

## CHAPTER XVII.

Flora and Fauna of the Isthmus of Panama—Aspect and Character of the Vegetation—Useful, Noxious, and Ornamental Plants—Animals—Agriculture.

THE aspect of the flora is much more diversified than the uniformity of the climate and the surface of the country would lead one to expect. The sea-coast and those parts influenced by the tides and the immediate evaporation of the sea produce a quite peculiar vegetation, which is generally characterized by a leathery glossy foliage, and leaves with entire margins. In all muddy places, down to the verge of the ocean, are impenetrable thickets, formed of mangroves, chiefly *Rhizophoras* and *Avicennias*, which exhale putrid miasmata and spread sickness over the adjacent districts. Occasionally extensive tracts are covered with the *Guagara de puerco* (*Acrostichum aureum*, Linn.), its fronds being as much as ten feet high. Myriads of mosquitoes and sand-flies fill the air; huge alligators sun themselves on the slimy banks, lying motionless, blinking with their great eyes, and jumping into the water directly any one approaches.

To destroy these dreaded swamps is almost impossible : the *Avicennias*, with their asparagus-like rhizomes, send up innumerable young shoots whenever the main stem is felled ; the *Rhizophoras* extend, in all directions, their long aerial roots, which soon reach the ground and preserve the trees from falling, after their terrestrial roots have lifted them high above their original level. At Panama, where the tide rises to the height of twenty-two feet, these trees are frequently under water, the heavy surf washing their tops, apparently without injuring or checking their growth ; indeed, so well has nature provided for them, that the seed of the *Rhizophoras* begins to germinate while the fruit is yet attached to the tree, and it is not until it has sprouted out to the length of some inches that it drops, as a young plant, into the mud below. Rivers, as far as they are subject to the influence of the ebb and flow, are full of mangroves, and the highest *Rhizophoras*, which, growing always on that side where there is the deepest water, assist the natives in conducting their canoes through the mud-banks. On the sand of the sea-beach the *Ipomœa pes-capræ* grows in wild luxuriance, producing runners often more than two hundred feet long. Higher up, where the ground is firmer, are groves of cocoa-nut palms, poisonous manzanillo-trees, and spiny *Prosopises* and pitajayas, or thickets of *Crescentia cucurbitina* and *Paritium tiliaceum*.

Far different is the vegetation of the savanas. The ground, being level or slightly undulating, is clothed during the greater part of the year with a turf of brilliant green. Groups of trees and bushes rise here and there ; silvery streams, herds of cattle and deer, and the isolated

huts of the natives, tend to give variety to the scene, while the absence of palms and tree-ferns imparts to the whole more the appearance of a European park than of a tract of land in tropical America. The turf is almost as dense as in an English garden, and contains, besides numerous kinds of grasses, many elegant *Papilionaceæ*, *Polygaleæ*, *Gentianeæ*, and *Violaceæ*; the sensitive plant (*Mimosa pudica*, Linn.) prevails in many localities, closing its tender leaves even upon the approach of a heavy footstep. The clumps of trees and shrubs, over which the Garumos and Pavas are waving their large foliage, are composed of *Myrtaceæ*, *Melastomeæ*, *Chrysobalaneæ*, *Papilionaceæ*, *Verbenaceæ*, *Compositæ*, *Dilleniaceæ*, *Anonaceæ*, *Malpighiaceæ*, and *Acanthaceæ*, and overspread by *Convolvulaceæ*, *Aristolochiæ*, *Apocynææ*, and other climbing or twining plants. *Orchideæ* are plentiful in the vicinity of the rivers, where the trees are literally loaded with them. The vainilla (*Vanilla* sp.) climbs in abundance up the stems of young trees, and often increases so much in weight as to cause the downfall of its supporters. The Chumicales, or groves of sandpaper-trees (*Curatella Americana*, Linn.), form curious features in the landscape; they extend over whole districts, and their presence indicates a soil impregnated with iron: they are about forty feet high, with crooked branches—an approximation to the twining habit of the tribe,—and their paper-like leaves, when stirred by the wind, occasion a rattling noise, which strongly reminds one of the European autumn, when northerly breezes strip the trees of their foliage.

Forests cover at least two-thirds of the whole terri-

tory. The high trees, the dense foliage, and the numerous climbing and twining plants, almost shut out the rays of the sun, causing a gloom which is the more insupportable as all other objects are hidden from view. Rain is so frequent, and the moisture so great, that the burning of these forests is impossible—a striking difference to those of the temperate regions, where a fire often consumes extensive woods in a short space of time. Flowers are scarce in proportion to the mass of leaves with which the places are crowded, and in no respect is the European more disappointed: from cultivating in his gardens none but the choicest and most brilliant flowers which the regions of the sun are capable of producing,—from seeing on the stage tropical scenery, which looks more like a representation of fairy-land than of sub-lunary places,—and from reading the highly-coloured accounts with which many travellers have endeavoured to embellish their narratives, his imagination has drawn a picture of equinoctial countries which a comparison with nature at once demolishes. The Espavè (*Anacardium Rhinocarpus*, DC.) and the Corotu (*Enterolobium Timboïva*, Mart.) are amongst the most gigantic trees, attaining a height of from ninety to one hundred and thirty feet, and a circumference of from twenty-four to thirty feet; and no better estimate can be formed of their size, than by an inspection of the port of Panama, where vessels of twelve tons' burden, made of a single trunk, ride at anchor. The forests occasionally consist of a single species of tree; but generally they are composed of different kinds, the principal forms belonging to *Sterculiaceæ*, *Tiliaceæ*, *Mimoseæ*, *Papilionaceæ*,

