

of Aguascalco and Santa Inés, in order to admire the magnificent fiery fountains, cast up through numerous larger and smaller openings. On this occasion the ashes covered the roofs of Queretaro, 48 leagues from the volcano in a straight line."

Forty four years after Humboldt had visited the volcanoes, the subterranean fire was less active, and vegetation appeared on all sides; nevertheless the thermometer rose in the shade to 43° C. Persons well acquainted with the fact, affirm, that for several years after the eruption the heat was insufferable, and the vast plain therefore uninhabited. To the present day the traveller is shewn the beds of Cuatimba and San Pedro, whose crystal waters once fertilised the estate of Don Andres Pimentel. In the fatal night of the 29th September the sources were dried up, but 3000 paces further to the west, in the raised district, two brooks now burst forth from the calcareous cones of the "hornitos" as hot springs, their temperature being about 50° C. Far below the surface the sound of a great mass of water is heard flowing from east to west, and near the hacienda "Presentacion" runs a brook, 14 to 18 feet wide, developing an extraordinary quantity of sulphurated hydrogen gas.

According to the latest measurements, the absolute height of this volcano is 4004 feet, the elevation above the plain 1223 feet. The cone is very steep, with a slope of 45°. The principal crater is on a great cleft; and it has several smaller craters; the temperature of the exhalations is now from 45 to 55° C., that of the sides and clefts much higher. In the crater, there are everywhere deposits of pure sulphur of every gradation of colour, from scarlet to pale yellow. The temperature of the atmosphere in the raised plain, which Humboldt found to be 43°, is now only 24° in the shade.

The list of active volcanoes ends with Colima, which was formerly deemed extinct, but of late years exhibited several eruptions, casting forth ashes only, and discharging mud.

The whole succession of volcanic mountains in Mexico, from Tustla on the Gulf, to Colima, traverses the mountain-range at right angles, and all seem to stand on a great rent or cleft in the firm crust of the earth; even Jorullo, the most recent in its origin, exhibits a cleft far down in the crater, at a right angle with the mountains. Frequent observations have shewn that, for the last twenty years the earthquakes were most severely felt in the volcanic line, and that the shocks were more from east to west, or *vice versa*. They were also remarked on the whole line from the South Sea to the Atlantic, with a variation of but few minutes, and decreased in severity towards the north and south, so that, whilst they cast down buildings, or rent the earth on the chief line, the shocks were scarcely felt at a distance of a few miles on either side.

Of the many earthquakes I have experienced there, one in particular is impressed on my recollection, which I observed between the volcanoes of Toluca and Popocatepetl. It was on a hot summer's afternoon; I was sitting with my friend St. . . before a miner's hut, on a hill affording an uninterrupted view of the plain towards Toluca. The air was sultry, and the calm atmosphere filled with a greyish

violet vapour. Suddenly a low rumbling, like thunder, was heard, proceeding, as it were, from the depths of Toluca, which seemed to approach with an undulating motion. We started up, and gazed anxiously in the direction of the phenomenon. The trees in the plain and on the mountains, rocked as though on the point of being uprooted; our horses, which were tied up at a short distance from us, snorted and reared; the ground trembled, the beams of the house creaked, and the shingles of the roofs rattled as in a mill-work. The people rushed out of their dwellings, fell on their knees, and sang: "Santo Dios, santo fuerte, santo imortal, libra nos Sennor de todo mal." All this was the appearance of a few moments. The subterranean thunder had subsided eastwards, before we well knew what had happened. The agitated appearance of the people, and the trembling of the horses alone assured us that the mighty spirit of earth had shaken the foundations of his abode.

Never shall I forget the impression made on me by an earthquake in the profound depths of a mine. The awful roll of the thunder seemed to issue from the rocks on every side, the solid mountain reeled, stones fell here and there, and amidst all was heard the hymn of the miners resounding from the pits and galleries. The shock lasted about 10 seconds, and after a slight pause, was repeated; but was of shorter duration. In both cases no misfortune happened. Mexico, however, does not always escape with such impunity; for only a year or two ago several buildings were destroyed in the capital, and many injured. The shock was very severely felt on the whole volcanic line, and moreover almost at the same instant from one sea to the other.

