

CHAPTER XVI.

Geographical Position of the Isthmus of Panama—Boundaries—Extent of Surface—Coast—Islands—Tides—Charts and Maps—Rivers—General Aspect of the Country—Geology—Metals—Gold-Mines—Salines—Volcanoes—Earthquakes—Hot Springs—Climate—Winds—Waterspouts.

THE Isthmus of Panama lies between the 4th and 10th parallel of north latitude, and the 77th and 83rd of west longitude; it belongs politically to the Republic of New Granada, and comprises the provinces of Panama and Veraguas and the territories of Darien and Bocas del Toro. Its least breadth, from sea to sea, is twenty-seven miles, and its configuration that of a bow, the coast of the Caribbean Sea forming the convex line, that of the South Sea the concave. Bounded on the north and north-east by the Atlantic, on the south and south-west by the Pacific Ocean, on the east by the rivers Atrato and San Juan, and on the west by the Republic of Costa Rica, it presents, including the adjacent islands, a surface of 34,000 square miles—an extent of territory nearly equal to that of Portugal.

The coast on the Atlantic side extends from Costarica to the river Atrato—three hundred and sixty miles. Its most western part is formed by the Lagoon of Chiriqui, an oblong bay, in which the port of Bocas del Toro is situated. Thence eastward lies the river Belen, where Columbus in his fourth voyage tried to establish a settlement, and, in lat. $9^{\circ} 18' 6''$ north, long. $79^{\circ} 59' 2''$ west, the port of Chagres, the most frequented on this side the Isthmus: the port itself is an open roadstead, and its inner harbour, on account of a rock, is difficult to enter, and fit only for vessels of small burden. Much superior to it is Portobelo, situated in lat. $9^{\circ} 34' 29''$ north, long. $79^{\circ} 43' 40''$ west. Still following an easterly direction we come to the Bay of Limones, or Navy Bay, as some navigators term it. "At the entrance," says Mr. J. A. Lloyd, "it is about five miles wide, and can be approached without danger by day or night, in any weather; its opening is due north. On the western side several projecting points afford secure and commodious anchorage. The bottom of the bay curves regularly, and is bounded by a beach of very tenacious sand, and beyond by a bank, which is raised a few feet above high-water mark, and formed of shells thrown up by the surf. About three miles from the east point of the bay the land falls back in another deep curve, within which is Mazanilla, an island a mile and a quarter long and a mile broad, forming a fine channel with the mainland, with excellent anchorage for large ships for some distance within its entrance, and shelter for smaller vessels to repair or careen, in a large lagoon enclosed between the mainland and the south-

eastern end of the island. 'The depth of the water in the bay decreases regularly from six fathoms to three, and one and a half even close to the shore.'" Passing the ports of Bastimentos and Retrete, more famous for the tragical events connected with them than for commercial advantages, we reach the Puerto de Escoces, deriving its name from the Scottish colony that once stood there. Thence the coast takes a southerly direction, and forms, in conjunction with that of the province of Cartagena, the Gulf of Darien or Uraba, known in history as that part of the Isthmus first discovered and inhabited by Europeans.

The line which the coast of the Pacific describes, extending from the river Chiriqui Viejo to the mouths of the San Juan, is six hundred and sixty miles in length. The shores are, generally speaking, bold and rocky, as far as Cape Corrientes, but thence to Chirambira flat, rising only a few feet above the sea-level. There are several ports and natural harbours. The most western is Boca Chica, the principal seaport of the canton of Alanje (Chiriqui), situated in lat. $8^{\circ} 13'$ north, long. $82^{\circ} 13' 30''$ west, but the place of embarkation for goods is in lat. $8^{\circ} 21' 43''$ north, long. $82^{\circ} 26'$ west. The passage to the latter is fit only for vessels of small dimensions, and leads through a perfect maze of mangroves at the mouths of several rivers, which empty themselves into the sea through three channels, the Boca Chica, the Boca del San Pedro, and the Boca Brava. The Boca Chica is best adapted for coasting-vessels, but the Boca del San Pedro, if surveyed and buoyed, would probably be far easier and more expeditious. Traversing the coast in an easterly