*Euphorbiaceæ*, *Anacardiaceæ*, *Rubiaceæ*, *Myrtaceæ*, and *Melastomeæ*; these, and the prevalence of palms, tree-ferns, *Scitamineæ*, and *Aroideæ*, stamp on them the real tropical character.

Mountains, exceeding 2000 feet in elevation, situated principally in western Veraguas, possess a vegetation which resembles in many respects that of the Mexican highlands; in it the forms of the torrid region are harmoniously blended with those of the temperate. Alders and blackberries are found with *Fuchsias* and *Salvias*; the brake grows in company with lupines and *Ageratum*s; oaks and palms are intermingled; and large flowers are abundant. The genera represented are *Styrax*, *Rondeletia*, *Salvia*, *Lopezia*, *Fuchsia*, *Centradenia*, *Ageratum*, *Conostegia*, *Lupinus*, *Hypericum*, *Freziera*, *Galium*, *Smilax*, *Euphorbia*, *Rhopala*, *Equisetum*, *Clematis*, *Chorisia*, *Verbena*, *Condaminea*, *Inga*, *Solanum*, *Clethra*, etc. The oaks, like most tropical ones, are scarcely more than thirty feet in height, resembling neither in size nor in grandeur those which our heathen forefathers worshiped; their branches are smooth and devoid of that rugged appearance which renders those of the northern species so picturesque.

The Isthmus is rich in medicinal plants, many of which are known only to the natives, who have ably availed themselves of their properties. As febrifuges, they employ *Chicoria* (*Elephantopus spicatus*, Juss.), *Corpachi* (*Croton*), *Guavito amargo* (*Quassia amara*, Linn.), *Cedron* (*Simaba Cedron*, Planch.), and several *Gentianeæ*—herbaceous plants, which are known by the name of *Canchalaguas*. As purgatives they use the *Niño muerto*, or

*Malcasada* (*Asclepias Curassavica*, Linn.), *Frijolillo* (*Cassia occidentalis*, Linn.), *Cañafistola de purgar* (*Cassia Fistula*, Linn.), *Laureño* (*Cassia alata*, Linn.), *Javilla* (*Hura crepitans*, Linn.), and *Coquillo* (*Jatropha Curcas*, Linn.). Emetics are obtained from *Garriba de peña* (*Begonia* sp.) and *Frailecillo* (*Jatropha gossypifolia*, Linn.). As vulneraries they use *Chiriqui* (*Trixis frutescens*, P. Br.), *Guazimillo*, or *Palo del soldado* (*Waltheria glomerata*, Presl), and *Cope chico de suelo* (*Clusia* sp.). Anti-syphilitics are *Cardo santo* (*Argemone Mexicana*, Linn.), *Zarzaparilla* (*Smilax* sp. pl.), and *Cabeza del negro* (*Dioscorea* sp.). Cooling draughts are prepared from the Ferns, *Calahuala* (*Goniophlebium attenuatum*, Presl) and *Doradilla de palo* (*Goniophlebium incanum*, Swartz). Antidotes for the bites of snakes are found in the stem and leaves of the *Guaco* (*Mikania Guaco*, H. B. K.) and the seeds of the *Cedron* (*Simaba Cedron*, Planch.). Cutaneous diseases are cured by applying the bark of the *Palo de buba* (*Jacaranda filicifolia*, Don), *Nanci* (*Byrsonima cotinifolia*, H. B. K.), and the leaves of the *Malva* (*Malachra capitata*, Linn.).

The most dreaded of the poisonous plants are the *Amancaes* (*Thevetia neriiifolia*, Juss.), *Cojon del gato* (*Thevetia nitida*, De Cand.), *Manzanillo de playa* (*Hippomane Mancinella*, Linn.), *Florispondio* (*Datura sanguinea*, Ruiz et Pav.), and *Bala* (*Gliricidia maculata*, Kunth). It is said of the *Manzanillo de playa* that persons have died from sleeping beneath its shade, and that its milky juice raises blisters on the skin, which are difficult to heal: the first of these statements must be regarded as fabulous, and the second received with modifi-

