple and the shroud had become a delicate rose-tinted covering of exquisite beauty. Then the sun dropped suddenly behind the wooded heights of Ajusco and the last loving, lingering beam of rosy light rested on the cold bosom of the lady as a lingering caress and the shadow of death seemed to suddenly envelope the great form in pallid white of a strange and mysterious kind.

Back of the crest, and forming a rich background, lay the dark purplish twilight steadily deepening into night until the snowy crest seemed at times like frosted silver. Then the earthborn shadows of night crept up from the pine forests at the base and joined the blackness of the heavens where the stars were already showing their points of light.
head of the lady has a broad smooth forehead and a tongue-like headdress coming down by the ears giving an Egyptian cast to the head.

Then came quickly forth the stars hanging their twinkling lights over the crest and an answering gleam shines forth from an Indian camp-fire high up in the midst of the huge blackness that now indicates the mountain.

When the moon shines full I have watched it rise many a night over this mountain and never without a feeling of strange exaltation as the pale light swept over the snowy summit and down along the sides revealing sculptured cliffs and deep canons lying revealed in a wondrous beauty whose spirit seemed to pervade one's entire being until all feeling except that of rapt and exquisite pleasure seemed to have gone.

Failed to arrange for my outfit yesterday so am delayed here another day. The weather is beautifully clear and the view of the mountains is very fine. I have finally found the name of the small rabbit, *Lepus diazi*. The Spanish name is *te-por-in-go*, and the Indian name is *sā-ca-tō-pó-lin*. The small rabbit is also called *sa-ca-te-por-rin-go*.

Seeing a funeral procession going up the side of the Saoro Monte, I followed. A winding road up through the cypresses and oaks hung with *Tillandsia*. Beautiful vistas were caught of the valleys and mountains until the summit was reached. There I found a chapel and the entire platform of the summit around this serves as a burial ground. Flat slabs a little above the general surface and cemented down to rubble or brick-work cap the graves and bear the inscriptions, each stone stating the name, age, and date of decease. Below this is given the name of the person who placed the slab, or states that the sons, daughters, or husband or other relative as the case may be erected this slab in memory of deceased. Descending from the summit on the southeast side of the hill, I found a sort of niche-like platform cut back into the
hillside on which is the main chapel covering the cave of the saint to whom this hill is dedicated as the Senor del Sacro Monte. Here mass was being said for the deceased, with a brass band accompaniment. The entrance to the chapel is roofed and enclosed except at the front and in this ante-sala are hung dozens of rude oil paintings representing almost every variety of accident by field and flood, with a statement below detailing the circumstances of the accident and date thereof and that this tablet is hung here in gratitude to the Senor of Sacro Monte for his having preserved the person from harm despite the danger. From this chapel a broad cobble-paved road leads down to the plain at the foot of the hill. Beginning near the bottom and ending at the top close to the chapel are the 14 stations of the cross marked by pillars with a monition to the faithful. At the times of the pilgrimages to this hill (in February) many persons, taper in hand, ascend this via dolorosa on their knees over the rough pebble pavement, saying their prayers before each station. Along one side of this way the roots and branches of bushes and trees on the earthen bank are hung with many bits of rags torn from garments, fragments of reboso fringe, old straw hats and great numbers of small rag packets containing locks of women's hair and even the entire head of hair in many instances. These are all hung free from the ground and reminded me of the locks of hair I have seen hanging from bushes near Indian villages on the Yukon in Alaska.

In the chapel on the summit were pictures of Santa Rosalia and other saints naked to the waist with one of the spiked chain bands like my Guadalajara collection around each biceps and another around the waist and a chain scourge hanging over one shoulder, while long bloody scores along the back, and drops of blood oozing from the bands showed the extent of penance held up as an example to the faithful. Over the door of the main chapel is a large notice of indulgences from
1894
Amecameca
(Mexico)

80 to 200 days to all who do penances and other acts of devotion at this shrine,—these being authorized by bishops of Sonora, Monterey, Puebla, and Mexico.

The hill of the Sacro Monte is almost entirely free from pines, but oaks and cypresses are common. The hill is built up mainly of volcanic tufa, some deposits of pumice near the top 5 in number ranging from 2 to 6 inches in depth and these in turn are buried on the north side under a heavy layer of tufa of which I obtained a sample with some of the pumice.

Popocatapetl
January 5

Secured my outfit yesterday and today Goldman and I, with 2 saddle horses, a pack-horse and packer with 3 Indian hunters, left for the mountain. We made camp on the steep side of a small canon at 11,000 feet. My hunters were out all day and secured one specimen of Lepus diazi, one L. veraeuros, and one of the small kind they call Castellano here. We found firs, pine (upper sp.) and alders common here, with an abundance of the tall sarcocata. This latter grows mainly on northerly slopes in dense bunches 2 to 4 feet in diameter and often from 6 to 8 feet high. These bunches grow near together, so that often only small patches of ground can be seen here and there. The bases of the bunches are matted with the old and new grass, and under them live Arvicola, Sigmodus, Oryzomys, Lepus veraeuros, and L. diazi. The latter animal we found to be very common as its little Arvicola-like runways under this mat of grass were found everywhere in a perfect network. Owing to their keeping very close under cover they are extremely difficult to shoot. We put out many snares to try and get some in that way.

As night closed down a cold wind came down the canon and my hunters were kept busy about the fire all night to avoid freezing. A severe frost occurring. The surface of the ground now remains frozen all day
January 6: The snares yielded no example of *L. diasi*. While watching for these animals last night, a *L. veracruzi* came hopping out into an open spot by a dense brush patch and I secured him.

Taking my horse, I rode up the mountain to about timberline where I took a view of the mountain. The smoke is very apparent when the weather is calm now. From the base of the peak of Popocatapetl I crossed the divide to the northwest toward Iztaccihuatl. The intervening country ranges from 12,200 feet at its lowest part up to 13,500 feet at bases of the mountains. It is in the form of a rolling plain draining to the NE and SW, and is covered with bunch grass with scattered trees along the sides of small canons and sheltered hill slopes, but it is mainly open and resembles a rolling prairie. The old highway from Tlaxcala and Puebla crosses here. Getting near the south end of Iztaccihuatl, it was evident that this end of the mountain once gave off 3 large glaciers; one leading down toward the plain of Puebla where its drainage flowed, and two draining into the Valley of Mexico. None of these were recent and I noted no signs of moraines and drift rocks as these glaciers were a part of the system capping the mountain. The two basins draining into the Valley of Mexico are about a mile across, 1000 feet deep, and 3 to 4 miles long. No signs of glacial work goes below about 11,000 feet and usually not below 11,500 feet.

Having examined the country across to the border of Iztaccihuatl, I returned to camp. The hunters were all anxious to change to a place on the point of a hill under a huge fir, and I consented so we moved over a few hundred yards and we had a very pleasant camp overlooking the valley and sheltered from the mountain winds. In looking about for *Lepus diasi*, several holes leading into the ground and evidently used by them were found but they usually make their forms under dense bunches
of saccaton. Their color and habits are remarkably like those of *Arvicola* living in the same localities. As an experiment a number of steel traps were set in their runs.

During my trip today, a number of birds were seen. On the plains between the mountains, 12,200 to 15,000 feet, I saw many *Aim. supercilios*, *Sialia mexicana*, and *Sturnella mexicana*. At 15,000 feet several ravens and a sparrow hawk; at 14,000 feet a turkey buzzard. Among the trees from 9,500 to 12,000 feet I saw flickers, Pigmy nuthatches, *Gymnura diademata*, *Mex. titmice*, *Bouton's Vireo*, *Olive-head*, *Warbler*, *Regulus calendula*, creeper, robins, *Turdus auduboni* (and a few *Catharus occid.* at 11,000 feet) also Red Warblers, small headed redstarts. From 9,000 to 12,500 feet, Violet gr. swallows common. In the evening, a pigmy owl and several *Mex. Whipporwill* were heard about our camp, 11,000 feet. *Pipilo maculatus* and *Trog. brun.* were also seen at from 10,000 to 11,500 feet.

January 7: On bringing in traps in the morning it proved that it was a fortunate thing that they were set as fine *L. diasi* were caught during the night and in addition a *Nectroma* was taken in one of their runs and in the gopher traps set we secured a fine species of gopher never taken by us before, with a yellow spot under each eye. With the game brought in by my men, I now have as many small rabbits as I came for, and am ready to leave here. We broke camp right after breakfast and nearly all day was occupied in crossing from our camp to the cave at base of Iztaccihuatl, just at timberline.

It was severe work crossing the glacier basins with their sharp, high, intervening ridges and in many places it was too dangerous to ride. My Indian hunters insisted that it was impossible to cross between the mountains by this route. The Indian packer I had along showed
an amusing timidity on several of the steep long slopes and kept talk-
ing about the horses falling down the hill whenever we stopped. On
the road I saw a Red-tailed Hawk at 13,000 feet near Iztaccihuatl, and
a number of were seen at about the same altitude. Near
our camp on Iztaccihuatl, at 13,400 feet, I was quite surprised to have
a covey of Massena quail suddenly whir up from before my horses' feet.
This was close to extreme upper timberline. In talking with my hunters
who are old sulphur gatherers, they tell me that men used to work from
15 to 30 days at a time in the crater and made from $3. to $5. a day
according to the amount of sulphur gathered as they got 37\(^{1}/\) cents for
each 25 pounds. They said that they often became ill from the sulphur
fumes. At night they slept warmly in small cave-like shelters at
bottom of crater. Their work was done in early morning and late in
afternoon as during the middle of the day the warmth of sun thawed the
rocks loose about walls and they were continually falling, rendering it
too dangerous to do any work then.

In the evening, in our cave shelter at 13,500 feet, a single bat
kept flying about but we were unable to capture it. At our camp at
11,000 feet on Popocatapetl, a single bat was seen to fly out from a
hollow stub at dusk so it is evident that some of these animals winter
in the mountains here.

Between timberline and the lower border of the snow on this mountain
the exposed edges of heavy beds of porphyry are worn rounded and smooth
in many places so that in certain lights the rounded glacier worn bosses
retain polish enough to reflect the light and glisten faintly. This is
particularly noticeable just at sunset.

Rode up to the foot of cliff forming head of the White Woman. Found
there a dying glacier descending from the upper part of breast and
hemmed in on NW side by the head. The glacier has two large lateral
moraines like the one at middle of mountain. These are now wholly outside the glacier and are about 100 feet thick and extend several hundred yards below the present nose of the ice. The nose of glacier is now forming a small terminal moraine a few feet high (4 or 5) and this one is thrust up against a series of similar terminal moraines which form a mass about 40 yards across and 5 feet high in middle and much higher on sides with a wavy surface showing that they are a series of successive marks of the retreat of the glacier. Then succeeds a sloping area 60 yards across free from moraines and then a dam-like moraine about 6 feet high in centre and over 200 yards long, but lower at ends, and evidently marking time when the glacier front was of this length and came over the now exp. cliff. Back of this, near breast end, is a series of wavy moraines 25 yards across and 20 feet high and this is again succeeded by a free space or slope 150 yards long to where the glacier fell over another cliff. Co-terminous with this last series in front of present nose of glacier is a terminal moraine 35 to 40 yards long and 15 to 20 feet high and it is succeeded by a long free slope 125 yards long to cliff. The following outline will indicate the position of these moraines:
1894

Iztaccihuatl

January

Just below the large lateral moraines is a gently sloping bench about 200 yards across on which are many huge blocks of drift boulders some 12 or 15 feet in diameter and the surface of the table has its surface bedrock polished and rounded. I have only seen occasional grooving of rocks anywhere on this mountain. From foot of glacier I descended on foot down the slopes of sand and loose earth by the lower point of the ice below central glacier. A number of cattle were grazing along the hillsides close to lower border of glaciers at 15,000 feet and the sandal tracks of the Indian herders were seen here and there. Here and there burnt areas showed where fires had been put out to cause a new growth of pasturage. Sparrow hawks were seen and the tracks of the small rabbit which ranges up to the limit of vegetation were common. At 1 p.m. I joined my assistant and outfit at upper border of fir where he had put out a large set of traps for gophers and we then descended to Ameca. At 5:30 I took the train for Mexico City.

The following evening (January 9) I was surprised to have my assistant turn up in the City with the report that the mountain Indians on Iztaccihuatl had stolen nearly all of his traps so that he had no means of continuing work and so came in.

City of Mexico
(Mexico)

January 10: Completed the work on hand here and packed up material ready for an early start.

Orizaba
(Vera Cruz)

January 11: Started at 7 a.m. for Orizaba which we reached at 3 p.m. I was very ill all the way on the train from a bilious attack.

January 12 to 16th: Laid up in Orizaba with my attack of illness. On latter date I secured rooms in the house of Jacinto Hernandez and moved in there. On 17th being still ill, I returned to City of Mexico.
for medical treatment. Remained there till the 23rd when I returned to Orizaba again and resumed work.

On the way back I had a fine opportunity to study the lay of the country below the border of the tableland, just east of Esperanza. It is evident that Mount Orizaba and the Sierra Negra once formed a great glacial centre with ice streams extending down on the eastern slope to about 5000 feet near the town of Maltrata. (Since this date, Don Florentino Sartorius tells me that there are glacial moraines at about 5000 feet above Huatusco). Below Mirador at about 2800 feet, I saw a considerable number of drift boulders of volcanic rock which had evidently been brought down the slope from a considerably higher altitude but I saw no signs of glacial action and think they were brought down the slope by the action of water from the place where they were probably left by glaciers.

Immediately after starting down the slope toward Orizaba, the country is changed from volcanic to limestone formation and the glacial action has scooped out deep basins leaving high knife blade ridges between. In one of these basins lies the town of Maltrata. Beginning on the east slope a short distance below the edge and extending down to the hills about Orizaba at an altitude of 4600 feet on N. slopes are the droop-leafed pines noted at Las Vigas. (At Mirador and near Huatusco these pines reach extreme lower limit at about 4000 feet).

About the steep hills leading down the east slope of these mountains the Mexican R.R. of Vera Cruz - the pioneer road of Mexico - cuts its way at a high grade along sides and slopes that give beautiful views down into the deep valleys below. All north hill slopes are clothed with almost impenetrable thickets and growths of low trees, while the south slopes are grassy with scattered trees and bushes. The hills are too steep for cultivation until Orizaba is passed, but the valleys about
Maltrata are used for corn, wheat, and various fruits such as oranges etc. At about 4500 feet begin a few tobacco, banana, and coffee fields but neither of these two latter plants begin to do very well until one reaches an altitude of 4,000 feet in this vicinity.

Cool fogs are very common at Orizaba, sweeping up from the sea and enveloping everything, often for days at a time, in a thick mist that sets everything dripping. When the weather is clear the dews are extremely heavy and the bushes, trees, and grass are glistening with moisture in great beaded drops at sunrise, and it is well along in the forenoon before this is gone. Birds were remarkably scarce about this locality with much fewer signs of the tropical fauna than I expected to see. Traps set in grassy and bushy fields about town yielded several species of mice and in the woods bordering the river we took a large new *Sitamys*. Opossums of the common species were numerous and a few of a smaller gray species were taken with some of the common civet cats, like those of the tableland apparently. A *Blarina* and 2 sp. of *Sorax* with *Arvicola quaesier* were also secured here on north hillslopes and among dense thickets in damp places in the valley. The hills are all of limestone about Orizaba with the stratification tilted up to a wide angle from the horizon. The soil is not abundant except in the bottoms of valleys and is far less rich than about Jalapa where the rocks and soil are all of volcanic origin. As a consequence the vegetation about Jalapa is far more luxuriant than here and coffee does much better there.

The house where I have rooms here is owned by a man who has worked much for the Mexican and other railroad companies, and so is somewhat liberalized in his ideas. At the same time, he is bitterly opposed to the present government and accuses it of tyranny and the creation of an enormous debt. These are the common complaints of the opposition throughout the country, and I am surprised to find such a considerable
part of the people with this feeling. Were it not for the firm hold
the present power has by means of its military forces, I am satisfied
that a revolution of considerable magnitude would soon occur, or would
have already taken place.

My host talks much of the energy and the business capacity of Ameri-
cans and says the Mexicans are too idle and careless to manage properly,
and says that he thinks that the Americans will gradually secure a large
part of the mines and other valuable property of the country and that
the eventual result will be annexation to the U. S. This same idea has
been stated to me by many other Mexicans. In many cases I presume it is
done as a sort of flattery of my nationality, but the idea is certainly
a widespread one. At the same time, there is a strong feeling existent
against Americans and the U. S. due to the Mexican war.

