height. This majeſtic mountain, from which are conſtantly ejected flames towards the end of the rainy ſeaſon, ſurmounts an extenſive plain, covered with palm-trees and ananas. It is wholly compoſed of gneiſs, micaceous ſchiſtus, ſlate, and amphibole. Throughout this chain, granite appears predominant. The rocks reputed primitive and ſecondary, are here arranged in a very ſingular order. The maſſes of talc, or ſhining mica, with which the chain of Parina abounds, have given riſe to the fabulous tradition of El Dorado, or a country of gold.

On the road to Los Llanos, leading to the Andes of Peru, lie immenſe deſerts, ſimilar to thoſe of Africa; where, in conſequence of the reflection of the heat from the ſand, Reaumur's thermometer uſually aſcends to 33, or ſometimes even to 37 deg. in the ſhade.—Throughout an extent of more than 6,000 ſquare miles, ſcarcely a ſingle inequality on the ſurface of the ground can be perceived.—Being wholly deſtitute of vegetation, during the dry ſeaſon this ſandy plain exhibits the appearance of a vaſt ocean, and affords only a ſhelter to crocodiles and ſerpents of different

kinds. The traveller, in purſuing his way through this dreary region, has no other guide than the courſe of the ſtars, and the trunks of a few decayed trees.

It was through theſe deſerts that M. Humboldt and Bonpland purſued their journey to the upper Oroonoko; but on their way to Quito they went by St. Martha, and aſcended the magnificent river of Madelaine, paſſing by the city of Santa Fé of Bogota, which ſtands 1360 toiſes above the level of the ſea. From this part of the country, which M. Humboldt deſcribes as a perfect deſert, they proceeded to Popayan by the way of Buga, and croſſing the delightful valley of Cauca, they viſited the mines of Platina, in the mountain of Chaca.

This indefatigable naturaliſt likewiſe viſited the Baſaltic mountains of Juluſinto, and the craters of the volcano of Purace, which, at that time, ejected, with a dreadful noiſe, volumes of hydro-ſulphurous vapours. The temperature of the vallies lying at the foot of this mountain is ſaid to be extremely mild and delightful; the range of Reaumer's thermometer being from 17 deg. to 19 deg. This neighbourhood abounds with beautiful por-

phyritic granites, which are generally found in the form of ſmall columns. In the province of Paſto, which comprehends the environs of Guachucal of Tugueres, lies an immenſe frozen and barren plain, almoſt ſurrounded with volcanoes, which continually throw out clouds of ſmoke, ſo as to darken the ſurrounding atmoſphere. The unfortunate inhabitants of theſe deſerts have no other food than a ſpecies of potatoes, termed by them *patates*. In 1800 the total failure of this their only crop reduced them to ſuch a ſtate of wretchedneſs, as forced them to aſcend the mountains, and to devour the trunks of a ſmall tree or ſhrub, named *achapella*; but as the bears of the Andes feed upon this ſmall tree, the victims of famine were frequently even deprived by theſe animals of the only reſource they had left to prolong their miſerable exiſtence. Near the ſmall Indian village of Voiſaco, ſituated at 1370 toiſes above the level of the ſea, is found, in great abundance, a red porphyry, with an argillaceous baſe, incloſing vitreous and corneous felthſpath, which poſſeſſes all the properties of the ſerpentine of Montichtel, in Franconia.

M. Humboldt, who viſited the city of Quito in 1802, there deſcribes the effects produced in its vicinity by the dreadful earthquake which occurred in 1797. "Quito," ſays this traveller, "is a handſome city, but the atmoſphere is always cloudy; the neighbouring mountains are only covered with a ſcanty verdure, and the cold is very conſiderable. The tremendous earthquake of February, 1797, which deſolated the whole province, and ſwallowed up from 35 to 40,000 individuals, was alſo fatal to the inhabitants of this capital. Such was the change produced by it, on the temperature of the air, that Reaumur's thermometer, which at preſent fluctuates from 4 deg. to 10 deg. and rarely aſcends to 16 deg. or 17 deg. conſtantly ſtood, previous to that cataſtrophe, at 15 deg. or 16 deg. Since this period, likewiſe, the province under conſideration has been conſtantly ſubject to more or leſs violent ſhocks; and it is not improbable that all the elevated part of it forms a ſingle volcano. The mountains of Cotopaxi and Pichincha are only ſmall ſummits, of which the craters form the different funnels, all terminating in the ſame cavity.

The earthquake of 1797 unfortunately affords but too convincing a proof of the juſtneſs of this hypotheſis, ſince during that dreadful occurrence, the earth opened in all directions, and ejected ſulphur, water, &c. Notwithſtanding the recollection of this afflicting event, and the probability of a recurrence of ſimilar dangers, the inhabitants of Quito are ſaid to be gay, lively, and amiable; their city is the abode of luxury and voluptuouſneſs, and in no other place can there be diſplayed a more decided taſte for amuſements of every deſcription."