cation. Some people will bear the juice upon the surface of the body without being in the least affected by it, while others experience the utmost pain, the difference seeming to depend entirely upon the constitution. Great caution however is required in protecting the eyes, for if the least drop enters them, loss of sight and the most acute smarting for several days are the consequence; the smoke arising from the wood produces a similar effect. While surveying on the coast of Darien, a boat's crew of H.M.S. Herald was blinded for some days through having kindled a fire with the branches of this tree. The natives, when affected by the poison, at once wash the injured part in salt water: this remedy is most efficacious, and, as the *Manzanillo* is always confined to the edge of the ocean, of easy application. It has been stated that the Indians of the Isthmus dip their arrows in the juice of the *Manzanillo*; there are however reasons for doubting this assertion: first, the poison is, like that of all *Euphorbiaceæ*, extremely volatile, and, however virulent when first procured, soon loses its power; secondly, its effect, even when fresh, is by no means so strong as to cause the death of human beings, not even producing, as has been stated, the slightest injury on some constitutions. The statement may therefore be considered inaccurate, and we may rather suppose that the Indians, like those of Guiana, obtain their poison from the two species of *Strychnos* common throughout Panama and Darien. The fruit of the *Amancaes* (*Thevetia neriiifolia*, Juss.) is also considered very poisonous, but its dangerous qualities have probably been overrated: there is a gentleman in Panama who, when a boy, ate four of

these fruits without experiencing any other effect than mere griping. The leaves of the *Bala*, or, as it is also called, *Madera negra* (*Gliricidia maculata*, Kunth), are used to poison rats. The *Florispondio* (*Datura sanguinea*, Ruiz et Pav.) appears always to have played, and still continues to play, a prominent part in the superstition of tropical America. The Indians of Darien, as well as those of Chocò, prepare from its seeds a decoction, which is given to their children to produce a state of excitement in which they are supposed to possess the power of discovering gold. In any place where the unhappy patient happens to fall down, digging is commenced; and, as the soil nearly everywhere abounds with gold-dust, an amount of more or less value is obtained. In order to counteract the bad effect of the poison, some sour *chicha de maiz*, a beer made of Indian corn, is administered.

Many indigenous plants bear eatable fruits, some of most delicious flavour. Several spontaneous productions are used as culinary vegetables. *Marathrum fœniculaceum*, H. B. K., a plant resembling some of the finer seaweeds, and growing in most rivers of Veraguas, is esteemed so highly by the inhabitants that they have called it *Passe-carne*, *i. e.* excels or surpasses meat, and, indeed, its young leaf-stalks, when boiled, have a delicate flavour, not unlike that of French beans. The leaves of the *Ñaju de espina* (*Peirescia Bleo*, De Cand.) are eaten as salad, either raw or boiled, like the young branches of several *Opuntias* in Mexico; and in a country where, from the nature of the climate, the rearing of lettuces is attended with difficulties, they form a tolerable substi-



tute. The foliage of the *Col de Nicaragua* (*Jatropha multifida*, Linn.) affords another culinary vegetable, losing, apparently, as do most *Euphorbiaceæ*, its poisonous qualities by boiling. The seeds of the *Chigua* (*Zamia Chigua*, Seem.), a plant abounding in the vicinity of Chirambirà, after having been boiled and reduced to a mash, are mixed with milk and sugar, and thus eaten; a kind of bread is also prepared from them. As condiments for esculent purposes, divers plants are used. The red berries of the *Malagueto chico* or *Malagueta hembra* (*Xylopia frutescens*, Aubl.) are substituted for pepper, especially by the negroes. The fruit of the *Vainilla* (*Vanilla* sp.) and *Vainilla chica* (*Sobralia* sp.) are spices employed in flavouring sweetmeats, chocolate, and puddings. The leaves of the *Toronjil* (*Ocimum*), a common herb, are chopped, and serve to replace our parsley. The most important however of all the aromatics to the Pananian cook is the *Culantra* (*Eryngium fetidum*, Linn.); it imparts a flavour difficult for a foreigner to relish; but the inhabitants consider it indispensable, and are quite distressed when in the soups and sancoches their favourite condiment has by some accident been omitted.

Excellent timber for building, and wood for cabinet-makers' purposes, abound. Dyes the country produces several: a yellow one is obtained from the wood of the *Macano* (*Diphysa Carthaginensis*, Jacq.), a scarlet from the leaves of the *Hojita de teñir* (*Lundia Chica*, Seem.), a blue from the foliage of the *Añil silvestre* (*Indigofera Anil*, Linn.), a violet from the fruit of the *Jagua* (*Genipa*), a red from the pulp of the *Bija* or *Acholte* (*Bixa Orellana*, Linn.), and a black from the seeds of the *Ojo*

*de venado* (*Mucuna* sp. pl.). A brown colour might be extracted from the *Dichromena pura*, Nees ab E., which abounds in the savanas, and makes on cotton and linen a stain very much like that caused by the rusting of an iron nail, whence the vernacular name, *Clava*, a *nail*. The Indians of Southern Darien paint their faces with the colour obtained from the *Biwa Orellana*, Linn., or, as they themselves term it, *Bija*. The scarlet dye observed in the hammocks of Veraguas is not given with the purple shell (*Purpura patula*, Lam.), as the people of Panama assert, but with the leaves of the *Lundia Chica*.