Two of the daughters of my host are school teachers and one of them
gravely informed me that the Americans could never have conquered the
Mexicans in the war if Santa Anna had not sold the Mexican cause, and had
the soldiers' supply of powder replaced by dirt so that their guns were
useless and so the invaders triumphed. In the few days we have been at
this house it is rather amusing to see the naive frankness that the young
ladies of the establishment exhibit. They tell us, as being a part of
the family, of their lovers; and the old folks - especially the mother -
says that she has no use for the dissipated young fellows who hang about
to make love to girls. She says she is willing that her daughters should
have lovers who are men capable of supporting them but that she does not
wish to have any idlers hanging about.

The two oldest girls who are 22 and 24 echo these sentiments. They
also tell with great amusement that it is a common thing when a girl has
a lover obnoxious to the parents for him to come to the window to pay her
court but if the father is heard approaching he takes to his heels.
The father of these girls is of evident Indian extraction (also the mother) but they now speak pitifully of the ignorant Indians of the villages and are counted as Mexicans. He is a wood dealer and an honest, hard working man who, with little or no education himself, is anxious that his children should have education. As a result, two of his daughters are school teachers, getting $25. a month which is considered to be good pay. The home life of these people is very simple. The daughters and a cousin living with the family do the work each having a specified task to attend to. The table is set in an open corridor and as we pass out to our meals and salute the family, each time we are asked with the usual polite formula if we would like something with them. The family retire early and rise at about 6 to 6:30. The daughters have very plain common calico house dresses which are exclusively worn at home and no effort is made to dress for the mere sake of being neatly clad about the house. All effort of this kind is reserved exclusively for the street and this is apparently an almost universal custom. They are accustomed to powder and dress to a certain extent when they prepare to sit by the open window at the street to see and be seen, also; but this is the same as going abroad.

While at Orizaba I looked up a resident collector named Toro who was said to have lived here many years and to know about the country. I found him to be a very ignorant fellow with no energy and a surprisingly small amount of information.

January 30: Left Orizaba and went down to Fortin about 8 miles east and a few hundred feet lower. At this latter place the mountains already open out and a long slope with few hills extends down toward the hot country. Here coffee does very well and some fine fields were seen. We were told that the coffee bushes here have a life of about 15 years. The Hacienda of Fortin is a fine well-kept place in charge of an American.
January

San Juan

The house has a handsome garden in front with flowers, fountains, etc. This place is the point of departure for Huatusco and the coffee crop from there is shipped here by pack mules.

January 31: The morning was beautifully clear and a very fine view of the Peak of Orizaba rising nearly 15,000 feet above us with its snowy summit rose-tinted by the first rays of the sun and its wooded base having a soft purple haze thrown over its buttressed outlines. Below, in the foreground, were the coffee fields overshadowed by the broad banana plants. Trees of many subtropical genera arose in belts and patches among the fields and the clear musical notes of Harpocrhydrhynch longirostris and the "What Cheer" bird arose clear and sweet from the masses of foliage all about. Here and there came the cries and notes of the ruffed cowbird and Surnichraunis blackbird. After an uncomfortable night on a hard bed at the rude fonda near the station, we were eager to set out on our journey toward Mirador. At 9 a.m. we succeeded in getting away and spent the entire day up to 2 p.m. in reaching the village of San Juan.

Our route lay nearly due north crossing the broad open slopes extending down from the mountains with small canons at irregular intervals. About 7 miles out of Fortin we crossed a fine barranca full of ferns and other vegetation. Here, at an altitude of about 3500 feet, we saw for the first time small tree ferns from 6 to 10 feet high, with the trunks 3 to 5 inches in diameter. Early in the afternoon we reached a sleepy little town called San Juan where we were forced to lay over till the next day as our mule driver refused to take us further.

February 1: Early in the morning, soon after sunrise, I went out in the street to get a photo of the summit of Orizaba and a small shopkeeper, seeing me in front of his place, came out and politely invited me to go up to his balcony whence I got a very fine view of the mountain.
Our lodgings over night were in a typical meson - a stable yard with rooms opening off it. Fortunately we were about the only guests so were comparatively comfortable with our own bedding. At noon we reached Huatusco and put up in another fonda and meson where we were far from comfortable owing to the yard being filled with donkeys, pack mules, and arrieros. We found this place with the same altitude as Orizaba. It is situated farther from the great mountain and out on the general slope with fewer surrounding hills and this serves to give it a somewhat warmer climate. Coffee does well in nearly all this district and about 2,000,000 dollars are exported a year from this canton and the plantations are being enlarged. The town is much cleaner than Orizaba.

Here our packer left us and took a load of coffee back to Fortin, and I hired a new outfit to take us on to Mirador tomorrow.

February 2: Now owned by Don Florentino Sartorius, son of Dr. Carl Sartorius the original owner. Born 1837 in a grass hut lower part of Hacienda, '49-'57 was in Europe in Polytechnic School Chem. laboratory of Prof. Fresenius Wiesbaden and then in Univ. of Berlin. Returned to Mirador and remained until '67 and in this time he sent to Washington birds, mammals, snakes, and lizards. Between 1827 and 1829 the Hacienda was purchased by Dr. Carl.

March 31: On our arrival I learned that a boat would leave the next morning at 4 a.m. for points on the river Cosamoloapan, so we
April 1: When the sun arose in the morning we were already many miles up stream churning along with a wheezy little stern wheel boat. The morning breeze blowing up the stream had been decidedly chilly before the sun came up so that the first warm rays were peculiarly grateful. As daylight came on we could see large sugarcane plantations along the banks, with scattered sugar mills. As we passed each of the latter our engineer saluted and was answered by the steam whistles.

During the entire day we pursued an upward course along the winding stream (from 200 to 300 yards from bank to bank). The banks were low and level and where not cleared away a low dense growth of small trees, bushes, and vines concealed the back country. Many palms 25 to 35 ft. high were seen and with the bananas and cocoanut palms that were growing about nearly every ranch along the bank made up the main features of the landscape that would suggest that we were within the tropics.

A few white herons, 3 species of Kingfishers, Fish hawks and cormorants (*mexicanus*) were the principal birds noted. We stopped at several sleepy little towns along the route, landing a few passengers and some corn and then steamed on our way again. In the afternoon we reached Chacaltianguis where we changed from the steamer to a conveyance called the wagon. This was a species of coach with a seat along each side behind the driver. Three half-broken mules were hitched on and after a few minutes devoted to the eccentric performances of our motive power, we dashed out of town amid the great excitement created among dogs and naked children.

The road for about ten miles lies through a fine level country of rich alluvial soil with only a patch of cultivated land here and there. The people along the route were apparently satisfied to remain miserably
poor rather than exert themselves. The houses were of wattle or mud and wattle walls roofed with steep thatches of grass or palm leaves. Dirt floors and unglazed windows with a familiar grouping of dogs, pigs, chickens, and naked children were the most salient features of the places we passed. Throughout this district it is common for children of both sexes of the lower people to run about perfectly naked until they are several years old and many are half-naked until they reach 12 or 14 years. All along the route the low woods showed marvellously beautiful masses of foliage and many flowering shrubs and trees while palms were common.

As we drove along through the narrow road cut through the vegetation it was amusing to see the alacrity with which all of the horsemen we met gave us the right of way. Our driver seemed duly impressed with the importance of his position and would give an imperious wave of the hand to the horsemen and the latter at once spurred their horses into the dense thicket until we had passed. At dusk we drove into Otatitlan, known locally as the Santuario from the fact that a so-called holy figure of Christ is in the church here. This figure is life size and carved of wood and represents Christ on the cross. It is said to have been found here floating down the river on a raft from some mysterious source and is greatly venerated by all the Indians of this region who make pilgrimages here the first of May each year, from a hundred miles or more, to pay devotions here. A fine church is built to contain the image and at the time of my visit $7,000 were being spent in painting and decorating the church in preparation for the coming pilgrimage when the Bishop and various of the clergy would appear here. I was informed that the gifts of the Indian pilgrims here each year amount to the neighborhood of $20,000. The Indians here attribute many wonderful things to this image. One story is to the effect that a certain woman had been told that the
image was truly flesh and blood but was doubtful. In order to test it while paying devotions at the altar she leaned forward and bit the image on the calf of the leg. Her teeth all fell out on the spot and a stream of blood trickled down the leg of the image! This town contains some 1,200 or 1,500 people who manage to make nearly a year's living out of this pilgrimage so that they are very independent about doing work of any kind. A surveyor who was surveying and plating the town at the instance of the local authorities was obliged to hire men from another place to assist him while I found it very difficult to get anyone to hire me horses, even at large prices, to make a trip to the next town.

April 2, the next day after my arrival here, my baggage came up to Omatitlan on another small steamer which reaches this point during low water.

April 3: Having secured horses for ourselves to make the trip to Tuxtepec, it was found necessary to ship my baggage by canoe as no proper packsaddles could be found in town. When we prepared to start, accompanied by a boy to bring back the horses, we found that an old woman was to accompany us. She mounted astride of her horse and then, with a huge lighted cigar in one corner of her mouth and a tall peaked straw hat on her head, she made a figure that furnished me some quiet amusement as she ambled through the streets and out of town with us.

Our route lay along the course of the river most of the way and the country is slightly rolling. We passed several small ranches devoted to stock raising on a small scale and then through a belt of long forest full of palm trees. Finally we came out on the river bank nearly opposite Tuxtepec and were ferried across while our horses swam over. Entering the town we soon found a semiprivate house where we secured board and lodgings. This town is just within the state of Oaxaca, the line between Oaxaca and Vera Cruz passing midway between Omatitlan and
Tuxtepec. Tuxtepec is the place where General Diaz issued his pronunciamento leading up to his ultimately successful revolution.

It is an obscure town, far from R.R.'s and other means of communication with the outside world, except for the small river steamers which get up to it during high water of the rainy season. As at Omatitlan, nearly all of the houses here are built of upright sticks covered with mud and with sharply pitched double roofs of palm leaves over a framework lashed together with vines. Unglazed windows with heavy wooden shutters to close at night and similar doors are almost universal. The place, like most other towns, has very little life, the people living a self-centered, dull existence with few or no newspapers, books, or other means of keeping in touch with the world. Things of ordinary everyday life among more advanced people seem like vague fairy tales to these people.

This is the center of a great extent of fine agricultural country where pineapples, bananas, sugar cane, rice, and many other tropical products do very well, but as yet little effort is being made to do more than produce enough to barely support the scanty population. Throughout this region the population is mainly Indian with a small proportion of mixed bloods, some Spaniards or their descendants, and a very few foreigners. A few Americans are settling in this region for the purpose of coffee growing. The altitude of this place is about 300 feet above sea level.

(During the winter or dry season, it is comparatively healthy, but in summer it is very unhealthy. The last of May, 1894, a form of yellow fever was common there and many people died from it. The disease was accompanied by vomiting and purging in its severe form, and at times death came within a few hours. An American I left there came down later and said he saw one Indian lie down beside a house in one of the main
1894

Tuxtepec
(Oaxaca)

streets of town and lie there from 11 a.m. to 4 p.m. when he died from this disease without anyone offering him the least assistance).

The man I stopped with was formerly worth $30,000. or $40,000., but owing to failures in cotton and tobacco crops he was practically ruined although he still has some thousands of acres of land. He has one of the few large, tiled adobe houses with pillared portico that the town affords. Here, with the assistance of two nearly grown sons, he runs a petty drinking cantine and store the entire stock not being worth over $200. By this and a small ranch cultivated on shares by some Indians, he manages to live, but neither he nor his sons seem to have the least idea of trying to do anything beyond gaining sufficient to live upon from day to day. The old man is anxious to sell some of his land, but beyond this has little desire to accomplish anything. In the family are several grown daughters whose life is wholly passed in a small round of light household work (all hardwork being done by Indian servants) and idleness.

I was there a week during which I never saw any of the daughters read anything or even leave the house for a walk. A little arranging of the rooms in the morning and embroidery in the afternoon with hours passed sitting in aimless idleness filled up each successive day. As this family was among the best in the town, it was quite evident that a high intellectual level is not sought here. The head of the family took no papers and seemed to be ignorant of all current affairs even in his own country. Above this town at Valle Nacional about 25 miles up the river on a branch is a noted tobacco district.

The traffic along this river is wholly by canoes made from large trees by the natives. Some of these canoes are very large and will carry 6 or 8 tons. They have a "toldo" or arched house near the stern made by lashing mats or a canvas over a framework of poles. A stout mast with a large square sail is used when the wind is favorable.
1894
Tuxtepec (Oaxaca)
April

Clumsy oars and poles to use when advancing along the banks make up the motive power. The clumsy oars are lashed to a peg in the gunwale and are used, without the least feathering, by short strokes made mainly by the arms,—the rowers making very little body motion. The poles are forked at lower end and are 12 or 15 feet long. They are thrust into the mud and the poler then pushes heavily against the end and runs back about 1/3 the length of the boat. Two or three men pole heavy canoes along 2 miles an hour or more in this way. These canoes are flat-bottomed with a broad flat platform extending up and out from bow and stern. This is the general shape of both large and small canoes except the very small ones which are merely dugouts. All of the larger canoes have wooden knees on the inside.

April 7: Today we left on horseback for a camp that I made on the edge of the virgin forest about 10 miles north of town. The road led over slightly rolling country covered with thick second growth. Our road led through some miles of matted jungle where long thorny vines and bushes interlacing across the trail caused us much trouble in making our way. We camped under a ruined hut partly thatched with palm leaves and open on all sides to the weather. The thickets came close up on all sides and a few hundred yards away began the rougher hills covered with virgin forest. The trees and bushes were wholly tropical—cedar, mahogany, rubber, palms, Cecropias and others being conspicuous. The rocks are all limestone but water is very scarce everywhere except along the streams which occur at considerable intervals. We had an Indian hunter with us and a boy to attend to the camp. Peccaries, deer, Temesates, and monkeys (Atetes vellerosus) were the main game animals here but the two large species of pheasants were common and Chachalacas abundant.

The two last nights of our stay occurred heavy showers and on the
1894
Tuxtepeo
(Oaxaca)

10th of April I broke camp and returned to town. Our return was so
timed that we rode for over 2 hours through an extremely heavy rain
storm. We were wet to the skin at once after which we did not mind
the warm downpour which came in heavy drops that rattled through the
tree tops with a loud rushing noise that could be heard for a consider¬
able distance before the advancing storm reached us.

April 13: Took a canoe and descended the river to Otatitlan (About
20 miles by stream). Just as we left Tuxtepeo I saw the fin of a small
shark cutting the water and my men said that they are not uncommon up
to this point in the river. They are small "dogfish", 3 to 4 feet long.
A few crocodiles are also found along the river here although we saw
none.

April 14: We stayed here a few days in a small wooden hotel. The
rooms are rudely floored with brick and are little more than a series
of wooden boxes with walls about 9 or 10 feet high with a door in each
end and a tiled, pointed roof over all. Rude cots with a single sheet,
a rush mat, and a pillow are furnished for sleeping accommodations, at
fifty cents a night. Here, as elsewhere, in the hot country, the food
is cooked with so much oil or grease that it is very unpalatable to an
unsophisticated taste. North of this place a few miles are some grassy
llanos bordered by oak forest although the altitude is less than 300 ft.
above sea level. Nearer the river where the ground is damper, the
vegetation is similar to that near Tuxtepec. The latter place is about
the extreme lower limit of the damp climate that forms the humid tropi¬
cal belt along the foothills and low mountains. From about Otatitlan
and down to the coast, the climate is much drier and none of the recent
rains at Tuxtepec have reached here. Were it not for the fact that
this belt from here to the coast is so low that much of the ground is constantly damp and is overflowed in summer season this area would belong to the arid tropical belt. As it is, the higher ground is dry and partakes of the arid tropical in many of its vegetable and animal productions. The people are already coming here to pay devotions to the holy image and every day sees Indians in the white shirt and trousers among the men, and with white skirt and a long loose chemise-like garment with flowing sleeves, often richly embroidered, worn by the women. These are the costumes from Amatlan, near Cordoba mainly.

The Indians often bring a bunch of flowers that frequently have been dried and brought a long distance. These were heaped about the base of a large stone cross in front of the church. They then enter the church, after kneeling and crossing themselves at the cross, and kneel close to the door lighting each one a wax taper. After praying they advance to the altar on their knees, halting 14 times to represent the 14 stations of the cross, and the lighted taper is then put in one of the sockets arranged for them at foot of altar. This ends the devotion unless for some cause the pilgrim remains on his knees for some time. During the time of this pilgrimage drunkenness and gambling and allied forms of amusement are everywhere in the town. Three days are put in as the special time devoted to this image with the flourishing vices that attend these exhibitions of piety. The town is supplied with water from the river.

Chacatianguis

April 19: Returned to Chacatianguis by wagon and took the steamer down the river to Tlacotalpan where we arrived about dark.