During his ſtay in Quito, M. Humboldt alſo viſited the crater of Pinchincha, which had formerly been examined by Condamine. From the ſides of this crater riſe three pyramidal rocks, from which the ſnow has been melted by the heat of the vapours continually iſſuing from the mouth of the volcanoes. In order to examine more accurately the bottom of the crater, Mr. Humboldt aſſumed a prone poſture: and it is impoſſible, he obſerves, for imagination to conceive a more diſmal and terrifying picture than preſented itſelf to his view. The mouth of the volcano formed a circular

opening nearly three miles in circumference, of which the rugged and perpendicular ſides were covered with ſnow towards the top: the interior was of a deep black, and ſo immenſe was this gulph, that he could diſtinguiſh the ſummits of ſeveral mountains contained within it. Their tops ſeemed to be two or three hundred toiſes beneath the point where he ſtood; hence we may judge at what depth their baſe muſt be placed. M. Humboldt is of opinion that the bottom of this crater is on a level with the city of Quito.

M. la Condamine, during his ſtay in America, aſcended the volcanic mountain of Antiſanna to the height of 2470 toiſes, which point M. Humboldt was not able to paſs; but in the month of June 1802, he ſucceeded in aſcending as high up the Chimboraco as 3031 toiſes. In both caſes ſuch was the rarity of the air that the blood guſhed from his noſe, mouth, and ears. During his ſhort ſtay upon the latter mountain he was enveloped in a thick miſt, which ſometimes diſperſed for a moment, ſo as to diſplay to him the frightful abyſs beneath his feet. No animated creature, not even the condor, which in Antiſanna

hovered continually over his head, appeared in this alpine region to diverſify the dreary ſcene. From a trigonometrical meaſurement, taken by M. Humboldt, at two different times, the height of the *Chimboraco* is 3267 toiſes. This coloſſal mountain, like all the other high mountains of the Andes, is not compoſed of granite, but of porphyry, from the baſe to the ſummit; and the porphyry is 1900 toiſes in thickneſs. According to Bonguer the line beyond which lies perpetual ſnow, is 2440 toiſes above the level of the ſea. Humboldt has not, ſo far as we know, given any opinion on this point. The volcano of *Cotopaxi*, ſituated to the ſouth eaſt of Quito, muſt be at leaſt 18,600 feet in height. The *Deſcabeſado* is likewiſe very elevated: but the Andes reſts on a very high baſe, ſo that eſtimated ſeparately they do not equal the Alps in height, but when meaſured from the level of the ſea, their elevation is infinitely greater.

The Andes of Chili appear to be equal in point of altitude to thoſe of Peru: their nature, however, is leſs known, though from all the information we have been able to collect on this ſubject, volcanoes ſeem to be equally

numerous in this as in the former chain of mountains.

Minerals.

ALL travellers agree reſpecting the mineralogical riches of South America; many of the provinces of which abound in extenſive mines of native gold. In this country the ſilver mines are, however, ſtill more numerous and more productive than thoſe of gold, and being more eaſily wrought, have chiefly engaged the attention of the coloniſts. But it would be here ſuperfluous to enter into any details reſpecting a ſubject ſo fully and ably treated on in the preceding part of this work.

Mercury, platina, copper, lead, and various other minerals, as will be ſeen from the account of M. Helms, are likewiſe common to various parts of South America.

During the reign of the Incas, among other precious ſtones, emeralds are ſaid to have abounded on the coaſt of Manta, and in the government of Atacama, and it is affirmed that ſome valuable mines of this precious ſtone are ſtill known to the Indians of theſe parts,

but which they conceal, through the dread of being compelled to work them.

The emeralds found at this day in the ſepulchres, are faſhioned into circular, cylindrical, conical, and other forms, and are perforated with great nicety, but what methods were employed by the natives for this purpoſe, remain unknown.

Temperature and Vegetable Productions.

Climate, it is well known, does not wholly depend on the degree of latitude in which any place is ſituated, but on various other cauſes, ſuch as the greater or leſs elevation of the ground, the nature of the ſoil, the proximity of ſeas and rivers, and the ſcarcity and abundance of foreſts, &c. Thus it is that we meet with different zones and climates in the chain of the Andes, ſo that while winter prevails in the vallies, ſummer reigns in the more elevated regions. Thus alſo the rainy and the dry ſeaſon occur at different times, in different places, ſeparated only from each other by a few leagues. In general the countries, towards the eaſt of the Andes, are ſubject to violent rains, while

on the contrary thoſe to the weſt, being ſhel-tered by high mountains, which impede the progreſs of the clouds, enjoy a dry atmoſphere, the ſerenity of which is never diſturbed by vio-lent rains, tempeſts, nor thunder-ſtorms.