The cordage which the Isthmians use is solely procured from indigenous plants. The best and whitest rope is made from the fibre of the *Corteza* (*Apeiba Tibourbou*, Aubl.). A brownish-looking rope, easily affected by dampness, probably because the tree from which it is taken has saline properties, is manufactured from the *Majagua de playa* (*Paritium tiliaceum*, Adr. Juss.). The *Barrigon* (*Pachira Barrigon*, Seem.) and the *Malagucto hembra* (*Xylopiia frutescens*, Aubl.) also yield a fibre fit for ropes. The hammocks of Veraguas consist of the fibres of the *Cabuya* (*Agave* sp.), and those of a palm called *Chonta*. A strong fibre is contained in the leaves of the *Pita de zapateros* (*Bromelia* sp.), which is prepared like flax, woven into bags, or *Chacaras*, by different Indian tribes, and extensively used by shoemakers for sewing. The fibre surrounding the wood of the *Cucua* or *Namagua* forms a close texture of regular natural matting, which the natives soak in water, beat, and make into garments, beds, and ropes, or use as sails

for their canoes. The mats which the poorer classes use to sleep upon are manufactured from the fibre of plantain-leaves (*Musa paradisiaca*, Linn.).

Numerous vegetable substances are applied to miscellaneous purposes. An infusion of the leaves of the *Tē* (*Corchorus siliquosus*, Linn.) is drunk instead of tea, and a similar preparation may be made from those of the *Freziera theoides*, Swartz, a shrub common on the volcano of Chiriqui. The aerial roots of the *Zanora* (*Iriartea exorrhiza*, Mart.), being clad with numerous spines, are used as graters; and although they are not so fine as those supplied by art, yet in a country where, from the humidity of the climate, tin ones soon get rusty, they are almost preferable: the natives chiefly employ them for grating cocoa-nuts, which, boiled with rice, compose one of their favourite dishes. The leaves of the *Papayo* (*Carica Papaya*, Linn.) are a substitute for soap. The wood of the *Balsa* (*Ochroma Lagopus*, Swartz), being soft and light, like cork, is used for stopping bottles: the never-sinking rafts, which, at the discovery of South America, caused such surprise among the early adventurers, were then constructed of it and are so still. The fruit of the *Palo de velas* or *Candle-tree* (*Parmentiera cereifera*, Seem.) serve to fatten cattle. The wool of various *Sterculiaceæ*, the *Balsa* (*Ochroma Lagopus*, Swartz), *Ceiba* (*Eriodendron Caribbæum*, Don), and *Barrigon* (*Pachira Barrigon*, Seem.), is employed for stuffing pillows, cushions, etc. Hedges are made of the *Ortiga* (*Urtica baccifera*, Linn.), *Poroporo* (*Cochlospermum hibiscoides*, H. B. et Kth.), *Pitajaya* (*Cereus Pitajaya*, De Cand.), and *Piñuela* (*Bromelia* sp.). The

hard shells of the *Crescentia Cujeta*, Linn., are turned into bottles, sieves, pails, spoons, and various other household articles. In catching fish by stupefaction, the natives avail themselves of the juice of the *Manzanillo de playa* (*Hippomane Mancinella*, Linn.), the bark of the *Espavè* (*Anacardium Rhinocarpus*, De Cand.), and the leaves of the *Barbasco* (*Ottonia glaucescens*, Miq.). Oil is obtained from the fruit of the *Corozo colorado* (*Elaeis melanococca*, Gærtn.), and wine, vinegar, food, habitations, clothing, and numerous other necessaries of life, from the different palms which inhabit the country. The leaves of the *Chumico* (*Curatella Americana*, Linn.) and *Chumico bijuco* (*Davilla lucida*, Presl) are used for cleaning iron, and for polishing and scouring wood; indeed, they serve all the purposes of sand-paper. From the *Jipijapa* (*Carludovica palmata*, Ruiz et Pav.) the far-famed Panama hats are plaited.

Nor is the flora destitute of plants which claim attention on account of their beauty, rarity, or singular configuration. The *Espiritu Santo*, or Holy Ghost plant (*Peristeria elata*, Hook.), bears a flower resembling a dove, and is, like the *Flor de semana santa*, another Orchid, almost held in religious veneration, and eagerly sought for when in blossom. The *Biura* (*Petræa volubilis*, Jacq.) is a flower of whose beauty those who have only seen it in conservatories can form but an inadequate idea: nothing can be more charming than the sight of whole groves overspread with the long blue racemes of this creeper, it almost baffles description. The *Palo de buba* (*Jacaranda filicifolia*, Don) is another of those plants on which poets delight to try their

pen, and painters their brush: when this noble tree rises on the banks of the river, amidst the dark foliage of a luxuriant vegetation, and waves its large panicles in the air, the foot is involuntarily arrested, and one gazes for some time lost in wonder and admiration. There are also numerous plants which exhale a delicious perfume, and a long list of them could be cited.