April 23: Left Tlacotalpan on a small propeller launch for the district about San Andres Tuxtla. The route led first up the Rio San Juan
and then up through various side streams to a place called Alonso Lazaro. This is a ranch at the extreme head of navigation. The route from Tlaco-talpam here is wholly through low, flat country that is covered with water in the summer rainy season. The vegetation was like that about Tlaco-talpam. Hiring horses here, we arranged to leave early tomorrow morning.

Vic. of San Andres Tuxtla (Oaxaca)

S. Andres Tuxtla (Oaxaca) April 24: At 4 a.m., we were on horseback threading our way along the trail toward Tuxtla. The trees overhung the road like a dark wall upon each side, leaving a long open lane above through which the stars were shining brightly. The temperature was cool and pleasant. At length the sun came up as we reached the rolling hills which rise gradually toward the NE and E here to the low range toward which we are heading. For some hours we continued up through gradually rising country until at about 10 a.m. we reached Santiago Tuxtla at an altitude of about 750 feet. This is a town of a few thousand people located at the lower border of the wet belt of the mountains rising to the N and E. These mountains form the range of San Martin. From the outlying foothills to the summit this range is wholly volcanic. Among the foothills about Tuxtla are a number of small, clear streams. Some coffee is raised at this place. After stopping for breakfast here, we went on and after crossing some higher ridges than those we had encountered we came out at noon on a bold hill-top facing the valley in which is San Andres Tuxtla. Descending the steep slope, we crossed a part of the valley and entered upon the cobble-paved streets of the town and after some difficulty among irregular streets found the hotel. In the afternoon I saw the Jefe Politico and found him to be Don Carlos A. Pasquel, a gentleman who speaks English very well and who gave me some useful information regarding the country.
Armed with several letters of introduction from the Jefe at San Andres, I went on today to Catemaco, 6 leagues beyond Tuxtlas and 3 beyond San Andres. The town of San Andres lies at about 1000 feet altitude, and Catemaco at 1,100 feet, with some intervening hills a little higher.

The road ran over low ridges and across one or two narrow valleys until we came out at the town of Catemaco strung along a beautiful lake of the same name. The road crosses several remarkably clear creeks. The valleys about San Andres and thence to Catemaco are notable for the production of some of the finest tobacco grown in Mexico. Everywhere may be seen large thatched drying sheds with the hut-like houses of the laborers nearby.

The gentle slopes of these valleys and rolling hills all about are covered with rich volcanic soil, but there are few signs of the prosperity that should exist here. The land is peculiarly adapted to agriculture and the climate healthy, yet I found the owners of the land desirous to sell. Owing to the ready sale of tobacco grown here, land is held at pretty good prices. I was informed that from various causes such as too much or too little rain etc., the crop was poor 2 or 3 years out of 4, and it was only by the 4th year’s crop selling at a good price that the planters keep going. The large prices and great profits of the good seasons keep everyone having valley lands here in this business. The hills are not utilized for tobacco. All the way from Tuxtlas the road is bordered in places by belts of second growth woods containing Palo mulato, Rosa morada, and many other tropical trees.

Catemaco is strung for a mile along the shore of the lake near its outlet. Near the lower end of the lake the woods have been cut away and ranches are scattered all about the shore, but heavy forest borders most of the upper end and the slopes extend up rapidly into the high
range lying a few miles back. The lake is about 6 by 3 to 4 miles and
the greatest known depth is 46 feet. It is evidently a volcanic lake
formed by the uplifting of the lower end of a small valley into which
flow numerous fine large springs. Various species of fish common in
the river forming the outlet occur in the lake as well. Numerous caimans.

We rode into the town and I delivered my letter of introduction to
the Alcalde and with his aid we soon were installed in a large house
vacant except for a large colony of bats. Evening had set in before we
were settled and the Alcalde had ordered a couple of men to be brought
out of jail to bring our baggage to the house. He then called one of
them to one side and I heard him say to him in an undertone with a
fatherly inflection, "Now, if I leave you here to wait on these gentle-
men you will not go away, will you?" "No, sir," replied the prisoner,
whereupon the Alcalde came forward and informed me that he would leave
the man to attend to any service I had for him. He then took us out
and after going to a couple of houses found some people who were willing
to furnish us meals. He then took us to his own house for supper and we
met his wife and two attractive looking daughters of 14 and 17 years.
This family is nearly or quite all of Spanish descent and were most un-
expectedly frank and informal in their bearing.

During the night our servant slept in the hallway saying that he
would rather sleep there than to go back to the jail for the night.
Soon after the lights were extinguished a swarm of bats came whirring
through the rooms, uttering squeaking cries and making it impossible
to sleep. The next morning I found a considerable number of fruit-
eating bats hanging from the wooden rafters. Many of them were females,
each of the latter having a young one about one-third grown clinging to
her breast crosswise. So far as I have seen, bats have but a single
young at a time and the female carries it about with her until it is half-grown or more. Although the flight of the female is rather heavy when the young get to be large, it is surprising to see how active they are with a young one weighing about a third as much as the parent. In addition to these fruit eaters were a number of bats of the genus Molossus. These lived in crevices under the tiles and at intervals the males uttered a curious series of chattering and squeaking notes that had considerable variation and undoubtedly formed a song. These notes were usually heard at night or in morning and evening. In addition they had a curious low chattering note and low squeaky notes uttered in a conversational tone which arose to sharp querulous cries of complaint as they shuffled about and interfered one with another.

By the use of castnets and a few seines, many fish are taken from the lake here. In the wet season tobacco is grown and in the dry season the people do little but hunt, fish, and odd jobs. Several factories of cigars and cigarettes exist here and at San Andres. Several small craters, one containing a very deep lake called the Laguna Encantada, exist near Catemaco. Over Laguna Encantada was seen a pair of Harpy Eagles during our stay here. A good soda spring exists on the border of the lake a few miles above the town. Owing to the sluggish drainage of the lake its water is warm and of a brownish color although the tributary springs are of crystalline clearness.

Many canoes of various sizes are in use on the lake,—the larger ones having sail and oars, the others paddles. They are similar to the canoes on the San Juan and about Tlacotalpan. After several days a hunting party was organized and I went with them across the lake.

The wooded mountains coming down on about two-thirds of the lake shore and then rising back to summits 6,000 to 8,000 feet give the surroundings much the same picturesque air of Lake Patzcuaro.
1894
Catemaco
April

Rocky islets are found about the shores of the lake and are usually occupied by herons, blackbirds, etc., as nesting places.

Leaving Catemaco at 4 a.m. with a large canoe containing 10 men and a half dozen dogs of pretty good breed since they are direct descendants of hounds imported from the U.S. at considerable expense. (There is a considerable number of these dogs kept for deer hunting in this district and a pack of 15 or 20 can be readily gathered for a large hunt. These dogs are good only for deer, however, and curs are used for peccaries, tigers, and similar game. Other common dogs are trained to hunt Coelogenys poca and Dasyprocta mexicana—these two species living on dry wooded hillsides all about this locality). For an hour the men pulled steadily across the lake and then the day began to dawn gradually and the hills came out one by one and just at sunrise we came to the neighborhood of the opposite shore. On a rocky islet were a dozen or so snowy herons feeding at the water’s edge. When our canoe was a hundred yards away they flew up and away in wild alarm and my companions said that they were very shy now from the fact that a year ago a plume hunter had been here and killed many of them. They nest on a rocky islet partly covered with trees and bushes on this shore. A little further in we caught sight of a caiman lying on a rock at the water’s edge. We were about 80 yards away and a shot from my rifle through the spine at the foreshoulders disabled it so that it could not move. When we drew close to it in the canoe its head was still fully alive and made several efforts to throw itself from the rock. At the same time any object presented to the jaws was snapped at viciously. Throwing a noose over the head and jaws, the animal (about 9 feet long) was dragged through the water to our landing and hauled up on shore where it was left with the rope still on it. An hour later when one of the men returned to the boat it had disappeared, rope and all.

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The trip across the smooth surface of the lake in early dawn was especially pleasant as the moist air had a balmy temperature that was very agreeable. We left the canoe and went up to the house of the ranchman living here to whom I brought letters. He welcomed us cordially on the strength of these and insisted on our having coffee with him. He has a ranch here with from 100 to 200 cattle and has made a business of sending milk across to Catesmaco daily.

The land hereabouts is very fertile and where it has not been cleared a heavy forest exists down to the shore. After our coffee several of us took stations in a pasture near the edge of the forest just above the house and the dogs were put out into the woods. For about an hour they followed a trail back and forth on the wooded slope in front of us and finally a doe came down through the bushes and began to trot slyly across the pasture among the scattered brush. She came within about 80 yards of my stand and I shot her with my rifle. This, combined with my shot at the caiman seemed to convince my companions that I was a remarkable shot, as they said they always killed their game with buckshot. The rest of the day was put in trying to get more deer, without success.

The next morning we changed to another ranch on the shore at the head of the lake. This place had been planted to coffee a number of years ago but is now in a neglected and ruinous condition. Coffee growing here under the shade of large trees is slender and tall with few branches and no flower buds, while that growing where the sun can get at it appears thrifty and has a good supply of buds. Near this ranch a short time since, a dog treed a jaguar and kept it up the tree nearly all day by persistent barking. In the evening the tiger sprang down and killed and ate the dog and left. This occurred near enough the ranch where several men were living so that they heard the barking of the dog.
and knew that he had a tiger treed as a boy had seen it in the morning but none of them had sufficient courage to take a gun and kill it.

As a contrast between the style of living in this country and our own, I will cite the ranch where we were yesterday. The owner has some thousands of acres of land, at least 200 head of cattle and horses, besides some other property.

His home on the ranch is a mud daubed hut with a thatched roof and dirt floor. A couple of rude tables, 3 or 4 rude chairs and stools, a rough sleeping bunk and a scanty stock of dishes with no knives and forks and but few spoons make up the household furniture. The entire place has the appearance of squalid poverty with chickens and dogs overrunning everything. In the evening before retiring all of the chickens and a number of muscovy ducks were herded into the main room where they were kept regularly at night to keep them from tigers and other animals. This ranch is typical of thousands of others throughout central and southern Mexico, the owners of which have sufficient property to live comfortably but lack energy and desire to lift themselves above the merest necessities of life. In such surroundings they rear their children, and one generation succeeds another living and dying in brutal ignorance and indifference to all but the animal promptings and a little formal religion that has the character of fetishism.

At our new place we secured another deer and then wasted the rest of the day in vain search for others. I found several *Sciurus aureogaster* among the trees in the coffee plantation and secured them. In the evening we rowed out on the lake and sailed away to Catemaco again leaving the mountain summits behind us covered with wildly flying cloud masses that came whirling over the ridge and down toward the lake in angry masses. The sun set and the sky filled with a haze that made a mysteriously sombre twilight as though nature was pausing for some great convulsion. As darkness came on, the white caps ran about us and
Continued collecting here and secured specimen of Temesate, Coelognathus, Dasyprocta, Gallus barbara, Synatheres, and other commoner species. The Howling Monkey, Tanirus hairdi and southern peccary are all reported as occurring here, and evidently with good cause. The hunters also describe two well distinguished species of jaguars,—the tigre real and a larger tigre serrano. At times brown pelicans and Man-o'-War birds come sailing out over the lake from the coast. A great stretch of virgin forest runs from near the lake back to the summit of the high ridge of mountains lying between the head of lake and Coatzococales. This is the highest part of the mountains along the coast north of the Isthmus of Tehuantepec. The Mico de Noche (Cycloturus didactylus) is also reported to occur in the forests from Acayucan to the Volcano of Tuxtla. About town here the Quiscalus macrourus is semi-domesticated and flies in and out of the houses after food and makes regular raids upon the table for scraps after meals.

On May 6th we returned to San Andres Tuxtla. There I called on the Jefe Politico again and was surprised to learn that on the strength of my having expressed a desire to go to the summit of the Volcano of Tuxtla, he had ordered out all the people living near the volcano and some from about San Andres to the number of nearly 70 and they were now engaged in cutting a road through the forest to the summit. This being underway for my benefit, I had nothing to do but wait until the 10th when the road was reported finished and I prepared for the trip.

May 11th. Trip to Volcano of Tuxtla, locally known as San Martin. In the morning of the 11th, the Jefe had ready for me 18 men to serve
as guides, packers, and cook. Four of the men carried each 10 gallons of water in coal oil cases and the others had the provisions, bedding, tent, etc. They set out on foot an hour or more ahead and then with the guides I went on to join the party on horseback. To the NE of San Andres lies the mountain, and the road lay most of the way in a nearly direct line for it. Leaving the town we ascended the steep slope bordering the valley on the north side here to about an altitude of 2200 ft. The slope then became much gentler and we had soon left behind the cultivated land and entered a fine stretch of virgin forest.

Through this we continued for several miles until we came out on a long, narrow, grassy prairie which lies between 3300 ft. and 3500 ft. close to the base of the Volcano. Following this for a mile or two we swung sharply to the right and entered the forest again on a trail which led us up to the top of a ridge extending south-east from the volcano. We camped on the extreme top of this ridge at an altitude of 4400 feet. The vegetation of this ridge differs from that of the forest below and shows signs of being subjected to a much greater rainfall. The trees become stunted and slender near the top of the ridge and are everywhere hung with moss, giving the woods a dreary appearance in the misty fog that settled down as we reached this point. It is about 9 miles from here to San Andres and at this point where we camped the road cut to the summit began. At once after our arrival the men put up the large shelter tent for me and then built a thatched shelter of palm leaves opposite for themselves. They were a good-natured jolly crowd, laughing and evidently enjoying themselves. Before night came on I went out in the woods and looked about to see what birds could be found. *Turdus grayi* and *Hyadestes unicolor* were common and singing everywhere despite the cold drizzle. Beyond these birds, scarcely any feathered creatures were found and no traces of mammals except signs of *Geomys hispidus*, a
Volcano of Tuxtla

Sitomyys, and a Sorex. For these animals traps were set and many of the last two taken during the night.

The slender, bamboo-like palm from which the men made their shelter is abundant all through the forest here from 1200 to 4600 ft. Soon after we made camp two of the water carriers were sent back to town to bring up another load of water tomorrow and join us. Soon after dark we turned in, the men talking continually talking about tigers (jaguars) and the necessity of keeping a fire going to keep them away. About 9 p.m., a loud rushing sound came sweeping across the forest and we were suddenly enveloped in a terrific rainstorm that lasted nearly all night. A high cold wind accompanied the rain and swept across the ridge on which we were perched with disagreeable force. Water beat in under our shelter and flooded the ground so that the men were soon on foot. The fire was extinguished at once and the men put in the rest of the night miserably.

May 12: The day broke with rain still falling and the men were evidently tired of their trip. Several of them made remarks about the impossibility of going on and one asked me if I would still go to the mountain. I replied that we would certainly go on and then spent an hour or so scanning the sky. To my great pleasure, between 7 and 8 the rain ceased and the clouds began to break away. Camp was broken at once and I started on foot up the road cut through the woods for the volcano, followed by the entire party. (I had sent our horses back to San Andres last night). The trail had been cut along the top of the ridge leading to the volcano and swung up and down across several steep-walled canons that separated hills scattered along the ridge. In this way we wound along through the dripping forest until we finally came to the main mountain up the steep slope of which we advanced slowly and by zig-zag courses. At about 5,000 ft. altitude the vegetation became even more stunted than at 4500 ft. and mosses and lichens grew everywhere while
the bushes and scrubby trees made dense thickets. From 5000 ft. up the main vegetation is in the form of bushes among which are great patches of the Arreyan whose winter green-like odor filled the air. Great patches of orchids growing on the ground imbedded in masses of ground pine were passed over and in many places spongy mosses a foot or more deep carpeted all the ground among the close-growing low trees and bushes. Finally we came out on the summit and could look down into the crater. There are two of these,— one of which, the later one lying on the southwest side, is the most perfect and has cut off a portion of the older crater. The southern and southwestern walls are much the highest and form the highest point of the mountain,— 5650 ft. on SW side. On these sides are some cliffs, on other sides the craters are of easy access down easy slopes and the walls have a rounded top. The sides and tops of crater walls are overgrown with grass, bushes, and small trees and the bottoms are rather open and covered with grass. The most recent crater is about 600 by 500 yards in size and must be 700 or 800 ft. deep from the top of the highest point on border. The last two eruptions of this volcano were within historical time. The first in 1664 and the last March 2, 1793. The entire country to the south and southwest of this volcano for 6 or 8 miles in a straight line is covered with layers of volcanic sand of unknown depth. The vegetation on the sides of the volcano grows in this sand and has made only 1 to 2 or 3 inches of vegetable mould during the past century. In many places the mossy and orchidaceous growth may be stripped off in large flakes several feet across leaving the unmixed sand of the last eruption exposed. All about the slopes of the volcano and adjacent ridges nothing but sand can be seen but at the base of the main slopes about the grassy llanos already mentioned are some broken lava beds. The forest on the sloping plain from base of the volcano toward San Andres contain numbers of
extra ordinarily fine trees that must have withstood the ashy storm of the last eruption. The largest of these trees are wild figs. One of these was seen that would measure about 15 feet in diameter,—10 feet above ground, and about 75 ft. or more to the first branches. These large trees extend up to about 4500 feet on base of volcano. Owing to the gravelly character of the soil, no surface water is found anywhere about the volcano and adjacent slopes. It is wholly extinct. From the summit to the seashore in a straight line it is about 6 or 8 miles.