IX.

THE CHASMS (BARRANCAS), CAVES, WATERFALLS.

Amongst the peculiarities of Mexico, are the deep, almost perpendicular rents, those wonderful chasms, which are so frequent in all parts of the country. The greater part are met with between the mountains and the sea; but even on the tableland they are not uncommon. A great part of the east coast is so rent by chasms, mostly directing their course from east to west, that one can scarcely travel a league from south to north, without finding the road interrupted by these perpendicular abysses. Many of these chasms may have been formed when the country was convulsed by plutonic agency, and the horizontal deposits of the conglomerate would seem to bear out this opinion; others, on the contrary are clearly volcanic hollows; whilst others are doubtless produced by the resistless force of the mountain-torrents.

The number of the barrancas is so extraordinary, that their appearance and size must of necessity be very different. They are frequently narrow clefts, scarcely 100 feet wide, with bare perpendicular rocky walls, more than 1000 feet in height; often they are of immense width, gradually narrowing towards the bottom, but so that the valley is still of considerable extent; nevertheless they are always distinguished by perpendicular sides, though by giving way they have often different stories or terraces. Sometimes several chasms communicate, and where at the junction an acute angle is formed, grotesque, and highly picturesque masses of rock appear. Foaming torrents almost invariably hurry through these ravines, plunging from rock to rock, sometimes as a noisy cascade, sometimes as a roaring cataract. The humidity brings forth the most beautiful vegetation: tall and dense forests cover the bottom of the chasms; in the larger ones, only, have they made way for agriculture; shrubs and creeping plants start up from every crevice, on the loftier ridges and projections we find the cactus, agave, and cycas, or in the calcareous mountains different sorts of fan-palms, cereous and other pulpy plants. In the rainy season the bare rock is quite covered with lichens and moss, and presents the most charming play of colours, black and silvery, dark-green, yellow and scarlet, with all the different gradation of tints lying between.

In the rainy season, too, after the heavy tropical storms, the waters of the chasms roar like thunder, carrying with them huge blocks of stone; frequently vast walls of rock are loosened, and plunge with a tremendous noise, crushing the primitive forests like blades of grass; on all sides cascades are seen like threads of silver, or streaks of mist, in which rainbows are formed. The landscape painter finds a profusion of subjects for the most brilliant representations, whether he prefer the wildly romantic or the idyllic. But he rarely finds a beaten path, being forced to struggle through a thousand difficulties to reach the beautiful points; as neither guide-book nor cicerone can afford him assistance. Perhaps one of our readers may extend his wanderings to these regions, and be desirous of beholding some of these waterfalls, of which there are an incredible number in the country, without going far out of his way: near Jalapa he can see the torrents of Maulinco and Jilotepec, the cascades near Teocelo, and in the Barranca de la Junta. Near Huatusco are some beautiful waterfalls, and not far from Orizava the falls of the Rio Blanco into Rincon Grande, and Tuspango. The cataract of Regla, to the north of Mexico, has been frequently described and drawn, and is one of the most remarkable for its superb basin of dolerite pillars; but if sought for, more imposing ones may be found, surrounded by beautiful vegetation, in almost every river flowing from the mountains towards the sea. For nearly all the streams rising in the highlands, which is the case with most of them, have in their course of a few leagues to descend several thousand feet, and in the lower plains alone, near the coast, is it possible for them to flow tranquilly. The same is met with in all mountainous countries; in the Alps, the Aar and Reuss plunge in a thousand cascades towards the plain, as in Mexico the Panuco or Zacatula.

These chasms interfere sadly with the communication in the interior, but only on the slopes towards the two seas, and in a direction parallel with the coast. From the mountains to the sea, for instance, we meet with carriage roads, whilst it is morally impossible to travel a league in a straight line from north to south. These chasms are frequently inaccessible for a distance of many leagues, and having gone far out of the road before a passage can be effected, long use, and confidence in the sure-footedness of the mules and horses are requisite, to enable one to ride down these neck-breaking, winding rocky paths, without becoming giddy, especially as they are often only two or three feet in width, and on the brink of fearful precipices.

