VIEWS OF NATURE

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Concerning the Waterfalls of the Orinoco near Atures and Maypures

In the previous chapter, which I used as the subject of an academic lecture, I described the immeasurable flatlands, the natural characteristics of which are so diversely modified by climatic conditions, appearing in one instance as deserts devoid of vegetation and in another as steppes or as far-reaching grassy plains. In contrast to the Llanos in the southern portion of the New Continent are the terrible oceans of sand that lie in the African interior; in contrast to these are the steppes of Central Asia, home to invading shepherd peoples who, driven from the East, once spread barbarism and desolation over the face of the Earth.

While I dared at that time (1806) to unify great land masses into a single portrait of Nature and to discourse before the public upon subjects of a complexion that bespoke the somber disposition of our minds, I will now, restricting myself to a narrower variety of phenomena, attempt to sketch the friendlier picture of luxuriant vegetation and effervescent river valleys. I refer to two nature scenes from the wilderness of Guyana: Atures and Maypures, the waterfalls of the Orinoco—of wide renown, and yet visited by few Europeans before me.

The impression that the sight of Nature leaves within us is determined less by the properties of the region than by the light in which mountain and meadow appear—now in ethereal sky-blue, now in the shadow of low-hanging clouds. In the same way, descriptions of Nature more strongly or weakly affect us depending upon the greater or lesser extent to which they correspond to the needs of our feelings. For in the innermost receptive mind, the physical world is reflected, living and true. That which designates the character of a landscape—the profile of the mountains that border the horizon in the hazy distance, the darkness of the fir forests, the roaring forest river that plummets between overhanging cliffs—all of it stands in an ancient and mysterious association with the disposition of human temperament.

Upon this association rests the nobler part of the enjoyment that Nature

provides. Nowhere does she more completely fill us with the sense of her greatness, nowhere does she address us more mightily, than in the world of the tropics—under "the Indian sky," as the climate of the torrid zone was called in the early Middle Ages. If I may thus dare entertain this audience anew with a description of those regions, so might I hope that their inherent charm will not remain unfelt. The memory of a distant and richly endowed land, the sight of a free and powerful growth of vegetation, refreshes and fortifies the mind, much as the upwardly striving spirit, embattled by the present, gladly takes joy from the early age of humanity and its simple grandeur.

Westward currents and tropical winds facilitate the voyage across the peaceful arm of the ocean[1] that fills the broad valley between the New Continent and West Africa. Even before the coast rises from the vaulted ocean bed, one notices a churning of foaming waves cutting across and through one another. Mariners unfamiliar with the region would assume the proximity of shallows or an astonishing eruption of freshwater springs, as may be found in the ocean between the Antillean Islands.[2]

Nearer to the granite coast of Guyana appears the wide estuary of a mighty river that breaks forth like a shoreless sea and covers the ocean around it with freshwater. The river's waves of green, or milky-white in the shallows, contrast with the ocean's indigo blue, which forms a sharp perimeter around the river waves.

The name Orinoco, which was given to the river by its first discoverers and which probably owes its existence to a linguistic confusion, is unknown deep in the country's interior. Primitive peoples distinguish with particular geographical names only such objects as can be confused with others. The Orinoco, the Amazon, and the Magdalena Rivers are simply called "the river," or at best "the great river" or "the great water," while the inhabitants of the banks differentiate the smallest streams with individual names.

The current that is created by the Orinoco between the South American continent and the bitumen-rich island of Trinidad is so powerful that ships sailing into it with a fresh west wind and sails unfurled can hardly overcome it. This bleak and fearsome region is called the "Gulf of Sadness" (*Golfo Triste*). The entrance is the "Dragon's Mouth" (*Boca del Drago*). Here individual cliffs rise up like towers amidst the raging flood, indicating the ancient dam of rock[3] that, now penetrated by the current, once connected the island of Trinidad with the Paria Coast.