direction, we find Bahia Honda, a fine natural harbour, Montijo, the seaport of Santiago de Veraguas, and, on entering the Bay of Panama at Punta Mala, the ports of Aguadulce, San Carlos, Chorera, and Perico. Perico, as that of Panama is called, is an open roadstead, ill adapted for a packet-station; ships of even less than three hundred tons have to lie two miles seaward, and, in order to procure water, are obliged to proceed to the island of Taboga. The site of the city was evidently chosen more for its security against attack than for the convenience of commerce, yet, as it is free from violent winds, the anchorage is secure. The coast, from Panama to the Gulf of San Miguel, is low, muddy, and destitute of ports. The Gulf of San Miguel, where Balboa first embarked on the South Sea, is a spacious basin, in which a number of rivers empty themselves. Its entrance is limited by two points, Punta Brava and Punta de Garachinè; the latter and Punta Mala form the Bay of Panama. The Pearl Islands are nearly in the centre, thus leaving two passages for entering. Navigators prefer the western during the wet, the eastern during the dry season; the eastern passage however has in its fairway the disadvantage of the shoal of San José, in the middle of which Captain Kellett discovered a rocky patch with less than three feet water upon it. From Garachinè southwards are the Bays of Piños, Ardita, Cupica, San Francisco Solano, and near Cape Corrientes that of Utria, all of which offer fine accommodation for shipping, and will be of importance when the country is more civilized and more thickly peopled, and has fairly become that for which nature seems to have destined it—the highway of the world.

The coasts are fringed with numerous islands. The largest on the Atlantic side are the Escudo de Veraguas, and those situated in the Lagoon of Chiriqui; others, of a smaller size, generally known to the voyager by the name of Cayos, or keys, are scattered along the shores, and form occasionally, as in the case of the Sambaloes, regular chains. The latter group comprises the Isla de Piños, the Golden Island, and various others, well known from being connected with the early history of the country. All however are but thinly peopled, and at present not much frequented by foreign vessels.

Of greater importance are the islands in the Pacific Ocean. Several groups, Secos, Paredez, Ladrones, and Contreras, are situated on the south-western coast of Veraguas, and another cluster, of which Coyba, Gobernadora, and Cebaco are the largest, in the Bay of Montijo. Coyba,—or Quibo, as it is incorrectly spelt by foreigners,—the most extensive, is twenty-four miles long, fourteen broad, and well supplied with wood and water. Until lately it was uninhabited, and only visited at certain seasons by pearl-fishers, and would probably have remained in that state had not the attention of the New-Granadian Government been suddenly directed to it. The survey of Coyba by H.M.S. Herald, and the proposal of a North-American Company to purchase the island, seemed to be so many proofs of its value, and at last, in 1848, the executive power thought it necessary to form a settlement, and sent soldiers to hoist the flag of the Republic. The Pearl Islands, also known by their synonyms of *Islas del Rey*, *Islas del Istmo*, and *Islas de Colombia*, are valuable from the number of pearls annually

collected on their shores ; they form a little archipelago at the entrance of the Bay of Panama, and are composed of sixteen islands and several rocks. San Miguel is the largest, San José, Gonzales, Saboga, Pacheque, Casayos, and Contadora, are of secondary, the rest of minor magnitude. Smaller, but scarcely less important, is the group in the vicinity of Panama, consisting of Perico, Flaminco, Otoque, Taboguilla, and Taboga. The latter is one of the most delightful spots in the bay. In its centre rises a hill about a thousand feet high, which is cultivated nearly to its summit with useful fruits and vegetables, and sends down streams to the valleys, where, amidst cocoa-nut palms and tamarind-trees, the habitations of the natives are almost hidden. When walking among the orange-groves, and seeing the trees loaded with delicious nisperos, alligator-pears, and mangoes, or the sides of stony hills covered with fields of pine-apples, fancy almost transports the stranger into some fairy garden.