Owing to the situation of this mountain and its ridges close to the sea in the track of all N and NE winds from the gulf, it has an excessively damp climate and is covered with clouds and subjected to many heavy storms throughout the dry season. The climate of the mountain above 4500 feet is very cool as is evidenced by the abundance of mosses, lichens, stunted vegetation and the presence above 5000 ft. of several species of small plants not found elsewhere. No pines or other coniferous trees are found on this mountain although the climate is suitable for them. The vegetation is mainly derived from below. The men with me said that there are many wild cattle running in the forest on the seaward face of the volcano and that in summer they are often found grazing in the crater. The rolling hills between the volcano and coast are heavily forested and abound in game according to my men.

At the city of Orizaba and other places I was told that the Volcano of San Andres often emitted great noises, but could learn nothing of this in its immediate vicinity. Earthquake tremors are felt several times a year in this district and it is quite within the bounds of possibility that this volcano may burst out with another eruption sometime. Having taken specimens of the plants found on the summit, I turned about and decided to descend the mountain directly down the slope instead of along the ridge up which we came. Two men with machetes took the
lead, cutting the new trail down the very steep mountain side of the south slope, going directly toward the prairies or llanos at the base.

My two guides here took it into their heads to camp on the summit of the ridge again, in place of going down the slope and only by my insistence did they finally start down, both of them in very bad humor. We descended to 4400 feet and then camped on the first spot we had found with sufficiently gentle incline to enable us to make camp. The forest was tall and dense here with an abundance of the cone-like palms. The men soon had the camp made but none too soon as it began to rain again and continued nearly all night. The men profitted by last night's experience and made themselves a good hut of palm leaves. Both nights they constructed me a cot of poles that was very useful with the ground running with water.

During the night some of my men got up and circled about camp with a flaring fire-brand over their heads to drive away a jaguar which they claimed was moving about us. With persistent inquiries I could only learn of one case of a jaguar having injured anyone in this district. This was said to have been a man who camped alone in the forest without a fire and I am inclined to consider rather apocryphal. They do kill young cattle and horses. Despite their general harmlessness, nearly everyone among the natives here holds them in much dread. A negro cook I had was very much worried over the "tigers" at his camp.

May 13th: The rain nearly ceased about 7 a.m. and we broke camp and started down through the forest again en route for the llano. After cutting our way for some hours we finally came out on the grassy plain at about noon. There we found camped a party of hunters from San Andres who had barbecued a deer in banana leaves the night before. On their invitation we stopped and had dinner with them and then went on down the return trail and reached San Andres at about 4 p.m.
On going to the hotel, I found that the room I formerly occupied and in which some of my things were stored had an American in it who proved to be Mr. Bullis, American Vice-consul in Vera Cruz. The landlady put us in it also, and I proceeded to clear off a large table and to spread on it the miscellaneous gatherings of the trip, such as snakes, frogs, lizards, mice, birds, and shells, preparatory to labelling them. Soon after our fellow lodger came in and, after giving a surprised and horrified glance at the table, turned and went immediately to the landlady and got transferred to another room.

On the 14th I sent my assistant down to Tuxtla, 7 miles below, to do a couple of nights' trapping. He went down and after setting traps along a cliff, he shot a squirrel and went on to the town to find a hotel. When he came near the town, he was met by 3 policemen each carrying an old musket in one hand, at full cock. They asked for his gun and told him he was wanted at the jail. He gave up his gun and went with them and was put in jail where he was kept for several hours. While in with the other prisoners he walked about and showed some uneasiness at which his fellow prisoners, natives, tried to comfort him by saying, "Don't feel badly, we'll all get out tomorrow." As soon as put in he asked to be allowed to telegraph me and they said he could, but then kept putting him off until the office was shut. When first taken to jail he had told who he was and what doing. Finally they took him, late in evening, to the Alcalde and the latter had him give an account of himself and then said that a local law exists here that no one is permitted to hunt within half a league of the town without a license and the latter are only given to responsible people, and no one is permitted to go on another's land without permission. "However," he added, "you are a stranger here and meant no harm, so I will not hold you responsible. You are at liberty." Then he said that the land
where my assistant hunted belonged to him and that he could hunt there as much as he liked. The reason for this strictness being that a few years since two factions of the towns people were rather unfriendly over land matters and there were five fatal hunting "accidents" by which five men of one side were shot while in company with men of the opposite side and all claimed to be accidents while hunting. It being too late to find a hotel when liberated, my assistant was invited to share the quarters of the captain of the police over the jail, which he did.

The next day he hunted on the land where he had been arrested the night before and found the men and guards very friendly. During the day an alarm was given that some one had been seen on the land and the policeman cocked his musket and then carrying it by the middle in his right hand he proceeded to hunt for the trespassers. Finally, not finding them, he uncocked the gun and began his watch again. He used charges of irregularly shaped slugs but from lead and, standing 50 yards from a large tree, fired at it to show how he could "bathe it in lead," as he expressed it. Not a slug touched the tree.

May 15th: Today I sent off my baggage by pack train for Alonso Lazaro and on the 16th at 5 a.m. left, myself, for Alonso Lazaro, picking up my assistant on the way. We arrived at the place at 11 a.m., just as the little steamer arrived and at 6 p.m. were again back at Tlacotalpan.

Tlacotalpan
(Vera Cruz)

May 17
to
May 29

The water supply for the town is brought in large red jars in canoes from about 5 miles up the Rio San Juan, the head of the brackishness from the effect of the tide. The tide is regular for a still greater distance up the Cosamaloapan. No mail being here for me, I found myself
Tlacotalpan (Vera Cruz)  
May 17 to May 29

out of funds, and put in my time getting reports up to date. Finally I learned that my mail had been sent to Paso San Juan the first of May. By telegram from that place, I learned that nothing had been received there.

During my waiting here I did some hunting and particularly learned something of the habits of the curious rail-like Montezuma's chicken or po-pose-cal.

At this place I have met a number of Americans searching for coffee land; several have been over considerable of the country and are now preparing to buy near Paso San Juan at an altitude of from 500 to 700 feet above sea level. There at a place called Buena Vista is located Dr. Cockrill, a son of Senator Cockrill of Missouri. A large number of Americans have come to Mexico within the past few months looking for coffee lands, but only a small percentage make actual purchases and start to cultivating the coffee.

Vera Cruz (Vera Cruz)

On May 30th I took steamer for Alvarado and thence proceeded to Vera Cruz. The U.S. Consul there told me that about 10 or 12 people a week are dying here now of yellow fever, mostly among people from the other parts of the country, or foreigners. He says that the natives suffer but little from it.

Orizaba (Vera Cruz)

May 31st: At 1 p.m., today we took the train for Orizaba. On the way up I again paid especial attention to the great number of drift boulders lying scattered over the plain between 500 and 1000 ft., along the line of the R.R. With them is a bed of conglomerated drift, gravel, etc., below, and I am much inclined to believe that the entire deposit is of glacial origin.
June 2: Left Orizaba and proceeded to the City of Tlaxcala where we remained over night. Was much disappointed to find this town to be small and to contain very little of interest. A large plaza shaded with fine trees (*Fraxinus berlandieri*) is the most attractive feature. An old government building or palace bears an inscription dated early in the century praising the faith and allegiance to Spain of the worthy citizens of this town and on the other side of this portal is an inscription praising the people’s devotion to the constitution.

June 3rd and 4th: We put in in the City of Puebla, in order to ship my baggage to Oaxaca.

June 5th: The tableland region continues from Puebla nearly to the limit of the state beyond Tehuacan. The R.R. Mexicano del Sur continues to descend until it reaches an altitude less than 2000 feet above the level of the sea, and all through this low area it is in an extremely arid belt belonging to the Arid Tropical. Then the road climbs up to over 6000 feet at Las Sedas and proceeds across a plain to the City of Oaxaca, at a little over 5,000 ft.

June 6th: We reached the City of Oaxaca last evening and as the train entered the station a crowd of about 200 people was seen on the platform, a couple of bands began to play and some fireworks were exploded in the street. On inquiry, I learned that this was in honor of General Martin Gonzalez who is candidate for governor of the State at the coming election. The crowd was a decidedly small one mainly of young men and boys and certainly made no very imposing welcome.

Oaxaca City is in a dry valley with a range of mountains rising to over 10,000 ft. just to the north of it. On all sides toward the horizon rise hills and mountains high enough to be covered with pine timber.
The climate is evidently Lower Sonoran (dry). The city is fair sized with a very good stone palace, or government building. The town has straight streets, mainly one story houses with barred windows, and about 30,000 inhabitants. It has several pretty parks or plazas shaded with the common ash of the tableland (*F. berlandieri*). Various ornamental shrubs, flowers, and some statuary deck these parks and render the city more attractive than it would be otherwise. The city was reached by railroad about a year ago and has since put up a good corrugated-iron market. It also enjoys electric lights and streetcars from the plaza to the depot. The two latter institutions can be found everywhere in Mexico in towns where there is no apparent warrant for them, to judge by the business carried on.

The valley about the city is full of scattered Zapotec Indian villages. The women from these villages within from three to ten miles come in every day with supplies of tortillas which they sell and thus supply the entire demand. As in most Mexican cities, the main business is in the hands of Spaniards, French, or Germans; the native Mexicans being found dealing only in a small way. The owners of property nearly doubled on their rents and values on the arrival of the railroad, but I heard one old merchant complain that the coming of the road had hurt the city as many people now went direct to Puebla and Mexico for supplies in place of buying here. The upper classes here usually dress in civilized fashion though the charro costume is common. Nine-tenths of the people, however, are Indians dressing in a loose shirt-like blouse that hangs free at the bottom and a pair of wide loose drawers made of the same unbleached drilling fastened at the waist under the blouse. Broad-rimmed, sugar loaf hats of felt or straw (often with a heavy cord) which often cost more by several times than the rest of the costume. The drawers are held in place by a double leather girdle which serves as a
money belt and must be removed in order that the wearer may take out any money. The feet may be covered with rudely made shoes, a pair of sandals called *Cacle* which is much like a coarse shoe with heel and upper over front half of foot gone. It is a cross between a sandal and a shoe and I have only seen it used here. Sandals are also used. The women use the common blue and black rebozo thrown over the shoulders when it is cool, but worn like a kind of turban on the head with flowing ends down the back during the heat of the day. A chemise with very short sleeves and very low neck. Over this is worn a skirt of coarse hand-woven woolen cloth, wide enough to reach between knee and ankle. This skirt is wrapped about the waist so that the fullness comes in front and is held in place by a cloth sash. This skirt is usually merely a straight piece of cloth. On the streets I saw a woman from Tehuantepec with a peculiar headdress called *huipil*. It is made of light gauzy muslin in the form of a sack with ornamental sleeves too small to admit the arms; and has abundant lace trimmings. The wearer either throws over her head the part answering to the lower end of the waist, letting the sleeves hang down her back, or encircles her face with what would be the neck. It presents a very picturesque appearance.

Around the Plaza de Armas are large portals supporting a second story to the stores which back them. Among the pillars are many tables with benches where open air restaurants or cafes are run for the poor people. Under the shade of the trees near by along the walk beyond the portals are a number of fruit stands, where various tropical and subtropical fruits are sold. Just after dark every evening these small traders light up with little lanterns and their swarthy customers gather about in crowds chattering in several Indian tongues as well as Spanish and a most interesting and picturesque scene is presented in the dim light out of which show faces and objects with the black background of the street beyond.
June 8th: Saw a fine archaeological collection with perfect data today. It belongs to a Dr. Sologuren who has been securing the pieces in this region for the past twelve years and has some remarkably fine things. Here, as in other parts of southern Mexico, I am told that a majority of the common people are living together without the form of marriage. The priests are opposed to civil marriage and through ignorance and religious prejudice many local officials evade the performance of marriages as often as possible. Mr. L. C. Smith tells me that in many instances when he has tried to get a couple of Indians to get married who have lived together for years, they object by saying they are ashamed to be married.

The official papers of Oaxaca and City of Mexico as well as numerous large posters on trees and walls in town gave a glowing eulogy of General Martin Gonzales and of his enthusiastic reception by the people of Oaxaca. The rabble-like crowd of from 100 to 200 people who met him at the same train which I arrived on certainly was no evidence of great popularity. The conservatives here speak very slightingly of the sorry show and the students of the State College come out in a card saying that while not desiring to be considered in opposition, necessarily, yet they wished to have it understood that the rather disreputable gathering at the depot on the night of the arrival of Gen. Gonzales contained none of the representative students of the College. This was rather unfortunate for the official organs, since they all claimed that the students had welcomed him with great effusion.

Soon after my arrival here I went to see the Governor now in office. He read my letter of recommendation from the Secretary of State and I told him that I wished a letter to the local officials in the state so that I could get reliable men through them. To this he at once made reply that I must pay for any men I got and after I finally satisfied
him that I had no intention of asking for any free service he told me to come the next day for my letter. I then told him that there was published by the state a pamphlet containing a list of plants and animals of the state that I desired to get. He claimed to know nothing of this but said he would make inquiries and let me have one with my letter if such a publication existed. The next day when I called for my letter I was told by the clerk who gave me my letter that such a list was published by the state and that I could buy a copy in the office of the state treasurer! This is the first instance since I came to Mexico as a representative of another government that the state officials have been so little desirous of forwarding my work that they grant letters of ordinary recommendation only under a kind of halting protest and then wish me to pay for a small official publication. The governor here did not appear to have the slightest desire to forward my work but merely to do just what was unavoidable. I was reminded very much of the kind of reception I had in Morelos although even there they expressed great willingness to give me any publications of the state. I presume that little else can be expected from officials in out of the way states of this country, but I have had such civil treatment and apparent willingness to assist me in other states that it is rather disagreeable to meet the contrary.

I have learned some curious details of election methods here which are rather interesting as showing how they are conducted. Before the presidential election each little town in this state chooses its electors who then go to the capital of the state and there cast their ballots for president. One of the electors chosen in one of the towns about a day's ride from Oaxaca was visited by the Jefe Politico just before time to go and told that it was best for him to claim that he was unable to go to the meeting on account of sickness. This man was
known to be in opposition to the present administration and he knew enough to take the hint, and stayed at home. In this way the elections are made practically unanimous. In the state of Hidalgo this condition of affairs has been going on for years and the family of the present governor has been in power without a break. Despite the fact that there are many people in the state bitterly opposed to their rule yet every succeeding election brings out the report that the present governor has been re-elected "unanimously". In voting, each man is required to place his name on his ballot so that there is no chance for a voter to escape having his way of voting known. The result is that few people of the opposition like to put themselves on record. The last of June, when leaving the City of Oaxaca, I was surprised to see a few posters on the walls of houses in out of the way corners at the edge of town announcing someone for governor in opposition of the official candidate, Gen. Gonzales. The bills read that the opposition candidate was proposed by the "Workmen's Club" of Oaxaca.

Mount Zempoaltepec

June 27th: Today I managed to get started for a trip to Mt. Zempoaltepec. I have been trying for over a week to get a man to go along, without success. Three different men came, two of whom saw me first and agreed to return, but failed to come. Another stayed 3 or 4 days and then left. The fourth one I found yesterday and he stayed but wished to take along his wife, or mistress. I agreed to let him do this as both of them are to walk. The mule I have for pack animal proved to be unaccustomed to packing and the bulky, heavy load I took was very awkward to manage. Every little while the load had to be repacked so that it took us all day to get the first ten miles on our road to the village of , where we were all very glad to arrive. The woman with my man proved to be very much more active and useful than
did the man himself. We travelled east from Oaxaca and about 6 miles out passed El Tule where stands the huge cypress tree of well known size.

June 28th: Altitude 5450 feet. Today our progress was much better than yesterday’s, and we made about 20 miles up the valley to the village of Mitla where are located the famous ruins. This is said to have been the residence of the high priest of the Zapotecos in the time of the arrival of Cortes in Mexico. The king, or political chief, lived far to the SW beyond the present City of Oaxaca.