America is generally divided into two zoological provinces, separated from each other by the barrier presented by the Mexican table-land. That these divisions are well characterized few are inclined to dispute; but, it may be asked, was or is the barrier sufficient to check the progress of species? Confining ourselves to the tropics, it is possible to migrate from Guayaquil to Mazatlan, which may be considered their extremes on the western coast, without a change of temperature of more than a few degrees, and without ascending mountains possessing a physical constitution different from that of the lower equinoctial region. That this passage has been adopted is evident from the presence of several South American species in Northern America; that many animals have passed the Isthmus without stopping is also proved; the armadillo, for instance, which indisputably belongs to South America, is found in no part of Panama, but again appears in the neighbourhood of Mazatlan, in lat.  $23^{\circ} 12' 0''$  north. It is no less evident that the migration of animals, if not otherwise restricted by change of food, etc., could have avoided the Mexican table-land, by pushing from the north along the Gulf of California, a route which, according to recent researches, was that taken by the Aztec nations in passing to the

plains of Anahuac\* The Isthmus therefore, in connecting the American continent, promotes not only the distribution of plants, but also offers facilities for the migration of animals, and without this passage many genera and species now common to both countries, would probably have been confined to one.

Mammalia are represented by a variety of forms. Hosts of monkeys, including the white-headed chapolin (*Cebus hypoleuca*, Gray), inhabit the woods. Bats are numerous: a kind of vampire is common, causing dangerous wounds in the cattle; *Dicliderus Freyreisii*, Gray, seems to be a bat peculiar to the Isthmus. The jaguar, or, as the natives call it, *Tigre* (*Felis onca*, Linn.), and the puma (*Felis concolor*, Linn.), verna- cularly termed lion, are destructive to cattle, but seldom attack man. A grey opossum (*Didelphis* sp.), called *Gato solo* from its solitary habits, is frequent. Several kinds of cornejos, or squirrels, are met with. Rats and mice, in the Isthmus, as everywhere else, are the plague of the dwellings. The *Gato de pachorra*, here and there observed, is a sloth (*Bradypus didactylus*, Linn.). Sajinos are frequent, but merely eaten by the dogs. Pigs wander in herds about the forest, and are dreaded by the natives, who, when they meet them, seek safety in flight or by climbing a tree. The tapir (*Tapirus Americanus*, Linn.), the *Macho de monte*, *Danta*, and *Gran bestia* of the Panamians, is the largest terrestrial animal of the Fauna, though in comparison with the Asiatic species (*Tapirus Indicus*) a mere dwarf. Its

\* I allude here to the investigations of my friend Don Fernando Ramirez in Durango.

flesh is eaten, but is insipid; medicinal virtues are ascribed to the hoof, which is administered for paralysis, and a decoction of it is taken by women after child-birth.

The only ruminant animal is the *Venado*, a species of deer (*Cervus* sp. nov. ?), met with in herds in the savannas. Its horns are not simple, like those of *Cervus rufus*, Cuvier, a common Peruvian animal, but branched and divided. The venado is about three feet high, and when young spotted with white dots; this colour however soon changes into a light brown. The meat, very tough when fresh, becomes tender if kept awhile or boiled with papaya; the hide is converted into a soft yet durable leather, well adapted for boots in so hot a climate. The animal is easily domesticated: Mr. J. Agnew, a gentleman in David, had one which had been reared by a bitch and possessed the habits of a dog, eating meat, running about the house, and following its master. The people of Veraguas have a curious mode of hunting the venados. The bone of a pelican's wing is covered at one end with a peculiar kind of cobweb, which forms an instrument that will imitate the cry of a young deer so closely that the old ones, in the belief that some mishap has befallen their kid, repair to the place whence the sound proceeds, and are shot; the hunters frequently return with twelve or fifteen of them after one day's sport.

The sea on the Pacific shore is frequented by porpoises and blackfish, and the manati or sea-cow (*Trichechus manatus*, Linn.), one of the herbivorous *Cetacea*, or whale-tribe, occurs on the coast of the Atlantic: it was well known to the Buccaneers, who in times of scarcity were

compelled to subsist on it. The flesh is said to resemble beef in appearance, and to have the taste of pork: the skin of the back, says an old author, is two fingers thick, and when dried becomes as hard as whalebone and may serve to make walking-sticks.

Birds exist in great numbers. The humming-birds, macaws, and parrots are distinguished for the beauty and brilliancy of their plumage; pigeons, partridges, and turkeys for the delicacy of their flesh; while the galinazos (*Discolophus cristatus*), pelicans, and others, attract attention by their singular features and habits.