The view of this region first convinced the bold explorer Columbus of the existence of an American continent. "Such a gigantic amount of freshwater," concluded this man learned in the ways of Nature, "could come together only in a river of great length. The land that gives forth these waters would have to

be a continent, not an island." Just as the companions of Alexander on crossing the snow-covered Parapanisus[4] believed, according to Arrian, that they were seeing in the crocodile-filled Indus a part of the Nile, so did Columbus, unaware of the physiognomic similarities of all products of tropical climates, imagine the coast of the New Continent to be the eastern coast of far-reaching Asia. The mild coolness of the evening air, the ethereal purity of the starry firmament, the balsam scent of blossoms carried on the land wind: all led him to suspect (so says Herrera in the *Décadas*)[5] that he was approaching here the Garden of Eden, the sacred home of the first generation of humanity. To him, the Orinoco seemed to be one of the four rivers that, according to the venerable myth of the world's origin, flowed down from Paradise to divide and water the Earth, now newly adorned with plant life. This poetic passage from Columbus's travel report, or rather, a letter to Ferdinand and Isabella, sent from Haiti (October 1498), is of singular psychological interest. It instructs us once more that the creative imagination of the poet expresses itself in the explorers of the world, as in any of humanity's great characters.

When one considers the amount of water that the Orinoco carries to the Atlantic Ocean, the question arises: which of the South American rivers, the Orinoco, the Amazon, or the Plata, is the largest? The question is ambiguous, as is the concept of size. The broadest estuary is that of the Rio de la Plata, with a width that covers 23 geographical miles. But this river, like those of England, is relatively short. Its insufficient depth already hinders shipping even at the city of Buenos Aires. The Amazon is the longest of all rivers. From its source at Lauricocha Lake to its mouth, its course covers 720 geographical miles. On the other hand, its breadth at the cataract of Rentama in the province of Jaen de Bracamoros, where I measured it beneath the picturesque mountains of Patachuma, is barely equal to the breadth of our Rhine at Mainz.

The Orinoco is narrower at its mouth than either the Plata or Amazon River, and its length, according to my astronomical observations, is only 280 geographical miles. Deep in the interior of Guyana, however, 140 geographical miles from its mouth, I found the river at high water to be over 16,200 feet wide. Its periodical rising lifts the water level annually 28 to 34 feet above the low-water mark. There is as yet insufficient information for an exact comparison of the tremendous rivers that cut across the South American continent. To accomplish this, one would have to become familiar with the profile of each river's bed and with its speed, which can vary so greatly in every area.

The delta that is embraced by the Orinoco's many separate and as yet unexplored arms shows manifold similarities with the Nile in terms of the regularity of its rising and falling and the number and size of its crocodiles. The two rivers are also analogous insofar as both wind their way for a long

distance between granite and syenite mountains as rushing sylvan streams and then flow slowly forth, contained now by treeless banks, onto virtually level plains. From the celebrated mountain lake at Gondar in the alpine mountains of Gojam in Abyssinia, an arm of the Green Nile (*Bahr el Azraq*) rolls through the mountains of Shangalla and Sennar down to Syene and Elephantine. In the same way, the Orinoco originates on the southern slope of the mountain range that, stretching along the 4th and 5th degrees of northern latitude, reaches westward from French Guyana toward the Andes of New Granada. The sources of the Orinoco[6] have never been seen by a European; indeed, they have never been seen by a native who has had dealings with Europeans.

When we paddled up the Upper Orinoco in the summer of 1800, we reached, beyond the Esmeralda Mission, the mouths of the Sodomoni and Guapo. Jutting above the clouds here is the summit of Yeonnamari or Duida: a mountain that rises, according to my trigonometric measurements, to 8,278 feet above sea level, and whose aspect is one of the most superb nature scenes that the tropical world has to offer. Its southern slope is a treeless, grassy meadow. There the scent of pineapple fills the humid evening air. Amongst the low-growing meadow herbs rise the bromeliads, their stalks bursting with juices. Beneath the blue-green crown of leaves, the golden-yellow fruit may be seen glowing from afar. Where the mountain waters break forth from the covering grasses, there stand isolated groups of fan palms. In this hot region, their foliage is never moved by cooling currents of air.

East of Duida begins a thicket of wild cacao plants that surround the admirable almond tree *Bertholletia excelsa*, the mightiest product of the tropical world.[7] The Indians collect the materials for their blowguns here—colossal grass stalks, which have segments of more than 17 feet from knot to knot.[8] Some Franciscan monks have penetrated as far as the mouth of the Chiguire, where the river is already so narrow that the natives have woven a bridge of tendrillar plants across it near the waterfall of the Guaharibes. The Guaicas, a people with whitish skin but small in stature, arm themselves with poisoned arrows to defend against further eastward incursions.