The present village of Mitla is an insignificant collection of wattled huts and small adobe houses. The ruins show a high degree of designing skill. On the west side of the ruins is a mound-like elevation made of adobe bricks which was flat on top and approached by a flight of dressed stone steps on the east side (from side of main ruins). A Catholic chapel is on the top of this mound now. The largest and best preserved house is now roofless as are all the others. The buildings are all one story and were built of a mixture of adobe mud and rough stones as the main part of the heavy walls, but were faced outside with very accurately dressed stone in various grecques. These patterns are mainly worked out by the use of small stones worked down to almost brick-like form, but in other places the pattern is cut in the face of massive stones. Each of the main buildings is entered by three broad low doorways side by side in middle of building and the doors are capped by massive, accurately squared and finished stones. Those over the 3 doors of the best preserved building measure as follows:

The doors under these were 6 ft. 8 inches high.

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These doors led into the middle of one side of a hall running east and west a little over 110 ft., long down the center of which runs a series of smooth round pillars, each of a single stone, and measuring 11 ft. above the ground and from 9' 1" to 9' 3" in circumference about 5 feet from the ground. At the ground they measure 3 or 4 inches more and this taper is carried nearly to the top. The last few inches is rounded in much more rapidly. In center of this building is a small court surrounded by small rooms and the court and rooms have figured walls in same patterns as on exterior walls. The rooms of all these buildings were without any windows or other openings through the walls. All doors are broad with flat caps. I asked my Indian servant what he thought these ruins were made for, and he said they were the chapel of some saint, but he did not know which one.

June 29th: Remained in Mitla.

June 30th: San Miguel Albarradas. 6400 ft. altitude. Finding the load too much for my single pack animal, I hired another one to help us along today. Our road was an extremely rough one leading several miles up a rocky canon just above Mitla and then crossing several high ridges with very rough trails leading up rough slopes. The mule distinguished itself by falling backwards off the trail three or four times and gave us a great deal of work in addition to her skinning herself in several places. The vegetation of the dry hills over which we passed is that of the dry Lower Sonoran region. A manzanilla, many agaves, cacti, yuccas, an Ocotilla like that growing on plains of southern Arizona, acacias and many species I had not seen before. This continued up to 6500 ft. Then there was evidence of greater rainfall and several species of oaks (3) came in and predominated in the form of scrubby trees up to about 7000 feet, which was as high as our road took us.
The man I hired in Oaxaca as a packer turns out to be of no use, as he knows nothing of the business he has undertaken. The road continued rough and rocky until just before nightfall when we reached the little village named above. The steep hillslope on which San Miguel is perched is cultivated in small corn patches and as we passed along I was amused by being hailed by the Indians working in the fields calling out, "Buenos tardes! Adonde se va?" In the village of straggling adobe houses, thatched with yucca leaves peeled off the trunk in bunches by cutting the bark in squares. The houses were set irregularly about on the hillside and connected by irregular trails with numerous small trees and bushes forming hedges along their sides. About many of the houses were growing a few peach trees yielding unusually good fruit. We were piloted to one of the houses in the middle of the town evidently where the boys we met seemed to think that they had best accommodations for us. Here we unsaddled and stood about for an hour or more, the women claiming that the owner of the house was away but would be back soon. Becoming impatient, I sent for the Presidente of the town and showed him my letter from the Governor and told him I wished for some place to put my outfit under shelter as it was likely to rain. The Presidente could not read but a young fellow managed to make out the import of the letter and then ensued a long discussion as to the necessity of complying with my request (this between the Presidente and the one who read the letter). It then turned out that the unoccupied house belonged to a man who had gone away for several days and whose wife was stopping next door. I assured them of my desire to pay for any service and house room. Finally a reluctant consent was given us to put our things inside of the miserable dirt floored hovel and we got installed at about 9 p.m. and managed to get something to eat. My worthless Indian servant from Oaxaca now complained of being very sore from
July 1st: At 6 a.m., when the man I had hired from Mitla with his burro started home, my mose from Oaxaca deserted me, carrying away various small effects he had pilfered from the outfit and owing me several dollars he had secured as advance pay. Although his disappearance was no great loss owing to his general inefficiency, I was angry at his sneaking off in the manner he did. By this I was delayed here today looking for other men to accompany me. I made my wishes known to the Presidentes and asked him to find me a man to go along as packer and two others to carry part of the outfit. This he promised to do but insisted on my paying double prices. In the morning some eggs were brought me for sale at 4 for 6 cents, but I had no change. A little later the Presidente came and told me that I could not buy any more eggs at that price but must pay at the rate of 3 for 6 cents. He also informed me that I could get no men to go more than a single day’s journey from this place. Throughout he acted exactly as if he desired to do as little as possible for me and to make me pay to the utmost limit. In the middle of the forenoon, he came about again accompanied by another Indian, both half drunk. They talked and talked about nothing and the companion of the Presidente told me that he was the Regidor, taking a little walk about the town with the Presidente. After repeatedly saying this, he seized my hand and kissed it effusively, and then asked me if I would not give him 3 cents for a morning drink. I finally did this to get rid of him, but the relief was merely temporary as the pair were an intolerable nuisance all day, the Regidor not satisfied with kissing my hand became so affectionate that I had to hold him off by main force.

In the afternoon the Presidente came and told me that I must pay for my men then or they would not go tomorrow. This I did, as he could
make me too much delay if I objected. When he had the money in hand
he exclaimed "Now it is arranged!" as though nothing had been done up
to that time. He then called up three men and divided the money up
among them and said they would be on hand in the morning. I hoped they
would, that I might get away from this miserable little place.

July 2: According to plan, we found the men on hand in the morning
and soon got under way. The road led down a long steep slope from the
altitude of 6500 feet to 5000 feet at the bottom of the canon through
which flows a small stream. All the way down the slope is covered with
scrubby oaks of 2 species which I secured and at 5200 feet down to 5000
were numerous Junipers of which I took a specimen. Crossing the stream,
we climbed the opposite slope through the village of Santa Catarina
where we entered one of the main trails from Yalalag to Oaxaca. This
trail led us up a long, rough, broken slope overgrown with scrubby oaks
and a few madronas and alders to the crest of a high ridge at an alti-
tude of 8000 ft.

The slope we had been ascending is rather dry and the vegetation
is small. As we reached the summit and descended on the other side, a
sudden and striking change to a heavy forest of large oaks and madronas
with a rank growth of grass and bushes in openings marked the abundant
rainfall that occurs, this slope fronting the NE and catching the moist-
ure-laden winds from the Gulf. There were also pines growing along this
ridge in scattered forest among the other trees.

This is a part of the main range between the mountains north of
the City of Oaxaca and the group about Zempoaltepec. The road now led
down long steep slopes past various small Indian fields on the hillsides
until just at evening we entered the village of San Pablo Yaganisa,-
another small Zapoteco village like San Miguel. It is located at an
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San Pablo Yaganiza

altitude of 3900 feet. Many bananas were growing in the yards about the houses. The place is at the mouth of a canon down which flows a small stream into the deeper canon below.

As we rode down the final slope to the village, we passed a number of women washing clothes in a small spring stream issuing in a little gulch beside the road. Some of them were naked to the waist and were quite indifferent to our passage. Others were carrying water into town in large black jars slung over the forehead by a band and hanging against the hips behind in a net made of maguey cord.

In the edge of town we stopped and I had one of my men to ask one of the women we saw looking at us from a doorway where we could find the President. She replied that the latter had gone away and was not in town. I then told my men to ask for any of the officials as any of them would serve my purpose to provide us a place to stop. After explaining my wants, the woman who had just denied the presence of the President announced that she would go to his house and get him—which she did in less than five minutes. He came slowly along and stopped about ten or fifteen steps away as if afraid to venture nearer. I held out my official letter to him but he made no motion to come nearer. My men explained what I wanted and he finally said I could stop at the municipal building at the edge of town. He then led the way and we crossed the village and went up on a small hill where we found the public building to be a small adobe house facing a church on the top of the little knoll. My first inquiries were for horse feed and some fruit and eggs. The President went away and came back carrying a load of corn fodder. He said there were some eggs and bananas for sale but did not send anyone with them and my men had hard work to get the people to sell a few things although they were themselves Zapatecos.

The President said there were no men I could get to go with me to
Yalalag (about 6 or 7 miles further). At this I set to work and persuaded my men who had come from San Miguel to go on to Yalalag, although the Presidents of San Miguel had positively insisted that they would go no farther than the present place. The Presidents hung about for an hour after he had been paid for the corn feed and finally asked one of my men to ask me to give him 3¢ for bringing the feed, which I did. He constantly kept some yards away with the distrustful air of some half wild animal.

In the evening, just as we were going to bed, a number of young fellows came and pushed the door open and came into the room evidently curious to see the strangers. They were good-natured and some of them talked a little Spanish. Several of them wished to know if we needed men to go on with us, announcing their readiness to do so. Coming directly after the President's statement that no men could be obtained here, it seemed rather strange. Why these officials here and at San Miguel should assume an obstructive policy is difficult to understand.

July 5: At 7 a.m., we left for Yalalag. The road leads along the hillside for a couple of miles and then down a long steep slope to a river lying at an altitude of only 1300 feet. Along the slope of this trying descent as well as about San Pablo Yaganiza the climate is arid tropical. There are some scattered scrubby oaks but most of the vegetation is that of the arid tropical areas.

At the river we overtook the Presidents and a number of people from Yaganiza on their way to the market at Yalalag, this being the regular day. At the crossing here we were surprised to see a fine suspension bridge swung from bank to bank of the stream. It was made of heavy cables formed of strong grapevines lashed into large round ropes, several of these united below as the foundation of the bridge. On
each side about 5 feet above and 3 feet each way from the center other heavy cables extended parallel to the bottom one with which they were united by a network of smaller vines so that the weight was borne equally by all of the cables. The passageway thus became a V-shaped one. The ends were fastened to some posts firmly planted near the bank and to some sycamore trees growing there. The posts extended much higher than the bridge and were guyed to various posts set in the banks farther back from the river. In order to have the bridge swing clear of the river it is hung about 15 or 18 feet from the ground at each end and a strong log ladder leads up to it. It is a very ingenious structure, wholly the work of the Indians who told me that they obtained the grape vines from the high mountains back from the river 10 or 12 miles. To gather the tons of vines necessary for this work was no small job, while to swing it in place was much more difficult.

From here we climbed rapidly up the slope to an altitude of 3800 ft. and entered the large Zapoteco village of Yalalag. Penetrating the center of the town we found a small plaza with a fountain and a dense crowd of Zapoteco and Mije Indians gathered for market day. I soon found the Presidente in his office—a dirty, mud walled, dirt floored room with a few benches and a table of the rudest make. He proved to be a more intelligent man than those I had met recently and at once read my letter and then took me to the adjacent school room where he permitted me to take up my quarters as there is now vacation and the town affords no accommodations to guests although it contains from 1500 to 2000 people.

Next to the school room we found the mother of the school teacher living and she agreed to furnish us with our meals while we were here. She was a talkative woman (Mestizo) and said she was only stopping here with her son for a short time until she could join her husband in the town of Ixtlan where he had been appointed the secretary of the local
judge who was her son-in-law. Here she was living in a room with her son and his wife and the only furniture consisted of a couple of palm mats laid in two corners on which a couple of cheap blankets marked the sleeping places. The kitchen outfit was barely sufficient for the scanty supply necessary for my assistant and myself. The old woman was a cheerful person and amused me by her scorn of the people of the present place owing to their ignorance. After getting settled I hastened out into the plaza close by and wandered about watching the picturesque figures of the Indians who have not had sufficient intercourse with outsiders to change their primitive habits and costumes to any extent. The natives of the town are Zapotecos. The women wear white skirts of unbleached cotton reaching to the ankles. Over this is worn a wide flowing tunic of same material falling in straight folds from neck to knees with broad loose sleeves. These women all have the hair dressed in two braids falling behind the ears and interwoven with the hair are numerous long black woolen strings which extend the braids down nearly to the knees. These huge braids of string are twisted about the ends with yarn to keep the ends in place and then the braids are twisted turban-like about the head each braid being passed in and out over the opposite one. The ends are then tucked in behind and the effect is that of a large black turban. The Yalalag men wear the usual costume of a pair of white cotton trousers, skirt, sandals and straw or felt hat. The Mije women could be at once distinguished by their hair having its woolen strings made up of alternate black and red strings also by their skirt and tunic cut on same pattern as that of the Yalalag women, being of coarse homespun cotton cloth of a black ground color with some narrow dingy white stripes crossing the cloth. About their necks some of these women wore huge masses of small bead necklaces often aggregating several pounds in weight. Blue, red, and black were the favorite colors of the
The Mije men are wild looking fellows with broad homespun trousers of white cotton cloth reaching between knee and ankle and flapping about as they walk. A short shirt reaching but little below the waist, and sandals, made up most of the costume. Some wore small crowned hats of leather having wide straight rims. Others had black felt hats of the same form. Like the Zapotecos they have slight beards of straggling chin hairs, in many cases.

The marketing was going on with a constant buzzing of chaffering and gossiping among the people. Under the shade of a large tree were sellers of dry salted meats cut in small string like bunches and beside them two or three men with rude axes were cutting up a freshly killed beef or cutting off long strips of flesh. Fruits, vegetables, corn, beans, serapes, rebozos, cotton cloth and prints, raw cotton, hats, sandals, maguey fibre cords and ropes were among the varied articles being sold. Everything seemed to have been brought in on the backs of the people and was sold from hampers or small mats spread on the ground. The people doing the buying were mainly women who went about often in groups of 2 to 3 or 4 and squatted on their haunches while chaffering with the sellers constantly referring to one another and handling over nearly all of the stock every time before buying a few cents' worth of material of any kind. The town is situated on a steep hillslope which is terraced to afford a level building spot for the houses and yards.

On asking from the Presidente the service of a moso for the trip, he showed the same unaccountable reluctance shown by the two others I had recently met. He assured me that I could only hire men here to go on to my next stopping place. I finally got my packer, who came from San Miguel, to go on with me and the Presidente brought 2 Mije Indians around in the p.m. saying that they were willing to pack my stuff a day
further on the way to Yacochi, where they were living. The Presidente then told me that I must pay them then in order that they would feel under obligation to come for the things in the morning. I did this and the man went off promising to be on hand in the morning. In the evening my packer became pretty drunk in celebration of his new bargain and talked loud and self-importantly. Was glad when bedtime came so I could get rid of him. The people are suffering much from smallpox and croup here now I am told—several persons dying daily.

July 4: Early in the morning we left Yalalag with our Indian packers. The trail out of town here leads in a winding course up the hill to the SE toward Mount Zempoaltepec. There are several large well-made trails leading in swinging grades up or down the steep slope from Yalalag. On all of these trails are built little adobe shrines of a single room 6 to 8 feet square with a good roof and a door. Inside is a small altar on which various small images or pictures grace the back; flowers are continually placed. These shrines are remarkably numerous, numbering from two or three to a half dozen along each trail within a mile or two of town. As the Indians pass they stop to cross themselves or place a few flowers on the altar and then go on. As we followed our carriers out of town we lost sight of them but were guided on our way by Indian women in the yards we passed. They all seemed to know where we were going and stopped us if we failed to keep the right road as occurred several times in the winding lanes that served as streets. Just out of town we overtook our men and kept along together the rest of the day.

The road led up and up until at 5000 feet we entered among a thin small growth of two species of oaks, *Quercus grisea* var. and another rounded leaved one both of which are commonly the ordinary species along the lower limit of the pines. Scattered pines descend here on some slopes
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Yacochi
to about 4000 feet but the regular forest is from 5000 to 7000 feet. It
does not amount to much in today's route but is small and scattered
and mixed with oaks. A large part of the hillslopes are grown over
with small bushes and herbaceous plants.

After skirting the ridge back of Yalalag for some miles, we crossed
it and began a series of sharp up and down steep slopes for the rest of
the day. Descending into a canon bottom at 6000 feet we at once began
the ascent to the opposite crest at 7000 feet and then down to less than
6000 feet, only to go up again to 7800 feet at Yacochi. Everywhere a-
long the roadside trails branched off to little fields cultivated on
slopes so steep that many places could only be cultivated by hand.
Mud walled huts with roofs thatched with grass made the homes of the
people and very few signs of domestic animals were seen. A few oxen
and dogs with rarely a horse, burro, or mule made up the list of farm
animals although chickens and turkeys are seen at nearly every ranch.
The people came out and gazed at us, surprised, as we went by and a few
who could talk a little Spanish wished to know where we were going. At
about 6500 feet the oaks became more dense and the trees larger and
continued to increase as we ascended above this, though the pines ceased
at about 7000 feet and were replaced by oaks; - a thing that has never
occurred in our previous experience in this country. Many species of
plants new to us were also noted.