The difference of the tides between the two oceans is great : on the Atlantic side, at Chagres, the mean elevation is 1.16 feet, while at Panama the highest flow is twenty-two feet, and it was stated by Mr. J. A. Lloyd that it rose even to twenty-seven feet. This statement however has not been corroborated by the observations of the expeditions of H.M.S.S. Sulphur and Herald ; but as so accurate an observer as Mr. Lloyd is not likely to have made so gross a mistake, it is but fair to conclude that he must have witnessed an additional rise of five feet, caused by some other force than the tide, —perhaps strong winds, or some of those earthquakes which occur at sea, and often cause a rising on the

adjacent coasts. For the remarkable difference which exists between the two oceans it is not easy to account satisfactorily; it is probable that Panama, at the head of a deep bay, receives the sudden check which the water must meet, and that thus the great rise is produced. This hypothesis appears to be in accordance with the fact that the tide rises at Taboga nineteen feet, at Saboga (one of the Pearl Islands) fifteen feet, and at other places outside the Bay of Panama only twelve and eleven feet.

The hydrography of the Isthmus is almost complete. A part of the northern coast was surveyed in 1828 by Captain Henry Forster, in H.M.S. Chanticleer, and a considerable portion of the southern during the years 1837, 1838, and 1839, by Sir Edward Belcher, in H.M.S.S. Sulphur and Starling. The remainder of the Pacific side was finished during 1846, 1847, 1848, and 1849, by the Herald and Pandora, by which the whole coast was explored, from the river San Juan to Point Burica, thus completing the survey of the south-western shores of America, a distance of four thousand miles, the charts of which will remain a monument of the eminent services rendered by the British nation to the science of geography. Of the interior no general map, founded upon astronomical or trigonometrical observations, is in existence.

A country like the Isthmus, visited by such heavy rains, abounds in rivers: not counting the smaller and periodical streams, their number cannot fall short of two hundred. Of those emptying themselves into the Atlantic Ocean, the Belen, Veraguas, Chagres, and the nine-mouthed Atrato are the largest; among those flowing into the Pacific, the Chiriqui, Tavasara, Santa Maria,

Rio Grande de Natà, Bayano, Churchunqui, and San Juan. They are mostly shallow, and only navigable in flat-bottomed canoes. The Chagres was formerly called Rio de los Lagartos, and, according to Herrera, first explored in 1527 by Captain Hernando de la Serna and the pilot Corzo; it has been more accurately surveyed by Mr. Lloyd, who has given, in the journal of the Royal Geographical Society of London, the following description:—

“The Chagres takes its rise a considerable distance east of Portobelo, among the high mountains which approach the Bay of Mandingo, and, after traversing a great tract of country, when nearly opposite Portobelo receives the Rio Pequeni, which comes from the south-east, and is as large and broad as itself. The two form a noble river, too rapid however to be easily navigable, and, although canoes ascend both branches in the dry season, even above the common point of junction, the passage is considered dangerous from the number of falls and rapids. In proportionate distances its rate abates. At Cruces, which is twenty-three miles direct from the sea, and forty-four as the river winds, it seldom exceeds three miles or three miles and a half an hour, even in the rainy season; at Peña Blanca it runs two miles, at Gatun scarcely one, and at Brusa, in summer, the current is imperceptible. Few rivers of its size present more beautiful scenery than does the Chagres above Cruces: for miles together it is bounded by abrupt masses of limestone, of the most curious and fantastic forms; in other parts savanas extend to the very edge of the river, and the noble bongo-tree studs the banks. In most places the river is shaded by the higueron (*Ficus* sp.), a large tree which extends its

branches across the river. The water generally runs over a bed of various kinds of pebbles, and is in summer brilliantly clear. In many places near its source it is much wider than at its mouth, occasionally breaking into distinct channels, and forming islets, but in the rainy season these are all connected, and constitute one broad stream, with strong sets and eddies, caused by the abrupt turns, rendering its navigation peculiarly perilous. Many years ago, from continued rains, the river rose until it arrived at the foundation of the church of Cruces, situate on a small rise, forty or fifty feet above the present level; the greater part of the village was submerged, and for some weeks no intercourse, except by canoes, could take place. Towards its mouth it has never been known to rise more than six or eight feet, and this height the banks easily confine."

