

fill the atmosphere with an enchanting perfume, and not less so the *datura grandiflora*, a single tree being sometimes covered with hundreds of white blossoms. The acacias and mimosas have partly the powerful fine scent of the wall-flower, but the large trees are overwhelmed with blossoms. Of many other families of highly odorous plants, I need only mention the serbereæ and tabernamontaneæ, honeysuckle, jessamine, pothos and calla, eugeniæ, ocotæ, nictagineæ, liliaceæ etc.; among the syngenesists are many very sweet-smelling specimens, and a light breeze from the forest often conveys a perfect cloud of most delicious odours to the wanderer.

It is precisely the same with the singing-birds; the mocking-bird, the blue song-thrush, various silviæ, finches, tanagras and others are by no means inferior to the songsters of the old world.

VI.

THE PLATEAUS.

From the mountain-ridge we cast a passing glance at the table-land; we will now examine it nearer. It is singular in tropical and sub-tropical regions to behold a country, the climate of which is not unlike that of southern Europe, in consequence of the elevation above the sea averaging from 5000 to 8000 feet. Its extent is about 1500 miles in length, by 500 in breadth. Either mighty plutonic influences must have heaved up the whole country, or being the loftiest mountain-range of the globe, it was undermined and destroyed by fearful volcanic convulsions, and fell in; in the course of ages the great bed of the valley was levelled by the constant action of water. From the frontiers of Guatemala to the Gila river similar appearances are met with; under the 17th degree we find in the Province of Chiapas, plains with lakes, seven thousand feet above the sea, enclosed with lofty mountains covered with pine-forests and oaks; and the same thing is met with in 33° N. Lat. The table-land is continuous from south to north, sloping downwards towards the Atlantic and the South Pacific Ocean, intersected with numerous mountain-chains, which, however, never completely interrupt the communication of the plateaus with each other, nor produce any material difference in the level. From the 18th to the 13th degrees there are carriage-roads, and from Mexico to Chihuahua, a railroad could easily be constructed. Nevertheless certain large hollows may be clearly distinguished, being enclosed by the mountains, and the bottom filled apparently with stagnant waters. The lowest point of these hollows is occasionally indicated by lakes, or in the rainy season by pools, or deposits of common salt, brought thither by the rush of the tropical rains.

The character of the landscape is totally different from the coast-region. The vegetation has nowhere a tropical appearance, neither is it so perfectly developed, nor in such exuberant masses. The grasses are short and fine, the trees low, the mountains bare. Tufa and other rubble cover the slopes, a scarcity of water is almost everywhere remarked, which accounts for the scanty vegetation, particularly in the dry season. And yet precisely here, we meet with abundance of succulent plants, presenting man and beast with a new source of existence. In most places, north and south, the cactus, agave, and yucca, with the mimosa, and syngenesists, especially bacharis, senecio etc., determine the character of the landscape. The traveller, who in the morning has admired the most luxuriant vegetation, in the vicinity of Jalapa for example, where amidst a confused mass of lianas and brushwood, the arborescent ferns are so strikingly beautiful, in the evening imagines himself transported to some far distant region, when regarding the vegetable products of the plain of Perote. In a valley extending farther than the eye can reach, and from fifteen to twenty miles in width, wheat, maize, barley, pulse, etc., are carefully cultivated; here and there villages and large farm-yards are observed. Trees, however, are rare in the plain, if we except some mournful-looking cypresses, sables, or *schinus molle* near the churches and chapels. The eastern cordilleras exhibit pines, but the western hills and mountains are bare, with the exception perhaps of some stunted bushes on the sides of the steep cones and craters. On all sides the agaves (*agave americana*) bound the fields and roads, and surround the scattered dwellings.