Reptiles abound. The scales of the turtle form an article of commerce. At the time of the discovery of the country the Spaniards evinced a great repugnance to the iguanas (*Lacerta iguana*, Linn.), and expressed disgust at beholding the Indians eating them; this feeling is now overcome, and the eggs as well as the flesh of these animals are considered as delicacies. It is not the only instance in which such a change has been effected: the use of tobacco, another Indian practice, was equally disliked, now no people indulge more in it than the Spaniards and their descendants. Alligators are numerous on the mouths of rivers, where they are found sunning themselves on the muddy banks; it is amusing to see how motionless they lie, listening to any noise and blinking their great eyes, but immediately any one approaches they jump into the water. Some of these animals are from fourteen to eighteen feet long. Their eagerness to attack man has often been asserted, but there is reason to believe that they are cowards, like most animals belonging to the lizard-tribe.



I have only heard of a single instance of a person having been bitten, and that happened during the night, when he was wading through a rivulet. In the Rio Grande de Panama children may be seen bathing when around them there are numerous alligators; if the animals were as rapacious as they are represented, such risks would undoubtedly be avoided.

Both land and sea snakes occur; the former are sometimes eighteen feet long. The Coral, zonated scarlet and black, the *Vivora*, variegated black and brown, and the *Voladora*, or flying-snake, of a lively green colour, are considered the most venomous. The *voladora* lives in trees, darting with rapidity from branch to branch, which, having the appearance of flying, has given rise to the vernacular name. Before the *Cedron* was known many deaths occurred from the bite of snakes. The people used to wear—and in some parts of the country still wear—suspended round their necks or legs an alligator's tooth as a charm against them. I saw once a boy who had expired two hours after having been bitten, and in the afternoon the body was swollen to at least double its former size, presenting a frightful appearance: great caution is therefore necessary. Fortunately the presence of a snake is generally known before the animal is seen or heard: this the natives attribute to a smell peculiar to these reptiles, but as the smell is not perceived by Europeans, and yet the presence of the snake is known by them, it must be ascribed to some cause yet to be explained. Toads, and other frog-like animals, are most numerous during the wet season. A very minute species, beautifully spotted with black and red, is said to be

used by the Indians to poison arrows. The abundance of toads about Portobelo has often been noticed: "So prodigious is their number after rain," says Mr. Lloyd, "that the popular prejudice is that the rain-drops are changed into toads ('de cada goto viéne un sapo'); and even the more learned maintain that the eggs of this animal are raised with the vapour from the adjoining swamps, and, being conveyed to the city by the rains, are there hatched. The large size of the animals however—many of them being from four to six inches in breadth—sufficiently attests their mature growth in more favourable circumstances. After a night of rain the streets are almost covered with them, and it is impossible to walk without crushing some."

The quantity of fish, especially in the Bay of Panama, early gave rise to the name of "Panama," or "place where fish abounds." The market of the capital is well stocked, particularly with rock-cod, snappers, yellowbellies, dolphins, whiting, soles, catfish, bonitas, albicore, and young sharks. Devilfish, sharks (some measuring thirty feet), and various other kinds, infest the sea-coast. The rivers also abound in fish. The Indians, in order to procure them, form parties, and after spreading a net across a shallow part of a river, drive the fish towards it by beating the water and by loud shouts; the captives are killed by a blow, and thrown upon a raft anchored for that purpose in the middle of the stream. A more simple method is that of stupefying the fish with the juice of the *Manzanilla* (*Hippomane Mancinella*, Linn.), the bark of *Espavè* (*Anacardium Rhinocarpus*, De Cand.), or the leaves of *Barbasco* (*Ottonia glaucescens*, Miq.). A

net is stretched from bank to bank, and these substances thrown into the river. The effect is surprising: the fish instantly appear on the surface, and are driven without resistance against the net, where they are secured. The law however inflicts a penalty upon this mode of fishing, as it not only depopulates the rivers, but causes diseases among the people, who use river-water for every domestic purpose.

Shells occur in great variety and beauty, and belong chiefly to the genera *Arca*, *Avicula*, *Buccinum*, *Cancellaria*, *Cerithium*, *Chiton*, *Clavagella*, *Columbella*, *Conus*, *Corbula*, *Cypræa*, *Harpa*, *Marginella*, *Murex*, *Næra*, *Nucula*, *Oliva*, *Ostræa*, *Patella*, *Pecten*, *Phos*, *Pinna*, *Purpura*, *Pyrgula*, *Scalaria*, *Solarium*, *Terebra*, *Triton*, *Trophon*, and *Venus*. Species of *Arca*, and two kinds of oysters, are used as food; a purple dye is obtained from the *Caracolilla* (*Purpura patula*, Linn.); and pearls from the *Avicula margaritifera*, Bruguière. Pearl-oysters are common on the whole coast of the Pacific, but more abundant in the Bay of Panama. Balboa, when he discovered the South Seas (1513), was the first European who heard of their existence, having been presented with some pearls by the Cacique Tamaco; shortly after the pearl-fishery commenced, and has continued ever since. It is now carried on by free labour, a diver receiving, besides his daily food, fifteen dollars a month: he is able, if successful, to bring up each time a dozen shells, four of which he puts between the fingers of the left hand and eight on the bend of the same arm, while his right remains free for separating the shells from the rocks. The divers complain of the *aguamalas*, or sea-