From the relation of different travellers it appears that in the vicinity of the coaſt are produced many of the fruits and vegetables peculiar to tropical climates, ſuch as the cab-bage palm, the cocoa tree, the cotton tree, the pine-apple, ginger, turmeric, the banana, the ſugar cane, &c. while in the interior and more temperate regions, and on the borders of the Andes, plants and vegetables of a more hardy nature grow and flouriſh.

A country, indeed, of ſuch vaſt extent as South America, laying on each ſide of the equator, and poſſeſſing a variety of ſoils as well as climates, muſt neceſſarily contain many thouſand ſpecimens of plants and vegetables, which are either wholly unknown to us, or with which we are as yet very imperfectly ac-quainted. Hence the number of new ſpecies and genera which M. Humboldt, and his able coad-jutor have recently diſcovered, will not appear ſurpriſing when we conſider that they traverſed

the interior of America, from Carraccas to the frontiers of Brazil, a great portion of which had never before been explored by any botaniſt.

Beſides many other curious plants they diſcovered a new genus of the family of palms, to which they have given the name *Ceroxylon*, from its ſingular property of affording wax. This plant is only found on the mountains of Quindiu, ſituated in 4° 35′ N. lat. Theſe mountains, we are informed, conſiſt of granite and micaceous ſchiſtus. Tropical plants in general do not vegetate at a greater height than 500 toiſes above the level of the ſea; it is ſingular, therefore, that the wax palm is never found below 900, and that it grows in great profuſion at 1450 toiſes, where the mean temperature is from 66. to 58. of Fahr. It ſometimes alſo ſprings up and thrives in regions 1000 toiſes higher, and in a temperature 30. deg. below that in which any other of the ſame tribe or family are to be found.

The wax palm riſes to the prodigious height of 180 feet, and its leaves are 20 feet in length. Another remarkable circumſtance in the economy of this tree is the ſecreted matter with

which its trunk is covered, to the thickneſs of nearly two inches. This ſubſtance, according to the analyſis of Vauquelin, conſiſts of two-thirds of roſin, and one of wax. Being extremely inflammable, it is employed by the natives in conjunction with one third of tallow, in the manufacture of candles.

The *cardana alludora* is another large tree, which would appear to be well calculated for ſhip-building and ſimilar purpoſes; it is chiefly remarkable for the ſtrong ſmell of garlic, which exhales from the leaves, and even the wood when green. A ſpecies of wild coffee, *coffea racemoſa*, grows on the woody mountains in the interior; its berries are employed in the ſame manner as thoſe of the cultivated ſpecies. Various kinds of pepper abound in theſe countries; M. Humboldt enumerates not fewer than twenty-four ſpecies, and five or ſix of capſicum, which are held in great eſtimation by the natives of Peru.

Tobacco and jalap are alſo, we are informed, very common, eſpecially the ſmall woods at the foot of the Andes, as well as a variety of beautiful flowers and ſhrubs indigenous to the country, and many of which, ſuch as *calceolaria*,

salvia longiflora, &c. &c. embellish the gardens and green-houses in Europe.

The banks of the Oroonoko are covered with almoft impenetrable foreſts, particularly of the *bevea*, *lecythis*, and the *laurus cinnamoides*.

The foreſts of Turbaco, near St. Martha, where M. Humboldt paſſed a few weeks, are ornamented with the *Tolnifera*, *Anacardium*, and the *Cavanilleſca* of the Peruvian botaniſts. In aſcending the river Magdelaine, he obſerved among a profuſion of other rare and beautiful plants, the *dychotria emetica*, of which the roots are employed as a ſubſtitute for ipecacuana by the inhabitants of Carthagena. M. Bonpland, during an excurſion which he made to the foreſts in the neighbourhood of Jaen, likewiſe found a profuſion of valuable plants, among which may be mentioned a ſpecies of the *Jacquinia*, and one of the cinchona. This laſt, which is accurately deſcribed by Bonpland, he aſcertained to be the very cinchona delineated by Condamine; it is characteriſed by the pits or holes at the roots of the large nerves of the leaves. Our limits do not, however, permit us to enumerate more particularly

the valuable botanical discoveries made by these indefatigable naturalists, in the course of their travels through South America; suffice it here to observe, that every region which they explored was found by them to abound with a profusion of new and rare vegetables.

The Editor has been favoured by an eminent Notary Public with a correct Statement of the MONIES OF ACCOUNT *made use of in Spanish America.*

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From this proportion the value of the above coins may be calculated at any other price. Thus if gold be sold for 4l. per oz., say,

As, 3l. 17s. 10½d : 3l. 6s. :: 4l. : 3l. 7s. 9½d. = the value of the doubloon.

And if silver be at 5s. 4d. per oz. say,

As, 5s. 2d. : 4s. 5¾d. :: 5s. 4d. : 4. 7½d. = the value of the dollar.

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