The culture of the cerealiæ of the old world is promoted by artificial irrigation, wheat in particular, which is harvested in autumn. In some of the higher valleys barley and maize even require irrigation, the rainy season not being long enough to enable them to attain their maturity. The soil unfit for cultivation is usually turned into pasture-ground; on the steep, rocky declivities even, and on the hardened lava tracts, brown and white goats may be seen in search of food. All these mountains and masses of rocks bristle with prickly cactus plants, in the most whimsical and divers forms. Small, and very prickly mamillariæ, scarcely raise themselves above the ground, groups of a larger kind nestle in the clefts of the rocks, melocactæ and echinocactæ of all dimensions start up, from the size of a fist, to the altitude of a man, from one to three feet in diameter, furnished with short or long, with straight or curved prickles. The opuntia or Indian figs are crowded together in distinct groups, differing in form, size and colour of the leaves or branches, and in blossom and fruit. The cereæ creep like snakes along the ground, cling to the branches of trees and to the rocks, or rise in the form of a pillar thirty or forty feet above the generality of their species. There is one singular species called "organos", whose appearance is almost incredible. A thick ungainly trunk, from four to six feet in height, bearing several hundred upright multangular pillars of all sizes, which being tallest in the middle, and smaller on either side, resemble a large organ. The mountains, where frequently thousands of these plants are seen, are not unlike walls of columnar basalt. This stiff, shadeless vegetation is in many dis-

tricts quite in accordance with the character of the landscape, with the grey rocky masses of volcanic or with the yellowish calcareous mountains. The cactæ, however, are not met with on the mountains only; vast plains are covered with the same plants, interspersed with various agaves, yuccas in the form of thick trees with numerous branches, with the green stiff fasciculate leaf at the end of each stem-like branch; but also elegant yuccas with depending supple leaf, for example in the plains of Masquital, from Tula to Ouretoxo, in the valley of Ixmiquilpan and Actopan. The stiff dasylires represented in various species, belong wholly to this crystal-like vegetation, and in the calcareous mountains, but only in these, the lower fan-palms (*chamerops*) and the before-mentioned syngenesists.

Thorny arborescent mimosas are met with in these districts, producing abundance of transparent gum, which in spring give the tree the appearance of being covered with dew-drops. According to the locality we occasionally meet with other kinds of trees, such as the pine, oak, arbutus, juniper, cypress, taxodium, alder, and willow; but from the 16th to the 32nd degree North Latitude, the prevailing character of the vegetation is as already shewn. The appearance of a country is everywhere changed by cultivation, and the fertile plains of Anahuac* having for centuries been the seat of a dense population, these districts are of course no longer a wilderness overgrown with cactus.

The plains of Tlascala and Huatmantla, of Puebla, Mexico, Queretaro, Morelia, and Guanajuato present landscapes, resembling those of Southern Europe. Numerous towns, villages, and farms surrounded by olive, fig, cherry, apple, quince, and other trees, avenues of poplar and ash, orchards, and kitchen-gardens of all kinds, would make us forget that we are on the ridge of the Andes, if the plantations of maguey, the garden hedges of cactus did not remind us of Montezuma's empire. On approaching the mountains, however, or even a hill, where the water is unable to approach, the highland character is again evident. The lakes of the table-land give birth to white-blossomed nymphareæ, reeds, sedge, as in Europe; on the roads thither, we find a small shrublike convolvulus, mirabilis of all colours, yellow and white argemoneæ, thorn-apples; milk-wort, verbeneæ, plantagineæ, chenopodiæ, penstemon, and other well-known herbaceous plants, whilst the shrubs chiefly consist of syngenesists.

The cactus has been termed the vegetable spring of the wilderness (see: Humboldt's Glances at Nature), and certainly not unjustly, for without them and the agaves, the sterile mountains of the plateaus being so poor in water would be uninhabitable for man and beast.

