

of a primeval forest in the tropics are fulfilled, man himself is a mere vegetable, for the sultry, moist atmosphere produces not only all the bad fevers prevalent in tropical regions, but calls into existence countless armies of tormenting mosquitoes, ticks and blood-sucking insects, which render life a complete torment. Only here and there is a little settlement met with in the bush, where a rising ground affords a freer circulation of air. The forests would appear intolerably lonesome, were they not animated by the shrill noise of the cicadæ, the chirping of crickets and grasshoppers, the chattering of parrots, the tapping of the woodpeckers on the dry trees, and the cry of the apes. Herds of cattle, too, are frequently seen in these forests, where they find abundance of rich pasture-grounds. They are not wild, but are intentionally driven thither by their owners, especially in winter. Large butterflies flit beneath the thick foliage, settling occasionally on the blossoms of the beautiful creepers, which ascend to the highest tree-tops; whilst flocks of toucans and grossbeaks (*Rhamphastos*) seek for the ripening berries of the eugenias.

Although the tapir, the jaguar, and the *felis concolor* often frequent these forests, they are never met with by the passing traveller; occasionally, perhaps, a stag darts across the path, or an armadillo or aguti seeks a safer place of concealment. Even the snakes are found more towards the skirts of the forest, in the drier pasture-ground.

A few leagues more, and the plains with their palm-forests are in our rear, the country becomes undulated, the denser forest is seen in the valleys only; on the hills we find brushwood and tall grass. The climbing *combretum* covers the mimosa, with its long flame-coloured clusters; lime-trees appear among the acacias and ingas, and tree-like convolvuli with large white blossoms, reddish-brown within. —

The broad valley we have entered, opposite Antigua, conducts us by a gentle ascent to the main-road; a fine stone bridge across the stream assures us that we are approaching the habitations of our kind, and the different appearance of the country announces that we have entered another region.

III.

THE REGION OF THE SAVANNAHS OR PRAIRIES.

It is difficult to determine with any degree of precision where the forests of the tropics cease, and the prairies begin. This must in great measure depend on the nature of the soil; whether it consists of basaltic or volcanic remains, or of alluvial,

far-extending plains. In some parts of the coast, the grass commences within view of the sea; but on a more careful examination, we perceive that the country consists of extensive slopes, rising almost imperceptibly from the shore. There is little water here, and the whole district is covered with basaltic rubble, partly in smaller fragments, partly in larger blocks, and the soil consists of decomposed basalt. In general the savannahs are met with at the elevation of 800 to 1000 feet above the sea, and extend as high as 2500 feet. These districts form almost invariably a sloping plain, rent by fearful chasms, stretching from east to west, where the mountain-streams foam in their deep beds. The reader must not picture to himself fair lovely meadows, but rather dreary wildernesses, overgrown with low thorny mimosas, frequently varied with larger groups of trees and small forests. There is, however, nothing grand in the character of the vegetation; as far as the eye can reach, we see the umbellated spreading mimosas, the calabash-tree (*crescentia alata*) laden with its vast fruit, some lime-trees, convolvulus-trees, euphorbias, and a few myrtles and terebinths. Dark, pillar-shaped cactæ with their white tops peep forth, opuntias and mamillarias, bromelias and agaves start up from heaps of stones, and accord well with the grey brushwood of various kinds of croton and syngenesists. More to the west are groups of queerly-shaped cordélineæ; the base of the tree forms a cone of four, six, or more feet in diameter, diminishing as it rises higher to a diameter of one foot, having at its summit a large bunch of long, soft, riband-shaped leaves. In spring it is adorned with a succession of white blossoms, towering to a considerable height.

At a similar elevation we find on the borders of the chasms, the cycas with rigid leaves and stout stems, mostly from four to six feet in height. They are of both sexes, and the female plant bears a woody capsule with some hundreds of fruit of the size of a walnut, filled with a pure farina (sago). The stem and the root also contain sago. Here too we meet with the zamias.