Everything that has been proposed about the Orinoco originating in a lake is therefore fantasy.[9] In vain does one seek in Nature the *Laguna Dorada*, which Arrowsmith's maps still show as an inland sea 20 geographical miles long. Could the small, reed-covered Amucu Lake, where the Pirara (a branch of the Mayu) originates, have given rise to this myth? This swamp, however, lies 4 degrees farther east than the region in which it is presumed the source of the Orinoco lies. Erroneously placed within it was the Island of Pumacena, a rock of mica schist, the glittering of which has played since the 16th century

a memorable and, to a misguided humanity, often ruinous role in the legend of El Dorado.

According to the legends of many natives, the Magellanic Clouds of the southern sky (the patches of fog that accompany the ship-constellation Argo) are a reflection of the metallic gleam of those silver mountains of the Parima hills. It is also an ancient custom of dogmatic geographers to have every river of considerable size on the planet originate in an inland sea.

The Orinoco belongs among those remarkable rivers that, after a great number of turns to the west and the north, finally runs back to the east in such a manner that its mouth lies on almost the same parallel as its source. From the Chiguire and Gehette to the Guaviare, the course of the Orinoco runs westward, as though it wishes to take its waters to the Pacific. In this stretch it puts forth the Cassiquiare, an unusual arm little known in Europe which joins the Rio Negro (as the natives call it) or Guainia. This is the only example of a bifurcation in the deepest interior of a continent, a natural connection between the two great river valleys, the Orinoco and the Amazon. The nature of the ground surface and the influx of the Guaviare and the Atabapo into the Orinoco cause the latter to turn suddenly to the north. Due to ignorance of the geography, it was for a long time erroneously believed that the Guaviare, flowing from the west, was the true source of the Orinoco. The doubts regarding the possibility of a connection with the Amazon, which were engendered since 1797 by a famous geographer, Mr. Buache, have, I hope, been completely refuted by my expedition. On an uninterrupted boat trip of 230 geographical miles, by way of an extraordinary network of rivers, I succeeded in traveling across the interior of the continent—from the Rio Negro via the Cassiquiare to the Orinoco—from the Brazilian border to the coast of Caracas.

In this upper portion of the river region between the 3rd and 4th degrees of northern latitude, Nature has several times repeated the curious phenomenon of the so-called black water. The Atabapo, with its banks bejeweled by Carolinias and arborescent Melastomas, the Temi, the Tuamini, and the Guainia are rivers of a coffee-brown color. In the shade of the palms, this color changes to a nearly inky black. In a transparent container, the water is golden-yellow. With marvelous clarity the southern constellations are reflected in these black rivers. Where the water flows smoothly, they offer the astronomer who observes with reflective instruments a most excellent artificial horizon.

Scarcity of crocodiles, and fish as well, greater cooling, fewer plagues of the biting mosquitos, and salubrity of the air characterize the region of the black rivers. They probably owe their unusual color to a solution of carbonized hydrogen, the luxuriance of the tropical vegetation, and the abundance

of plants in the ground over which they flow. Indeed, I have noted that on the western slope of Chimborazo, inclining toward the Pacific coast, the waters that spill over from the Rio de Guayaquil gradually take on a golden-yellow or almost coffee-brown color after they have covered the meadows for weeks.

Not far from the shared mouth of the Guaviare and the Atabapo can be found one of the noblest forms of all palm plants, the piriguao,[10] whose 60-foot trunk is adorned with tender, reedy foliage with rippled edges. I know of no palms that bear fruit as large and as beautifully colored. These fruits are similar to peaches, yellow mixed with purplish-red. Seventy to eighty of them form bunches like enormous grapes, of which each trunk will produce three per year. One might call this magnificent plant a "peach palm." The fleshy fruits are for the most part seedless, thanks to the great luxuriance of the vegetation. They thus provide the natives with a nourishing and farinaceous food that, like pisangs and potatoes, may be prepared in a great many ways.

Up to this point, that is, up to the mouth of the Guaviare, the Orinoco runs parallel to the southern slope of the Parima range; but from its left bank southward to far beyond the equator approaching the 15th degree of southern latitude, stretches the tree-covered basin of the Amazon River. The Orinoco now suddenly turns northward at San Fernando de Atabapo, piercing a part of the range itself. Here are found the great waterfalls of Atures and Maypures. The riverbed here is narrowed everywhere by colossal rocks and at the same time broken into separate reservoirs by natural dams.