It has frequently happened, that newly arrived Europeans have accompanied me on such paths. As it never occurred to me that there was any danger, I rode on ahead, without inviting them to dismount. Pale and silent, resigned to their fate, they gave their beasts the reins, until a broader terrace permitted a halt, when I was usually forced to listen to some such speech as the following. "Man, what were you thinking of, to expose your fellow-creature (perhaps a hundred times worthier than yourself) so unscrupulously to such imminent peril! Do you not consider that I have a wife and family, that my life is of more value to me, than yours appears to be to you; if my wife, or my mother were to know of it! etc." The substance of the customary answer is: "Friend, the affair is not so dreadful as it seems; only a little practice, and the danger is quite forgotten; advance boldly, wherever a possibility offers, and you will again arrive at the broad every-day road, unless you break your neck by the way, etc." Four weeks later, you may wager that the opposition member wonders how he could lately have been so anxious.

You will ask: Why are bridges not thrown across these chasms? It would be impossible, even with a capital as large as England's national debt; much would be gained if only some of the main thoroughfares were rendered partly available. Here and there Nature has constructed bridges of most singular architecture. Thus near the village of Moliajaque, a natural bridge, called "puente de Dios (God's bridge)" crosses the river Atoyac, which flows through the valley of Puebla, and is here pent in a narrow ravine. The banks on either side are calcareous rock, which detaches itself in large slabs. Both shores were probably shaken by an earthquake: immense masses of rock were loosened on both sides, which approaching each other, formed an obtuse angle in the air, the banks serving as buttresses. The strangest circumstance is, that the same phenomenon occurs twice at the same spot, moreover directly above each other, so that one pointed arch is formed about 30 feet above the other. This bridge lies about three miles to the south-east of Puebla, and is not the only one in the country; I, at least, have seen two more, and have been told of several others.

Many deep narrow clefts are bridged over by felling a large tree on the brink, so that it connects both sides. Of course they can only be passed on foot, and persons who are giddy must sit astride on them, and work their way across. Still more aerial are the so-called Maromas, or hanging-bridges of the Indians. They are met

with, where the chasms are not above 30 to 50 feet wide, and where for many leagues no other passage can be found. A tree on each brink, serves as a pier, round which are strong cords made of the fibres of the agave, so that they represent two parallel ropes stretching across; these are bound and strengthened with creeping-plants, and short pieces of wood or bamboo-staves fastened horizontally, on which one may walk. Another rope is then stretched across, a few feet higher than this shaky bridge, to serve as a balustrade. Persons on foot can alone avail themselves of this passage. Some are also constructed of sufficient width for the conveyance of luggage, usually at the spots where a path conducts to a stream, too broad or rapid for laden mulcs to pass. The baggage and saddle are then carried over the bridge, whilst the animals swim across.

A strange way of passing over some of the steep and narrow chasms, but which are furnished with paths to a certain depth, is a long rope, attached to a higher-standing overhanging tree. One sits on a stick at the end of the rope and pulls one's self over to the other side by means of a creeping-plant stretched across; a complete flying bridge. On the west coast, a strong cable is stretched across some of the rivers, high above the surface of the water, with a large basket attached, in which the traveller sits or stands. By means of a rope the basket is drawn over to the other side. For many persons it is an anxious moment, whilst passing thus over the raging waters of the torrent, their lives depending merely on the strength of the fibres of a single rope.

In many Barrancas the river is too broad and deep for the passage to be effected in any of the above-mentioned ways; a ferry is then fixed upon, and as they are met with on nearly all the rivers of the plain, I give a description of them. Boats are seldom found, and their application is as usual. The 'balsas' or rafts are the customary Indian passage-boats, which all travellers must employ. In the state of Vera Cruz there are two kinds, either little rafts of very light wood which are drawn across the river by means of a rope stretched from one side to the other; or a long rope being attached to the raft, several naked Indians jump into the water, one of whom, with the end of the rope in his mouth swims to the opposite bank and then pulls, whilst the others swimming after the raft, push it forward and direct its course. These rafts are so small, that not more than two persons can stand on them; the baggage is conveyed across separately, and finally the horses must swim over, one horse being attached to a rope, and drawn after the raft, so that the others may follow. If the rivers are swollen, the passage is not without danger, and the stream often carries away the horses.