In the summer months, from June to October, the tropical rains call forth a lively green, thousands of cows pasture in the rich juicy grass, and afford variety to the uniformity of the landscape. With the cessation of the rains, the prairies fade, the soil dries up, the trees lose their foliage, the herds seek the forests and chasms, and in the cloudless skies, the sun scorches up the unsheltered plains. In this season the prairies are often set on fire, partly to destroy the clouds of tormenting ticks and tarantulas, partly to call forth a new crop from beneath the ashes. At night it is a wondrous spectacle, especially in a hilly country, to behold the long fiery streaks hurrying on like an interminable torch-procession. During the day flocks of grey buzzards assemble on the outskirts of the conflagration, to feast on the countless grasshoppers driven off by the smoke; the fox is also on the look out, to see if nothing in his way is to be picked up.

Not many animals are met with in the prairie regions; the stag (in size and colour resembling that of Virginia, but with straighter antlers), the coyote, or half-wolf, the fox, and the rabbit are most frequent. Large flocks of wild turkeys roam

about the savannahs, the little partridge, too, is often seen, whilst in the chasms and woods the penelopes greet the rising sun with their hoarse cries. Amongst the grazing cattle, we constantly remark the stupid bobo (*crotophaga*), a species of jay; the cows and horses gladly tolerate him on their backs, where he disencumbers them of the tormenting insects. Neither towns nor villages are found in these extensive districts, but merely here and there the solitary farms of the cattle-proprietors, or of the herdsmen. They are a peculiar people, simple and hardy, well mounted and excellent riders; at the same time they may be depended on, are obliging and always in good humour. They are called *Rancheros*, and may be recognized at once by their leather garments, the hunting-knife at their side, invariably on horseback, with a lasso of leather hanging down from the saddle, and with long spurs on their capacious boots. Later I shall give some idea of the mode of life of the *Ranchero*, and of his festivals; at present he is only intended to afford the dull landscape some variety.

Nevertheless this region has a peculiar charm for men of an enquiring turn. Traces of extinct tribes are here met with, of a dense agricultural population, who had been extirpated before the Spaniards invaded the country. When the tall grass is burnt down, we can see that the whole country was formed into terraces with the assistance of masonry, everywhere provision had been made against the ravages of the tropical rains; they were carried out on every slope, descending even to the steepest spots, where they are often only a few feet in width. In the flat valleys are countless remains of dams and reservoirs, mostly of large stones and clay, many of solid masonry, naturally all rent by the floods at the lowest part, and filled with earth. On the dry flat ridges the remains of large cities are found, forming for miles regular roads. The stone foundations of the houses may be recognized, covered with heaps of rubbish and stones, large squares with symmetrically arranged stately edifices, the principal front adorned with temple pyramids, from 40 to 50 feet high; there are also traces of plaster and mortar, and of pavements. There where the union of two ravines with perpendicular rocky walls (and there are many such points) forms a projection protected on three sides, are castles of solid masonry, with ramparts and battlements; in the court-yards are extensive remains of palaces, temples and graves. All is now concealed by trees or tall grass; for many miles scarcely a hut is built, where formerly every foot of land was as diligently cultivated as the banks of the Nile or the Euphrates in Solomon's time. We know not whether a plague or hunger, or warlike tribes from the North, or some great convulsion of nature destroyed the numerous population, indeed we have not the slightest clue, which could enable us to decide to what people these relics of great industrial activity belong. Countless fragments of earthenware, arrow-heads of obsidian, with now and then portions of large statues hewn in hard porphyry, are the only remains of the plastic arts. Perhaps they were Toltec tribes, and were destroyed in their wars with the Aztecs. Only a few small Aztec villages are built in the savannah-region, none of which have preserved any ancient traditions. The village of Codasta

alone, the ancient Cautastlan, with fine ruins of hewn stone, covered with sculpture, dates from an historical period; it was a royal residence, and was destroyed in the Aztec wars a century before the arrival of the Spaniards.

IV.

THE REGION OF THE EVERGREEN FORESTS.

From the platform of a "cué", or ancient Indian sepulchral mound, of which there are many in the plain, we will look round before the thick forest intervenes. To the east we overlook the light-green prairie, which is succeeded by the dark forests on the coasts. Beyond this the blue gulf is visible, and even the sails of the ships may be discerned; for in a straight line we are not so very far from the sea after all.