The rivers Atrato and San Juan approach each other within a distance of four hundred yards, nearly separating the Isthmus from the continent of South America, and forming the natural and political boundary of the country under consideration. The Atrato, or Darien, is described as a river full of shoals, dangerous to pass even for canoes: if small steamers could navigate it, this part of the Isthmus might be the most practicable for cutting a canal. Another close approach of rivers exists between the Chagres and the Rio Grande de Panama, of which due advantage has been taken in some of the projects for connecting the two oceans. Most of the rivers have deltas, which, in many instances, have the appearance of islands; their vegetation is a mixture of littoral and inland plants, and often exhibits species of the higher

mountains, by which the remote sources of the water may be traced.

The Isthmus is not remarkable for high mountains. The chain of the Andes, after traversing the continent of South America, diminishes in approaching it, and in the province of Panama is hardly recognizable in a ridge of hills which seldom exceed a thousand feet in height. The statement that the Cordillera is entirely broken in the vicinity of Cupica in Darien rests on obscure authority. A new series of mountains seems to commence at Punta de Chame, which attains a greater elevation on entering the province of Veraguas, and in the volcano of Chiriqui produces the most elevated part of the Isthmus, a peak seven thousand feet high: this ridge is covered with forests, and chiefly confined to the centre and northern parts of the country. The districts on the coast of the Pacific Ocean, especially the cantons of Natà, Santiago, and Alanje, abound in grassy plains (*llanos*) of great extent, which, in affording pasture to numerous herds of cattle, constitute the principal riches of the country. I have been informed, by persons on whose veracity I can rely, that from the tops of the mountains situated between Bocas del Toro and the town of David, both oceans may be seen at once,—a sight only equalled in grandeur by that presented in Behring's Strait by Asia and America. During the whole of my stay in the elevated parts of Veraguas, either the coast of the Atlantic or that of the Pacific was enveloped in mist, so that personally I have not been able to corroborate the statement; that they may actually be seen I consider probable, as in Central America, where the breadth of the land

far exceeds that of Veraguas, Mr. Stephens distinctly observed both the Caribbean and the South Sea. The belief that from the mountains near Cruces the same spectacle is enjoyed, I have found to be incorrect, the elevation being far too low, and that from the circumstance of seeing the two oceans at once the name "Veraguas" is derived, I have endeavoured to contradict.

The geological formation is as yet imperfectly known. "In some parts auriferous porphyries and granites prevail, partially impregnated with iron pyrites, and enclosing here and there veins of felspar and basalt; in others argillaceous hornblende, slate of various colours, and chlorite. Auriferous quartz is observed in different places*." The soil consists of clay, more or less sprinkled with fossil sea-shells, gold, and iron. The districts in which the latter prevails are mostly sterile, and, if left in their natural state, produce hardly anything save grass for rearing cattle. Petrified exogenous stems abound in various parts of Veraguas, and about Santiago they are so numerous that the streets of that town are partly paved with them: the natives call them *chumicos petrificados*, and consider them portions of the Chumico (*Curatella Americana*, Linn.), but, although there exists a certain resemblance, it is difficult, from the stem alone, to decide whether they are identical. Bituminous slate, indicating in many instances the existence of coal, has been discovered in the island of Muerto,

* E. Hopkins's Geological Character of the Isthmus, MSS.—This account was written at Panama by Mr. Hopkins when in the service of the New-Granadian government. A Spanish version of it has, I believe, appeared at Bogotá.

near David. Salines of some extent are established at Agua Dulce, in the canton of Natà, and their produce is sufficient to supply the demands of the Isthmus; another salt-spring has been found in the vicinity of La Mesa, which, according to popular statements, presents some extraordinary phenomena, deserving the attention of future travellers.