At 4 p.m. we climbed up a long excessively steep slope and entered
the straggling Mije village of Yacochi. It is perched on a high pro-
jecting shoulder of a ridge leading out on the western side of Mount
Zempoaltepue at an altitude of 7800 feet. The main peak is separated
from the hill on which the village stands by a deep gorge-like canon,
the hill of the village and the peak being at the two points of a semi-
circle opening to the south with the canon in the gulch. Climbing up
through the rocky lanes among the houses, so steep that stones or sticks are often set in to form a series of rude steps, we came out on a level platform above the living houses. On this levelled space about 50 by 75 yards across are built the church and a couple of small public buildings— all of the rudest character. They are all thatched with grass and the church walls are of stone, badly earthquake cracked. Near one edge of the platform a grass thatched shelter on 4 posts covered two bells founded in 1704. No one was about and we had to wait for our packers to arrive. As we passed through the town, a large share of the houses were closed and we learned afterward that the people were away in various places working, as the village lost its crop last year owing to too much rain. A cold wind came across the ridge above us driving over masses of misty vapor that hid the main summits and often drifted down into the valley.

Finally our men came and an hour was spent trying to get some of the local authorities up to get permission to occupy a room in one of the public buildings. The men I had as carriers belong here and one of them finally opened one of the houses and I took possession. After a while we found a local messenger of the authorities called "tupil", and paid him to bring some firewood. Our horses were staked out on some steep slopes nearby where a little grass is found. At sunset a raw wind swept down from the high ridge above us and made my woolen underclothing very serviceable.

July 5th to 8th: The morning after our arrival the head man of the village (Presidente) came up and I explained to him the object of my visit, but he acted shy and uncomfortable all the time and after assenting to our remaining went off as soon as possible. We continued working the vicinity of this place with very good success for several days, the people acting shy and distrustful but not interfering with our going
and coming in any way. It was curious to note the constancy with which the villagers, men and women, paid daily devotions to the images of Virgin and saints in the rude church. Fresh flowers were brought for the altar in front of images and each man or woman coming singly or one member of a family always carried a little clay vessel open at top and partly full of burning coals on which were dropped incense gums during the devotions. The vessels were all rudely made and shaped thus:

The first devotions were paid by some of the men just after the ringing of the matin bell at 5 a.m., or earlier. Then at about 7:30 the President stood on the edge of the terrace official cane in hand and uttered a series of loud calls which were soon answered by a string of villagers winding up the paths from the houses on the slopes below, each with a small wax candle and many incense burners in hand. They filed silently into the church whence could be heard the low muttering of prayers of ten or fifteen minutes after which all came out and dispersed. At other times during the day the President made a custom of coming up to the terrace and from two different points which commanded the houses on the slopes below he called down to the people seeming to have some formal calls of which I could not learn the meaning.

The first day or two we were here the men came about and showed a little curiosity in our presence, after which they gradually avoided us more and more. For two days a few eggs were sold us and then they brought these no more, and I had reason to think that the President had instructed the people to have as little intercourse with us as possible. As our quarters were located just where the main trail to several villages passed, we saw an endless string of men pass by loaded with corn, salt, or fruit on route to various towns where markets are held. These people were usually professional carriers and pack a load of 100 pounds for from 15 to 25 miles a day across these mountains. A
considerable number of the packers were carrying corn to neighboring villages where the people are wholly dependent on outside supplies as the crop throughout this district was a failure last year owing to too heavy rains. The houses on the steep slopes about the village here are all built in niche like terraces cut in the hillslope and the cultivated land is so steep that in many places no oxen could be used. I saw stones started and roll with accelerating speed from top to bottom of one of these hills through the growing corn. The hill is covered with zig-zag trails laid out so to take advantage of the slope. In all dealings with the people here they showed the greatest distrust even in the simplest things and invariably demanded pay in advance before doing even the slightest service. The "Tupil" who did our wood and water bringing throughout our 8 days' stay here made a rule to the last of never bringing a jar of water even from a spring about 150 yards away without first demanding and receiving his pay. Taking such trails in consideration with the fact that no service whatever would be rendered by most of the people and it was evident that these people were not pleasant ones to be among. In addition to this, in two or three instances in which they had the opportunity, they stole such things as possible from us and the Alcalde was twice caught trying to steal a mat worth about 12 cents.

July 10th: Today I made a trip up to the summit of Mount Zempoaltepec and found by my Aneroid that instead of having an altitude of 13,100 feet as given on my map, it really has only about 11,400 feet. I was certain that it could not have the height given as soon as we reached Yacochi and I saw the peak close by. On the slopes about Yacochi and extending thence up to about 9000 feet on the western and SW slope of the mountain cleared areas planted to corn or overgrown with low second growth brush extend in points and island-like spots among the oak timber that covers all unreclaimed areas of the western slope of this mountain.
and the untouched forest covers not over one-half if as much of the
surface below 9000 feet. The main range of mountains coming in from
a northerly direction has a high summit of about 10,000 feet altitude
just north of the main mountain. A high narrow ridge with a saddle
at 8000 ft. between connects the two peaks. This ridge runs in a
northerly course so that the easterly and north-easterly moisture laden
winds from the gulf and the low hot coast country come sweeping up and
pour almost constant masses of clouds and mist over the top of the ridge
and down a short distance on the west slope when a sudden change to a
vegetation of a much drier zone is noted. The top of the ridge from
about 7500 ft. up is covered with heavy oak forest which becomes heav¬
ier and denser on top of the ridge and still more so down the east
slope. On the top of the ridge up to an altitude of 10,000 feet, I
found dense oak woods thickly grown up to brush with interlaced matted
growths of large ferns and a long slender creeping cane. From the
branches of the trees hangs a great abundance of olive brown pendant
mosses, giving a very gloomy appearance to the forest whose sad colored
depths are constantly dropping water from the spongy mosses and other
growths on the branches and trunks. Above 9000 feet the undergrowth is
much less common and the bare leaf-coated ground is abundantly dotted
with beautiful rose-colored"Indian pipe" flowers whose delicate colors
are particularly attractive in the dull, gloomy surroundings.

Wherever openings occur in this forest as along the trails or other
places where the trees are gone the abundance of flowers is remarkable
along this ridge from 8000 feet to 10,000 ft. Hundreds of graceful
crimson petalled lilies and a great variety of other flowers abound.
From 9,000 to 10,000 feet, a beautiful scarlet flowered creeping plant
which was common down to 7800 feet becomes very abundant and for a
couple of miles carpets each side of the trail with the most brilliant
colored mass of flowers I have ever seen. Great masses of these flowers extend up to 10,000 feet where they cease abruptly with the oaks. On the west slope a species of pine climbs up on outlying ridges to about 7500 feet. Thence to about 10,000 feet is a belt of oak timber wholly devoid of pines. At about 10,000 feet the oaks cease abruptly and the pines come in and form a scattered forest of scrubby trees ranging thence up to the summit. An abundant growth of bunch grass and many flowers occur within the pine area that are not found elsewhere. A good trail leads up through the forest nearly to the limit of the oaks and then turns down the east slope. A small branch trail turns aside from this and follows on up the ridge and keeping along it I was interested to find it leading directly for the rocky summit. I had no trouble in riding my horse to the foot of the rocky ridge forming the peak and within about 150 feet of the top. There I tied my horse to a pine and followed the trail up to the very summit. There I was surprised to find an accounting for the trail I had followed in seeing that the extreme summit is evidently used as a place of sacrifice to some of the ancient deities.

The extreme summit consists of a narrow ridge of rocks with a small rounded, partly level space a few steps across at the extreme top and connected directly with a narrow ridge of rocks and earth extending to the south for some distance at only a few feet lower elevation. To the north, east, and west the summit thus stands up like a projecting knob of rock with scattered stunted pines on the steep sides and along the ridge to the south. The top of the knob is overgrown with small bushes, grasses, and flowering herbs wherever the crevices and shelves in the rock contain soil sufficient to nourish them, but is free from trees. On this bare rocky peak or knob I found gathered the feathers of scores of turkeys and a rude semicircular shrine of roughly
laid up rocks marked one of the points of devotion. An older but now
disused shrine had been made close by among the loose rocks. The tur-
key feathers covered all the level space on top of the rocks where
small bushes and other plants permitted the feathers to become matted
among their stems and so not be blown away. In addition to the turkey
feathers were seen fragments of shells of turkey eggs and pieces of
broken clay pots of rounded shape and full of round holes half an inch
or more in diameter, thus:

The holes were evidently made while the clay was soft. The pots were four to five inches in diameter and
were probably used for burning some kind of incense. I could find no
bones of the turkeys but marks of large fires were to be seen on the
ridge close to the rocks. While searching about the sides of the rocky
summit, I saw where some animal had dug a hole into the earthy slope
40 or 50 feet below the summit and was interested to note that a large
percentage of the soil seemed to be made up of broken fragments of
pottery like those lying about on the summit.

After my return to camp a man came along from a neighboring village
and in reply to my questions replied that the people of Yacochi and
neighboring villages are in the habit of taking live turkeys up to the
peak and offering their blood as a sacrifice to the spirit resident
there. The feathers are also left as an offering and the flesh is often
cooked and placed in some hidden spot close by for the repast of the
spirit. The people make these offerings about the middle of January
and July each year and my informant told me to notice the first fine
day after my visit and I would see many men pass each with a live tur-
key on his back on his way to make the offering of the season in order
to get good crops. On July 12th this took place and without special
attention I noted seven or eight men go by, each with his turkey as
foretold. One of the men who went was from the house of the sexton of
the church here. I was also told that similar offerings are made at a small lake in the mountains above Villa Alta. There cooked turkeys are hidden in the tall grass growing near the lake. The constant attendance of these same people at the church makes it evident that they intend to get something from both sides if possible as they are taught that the gods they worship on the mountains are devils. I was told of a number of cases in which the worshipers of the devils of the mountains had secured great riches but at the time of their death had suddenly vanished as their bodies had been claimed by the devil to whom they were bound.

The people of the Nige tribe are very timid and firearms are extremely scarce among them while none of them have any idea of hunting. They seem to be almost entirely vegetable eating with corn as the main article of food.

July 12th: In the early morning yesterday, my Indian servant from San Miguel was struck accidentally in the muscle of the right arm near the shoulder by a glancing pellet of no. 6 shot. It penetrated deeply and he complained that it hurt him considerably. After breakfast, he took a gourd water bottle and said he would bring some water. He left camp and evidently at once started for home as he has not been seen since. This is the second desertion on this trip. He left owing me about 6 dollars money advanced on his pay account.

The people of the town still show their unfriendly disposition and have even stopped ringing the matin and vesper bells that were rung so regularly the first days of our presence. I told the people that I wished to engage two men to go with me to Totentepes tomorrow whereupon the Presidente and Alcalde both came to see me and when I stated my desire they informed me that I would have to pay $2. for each man. As 50 cents is large pay per day here, I objected to paying four times
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that price and after some talk and reference to my official letter, I managed to get the price down to $1.12 each which I agreed to as the two old scoundrels said I could have no men unless I paid that price. It is with feelings of great relief that we pack up to leave this inhospitable place.

While at Yacochi, I obtained a few names of birds and mammals. They call the peak Ze-huäl-ti-péc, but at Totontepec it is called Zempoaltepec.

Bird names

| Chamaeospiza  | yük-puh |
| Dark colored thrush | yük-tsin |
| Flicker | kū-yūm |
| Catherpes mex. | sa-viśh |
| Trogon | kah-shk |
| Large Hammer | sűcks |
| Blk. Red-tail hawk | wiś-tsün |

Mammal names

| Civet Cat | ḫlah |
| Heteromyys | āks |
| Arvicola | nūhak |
| Sitomys | tsūk |
| Geomys | tī-hiśts |
| Rabbits | kōi-h |
| Squirrel | āhs-kēk |
| Deer | hōh-pū-ūt |
| Shrews | wiⁿts |

1895

Acapulco (Guerrero)

On January 1, 1895, we left our camp at La Venta de Aguncatillo and, crossing a sandy flat ascended to the top of a low ridge. From the top of this pass at about 1000 feet, we could see the ocean and across to the shore of the bay lay the town of Acapulco, about 6 miles beyond. Descending the steep rocky slope we came to a gate and custom house where all articles entering the town pay portaggo duties. By use of my letters, I managed to get our outfit through without examination. Descending to the narrow plain which lies between the foothills and the bay glimpses of the sea were seen but soon shut off by the sçocanut groves scattered along the shore. The hills are lying all about the oval bay forming the harbor. This bay is 3 or 4 miles across and is partly shut in from the sea by a couple of rocky islands, making a fine
sheltered anchorage just in front of town which lies at the north side of the bay. A small old-fashioned fort with moat and drawbridge is built on a low hill at the edge of town on the shore and a quarantine hospital is built on the outer island.

The town is along the water and thence up the slope of the bordering hills and contains about 4,000 people. Close by is a graveyard said to contain over 100,000 dead, including two American Consuls, thus showing the deadly character of the climate. The present consul, Edgar Battle, told me that the deaths here far exceed the births. The town is very poorly built mainly of adobe houses all of one story except some 4 or 5. About the borders of town and numbering over half the population are the jacosles of the native people. This is a coaling station of the P.M.S.S.Co. and many war vessels coal here. A considerable percentage of the natives here are of mixed Negro and Indian blood.

The hills which rise all about the bay are of granite and are overgrown with low woods of scrubby trees and bushes. Between the town and sea a narrow ridge cuts off the breeze and is supposed to add to the unhealthiness of the town. The people began a cut through a narrow and low part of this barrier some years ago but gave it up and it now lies like so many other things in this country that are started with great enthusiasm only to be abandoned as soon as the novelty of the idea wears off.

On our arrival we found the Hotel Pacifico where the U.S. Consul and a few other Americans were boarding. Among these I was surprised to meet Dr. E. Palmer, who is here collecting plants. From the 1st to the 9th of January we remained at Acapulco resting from the trip and working the vicinity.

For the last two days on the road in, and two days after my arrival, I coughed a little blood, but this soon ceased and I soon felt pretty
In Acapulco are stationed 1500 soldiers which are held as a menace since the insurrection in this region, the fall of 1893. The presence of these troops has added to the general unhealthiness of the town. The soldiers are followed by their women and some children and these camp about in all manner of shelters and are seen cooking messes of food for their men over little fires in corners and sheltered places near the quarters. These women have the reputation of being great thieves and are said to steal all manner of small articles that they encounter about town. The soldiers are also equally bad as they are largely made up of criminals who are forced to enlist. During our stay at Acapulco several parties, one consisting of between 20 and 30 men, were brought into town under a strong guard and were enlisted. These are mainly men taken from jails, about the country, where they were confined for various offences and were released and brought in by the recruiting party sent out to get a new supply of men. These men desert at every opportunity. My assistant was going along a trail at the foot of the hill beyond town one morning when a soldier came running by, gun in hand and panting, with a scared look on his face, and as he came unexpectedly upon Goldman he exclaimed "You have not seen a soldier running away with a gun near here have you?" and, not waiting for a reply, continued his flight directly after getting out of sight along the trail he turned into the thicket and was not seen again.

During my stay here the soldiers were drilled on an open space along the seashore and a narrow stone walled open ditch about 18 to 24 inches wide crossed the drill ground. The company of Rurales here were taken across this small opening many times and never without from one to 6 or 8 of the horses falling in this insignificant ditch which was so narrow that the infantry marched across it without breaking their step. It
Acapulco  
(Guerrero)

was a ridiculous performance to see this much noted body of cavalry partly rolling on the ground and the rest of the troop broken into great confusion by such an obstacle. During one drill witnessed, the soldiers were given a rest in the middle of the exercises and the ever present women swarmed in among the men the moment the ranks were broken. Many of these women carried clay jars and dishes with food and numbers of the men ate on the spot. The necessity for eating thus could not have been great as the drill only lasted for two hours in the last half of the p.m. and was held within 10 minutes walk of the barracks. This is a great peculiarity of these people, however, to eat at all hours and places. One sees it in travelling as sellers of cooked food swarm about the trains at a large proportion of the stations and find buyers constantly so that one sees eating going on from morning until night.

Many limes of a good, thin skinned quality are shipped to San Francisco from this place. Living here is the family of a son of the old Californian Sutter of Sutter's Fort and early gold digging excitement. They are from a Mexican mother, but all talk English.

While walking through the bushes at the border of town one day, I ran across the old cannons that once formed the defence of the fort, but have been thrown aside here as out of date and useless.

Back of town the hills rise in a high ridge to from 2500 to 3000 feet and appear to be a broken spur-like range extending out from the high mountains of the interior.

The country in general is overgrown with thickets and low woods, nowhere becoming a heavy forest although many species of the humid tropical zone occur, such as mahogany, logwood (Falo de Campeche) India rubber, and others. The summer climate is damp and hot but the winters are hot and dry. At 2000 feet above town the climate is much cooler and two small species of oaks that I have not seen elsewhere were common.
One great cause of the unhealthiness of this locality is due to the
great change in temperature between night and day. The ordinary tempera-
ture in shade during the middle of the day was from 78 to 84°, while at
night there was a fall of from 12 to 20°. The air being damp this change
is a severe one and deaths from consumption are numerous. During my stay
I contracted a very severe cold which laid me up on the road.