If we turn to the west we behold dark wooded mountains, above which, jagged and abrupt, rise the highlands, but to the north and south the mountains extend in beautiful undulations to the distant horizon.

The vegetable world is of course always determined by the nature of the soil; on a calcareous soil we find a different description of plants to those which are met with in trachyte or porphyry, for instance, in lime we have chiefly fan-palms and malvaceæ: but the conditions which the elevation above the sea produce, the isothermal line, would everywhere call forth analogous appearances. On the whole of the east coast, we find oak-forests at an elevation of 2500 feet. There is no gradual transition from bush to tree; the complete forest stands all at once before us. The species which grow in the lowest situations, are, on the east and west coast, distinguished by a hard leathery leaf, small acorns in bunches, and very tough wood; other specimens soon appear, and as they extend vertically about 5000 feet, we find the greatest variety in about 30 different species; they appear already in the mountains between Jalapa and Orizava. There are some species with leaves a foot long, acorns of 2 to 2½ inches in diameter, and others not larger than a pea.

Here we can breathe freely, no pestiferous vapours rise from the soil, no intermittent fevers rob the planter of his vigour, no enervating heats hem his activity. A soft mild atmosphere prevails here all the year round, rendered pleasant during the day by the sea-breeze, cooled at night by the refreshing mountain-air. Here the clouds driven by the trade-wind towards the highlands, most frequently discharge themselves; the country is never long without the fertilizing rain, and the plants are nightly refreshed with a heavy dew. Without artificial irrigation, here flourish

the sugar-cane, rice, tobacco, and the banana, without wearisome labour bounteous nature furnishes abundance of wholesome food within a small space. —

If we were surprised at the majestic forms assumed by the vegetation of the torrid zone in the plains on the coast, as displayed in the palms, bamboos and mimosas, we admire here the endless profusion of the tropical vegetation. All is life and organic activity. The oaks which seek a ferruginous, argillaceous soil, crown the heights with their far-extending branches; in the lowlands, however, there is a dense mixture of tall laurels, myrtles (for example, *myrtus pimenta*), otherwise chiefly eugenias, sapinths, terebinths, aalias, robinias, mimosas, ingas and cassias, large-leaved cecropias, or trumpet-trees, silvery crotons, dark figs, woolly linden-trees, elms with broad, leaf-like stems etc. Between them in rank luxuriousness are numerous species of reed-palms, *chamaedorea*, one species of which is a kind of long creeper, the thin, reedlike bamboos, *panicum*, *sacharum*, and other tall grasses, the large-leaved scytamineas (musaceas and heliconias), agaves and tall-stemmed yuccas with splendid bunches of flowers, and polthos plants of every shape. Of the latter the most remarkable are the dracentias with enormous leaves, chiefly reticulate, which twine about the old stems of the trees high up into the boughs, or clothe the rocks with mighty festoons, sometimes with white blossoms, sometimes with scarlet fruit. It is hardly possible to form a conception of the countless lianas which twine about the brushwood, or ascend with bare stems even to the highest tree-tops, and are the roots of some parasite clusia, melastona, bromelia or eupativium. The vine, the clematis, the bignomia, the bramble, the sarsaparilla, also frequently appear like stout cables, putting forth shoots and leaves at the summit of the trees only.

Plants which in the north scarcely rise above the ground, here become trees, for instance the wolf's milk species, the thorn-apple (*datuna*), the nightshade, and sage. This is more especially characteristic of the climbing and arborescent ferns, which may be reckoned amongst nature's most graceful productions. Fancy only such groups of slender stems, twenty or thirty feet high, surmounted by a gigantic fan of fine pennated foliage, spread out like a vast parasol. How beautiful is the blue sky through the delicate texture! These ferns are always met with in damp situations, or on the borders of foaming torrents, surrounded by numerous specimens of the same genus, lycopodias etc., which twine about the stem, or take root in the charred leaf-stumps.