Before the mouth of the Meta there stands in a mighty whirlpool an isolated cliff, which the natives very aptly refer to as the "Stone of Patience," for at times of low water, it can cost those attempting to ship upstream a delay of two full days. Pressing deep into the countryside, the Orinoco here forms scenic, rocky bays. Across from the Indian mission of Carichana, the traveler is surprised by a remarkable sight. The eye is drawn irresistibly to a craggy granite cliff, el Mogote de Cocuyza, a great block that thrusts 200 vertical feet upward and has upon its flat top a forest of deciduous trees. Like a cyclopean monument of simple grandeur, this cliff rises far above the tops of the surrounding palms. It stands out in sharp relief against the blue of the sky: a forest above the forest.

Upon navigating farther downstream from Carichana, one comes to the point where the river has cut a way through the narrow pass of Baraguan. Here one can discern signs of chaotic devastation all around. Farther to the north toward Uruana and Encaramada rise granite masses of a grotesque appearance. Broken into jagged points and of a brilliant white, they blaze upward from the forest.

In this region, from the mouth of the Apure on, the river leaves the granite

range. Moving eastward all the way to the Atlantic Ocean, it separates the impenetrable forests from the grasslands, upon which, at an inconceivable distance, the vault of the heavens rests. Thus does the Orinoco surround on three sides—to the south, the west, and the north—the high Parima mountain range that fills the broad region between the sources of the Jao and the Caura. The river also remains free of cliffs and whirlpools from Carichana all the way to its mouth, with the exception of Hell's Mouth (*Boca del Infierno*) near Muitaco, a whirlpool brought about by rocks that, however, do not dam the entire riverbed as they do at Atures and Mayapures. In this region near the sea, the boatmen know of no other danger than that of the natural rafts, upon which their canoes are often dashed, especially at night. These rafts consist of forest trees from the banks that are pulled up at the roots and borne away by the swelling current. Covered like meadows with blooming water plants, these rafts are reminiscent of the floating gardens of the Mexican lakes.

After this quick overview of the course of the Orinoco and the general circumstances around it, I turn to the description of the waterfalls of Maypures and Atures.

From the high mountain mass of Cunavami, between the sources of the rivers Sipapo and Ventuari, a granite spine thrusts westward toward the Uniama Mountains. From this spine, four streams flow down, confining the cataracts of Maypures: on the east bank of the Orinoco the Sipapo and the Sanariapo, on the west bank, the Cameji and the Toparo. Where the mission town of Maypures lies, the mountains form a sort of wide bay that opens on the southwest.

The river now flows foaming down the eastern slope of the mountain. Far to the west, one can recognize the old, abandoned bank. A wide grassland stretches out between the two ranges of hills. Upon this the Jesuits built a small church of palm trunks. The plain is raised barely 30 feet above the high-water mark of the river.

The geognostic appearance of this region, the insular form of the cliffs Keri and Oco, the hollows that the flood washed out in the first of these hills and that lie at exactly the same height as the holes in the island of Uivitari standing opposite: all of these phenomena indicate that the Orinoco once filled this entire, now dry, bay. The waters probably formed a wide lake for as long as the northern dam provided resistance. Upon the penetration of this dam, the grassy plain now inhabited by the Guarequena Indians emerged, first as an island. It may be that the river for a long time enclosed the Keri and Oco cliffs, which, rising like mountain castles from the old riverbed, provide a splendid sight. As the waters gradually receded, they withdrew completely in the direction of the eastern mountain range.

This assumption is supported by many circumstances. For example, the Orinoco possesses the remarkable characteristic, like the Nile at Philae and Syene, of changing the color of the granite masses around which it has flowed for thousands of years from reddish-white to black. As far as the waters reach, there appears on the rocky banks a lead-colored coating containing manganese and perhaps carbon penetrating the rock surface to a depth of barely one-tenth of a line. This blackening and the hollowing mentioned above are indications of the old water level of the Orinoco. In the Keri cliff, in the islands of the cataracts, in the gneisslike Cumadaminari hill chain that runs above the Island of Tomo, and at the mouth of the Jao, those black cavities may be found 150 to 180 feet above the current water level. Their existence teaches us (as may also be observed, by the way, in all riverbeds in Europe) that the watercourses whose size arouses our admiration today are but weak remnants of the tremendous bodies of water of ages past.