nettles, species of *Medusa*, which cause a severe pain on touching the body; but they are most in fear of the sharks, which are frequently fatal to them. Scarcely a tenth part of the shells are found to contain pearls, and even among these are many grey and bad-shaped ones, of little or no value. The pearls are sold by weight, and vary in price according to shape and colour. The largest and most perfect one perhaps ever found on the coast of the Isthmus was obtained at the Paredes Islands, and is now in the possession of Mr. James Agnew, at David; it is three-quarters of an inch in diameter, and perfectly round. These shells form a lucrative article of commerce, and are much inquired after by French vessels. The mollusks themselves are strung upon cords, dried in the air, and eaten. About thirty years ago a diving bell was sent out by an English company, but it did not answer expectation: the expense at which the concern was fitted out and supported was too great, and the oysters did not lie in banks, as is generally the case, but were dispersed under rocks and on uneven ground; a peculiar ground-swell and motion under the water, together with a strong current, made it almost impossible to place the diving-bell in safety or to advantage.

Crabs, shrimps, and prawns may be obtained in any quantity required. Spiders and scorpions are frequent, the bites of the latter producing the utmost pain, great swelling of the wounded part, and, in some cases, slight fever. Garrapatas, or ticks (*Ixodes* sp.), which swarm in the woods, are a great annoyance to both men and animals: they adhere firmly to all parts of the body, and can only be removed by scraping them off with a knife

or washing the skin with spirits ; the dry season is most favourable for their development ; during the wet they are not so frequent, but are more than replaced by the coloraditas, very minute red insects, which exist in the grassy plains in prodigious numbers, and the pain they cause by introducing themselves into the skin is of such an irritating nature that they may justly be considered as the greatest plague of the Isthmus. The nigua, or jigger (*Pulex penetrans*, Linn.), another annoying insect, which enters the tender parts of the feet, under the nails, between the toes, etc., is met with principally on the higher mountains ; its congener, the common flea (*Pulex irritans*, Linn.), and most other vermin common in cooler regions, are fortunately rare. Beetles are not numerous, but those that occur are very beautiful. The carrion-feeding beetles are scarce, while those that subsist on vegetable substances are more numerous,—probably a natural consequence of the rapid decomposition of animal matter. Some are phosphorescent. The cocullo gives so brilliant a light that one may read by it ; the women collect them in the sugar-plantations for the purpose of decorating their hair in the evening, when these beetles have the appearance of diamonds. Myriads of fireflies swarm in the forests, and several species of cockroaches (*Blatta* sp. pl.), stick-insects (*Mantis* sp.), and many other *Orthoptera*, among them various kinds of crickets, have been noticed ; one cricket, the *Cigarro* of the natives, attains a length of six inches, and is probably the largest of these creatures in existence. The *Gorgojo* (*Cicada* sp.) has the peculiarity of making a sound not unlike the hissing of snakes, for which strangers are apt

to mistake it. When at Coyba, one of the officers of H.M. Steamer S\* \* \* had ventured some distance into the woods in search of game ; all at once, wherever he turned, the hissing of snakes met his ear ; he hurried back to the beach, and arrived quite exhausted with the exertion he had made to regain a clear place. The cause of the sounds was soon ascertained, and the bold hunter became for several days the laughing-stock of his companions. Of *Neuroptera*, dragon-flies and various kinds of ants may be enumerated. The arriero (*Atta* sp.) is about an inch long, and very destructive to plantations : it forms regular roads, occasionally from one to two miles long, and is always seen carrying portions of leaves, flowers, and other substances, mostly exceeding its own weight. A honey-bee is frequently met with, which, being stingless, may be robbed of its stores without difficulty ; another species of bee produces a black wax, which is used for candles. Butterflies appear in great number in the beginning of the wet season, but, though some are of exquisite beauty and large size, the generally are small, and do not display that brilliancy of colours to which the eye is accustomed in the Tropics. Mosquitoes and sandflies are the scourge of the sea-coast, but they are not so numerous in the interior. One of the most annoying animals is the *Gusano del monte*, or Guinea-worm (*Filaria* sp.). Entering the flesh, especially near the knee, as a very minute being, it grows in about six weeks to the length of an inch and the thickness of a good-sized quill. The place where it remains has at first the appearance of a mere pimple, but gradually becomes more inflamed, causing stiffness in the legs and extreme

pain. The worm should be cut out, or else it will attack the bone. Unluckily it is seldom discovered before it has obtained a considerable size, as the generality of people look upon the wound as a mere sore, and apply every remedy but the right one.