In the dry season, from November till June, when for many leagues no trace of water can be met with, when the grass disappears, the oxen and horses depend on the opuntia for nourishment; their instinct teaches them to remove the thorns and wool on the top of the thick echinocactæ with their horns or hoofs, and to

* Ancient Anahuac comprehends the country between the 14th and 21st degrees, North Latitude.

bite in the succulent flesh, so that a little reservoir is formed. During the night the clear sap collects in this, and in the morning quenches the animals' thirst; the reservoir refills itself for several weeks in succession. The animals know their watering places well, return thither every morning, and defend them against usurpers. In the large unwooded plains of Northern Mexico, the heights covered with the cactus are of great value to man. The young leaves of the opuntias are used as a favourite vegetable, the juicy fruit eaten raw is highly refreshing; dried and pressed, it is not unlike the fig, and forms an object of traffic. The juice of the fruit is sometimes converted into syrup, sometimes, slightly fermented, and termed *colonche*, it forms a substitute for wine at the festivals of the shepherds and mountaineers.

The maguey or agave is not less useful as a spring in the desert. When the plant is full grown, in its tenth or fifteenth year, and is preparing to throw up its long flower-stem, the cultivator cuts out the leaves which form its centre, and hollows it out into the shape of a bowl, at the same time removing most of the other leaves, so that the whole sap destined for their supply flows to the great stem, and is received by the bowl-shaped cavity, into which it runs with great rapidity. It is removed every morning and evening (by means of a vessel constructed of a kind of gourd), easily ferments, and is the favourite drink called *pulque*.

The employment of the sap of the agave for this liquor is evidently very ancient, and it appears that it was cultivated by the Aztecs, who in the twelfth century established themselves on the central plateau. At all events the mode of extracting the sap from the plant is represented in their hieroglyphic paintings. In the earlier half of the Christian era, the Toltecs also planted the agave, and treated it in the same manner as the Indians. Their inherited customs are stereotype, as we shall shew when we describe their peculiarities.

In European hot-houses, the agave plant is met with of considerable size, nevertheless it is dwarfish in comparison with that which it attains in its native country. A large plant produces daily about eight bottles of sap (smaller ones, from four to six bottles), for a space of four or five months. The hollow is cleansed every day of all its slimy parts, with a flat iron spoon, and is thus gradually enlarged. The greatest quantity of sap flows in the second month. The liquor is not clear, but whitish, something like whey, and precipitates little balls of farina. When newly fermented, pulque has an agreeable winy flavour, is intoxicating and refreshing, and agrees very well with most persons; the natives seldom use it till it has acquired a strong taste, and a disagreeable fetid smell, denominated *fuerte*, when it is esteemed in high perfection. The quantity of alcohol is about the same as in strong beer, but would be greater if more efficiently fermented. The sap is usually collected in ox-hides, which throughout the country are employed as tubs or butts, and as these cannot be thoroughly cleansed, part of the liquid to be fermented is converted into vinegar, and loses alcohol in proportion. It may appear strange that ox-hides should be used as tubs; the manner in which this is performed is as follows:

A frame-work three or four feet in width is constructed of four stout round pieces of wood, flattened at the ends, and bound together with strips of hide. This is placed on four stakes, forked at the ends, and about five feet in length, driven into the ground; a fresh ox-hide is then cut square, and with the hair inside, fastened with strips of the same material to the frame, so as to form a sack. This is completely filled with dry sand or stones, in order equally to stretch the elastic hide, in which state it is suffered to dry. In a few days it has become a hard vessel, capable of lasting several years, and easily constructed by the person requiring it, at an expense of certainly not more than fifteen or twenty pence. Similar tubs or vats are still seen in most of the brandy distilleries. Of course they are not particularly clean, as the hairy inner surface cannot be rinsed like a wooden tub, but no Indian would relish the flavour of his pulque, if it had not fermented in a hide. Enormous quantities of it are consumed, especially in the larger towns. There are estates boasting of twenty to forty thousand such plants, and producing a yearly rental of from 25,000 to 30,000 piasters. Caravans of several hundred mules are frequently met with, conveying the Indian nectar to the towns in goat-skins. One should see the happy faces of the Indians, squatting in a circle without distinction of sex, and passing round the filled "schikals" (large gourds), one must see them staggering home from their feasts, in order to comprehend how so vast a quantity of sap can be consumed. In districts where water is rarely seen, and where the agave flourishes most remarkably, it is often very difficult to procure a glass of water in the dry season, whilst every Indian willingly offers a cup of pulque.