Copper, iron, and gold are found all over the country; no indication of silver has as yet been discovered, and the existence of quicksilver near Panama is doubtful. The working of the iron and copper is impracticable, on account of the high price of labour, and will remain so as long as the country is thinly inhabited. From the quantities of gold collected by the first settlers, the Isthmus received the name of Castilla del Oro, but, when the wealth of Peru and Mexico became known, this appellation seems to have fallen into disuse. Still, as long as the Spaniards retained possession of it, the extraction of gold was carried on to some extent, and it appears that some of the mines were very productive: the most important were, and still are, those of the Mineral de Veraguas. The gold is found there on plains, and large pieces are also obtained from the beds of rivers and rivulets. Up to the year 1804 the revenue which the provincial treasury collected from the royalty of three per cent. amounted annually to half a million dollars, a considerable sum, if it is borne in mind that large quantities were sent away without payment of duty; since that time however the produce has decreased, as some think, because the great deposit has been exhausted, or, as others contend, because the mines are not worked with

energy. The mines of Estrella in Chiriqui, and Cana in Darien, were celebrated, and still hold a place in the traditions of the country. The latter were closed by command of the King of Spain, to prevent, it is said, the inroads of the Buccaneers. A few years ago their rediscovery was much discussed at Panama, and expeditions started in search of them; but, the site being imperfectly known, they failed in accomplishing their object. The sand of the sea-beach near Panama, and even the soil on which the city is built, contains gold-dust,—about as much as will enable one man to extract daily three or four reals' worth; the process however being rather laborious, it is not much resorted to. Gold-washings are established all over the country, but, although important to single individuals in the absence of other employment, they are too insignificant either to engage the attention of foreign companies, or to allow of the investment of large capital.

Volcanoes, all now extinct, exist in different parts. The highest is that of Chiriqui, already mentioned; another, of considerable elevation, about three thousand feet high, the Jananó, is seen at Cape Corrientes in Darien, and several others of great size are reported to exist in Veraguas. "Even the island of Taboga," says Mr. E. Hopkins, "appears to have been a portion of a volcanic crater. It is a broken sedimentary clay-slate, lifted on the southern side, and declining towards the bay, with its points and fractures filled with melted ferruginous rocks, large masses of which are seen bordering the bay. From the general aspect, and the great depth of the latter, one is led to suppose that it was the focus of

exemption." But although without active volcanoes, the Isthmus is by no means free from earthquakes. They occur mostly during the dry season, from January till May, and consist of undulating movements, coming from the west, and having apparently their origin in Central America,—a supposition strengthened by the fact that they are more severely felt in Veraguas than in Panama or Darien; they do not however seem to exercise any prejudicial influence on the vegetation, as is the case in Peru, where, after severe shocks, corn-fields have been known to wither. Hot springs are to be found in various parts of the country, and are much used by the natives as medicinal baths. One, named Agua de Salud, is near the village of Calobre, in the canton of Santiago; others are to be met with at Caldera in Chiriqui, and Cape Corrientes in Darien: none of them have as yet been subjected to a chemical analysis.

The geographical position of the Isthmus, the almost entire absence of high mountains, and the vast extent of forests and other uncultivated parts, tend to produce a hot and rainy climate, which nevertheless, with the exception of a few localities, such as Chagres, Portobelo, and Chirambirà, is healthy and more favourable to the constitution of the Caucasian race than that of most tropical countries. The most prevalent disease is intermittent fever, which makes its appearance during the change of the season; remittent fever is less frequent, but generally proves fatal to the patient. Cutaneous eruptions of a dangerous character are common, especially among the coloured race, and in those districts where there is the greatest fall of rain. Persons newly

arrived from northern climates are frequently subject to ulceration: on entering the country their skin, particularly that of the legs and feet, assumes an unusual degree of irritability, and the slightest scratch, or even a mosquito-bite, will often produce ulcers and sores, which take months to heal, and always leave upon the place a disagreeable bluish hue. Elephantiasis and paralysis, the bane of Spanish America, do not occur so frequently as in the elevated regions of the Andes, where indeed, from whatever cause, they prevail to a frightful extent. The cholera has visited the Isthmus on different occasions, but that disease has shown itself in temperate and torrid zones, in dry and in wet localities, in places built on the summits of high mountains, as well as in those situated in the lower coast-region; in fine, it has ravaged districts which in physical constitution differ most widely from each other, so that we may fairly conclude that climate and geographical position, however they may modify its character or increase its violence, cannot be considered as its causes*.