The active creative powers of nature call forth life wherever moisture can arrive. Even the naked sides of the rocks are clothed with lichens and mosses, and from every little crevice, where soil has been formed, proceed ferns, etc. Every tree becomes a colony of countless plants, from the roots, where fungi and orbanchææ germinate, up the stem, where every little indentation in the bark, every crack shelters an orchis (*stelis*, *pleurotalis*, *maxillaria*, *oncidium*, *trycopilla*, etc.) or a cryptogam, to the forks, which usually bear large bromelias, containing a considerable supply of water for the dry season, in the duct-shaped, well-closed radical

leaves. The branches are thickly covered with succulent broad-leaved tillandsias, between which blossom stanhopias, lælias, and different species of epidendrum, or ripsalis hang down in thick clusters, and thus it goes on to the summit which is often crowned by the northern misletoe and the bright-blossomed tropical lovanthus. On the skirts of the forests their place is supplied by melastomes, and rexies, with numerous shrubs. Where smaller patches of meadow-ground appear, we find beautiful species of grasses and sedges and between them ground-orchis (*serapias*, *cipripedium*, *bletia* etc.), amaryllideæ, *indigofera*, and many other leguminosæ and oxalideæ. Without culture, the forests produce many excellent kinds of fruit, as the sapote, ananas, and guayavas (*psidium*); citrons and bitter oranges have spread throughout the forests to such an extent, that it is doubtful whether the latter, at least, may not be considered as a native product. In these favoured regions the fruits of the whole earth may be united by cultivation, and would be there if the Spanish race interested themselves more for the thing; as it is, no inconsiderable number are met with. The old world has sent thither its apples, pears, cherries, peaches, oranges, figs, grapes, and pomegranates; by their side flourish the East-Indian mangoes and papaws (*carica*), the American ananas (six species), casimiroas, mammees, aguacates, spondias, the fruit of the passion-flower, excellent cactus-fruits, gourds of all kinds, and many others in such abundance, that even the natives are not acquainted with all the fruits produced in their country. An Indian village of this zone presents a truly delightful picture surrounded by heavily laden orange-trees, and banana stalks, by fruits of every imaginable shape and hue, and by the blossoming shrubs which invariably follow the steps of man. Among the latter we must reckon the graceful blumerias of every tint, the arborescent dahlias, the erythrimias, *datuna grandiflora*, the lilac, and the rose, which surround every Indian hut.

On passing through these fertile districts, where there have long been large settlements, for instance in the vicinity of Cordova, Orizava, Huatusco, Jalapa, Papontla and other towns and large villages, we are surprised at the few oases of cultivated land in proportion to the large tracts of what may be well called wilderness. It is partly accounted for by the spare population, partly by the productiveness of the soil, which within a small space produces a mass of nutritious fruits. Who is unacquainted with the valuable and important banana,* and of the nourishing roots, such as: yam, manioc, arum, batate, arrow-root? The yield of maize is two hundred fold, of rice fifty to sixty fold; the coffee-plant flourishes here as in its native mountains, vanilla grows in the forest, colouring matter, spices and drugs are in part spontaneously brought forth by nature, and are in part easily obtained by cultivation; can we then wonder if the natives enjoy the banquet thus prepared for them, and deem it folly to care for the future. The animal creation would seem to set the example of thoughtlessness. At all events the nests of most birds are construc-

* In some parts of Mexico the banana, or plantain-tree can furnish sustenance for fifty men from ground on which wheat would not give more than would be requisite for the nourishment of two.

ted much less artistically, and with infinitely less care than in colder regions; and the widely extended family of the troupiale (*cassicus, icterus etc.*), which come everywhere in flocks to the dwellings of man, leave the care of the nest and the rearing of the young to the thrushes and fly-catchers, so as to enjoy their lives in merry company.

It has been mentioned already, that the vertical extent of the oak-forests is upwards of 5000 feet,* and thus far extend also the evergreen forests. We find that the most luxurious vegetation exists at the height of 2500 to 4500 feet above the sea. At the elevation of 4000 feet are the tropical forms, such as palms, zamias, scytamineas, aroideas etc. Plants resembling those of the temperate zones begin to appear: liquid-amber and hornbeam (*carpinus*) are most frequent in the forest, and four species of magnolias appear in scattered groups. Near the streams the mighty stems of the plane-trees have a noble appearance, and are replaced higher up by willows and alders.