The agave is not esteemed on account of its sap only. The strong leaf-fibre is an excellent material, the only one in the high country for ropes and strong cables, for thread, etc. Sacks, or even cloth may be woven of it. The fibres of a species with smaller leaves, "ixtle", form a considerable article of traffic in the more extensive districts. The stem of this smaller species is roasted and eaten, and a peculiar Indian liquor distilled from it, termed "mescal" or *vino mescal*. In the agave districts the aborigines live almost exclusively on this plant. They build their huts with the long dry flower-stem, cover them with the leaves, which are disposed like tiles, and fastened with the thorns; the dry leaves serve for fuel; the plant furnishes them with food, drink and clothing, and is therefore well deserving of particular notice.

The general sketch I have offered of the plateaus, admits of various modifications, according as the geognostic peculiarities, or the local climatic appearances exercise their influence. I have already mentioned, that volcanic rock, porphyry, basalt, or their decompositions produce certain botanic groups, calcareous rock others. A ferruginous soil is more favourable for oaks and mimosas, a quartz soil for pines. Thus we find in the calcareous soil of Tehuacan many cactus and palms, and even numerous date-palms, in the calcareous mountains of San Luis Potosi, the rarest and finest melocactæ, further north in the mountains of Mazapil, the gigantic *mammillariæ* of a beautiful purple tint. Even the vine flourishes best on a calcareous

soil, both in the north and south of the table-land. The richest soil for grain is in the valley of Puebla, and in the plains from Queretaro to Guanajuato, where wheat and barley yield fifty fold, the maize two hundred fold. In the plains where the soil contains natron, nothing but low grass is produced, which is exclusively used as pasture-ground for the horses and mules. In some parts the quantity of natron is so considerable, that after the rainy season the whole surface is encrusted with it. It is now and then employed for technical purposes (*viz.*, for soap-boiling). The well-watered valley of Toluca, although more than 8000 feet in height, is surrounded by mountains producing wood, and affords rich corn-crops, whilst warmly situated valleys boasting of a good soil are almost sterile, the position of the mountains warding off the showers during the rainy season.

In districts where the vegetation is so poor the rays of the sun are sometimes powerfully reflected from the bare, often white, face of the mountains, the lower stratum of air uncommonly heated, and those singular mirages given rise to, exhibiting, not an image reversed in the skies, but by an image of the blue sky near the ground, causing lakes to appear before us, in which trees and grazing animals are reflected. The deception is so complete, that even the thirsty horses neigh at sight of it, and the dogs hurry towards it to cool their parched tongues. It happened even once to my servant, who begged my permission to ride to the lake and drink. Jestingly I bade him do so, but not overdrink himself. He now eagerly galloped after the phantom, until I had nearly lost sight of him, and returning out of temper; he thought: "matters were not quite as they should be; that some sorcerer had been playing tricks with him."

From the month of March till June the dryness and heat on the table-land are greatest; on the heights, and wherever water is wanting, the trees lose their foliage; the course of the rivers and brooks, however, is indicated by greening bushes and trees. A dense blueish fog mostly fills the atmosphere, causing the sun to appear rayless, arising from the heated state of the lower strata of air. At this period, too, vertical atmospheric currents often take place, whirling grass and dry leaves to an immense height.

All these phenomena vanish on the approach of the rainy season, the air is then most pure, everything assumes its green covering. The winter months, nevertheless, are somewhat raw; on the more elevated plateaus, night-frosts are not uncommon, snow occasionally falls, which, however, rarely lies more than a day, and in the northern highland valleys sometimes a week.

Not only has the surface of the table-land a totally different character from that of the eastern slopes; but the appearance and mode of life of the people, even the animal creation, are quite otherwise.

In order not to diverge from our subject, we shall occupy ourselves with animated nature in a subsequent chapter.