Gold is reported to have been found in small grains and nuggets in
the small streams coming out of the hills near town here but no effort
has been made to develop any placers or other mines or even to prospect.
The authorities here are said not to look favorably on any work of this
kind.

On January 9th we made a trip along the coast in a canoe to the bay
of El Marques, a small bay just south of Acapulco bay, where it is said
that Cortes refitted his boats while working on this coast. This may be
a legendary idea with small foundation. At the Marques we stopped at
the ranch or Hacienda del Potrero and stayed for several days collecting.
The house where we stayed is built on a sand ridge within 100 yards of
the open seashore and the nights were very damp and cold. One unexpect-
ed thing noted along the coast here is the scarcity of sea fowl. A few
black skimmers, Man-o-War birds, and Brown Pelicans were all that were
noted. No sea weeds were seen either in Acapulco bay or elsewhere along
the shore.

During our stay on the coast the weather remained clear but a faint
smokiness in a layer over the sea showed the presence of a thin humid
belt.

The Hacienda del Potrero has about 5000 lime trees in a very neg-
lected state and full of mistletoe and other parasites. On the brush
grown sand dunes bordering the shore at this ranch are thousands of
large rabbits and about the cocoanut groves are many squirrels which
eat the nuts and flowers.

After several days here returned to Acapulco in a large dugout canoe with outriggers lashed across to project on each side thus: These are made of a couple of stout poles of equal length lashed crosswise on canoe and then a couple of lighter poles lashed across these projecting ends and having a downward curve. In the stern a man steers with a broadbladed paddle and 2 or 4 oarsmen row. The oars are lashed to an upright thole pin and have short rounded blades.

On the morning of January 27th, at 4:48 o'clock, I was awakened by the sudden outburst of furious barking of all the dogs in town. A moment later I heard a low faint roar like the sound of distant breakers. This increased rapidly apparently coming from the mountains until the air became filled with the loud swelling roar that seemed to come rushing upon the town like the terrifying sound of some fierce beast.

Suddenly the noise was at its loudest a sharp but light earthquake shock was felt and the noise died away toward the sea. This was the strangest and most startling noise I have heard coming from such a cause and was decidedly alarming.

Memorandum: Between January 25 and 28th, '95, the people of Acapulco were notified by a telegram to the Prefecto that the government wished them and the residents of the district to make it a loan of $40,000 to assist in paying expenses of the war with Guatemala (which has not been declared). There were several meetings of the business men and it was decided to raise the money provided the government would turn into a sinking fund to repay the loan all profits from the custom house there beginning with the date of the loan. To this proposition the government agreed I was informed afterward.

San Marcos 

On the 29th of January we left Acapulco and started back toward
Oaxaca keeping along the coast through the low hills and across level stretches. On the 30th we reached San Marcos, a village of perhaps a couple of thousand people. During the 29th, Goldman had a severe chill on the road and that night a high fever. We failed to reach any stopping place until after dark. Then we found a small group of wicker huts before some of which were burning small fires about which the women were cooking supper. Riding up to the first of these, I asked if we might stop for the night and was granted a ready assent. The people were part Indian and part Negro blood. They were well disposed and very civil. While we made our arrangements for the night, various villagers came up and sat about watching us curiously but with unobtrusive manners. The children were running about naked and the woman was naked to the waist, a calico skirt tied about the waist by a string being her only garment. For a small sum she let me have her wattle bed under a shed in front of the house where I slept. The raw air, added to the soreness of my throat so that when we reached San Marcos I felt compelled to give up going farther until it was better. Goldman also was sick from the fever so that both of us had the pleasure of being invalids at the same time. Fortunately we found a comfortable place to stop at the house of Senora Margarita Quinones.

January 31st to February 8th: We remained at San Marcos. I had a severe sore throat and inflamed bronchial tubes which were very difficult to cure. Fortunately it finally began to leave me (the inflammation) without any present serious consequences. As already noted, San Marcos contains several hundred (1200 to 1500) people. They are Indian and mixed bloods (Negro) and are a rough brutal lot of savages. The fall of 1893 they killed the government tax-collector here in a fiendish manner. A party of men were drinking with him in the most friendly way one evening in the house of Senora Quinones, and the next a.m. these
with others numbering about 25 in all caught the collector and taking
him outside of town stripped and shot him. Then they cut out his eyes
and tied him to a stout pole by one hand and one foot and then, holding
the naked body thus aloft, paraded through the town with it and after-
wards buried it half within and half without the consecrated ground of
the burial ground. None of the men taking part in this affair were
punished.

The chief sport of the men here is to get drunk and then parade the
streets firing guns and pistols sometimes for a large part of the night.
One of the leaders in this sport is said to be the Presidente. The
Senora Quinones is the widow of an old Mexican general and has with her
a daughter of 35 or 40 years,—also a widow, with several children. They
are much more civilized than the people among whom they live and have
the largest store and their house is the usual stopping place for trav-
ellers.

For the first 2 or 3 days of my stay here, the two women and the
children sat at the table with us but becoming a little acquainted they
lost their shyness and I was surprised to see them place their dinner
on the floor near the foot of the table on a cloth and the entire family
squatted about eating with their hands from little bowl-like earthen
dishes and a few plates without a knife, fork, or spoon. The old lady
divided the meat with her fingers among the others and the meal was
eaten after the true Indian fashion. This is an example of the un-
cultured status of these people yet the old lady had been in San Fran-
cisco and some other parts of California with her husband and came from
the tablelands of Guanajuato.

She served our meals the same way, i.e., tore the large pieces of
fried meat into small fragments with her fingers and also dismembered
chickens the same way. She was a very kind old woman and in doing such
things merely did as she was accustomed. Some roast meat was brought
on uncut one night and no knife provided, so I asked for a clean knife
to carve it. She looked about the table and then asked an Indian who
was eating at the foot of the table for the knife he was eating with
(he was a remarkable exception in this). He wiped the knife on the
tablecloth and handed it to her but I hastily interposed my own knife
and afterward managed to get along without expecting much refinement
of service.

Stopping at this place was a young French-American, Paul Silva, who
is hunting this coast with 4 native hunters after plumes of the white
heron. So far he has found them scarce and rather scattered. He has
been killing the birds since December for the few plumes some have and
the 25¢ he gets out of each skin. He reports alligators as being common
in the lagoons of the coast here. These do considerable damage to stock
and a few cases are told of their having killed people. Some are said
to attain great size.

Finally my health became so that I could proceed on the journey and
we left here on the 8th and travelled all day in a SE course and were
forced to keep going until nightfall overtook us before we reached the
town of Copala.

There we got permission to stop overnight at the house of the
storekeeper here named Macario Figueroa. Here we found the storekeeper
a half caste Spanish-Indian who does considerable business and is worth
some property. He is married to an Indian woman and had a boy of about
5 or 6 running about naked. For supper we had dried meat, coffee, tor-
tillas, and pepper sauce. For breakfast, the same. The meat and sauce
were put on each in a single plate and they evidently expected two of
us to eat out of the same dish. When I asked for a couple of plates to
eat from, the woman appeared surprised and asked what I wished them for.
I told her and she handed them to us with a look of disdain on her face. I then asked for knives and forks at which she went into the next room and I heard her tell Figueroa that we wished knives and forks in a tone of consternation at such a demand. She soon returned without them for no such article existed in the house, so we ate with our fingers.

The next day (9th) we went on for another long day to the village of Juchitango which, like San Marcos and Copala, is built about 6 or 8 miles from the sea and contains several hundred people.

On the morning of the 10th we went on and reached Qmetpeo early in the afternoon. Nearly all the villages and the small groups of huts called Cuadrillas that we passed from San Marcos to Qmetpeo are built on bare tops of low hills where they get the breeze from the sea and are also out of the unhealthy bottoms. Water is carried to many of these villages from a mile or more in earthen jars. Soon after leaving Juchitango we noticed that in the villages and ranches we passed through a large proportion of the houses were round with conical roofs. These houses like the square ones are built by setting upright poles in the ground close together and capping them about 7 or 8 feet from the ground by the roof of poles lashed together by vines or tough bark and covered by a thick grass thatch,—the latter being often covered with palm leaves. These houses have an opening left in one side for a door and have one or more platforms for sleeping made by extending a set of thin sticks fastened together in two places over the frame. On this a mat is spread and the bed is complete. Very commonly a hammock is hung inside or outside below the shade of a shed like structure or roof on four posts built just outside and against the house. In the larger villages usually one or more square houses have tile roofs. When we
came near Ometepec we met large numbers of people on foot or riding
mules, burros, or horses. Some of the women astride. They were on
their way home from market day at Ometepec. Reaching the latter place,
we found no place to stop at first, as there is no hotel or other
guest house in town. Finally we found the store of Mr. Luis Mendez, an
American who has lived here a long time and were given the privilege of
stopping there while in town.

This place contains several thousand people but is a very poor app¬
earing town as the houses are nearly all of very rough primitive archi¬
tecture. We were particularly surprised to see the almost ruinous con¬
dition of the place from effects of the earthquake of November 2, 1894.
The walls are seamed and cracked in all directions; porches were fallen,
and a number of houses fell during and after the earthquake. The en¬
tire town appears as if ready to come to the ground at the next sharp
shock.

During the night of the 11th-12th, three sets of light shocks were
felt. First came 3 shocks in quick succession,—the first one awoke us
and when the roof and walls began to creak from the second and severest
one a few moments later, I sprang for the door. Goldman attempted to
follow but damaged his shin against the corner of a box on his way,
while a Spanish clerk who slept back of us sprang wildly against our
cots and we could hear him struggling to get by and becoming more
frightened as he made more noise. When the shocks were passed, he went
back to bed groaning and acting as if quite ill for some minutes.

Since November 2nd we are told that slight shocks have occurred here
very frequently. From the extent of damage to the houses here it is
evident that this earthquake was much heavier here than at any other
place we have visited.
On the 12th we left Cmetepce and made 9 miles in a SE course to the Hacienda del Capricho on the east side of the Sta. Catarina River. This is the property of Senor Mendez. There is a small cotton gin and press here and a small group of negroes and mixed bloods who grow corn and cotton on the lands of the Hacienda. They pay $2.00 a year for land each one uses for corn, and $3.00 for cotton land. The native houses are all round here. The people of all this coast are very ignorant and brutal. They all carry machetes and when drinking use them in bloody fights at the least provocation. Huge, deep scars across the face are common among the men as results of these brawls. When sober they are cowardly and peaceable enough. They are very lazy and have an extremely rude agriculture. For a corn crop they clear a piece of woods, burning off the smaller material. Then corn or cotton is planted merely by making small holes in the undisturbed soil and putting in the seed. It is a common belief among them that land will not yield a second good crop so the next year they clear another piece and leave the former one to grow wild again. In this way the community works over a large extent of country in a few years and destroys great values in rubber, mahogany, Brasil, and Campeche and Rosewood. Mr. Mendez gives this as the reason for a present scarcity of rubber trees along the coast where they do well and get to be a fair size in damp bottom lands.

A curious thing is noted in a quite general use of American axes along this coast south of Acapulco which seem out of place among poor tools.

The practice of wife stealing is followed all along the coast country from Acapulco south among the negroes and mixed bloods. The man usually arranges with the woman or girl and she is outside the house when he comes with his friends on horseback and she is carried off to some
other village. After they have lived together as man and wife some time, the man goes to the father of the girl and asks his pardon for having taken his daughter and this is granted. Then the bride comes back and a dance is given at expense of groom in the house of bride’s parents. Should the girl not wish to go, and the man desire her, then he goes to her house suddenly with a number of companions and while some keep off the father or brothers, others carry off the woman by force. If the father or brothers are present or about when a woman is being taken, it is the proper etiquette for them to attack the lover and his friends with their machetes. For this reason the latter usually go in force enough to overpower any resistance.

Cotton sells at the gin here for 3 cents a pound uncleaned, and the cleaned cotton is worth 12$. The seed has no value although a soap factory is just starting near here. Small cotton gins are working all over the coast country in this part of Guerrero and adjacent parts of Oaxaca. Mr. Charles A. Miller and Luis Mendez both Americans (P.O. Quetepoo) are large land owners here. Mr. Mendez told me that he had purchased land amounting to 180 square miles for about $20,000. The damp river bottoms are utilized in the dry season for corn and Para Grass. During the rains they are overflowed over most of their surface. Cotton is grown on parts above high water mark.

Tigers are reported to occur here rather commonly in the rocky hills on which a low growth of brush and trees is found. Saw several pheasants like the Penelope taken in Vera Cruz.

During the time of our stay at the Hacienda, from 12th to 15th, several slight earthquakes were felt and were always accompanied by a dull rumbling sound which was always heard in advance of the shock and ended with it. On one or two occasions the noise was heard without perceptible shock.
Memoranda:

Years ago considerable placer gold was found in the bed of a small creek just back of the edge of town at Acapulco. Much excitement was created along the coast and at San Francisco. A lot of American miners began to come in and then the governor of the state issued an order prohibiting any further placer mining there and so the matter has remained until now. The formation is gray granite. It has been suggested that this gold was from California and that in the early days it had been stolen and hidden in this small wash and never recovered until the bag decayed and the gold was washed down the bed of the wash by summer rains.

On Hacienda del Capricho are some ancient artificial mounds.

Living on walls of houses at Acapulco and along the damp coast belt is a small semitransparent lizard called Salamandaca. It was hidden during the day but came out and ran about on the walls in the evening. They had a loud chirping call note something like shiuk, chiuk, chuk. This was heard usually at dusk or about dawn. They eat small insects, flies, etc.

February 16th: We went on about 15 miles to the village of Llano Grande where we stopped at the house of one of the principal men. Here we remained the 17th and 18th as my horse became very lame at the Hacienda and I hoped to cure him here. The smith at Ometepec had driven a nail into his hoof so to lame him. This place is across the line into Oaxaca and is on the border of a large dry plain partly open grassy country but about half covered with a low growth of trees and bushes which are found along drainage courses and slopes or hollows wherever the soil best retains moisture.

The people here are mainly of negro blood and the village is made
up of a mixture of round and square scales with a few small adobe houses.

We had very poor service so far as food went here, as it was made up of a little dried meat with tortillas. The people were excessively dirty and our dried meat would be set before us on a single plate and the tortillas laid on a filthy fragment of cloth and so the table was ready for us to go ahead with the meal. The entire family including father and several boys, two girls of 10 and 11, and two servant women and a man slept in the open corridor on rude bed frames covered with stretched cowhide. Many of the women went about here naked from waist up, but usually with a rebozo thrown about head and shoulders.

Although oranges, bananas, and other fruits might be grown by these people, they are only raised in a very few instances from the indolence of the people. Cotton and corn, with some beans and tobacco, are the crops grown. Everything is planted by the rudest methods, and always by deforesting a piece of land; every year or two at the end of the second crop the land has become so hard that no more crops can grow on it. Here we secured a number of porcupines (Synatheres) and tried to get ant bears but none were secured although they occur here in small numbers.

While here a child of 4 or 5 years died and was laid on a board with paper and real flowers about her and then a fandango started and continued that day, all the following night, and until the next afternoon when the people left the house in procession a woman carrying the body on the board on top of her head and passing slowly through the village singing a slow chant in company with the others. They went to the church door with the body and the bell under a low shed nearby was rung a few times and then the procession went on now in silence to a graveyard outside the village where the child was buried without coffin of any kind, even the board on which she had been carried being brought back to the house. The abundance of wood on every hand left no excuse for burying in this
way except for the excessive indolence of these people. They are easily excited to brutality and have the reputation of being readily hired to do murder. Two of the negroes of this section were hired a few months since to assassinate Mr. Miller at Guajinicuilapa, and shot at him twice without succeeding. They had nothing against him and it was supposed that the attempt was made by a neighbor who objected to Miller's owning land and fencing it where he had desire to let his cattle run.

During our stay here two or three slight earthquakes were noticed. On the 19th we left and proceeded 24 miles further to the town of Pinotepa del Estado. My horse was very lame and had to be led. Here a blacksmith fixed its hoof and said it would recover in a few days, so we are forced to another aggravating delay.

Pinotepa has about 2000 people and is a straggling town on an irregular SW slope. Its main business is with the cotton crop of the lowlands and stock raising. A considerable number of white-washed adobe houses are found along the winding, irregular main street along which the highway to Oaxaca passes. There is a telegraph office, post office, and several stores here. The people are mainly Mixtecos or mixed bloods of Spanish descent. Negroes and their strains are very few but are said to be numerous on the lowlands near the coast.