In places where there is no forest, succulent grasses, ranunculaceæ, and plantains appear, besides the tough-leaved syngenesists (tall thistles and bushes), durantas and hawthorn, the representatives of the heath-tribe, andromedas and arbutus. The herbaceous labiatae are here most diffuse, and precisely these districts are fittest for the management of bees. The extreme limits of the banana and coffee-plant may be taken at 5000 feet, whilst ananas and mangoes no longer flourish at this elevation; European fruits, however, bear plentifully, also the chirimoyas and aguacates (*anona* and *persea*).

Between four and six thousand feet above the sea, most of the original settlements of the natives are met with, along the whole mountain-range. In loftier situations the climate is no longer tropical, frequent rains cool the air, and in winter, rime and snow-storms are nothing unusual. Nevertheless this climate is exceedingly healthy, and uniform; the average temperature being from 13 to 14 degrees of Reaumur; the valleys and mountain slopes are adorned with perennial green, and the products of the frigid zones can be harvested the whole year round.

In the savannah region we passed over the gentle slopes of profound chasms, whose sides contain conglomerate and sandstone, in some of the more elevated spots, a firm grey limestone: in the forest region the mountains are much indented; narrow valleys, steep declivities, sometimes red clay on the surface, sometimes decomposed lava and ashes. Everywhere are indications of volcanic activity, craters fallen in, streams of lava, mountains uplifted and cast down. All the streams are torrents, forming countless waterfalls. A vapoury cloud is often observed rising from some obscure recess of the forest; it is sure to be a cascade, precipitating itself into some deep abyss. The country only here and there assumes the level appearance of pla-

* This is not to be understood literally; for I discovered a species of oak some hundred paces from the sea near Salinas, a few miles to the south of Vera Cruz, others at an elevation of ten thousand feet in the mountains of Orizava and Toluca.

teaus, or of broader valleys; for the most part it has an Alpine character with a tropical and sub-tropical dress, smiling valleys, dark forest-grown mountains, everywhere moisture, an exuberant vegetable and animal kingdom.

V.

THE HIGHLANDS. REGION OF PINES.

The eastern side of the Andes presents us with a vast plain, resembling the sea; the principal mountain-range instead of jutting forth, gradually rises in the form of terraces, each of which is distinguished by the peculiar character of its vegetation. The whole of the country from the gulf of Vera Cruz to the highlands, is of undoubted volcanic formation; nowhere is there a trace of granite or gneiss, but on all sides we meet with conglomerate and tufa, lava, basalt and porphyry. Everywhere there are conical mountains with fallen craters, all open to the east, a proof of the fearful convulsions the country must have been subjected to. In many parts there is a crystalline-slaty stone, with a regular angle of incidence of about 60°, rising in a curve from below; at other points calcareous mountains appear between volcanic formations.

Quite apart, however, from the volcanic agency, it is perfectly evident that the whole country has been cast up from the profoundest depths by plutonic convulsions. The sides of the chasms, often rising perpendicularly from 1000 to 1500 feet, consist in many places of sandstone, mixed with rude blocks of basalt, in massive layers, separated horizontally by patches of rubble, sometimes three feet in thickness, firmly baked together with sand and iron-hydrate. The volcanic stream has open lofty conical flues, extending even as high as the snow-regions. At a considerable elevation above the sea, I have beheld petrefactions of sea-shells, in grey lime, amongst which I was struck by several large pectinites.

Future travellers will present us with geological sketches of the country; I have only alluded to the little I am able to judge of, in order to render the progressive elevation distinct, which here determines the change of climate. In countless spots we find ourselves in the most beautiful woods, in all the luxuriance of a semi-tropical vegetation; a steep mountain-path conducts us 2000 feet higher, and as though by magic we stand in a pine-forest, and hear the whistling of the wind as in the forests of the north. Elsewhere the change is more gradual; but everywhere the ordinary forest trees extend far into the pine-regions, especially the oak, the alder, the arbutus, etc. The lowest limit of the pines is usually 6500 to 6800