On the west coast the 'balsas' are of bamboo-staves, at the utmost ten feet square, a mere hurdle, beneath which some dozen bottle-gourds are fixed. The traveller entrusts himself upon it, and four swimming Indians urge the machine across the river. For a large party, encumbered with much luggage, this mode of effecting a passage is extremely tedious, and often attended with loss.

In some districts, I saw the Indians cross the river in a comical manner. Their village was on one bank, their fields on the other; men and women came down to the stream with a piece of wood as light as cork, four feet long, and six inches thick; having undressed, they made of their clothes, their food and hoe, a little bundle, which was held in the left hand above the water, whilst they rested with the left side on the wood, which was fastened round their necks by a string, paddling at the same time with the right hand. Old and young performed this operation with great dexterity, and so rapidly that one had scarcely time to observe that they had divested themselves of their clothing.

In the most tremendous chasms the little plantations of the Indians are frequently found, with their bananas and kitchen-gardens in the midst of a dense growth of forest-trees, in spots, apparently quite inaccessible. Laden with fruits, these people clamber like goats; or the women, with an infant at the breast, and a bigger child on their backs, ascend the steepest paths, scarcely twelve inches broad. The roots of the *seiba* (*ficus mexicana*) which force themselves into the clefts like monstrous snakes, often serve them as a ladder, or projecting points of basalt answer the purpose of steps on the steep face of lofty rocks. The Indian likes the dangers and the solitude of the chasms; a cave affords him shelter, and he fears neither the jaguar, prowling about in the night, nor the swarms of monkeys that plunder his fruit. In a future chapter I shall call attention to these people, and will only observe here, that they make use of the solitude of the chasms, secretly to practise many remains of their heathen rites, for which purpose the numerous caves here met with are very serviceable.

I shall not attempt to describe the remarkable caves and grottoes; many of them I have seen, and yet only a small part of those which exist; not even all on my own property. The caves of Cacahuamilpa in the state of Mexico, to the south-west of Toluca, are very renowned. A tolerably large torrent, flowing in a profound chasm, is suddenly opposed by a mountain-range of secondary lime, and has forced a passage underneath, three leagues in length. On the opposite side, it issues from the mouth of a great cave, but nobody is acquainted with the interior. Where the river enters the mountain, some feet above the surface of the water, is the entrance to a second mighty cavern, which in days of yore may have been the bed of the stream. The most beautiful stalactites are found in it, representing lofty domes, pillars, organs, and other fantastic shapes; there are also countless passages and labyrinths, so that no visitor has ever reached the end. There are no remains of antediluvian animals in the cavern.

In the district of Cuernavaca deep caves are seen in the calcareous mountains, on which the beautiful ruins of Sotschicalco repose. When treating of the Indian monuments, I shall again refer to them. Near Tasco there is a cavern in the volcanic rock, from which a large brook formerly issued. It was suddenly dried up after an earthquake, and burst forth again in the form of a bubbling fountain, six leagues further off. In this part of the mountains are many caves, the chasms,

in particular, exhibit them in abundance, and in many places they serve in the rainy season as a pen for the cattle, and as milking-places for the herdsmen. On the plateaus, however, the chasms and caves are less frequent, the vast table-land presents few obstacles, and the intercourse of the natives is checked merely by low ranges of hills, or smaller clefts, over which roads have been constructed with little difficulty.