The Indians here speak a dialect of the Mixteco which varies very little from that of the interior. This section forms a part of the Mixteca baja. The people (Indians) still wear here their ancient costumes. The men a pair of wide cotton trousers fastened at the waist by dyed a butternut brown scarf and a short jacket of drilling or heavy cotton cloth. This jacket has no collar and comes down to the upper edge of the trousers so that the body of the wearer about the waist becomes exposed at almost every movement. Fastened to the upper border of the jacket behind are two little tassels of colored threads of some shade of red. The people
usually go barefoot although some sandals are used. These jackets of
the men are not open in front but are put on over the head. The cow-
men wear tight vaquero trousers of tanned deerskin dyed brown with a
jacket of the same color having long sleeves that hang over the hands
with a slit on one side below so that the hand is not wholly enclosed.
The Indian women were walking about town by scores naked from the waist
up. A tight skirt consisting of a broad strip of striped, handwoven
cloth is wrapped tightly about the hips and hangs straight down to the
ankles. This is held in place by a handwoven sash. About their heads
the women usually had a square piece of handwoven white cotton cloth
that usually hangs about the shoulders or may cover nearly all of the
body or be folded merely on the head leaving the body quite naked above
the waist. Sometimes the white cloth is replaced by the huipil which
is a sack like garment coming to the knees and with short flowing sleeves
and only open at the top by a round hole for inserting the head. These
huipiles are of handwoven cloth (cotton) with various figures woven into
the cloth and with an embroidered band about the neck opening, and
stripes running from shoulders to hem before and behind. Many of the
younger women are pleasant faced and rather attractive appearing; the
breasts are rarely well formed and hang down flat and pendulous in the
middle aged or old ones. They sell tortillas, fruit, dried fish, and
so forth about the market here. Both men and women are short but rather
well built, many being sturdily formed. Their faces are rather short
and oval and their features while often rough or irregularly formed are
generally fairly well proportioned. Their cheek bones are not very
prominent and the general form of the face is a short oval. The men
wear the hair cut rather short. The women have long and rather coarse
black hair which is twisted into a long roll and then wrapped like a
band about the crown. The color is a rich, warm brown. Their eyes are
Pinotepa del Estado

dark brown.

As a rule their noses are straight with rather rounded and thick and somewhat flattened ends and alas— a small proportion of them have aquiline noses and some faces are strangely like a typical Sioux countenance, but these are rare. These people do trading with those of the interior. All products from this part of Oaxaca and adjacent part of Guerrero are shipped from the Bay of Teocanapa at the mouth of the Rio Sta. Catarina in Guerrero.

While we were here at Pinotepa the Secretary of the Municipio told me that a band of 6 bandits has been robbing for some time on the roads of the coast country but although many efforts have been made to get them, they have failed. Recently about 200 men made an unsuccessful search for them. The same man said that when bandits are captured in this district the Jefe now in office orders them hung although by law the death penalty is abolished in this state.

In March, 1894, the Jefe Politico of this district (Jenitapee) was assassinated by bandits while riding through a canon. The present Jefe has used the bandits with great severity and as a result the district is greatly improved. Before the present Jefe they tell me that horses and other animals were stolen from the town of Pinotepa at night and sometimes even corrals in town had to be guarded. Since robbing began to be rewarded by hanging the people have become much more honest.

At Llano Grande, which is also in this district, I was told the same thing. The Presidente of Pinotepa told me that from sometime in April, 1894, to the present time, February 22, 1895, the Jefe has had killed about 25 bandits. Although the death penalty is abolished by law in Oaxaca, it is only by such methods that the country can be governed.

During my stay at Pinotepa I have lived in the municipal building or town hall and have had a chance to see what is going on. The town
Pinotepa del Estado

has about 2000 people and the rest of the municipality about as many
more people, or 4000 in all. To attend to the writing and other busi-
ness of this small community there has been on duty and busily occupied
constantly a Presidente and secretary, a Regidor and one or two copyists,
a chief of police and 8 to 10 men besides the jailor and 7 soldiers.
Then there is the man who has charge of the portaggo or local customs.
During the day there is a constant succession of people coming before
the Presidente with all manner of little quarrels and complaints which
he hears gravely and his judgment is usually final and accepted by the
people. One case was of an Indian woman who came to complain that her
lover had struck her. He admitted it but alleged in defence that he
had come in and found his woman with another man which she did not deny.
When the case calls for it, the offending party is put in jail or fined.
The whole proceeding has a kind of patriarchal look. The Indians in
their peculiar costumes and frequently squatting about on the floor
while the case is being discussed, but rising to speak each in his turn.

Memoranda:

Mexican newspapers publish that at sea near Ometepec after the earth-
quake of November 2, evidences of a submarine volcano had been seen and
a light given out by it. Mr. Mendez who lives here and owns lands ex-
tending to this part of the coast discredits this statement. Lava is
said to be found on plains about Guajinicuilapa.

Where Americans come to Mexico and marry, the children except in
rare cases grow up in the local society with the ideas and habits of
their Mexican associates so that the result is that they become a part
of the common population with none of the force and character that may
have made their fathers successful. The father adopts the native tongue
and in the case of Mr. Luis Mendez, the children know no English.
On the morning of the 23rd (February) my assistant went on to Juquila to do what work he can until my horse is well enough for me to go on. In the evening of the 22nd after dark, a half dozen men came quietly to the municipio and were armed with revolvers and went off with the 8 soldiers here. They came and disappeared silently in their bare or sandalled feet. They failed to get the men they were after as just before they reached their goal a body of 100 men hunting bandits came there and their men took to the hills. A band of 8 to 10 bandits are being hunted vigorously but with no great success as two of them have been taken so far. They rob people of whatever they have, such as costly hats, saddles, etc., etc. Among cases brought before the Presidente was one of a vagabond who was complained of by a native as being without occupation or means. As such can only live by stealing, they are given a term in jail with work on the streets. Another man had a peon or workman brought in stating that the fellow had got pay in advance and then had gone away without working the proper time. The Presidente talked to this man and told him he must work out his time and if he ran away without doing so he would have him brought in and treated like a thief. The man agreed to do the work and went off with his employer. The present government, both local and general, is continually making efforts to suppress brigandage and similar crimes, but the ignorance and degradation of vast numbers of the population make this difficult. I was surprised to learn last night that none of the municipal officers are paid anything for their work except the secretary.

This includes the police. The system here is to choose sets of men; four sets are named for police duty for a month, each set serving a week without pay. This set is then free until the end of the month or period of four weeks. They are free from this service for a year following their one of service. There are 9 Regidores whose duties are to see to
the proper condition of the schools, streets, public buildings and grounds, and attend to any repairs or improvements that are being made (this is in Pinotepa).

At 2 P.M. on the 23rd the band of 100 men who are hunting bandits passed through town some on horseback and some afoot. They were armed with such weapons as each possessed and a great variety of shot guns of old cheap patterns with revolvers and a very few repeating rifles made up the list of fire-arms, nearly everyone having some species of fire-arm and all carried machetes of which at least one half were carried naked in the hand. Tied to the saddles or slung over the left shoulder of the footmen were net-like sacks in which a supply of tortillas and dried meat for several days if necessary was carried. The party was made up wholly of negroes, part bloods, and Indians wearing the common cotton garments dirty and ragged with wide felt hats, and made a wild, half-savage looking band.

In Pinotepa the beams and doors of houses, store fixtures, furniture, etc. are largely made of mahogany of which boards a foot across are about as large as can be cut. Up to this size this wood is said to be common along this part of the coast as well as the Palo de Campeche.

The court held by the Presidente of Pinotepa was an arbitrary but fatherly kind of an affair. One man came to complain of a workman who had received some pay in advance, as is the custom with these people, and had then run away without working it out. This man had been brought along by the complainant and the Presidente told him that he must return and work out his time or he would have him put in jail. Another complained of a man as a vagabond and he was sent to jail. An old woman complained of having been beaten by a man and he was put in jail.

Every Sunday a general license is given for anyone to get drunk who wishes and he is not arrested unless he disturbs the peace. During the
rest of the week, however, anyone found about the streets under the influence of liquor is at once locked up. The new governor of the state has recently issued a circular to all authorities urging them to improve and keep in good repair the roads and particularly calls attention to the practice of burning over large tracts of forest and orders the local authorities to prevent this. Such circulars, however, will have but little effect when the authorities themselves are doing this on the common lands. As no plows are used, the lands are roughly cleared and planted one or two seasons to corn or other crop. Then the soil becomes so hard packed that a crop cannot be grown and this land is abandoned and a new forest area is cut out for a field. As the most moist and richest spots of land on hill or bottom are selected, it follows that the best parts of the forest are thus destroyed and as the dry brush on this newly cleared land is burned at the end of the dry season the fire extends into the woods on all sides and often burns over large areas.

On February 23rd, I sent my assistant on to Juquila with the outfit, leaving me at Pinotepa until my horse can travel. Finally on the 28th I hired a horse to ride and taking a moso along to lead my horse and return with the other one, I left Pinotepa and crossed 22 miles of hilly country overgrown with brush and scrubby trees varied by a few barren grassy areas to the town of Jamiltepec, the head of the district. The hills run from 100 to 500 feet along road and are all of the same white granite noted everywhere along this coast. The town is at an altitude of about 1000 feet and has numerous cocoanut palms scattered about the place. It is a poor collection of huts or jacales with a few small poorly made adobe houses in the middle of the town.

On the 2nd of November, 1894, the same strong earthquake shock was
felt here as throughout this region and on December 30, '94, came another shock still heavier in this place which cracked the walls of many of the adobe buildings and one corner of the new official building that is being erected here of brick.

From the time of the earthquake of November 2, up to the present date, earthquakes of slight force accompanied by a rumbling noise have been of almost daily occurrence and some days from 3 to 5 occur.

The Jefe Politico, Cristobal Palacio, recently made a visit to the extinct crater of Chacana on the seashore near here (close to Tututepec) to see if he could find any signs of recent disturbance, but none were noted. The volcano is a low hill on the coast and has considerable sulphur mixed with scoriae and so forth on its sides and at the summit a temperature of 51° Cent. was observed in crevices from which gases were exhaled.

The Jefe told me that near Chacana is a somewhat higher hill called Cerro He also said to be an extinct volcano. The reason he made the trip was because he had heard many subterranean reports and the rumblings accompanying shocks usually from that direction. The next a.m. (at 8 o'clock on the 29th) as I was leaving the town behind me, I heard two muffled reports like distant cannon shots, both in the direction of this old volcano. No shock was perceptible.

The people of Jamiltpeo have been so alarmed by these numerous shocks, etc., that they have built a jacal in which the school is held and everyone living in adobe houses has constructed a jacal in which they sleep in an open space free from danger of falling walls at night. In the day they use the adobe buildings. The Jefe has his sleeping jacal in front of the office. I was given a room in an old adobe building with large cracks in the walls while the family occupied a newly built jacal in front of the house. During the night two shocks
were felt at a long interval and after the second one I must confess
that I slept but little for the uncertainty was too great. A shock much
milder than those of November 2 or December 30 would bring the roofs of
these half ruined buildings down over one's head.

At Ayutla, Guerrero, on February 15, '95, at 12:47 p.m., an earth-
quake was felt that lasted 28 seconds and at 10:10 p.m., same day another
one lasted 45 seconds. The last was very strong and accompanied by a
loud subterranean noise ending with a report like a cannon shot. (Ex-
tracted from Mexican newspaper).

The Jefe here came to this place last April to replace the former
Jefe who had been assassinated by robbers in revenge for an effort he
had made to capture one of them. The present man is an old soldier
of the revolutionary days and he at once put in practice a military
regime. He ordered shot at once all known robbers or bandits as soon
as they were caught and as a result over 25 have been disposed of since
the arrival of this Jefe. He has the country searched for them at short
intervals and the result is that the district is becoming tolerably
peaceable and honest. Before his arrival the thieves came into the towns
at night and stole horses and mules out of corrals and committed other
depredations. The Jefe admitted to me that he had the thieves shot
"for what can you do with such people" he added in deprecation. He
added that when he came here the local officials such as Presidentes,
etc., were in league with the thieves. That his measures have been well
taken I can testify from what I saw. In Llano Grande the people said
we need not fear having our things stolen for "the Jefe is very severe
now and robbers are shot since he came". The same idea was expressed
elsewhere and the only cause of honesty among the people seemed to be
in their fear of the punishment they were likely to get. From what I
saw of the Jefe, I took him for a plain, straight-forward man with re-
Jamiltepec (Oaxaca)

markedly little affectation and as being much more accessible to the common people than most men in his place. He struck me as being peculiarly fitted for the office in this community where his kind of rule is all that prevents semi-anarchy.

Rio Verde

On the next morning I took the road again on a horse furnished by the Jefe with a "tupil" on foot to serve as guide and to take back the horse from the Rio Verde. At 2 p.m., we reached this latter place after travelling about 25 miles first through the hills near Jamiltepec and then along up the valley of the Rio Verde and its tributary flats which are dry at this season.

In these bottoms were seen a number of trees and shrubs for the first time. The growth was low but dense, the scrubby trees being matted by bushes and vines into dense thickets over large areas.

Excepting several flycatchers and Collie's Magpie and trouplals, birds were not numerous and no mammals were seen except a couple of squirrels in the morning.

A few jacales were passed where Indian and negro mixed bloods were living. My "tupil" did not know the road most of the way and kept trying to get out of going farther. Several times he called out, "Senor, Senor, I can't go any farther." But did it so goodnaturedly and was so easily persuaded to continue that it was amusing rather than annoying. Finally we came to the crossing of the Rio Verde where my "tupil" took the horse I had been riding and I hired another with a man to go with me at once to the next village enroute where we arrived about 5 p.m., and I thus made 40 miles today despite my lame horse.

Tepanixtla-huaca

At this village of Tepanixtla-huaca the people were holding a council over the invasion of their lands by some neighboring villagers.
The Presidents, Secretary, and Regidores were sitting on benches against the wall of the municipal building and the other men were grouped about at 8 or 10 yards distance, squatting in a semicircle on the ground and discussing the matter in a quiet way, each speaking from his place. As no one came out on my arrival, I sent in my letter and even that produced no result so, after waiting until nearly dark, I went into the council and talked pretty sharply to the Presidente for his neglect, whereupon he quickly sent men stirring about to get the things necessary for my horse and for my own stay overnight as well as engaging another horse for me to use on to the next village tomorrow.

It was curious to see how quickly the people here became attentive as soon as I had shown them that although a foreigner I expected them to do their duty. After passing a flea-tormented night, I made an early start the next morning and reached the village of Panixtlahuaca a little before noon, crossing a rough hilly country between.

In fact, from the Rio Verde yesterday, the road is always among the hills, but is roughest after leaving the first village. Tepanixtlahuaca is 15 miles from Rio Verde and Panixtlahuaca is 16 miles further. The former place is in the dry hills but the latter is in a narrow valley where the water of a creek enables the people to grow oranges, bananas, sugar cane, etc.

After some delay at this place, I secured a small mule and a man to go on to Juquila which is 15 miles farther. The road became still more hilly, the slopes being steeper and higher with pines along the ridges and down the slopes. Several fine clear mountain streams of small size flow down the deep canons here. At about 4000 feet the oaks and pines on north slopes showed that a cooler climate was entered. But these were few until an altitude of about 5000 feet was reached. This is the altitude of Juquila itself which is a small dingy town of low adobe
houses and jacals with tile and thatched roofs. It is a town of only a few hundred people. And is built on a steep hillsid and ridge so that the streets and houses are seen climbing about one above the other in a confused and broken manner.

On an artificial terrace in the middle of the place is a huge church building of masonry and adobe and arched roof that appears to contain as much material in its walls as goes to make up all the rest of the town.

This locality is at the extreme lower edge of the frost belt and a few small coffee orchards are found about the houses in town where the houses protect them. The coffee plantations of this district which give it its reputation are a considerable distance from the town and we pass them on our way to Pochutla. The town of Juquila has a forlorn appearance and evidently has no benefit from the coffee boom.

The Jefe Politico here is Octaviano Jijon. He has the largest hacienda in the district (La Esmeralda) which he claims to contain 100,000 each of rubber, cacao, and coffee trees. His rubber is at about 300 feet and at 8½ years yields about 4 oz. rubber. These he transplanted from nursery at 2 years of age. The rubber and cacao on the Jijon plantation are irrigated. The rubber trees are planted in nursery 8 inches apart in rows and kept there until 2 years old. Cacao is at about same altitude as rubber and at 8 years just begins to yield. Jijon considers cacao the best crop as compared with rubber. This tree is transplanted at 6 or 8 months of age but the least injury to tap root causes the plant to die so that a considerable percentage of these trees (25 to 50) have to be replaced.

At a higher altitude (2500 ft.) on the same hacienda, without irrigation, Jijon planted 20,000 coffee trees and cultivated them for 3 years at a total cost of about $2600., and this year (end of 3rd year) he gathered from these trees a 10,200 pound crop worth over $3,000, thus