In a country like the Isthmus, where nature has supplied nearly every want of life, and where the consumption of a limited population is little felt, agriculture, deprived of its proper stimulus, cannot make much progress; it is therefore, in the Isthmus, in the most primitive state,—our first parents could hardly have carried it on more rudely. A spade is a curiosity, the plough has never been heard of, and the only implements used for converting forests into fields are the axe and the machete (or chopping-knife). A piece of ground intended for cultivation is selected in the forests, cleared of the trees by felling and burning them, and surrounded with a fence. In the beginning of the wet season the field is set with plants by simply making a hole with the machete, and placing the seed or root in it; the extreme heat and moisture soon call them into activity, the fertility of a virgin soil affords them ample nourishment, and without the further aid of man a rich harvest is produced. The same ground is occupied two or three years in succession; after that time the soil is so hard, and the old stumps have thriven with so much energy, that a new spot has to be chosen. In most countries this mode of cultivation would be found impossible; but in New Granada all the unoccupied land is common property, of which anybody may appropriate as much as he pleases, provided he encloses it either artificially or by taking

advantage of rivers, the sea, or mountains. As long as the land is enclosed it remains in his possession; whenever the fence is decayed the land again becomes the property of the republic. Colonial produce, such as sugar, coffee, cacao, tamarinds, etc., which require more attention than the inhabitants are wont to bestow, are merely raised for home consumption; and although the provincial government has tried to encourage this branch of industry by offering premiums for growing a certain number of plants, and the soil and climate are favourable, yet none, except a few enterprising foreigners, have taken a prominent part in the cultivation; and there is reason to believe that while the country remains thinly populated, the high price of labour, consequent on such a state of society, will be a lasting impediment to the establishment of plantations on a large scale. The cerealia grown are rice and Indian corn: the former was introduced by the Spaniards; the latter was known before the conquest to the Aborigines, who raised it extensively, and used to prepare from it their bread, and *chicha*, a kind of beer. Some successful experiments with wheat have been made on the mountains of Veraguas, which will doubtless lead to an extensive cultivation of that grain. Of dessert fruit probably no country can exhibit a greater variety. The plantain furnishes the inhabitants with the chief portion of their food. The esculent roots under cultivation are *Ñame* (*Dioscorea alata*, Linn.), *Yuca* (*Manihot utilissima*, Pohl), *Batata* or *Camote* (*Batatas edulis*, Chois.), *Otò* (*Arum esculentum*, Linn.), and *Papas* (*Solanum tuberosum*, Linn.). Except the potato, all these plants are propagated by cutting off the



top of the roots (tubers, corms, etc.). The vitality of these cuttings is very great; they may be left for weeks on the field, exposed to sun and rain, without receiving any injury. Other vegetables grown are the *Challote* (*Sechium edule*, Swartz), *Guineo* (*Musa sapientum*, Linn.), *Guandu* (*Cajanus Indicus*, Spr.), *Mani* (*Arachis hypogæa*, Linn.), *Pepino* (*Cucumis sativus*, Linn.), *Sapallo* (*Cucurbita Melopepo*, Linn.), *Lechuga* (*Lactuca sativa*, Linn.), and *Col* (*Brassica oleracea*, Linn.). The lettuce and cabbage are raised with difficulty in the lower region; but they never form heads, and are not much liked. Tomatos (*Lycopersicum esculentum*, Mill.) and different kinds of *Aji* (*Capsicum* sp. pl.) are cultivated in considerable quantities, and are used as condiments for culinary purposes.

Domestic animals were unknown before the arrival of the Spaniards; they are now widely diffused, but have degenerated, probably as much from want of proper attention as from the effect of climate. Cats and dogs are small and lean. Pigs thrive tolerably well, and are kept on account of the lard, which is as indispensable to the Panamanian cook as butter to the European. The horses are small and lean: I once saw a European who, on being offered one of them, took the animal under his arm, to the great amusement of the bystanders, and lifting it up, exclaimed, "Here's a thing for a man to ride upon!" The colour of most of the horses is grey, or rather dirty white, and the price of a common one is from five to twenty dollars. Asses are seldom used, but mules are highly valued. Goats are not extensively reared; sheep are mere objects of curiosity. Oxen are so numerous, that

not uncommonly five or six thousand may be seen grazing on one plain; their price is from one to twelve dollars. On large estates from five hundred to a thousand are killed at a time; the meat is cut in strips, slightly salted, and dried in the sun, and sent, under the name of *tasajo*; to Choco, where it obtains a good price; the hides, worth from six to eight reals a-piece, are shipped to the United States, the tallow to Peru. Cheese is made in small quantities; butter is hardly known. Bullocks are seldom used as beasts of burden or draught. The cattle, allowed to roam about at liberty, have become wild, as is the case in many parts of tropical and sub-tropical America, though in southern Africa, where no more pains are taken to confine them, horses and bullocks are gentle, and keep in the vicinity of human habitations. The difference must probably be attributed to the number of carnivorous beasts with which the Cape Fauna abounds, while in the hotter portions of America, where few ferocious animals are met with, the herds may pursue their grazing unmolested, and no longer require the protection of man.

On poultry more care is bestowed. Domestic fowls have multiplied to a great extent; it is reported however that some localities are unfavourable for rearing them. Mr. Lloyd asserts that at Portobelo fowls introduced from Cartagena or Panama cease to lay eggs, and that their flesh becomes tough and unpalatable.