Whoever visits the mountainous districts of Mexico, will meet with much that is interesting and beautiful in the 'barrancas', whether he roam the country as an artist or as a naturalist. Let him, however, be cautious how he descends into the chasms; in the close brushwood, one often imagines one's self at the bottom of the valley, when suddenly a stone rolling down, warns him that he is on the brink of a perpendicular wall of rock, and one false step would ensure inevitable destruction. More than once, a strange plant, or the hope of enjoying a fine view, has enticed me to the summit of a rock, whence there was no possibility of advance, and most hazardous to return. On one occasion I owed my life to nought save the toughness of a creeper, from which, at a dizzy height I hung suspended in mid-air. Indian hunters should be preferred as guides; they know every path, and glide through the thicket with the skill and celerity of the wild animals. One must also beware of descending into unknown chasms towards evening; the sun not only there disappears sooner, but the tropical twilight is so short, that half an hour after sunset it is quite dark. In the rainy season, more especially, the rapidly increasing mountain-torrents are to be feared; after a storm, little gullies become raging torrents, capable of bearing off horse and rider.

During the dry season many of the chasms have no trace of water, whilst in the rainy season devastating floods hurry through them. An English mining-company made bitter experience of this fact. In a tolerably wide chasm, they had erected their huts and store-houses, when in one tropical stormy night, all their labours were completely swept away. Some months afterwards I remarked in the branches of the trees, in the dry bed of the stream, various remnants of their mining-tools.

X.

THE INHABITANTS OF THE COUNTRY.

In the preceding sketches I have endeavoured to afford some descriptions of the surface of the country, less calculated perhaps to interest the general reader, than the friends of natural science. My intention was to offer a view of the soil, on which the various groups of population are met with, in order that the reader might picture

to himself the surrounding landscape, when I proceeded to describe the social relations. When the plateaus are referred to, he knows that tropical forests, and sugar-plantations are there not to be sought for; when speaking of the coast-regions, that corn-fields and pines are wanting.

This would be the fitting place to mention the most remarkable appearances of the animal kingdom; I must, however, reserve it for another chapter, and here venture only to observe that we must beware of attaching credit to all that modern works inform us of the zoological relations of Mexico. The otherwise carefully written work of Mühlenpfordt's, for instance, is quite incorrect in the zoological department; Tümmel's book "Mexico and the Mexicans" tells us fables of monstrous apes, which are clearly the offspring of the disturbed dreams of an ignorant settler, who had plied his rum-bottle somewhat too hard. Old Dr. Hernandez, who describes the animals of Mexico in the sixteenth century, is a more trustworthy authority than many of his successors; and though the learned Professor Lichtenstein of Berlin, in an academical treatise, considers as fabulous many of the animals described by Hernandez, the old author was right, and the animals exist.

This short digression brings me to the biped creations of Mexico, usually known by the generic name of 'man'. According to the Mexican terminology, they are divided into two kinds, the reasonable and the unreasonable (*gente de razon y gente sin razon*), and although these two species are to be found in all quarters of the globe, and in every climate, the latter predominating, the Spaniard has his own ideas on the subject, and considers the men of his peculiar race alone endowed with reason, the red-skins being denied it. The definition, however, is not extended to all the dark-skinned race, but specially to the full-blood Indians; for those of mixed race, though able perhaps to claim but the most distant relationship to the whites, also pretend to some modicum of reason, and are more pertinaciously opposed to the Indians than the whitest of the whites.

The law knows no distinction of the kind; the constitution has placed all the citizens of the country, whatever their colour, on an equal footing, all privileges of birth are withdrawn, and slavery long since eradicated. Customs, however, which have taken root amongst the people, and are perpetuated by the language, cannot so easily be obliterated by law: consequently we find here an aristocracy of colour, as in European republics or monarchies, an aristocracy of birth. It is precisely the same thing. There and here we talk of blood, of noble race; in the east, as in the west, unequal marriages disturb the repose of families; and we must not be surprised if a white Mexican 'proletarian', of pure and noble descent, on his daughter confessing her ardent affection for a brown youth of mixed race, and asking his consent to their union, bursts into a terrible passion, and exclaims: "Accursed child of Satan! how canst thou thus dishonour thy parents, and desire to sully thy pure race with a colour which would disgrace it for ever! Rather would I see thee in thy coffin, than a brown bantling in thy arms, etc." It is sad to remark