The seasons are regularly divided into wet and dry. The rains are expected with the new moon in April, and continue eight months, till the end of December; in the south of Darien however, and some places on the Atlantic Ocean, they are prolonged to ten and even eleven months. Slight at first, the rain gradually increases, and is fully established towards the end of May, when it falls in torrents, sometimes for days in succession, and

* A most ingenious explanation of the cause of the cholera was made known on September 24, 1852, at Wiesbaden, by Dr. Nees von Esenbeck, which has since been published in a separate pamphlet

is mostly accompanied by thunder and lightning of the most terrific description. The air is loaded with moisture, and fogs with calm or light variable winds prevail. The temperature does not vary more than from 75° to 87° Fahr., still, the perspiration being impeded, the atmosphere feels extremely hot and close. In the height of the wet season, about midsummer, generally on the 20th of June, the rains, as in other parts of South America, are suspended for a short time; for nearly a week subsequent to that day, the sun shines with great brightness, and the sky is clear and serene. The occurrence of the phenomenon is so regular that it is looked forward to by the inhabitants, who call it the "veranito de San Juan," probably from its taking place almost simultaneously with the feast of St. John (June 24th). Towards the end of December the violent rains are less frequent, the clouds begin to disperse, and with the commencement of the new year the north-west wind sets in. An immediate change follows. The air is now pure and refreshing, the sun brilliant, the sky blue and serene, hardly a cloud is to be seen, and the climate displays all its tropical beauties. The heat, although much greater, ranging between 75° and 94° Fahr., is less felt, as the atmosphere is almost free from moisture; the rays of the sun however are very powerful, and the rise of the thermometer to 124° Fahr., when at noon exposed to their influence, is no uncommon phenomenon. These statements however have reference only to the lower regions; on the higher mountains the climate is modified, and, on account of its lower temperature, better adapted to the constitution of the white man.

During the dry season the climate agrees tolerably well with a European. But a summer day in Europe and one in the Isthmus—what a difference! Night and day, from the vicinity of the country to the equator, are nearly always of equal length. Scarcely has dawn commenced when everybody is in action—it is the hour of business and bodily exercise; nature stands refreshed, and drops of dew hang on every leaf. Amidst a profusion of flowers, the stately palm waves its foliage, and gay-coloured birds, strongly contrasting with the azure sky, diffuse animation and life; in vain however does the Northman listen,—instead of the sweet melodies of nightingales and robins, the disagreeable cries of parrots and macaws strike his ear. Towards eight o'clock the heat begins to be felt, and that lassitude, for which the tropics are so well known, seizes everything. The further the day advances, the more is this influence perceptible: the leaves droop, the wood-pigeons, which all the morning sent forth their monotonous notes, are silent, the inhabitants have sought shelter from the scorching rays in the interior of their dwellings, all living beings are reposing, and a stillness prevails almost as profound as that of midnight. By degrees the heat becomes less oppressive, the breezes increase, and the cool air of the evening soon calls forth a new life. The forests now glitter with fireflies, crickets chant their merry tunes, and here and there are seen groups of people chatting and enjoying themselves. But nothing can exceed the beauty of the scene when the full-moon rises, shedding its silvery light over the broad foliage of the tropics; whatever may have been the fatigue of the day, what-

ever the body may have suffered from heat and languor, all is forgotten in the presence of this spectacle. Such nights indeed baffle description—they are the quintessence of equinoctial life.

'The winds have mostly the character of moderate breezes; they are seldom violent, and hurricanes have never been known to occur.' During the wet season they are very variable, but generally come from the south or south-west, and only assume some degree of regularity on the coast, blowing during the night from the land, and during the day from the sea; sometimes however calms prevail for several days in succession. In the dry season the prevailing wind is north-west, blowing regularly, and with more or less force, and only varying now and then a few points of the compass. It continues till towards the end of April, when it becomes less steady, alternating with calms and variable winds, and in the beginning of May dies away. Waterspouts occur on both coasts, especially during the wet season.