Even the primitive natives of Guyana did not fail to make these simple observations. Everywhere, the Indians brought to our attention the signs of the ancient presence of water. Indeed, in the midst of a grassy plain near Uruana there lies an isolated granite rock into which (according to the narratives of credible men) pictures of the sun, the moon, and many various animals, especially crocodiles and boa snakes, are carved almost in rows at a height of 80 feet. Without scaffolding, no one today can climb up this vertical wall, which deserves the most attentive investigation of future travelers. This is the remarkable position in which are found the hieroglyphic stone-carvings in the mountain regions of Uruana and Encaramada.

If one asks the natives how these pictures can have been carved, they answer: It happened in the time of the high water, for their ancestors then piloted boats at that height. Such a water level was thus contemporaneous with these rude memorials of human artistic endeavor. It is indicative of a former time of very different distribution of water and land, of an earlier stage of the Earth's surface; it is a stage, however, that may not be confused with that time during which the first adorning plants of our planet, the gigantic bodies of extinct land animals, and the pelagic creatures of a chaotic prehistoric world found their graves in the then-hardening crust of the Earth.

The northernmost outflow of the cataracts draws attention to itself through the so-called natural pictures of the sun and the moon. The Keri cliff, to which I have already referred several times, gets its name from a white spot that can be seen from far away, in which the Indians believe they see a conspicuous similarity to the disc of the full moon. I was not able to climb this sheer cliff face myself, but the white spot is probably a very large chunk of quartz formed by converging veins in the gray-black granite.

Across from the Keri cliff on the basaltlike twin mountain of the island of Uivitari, the Indians indicate with mysterious awe a similar disc which they revere as the image of the sun, *Camosi*. Perhaps the geographical juxtaposition of the two cliffs contributed to this appellation, for I did, in fact, find Keri oriented toward the evening and Camosi toward morning. Etymologizing language scholars have thought to discern in the American word *Camosi* some similarity to Camosh, the sun name in one of the Phoenician dialects, along with Apollo Chomeus, or Beelphegor, and Ammon.

Unlike the 140-foot Niagara Falls, the cataracts of Maypures do not consist of a single plunge of a great mass of water. They are also not narrows—passes through which the stream is forced with accelerated speed—like the Pongo de Manseriche in the Amazon River. The cataracts of Maypures appear as a multitude of small cascades that follow one another in a series of steps. The *raudal* (as the Spanish call this sort of cataract) is formed by an archipelago of islands and cliffs that narrow the 8,000-foot-wide riverbed to such an extent that often an opening of barely 20 feet is left for the water to pass through. The eastern side is at the present far more impassable and dangerous than the western.

At the mouth of the Cameji, goods are unloaded so that the empty canoe, or as they say here, the *piragua*, may be piloted by the Indians familiar with the *raudal* to the mouth of the Toparo, where the danger is considered to be past. If the individual cliffs or steps (each of which has been given its own name) are not more than 2 to 3 feet in height, the Indians venture to pilot the canoe down over them; should the direction be upstream, however, they swim ahead and, after many fruitless efforts, manage to get a line around the points of rock that jut out of the swirling waters and then use this line to pull the craft upward. In the course of this strenuous work, the canoe is often filled with water or capsized.

Occasionally, and only in this case do the natives show concern, the canoe is shattered upon the rocks. With bloodied body, the pilots attempt to escape the maelstrom and swim to the riverbank. Where the steps are high, or where the dam of rock has crossed the entire riverbed, the light boat is brought to land and pulled along the near bank on top of cut tree trunks like rollers.

The most celebrated and difficult steps are Purimarimi and Manimi. They have a drop of 9 feet. I was astonished to find through barometric measurements (it is impossible to conduct a geodetic leveling because of the inaccessibility of the location and the pestilential and mosquito-filled air) that the entire vertical drop of the *raudal*, from the mouth of the Cameji to that of the Toparo, amounts to only 28 to 30 feet. I say "astonished" for it becomes clear from this that the terrible roaring and wild foaming of the river are the result of the narrowing of the bed by innumerable rocks and islands, the result of

the back current brought about by the form and positioning of the masses of stone. The most convincing way to see the truth of this assertion of the small drop of the entire system of falls is to climb down from the village of Maypures over the Manimi cliff to the riverbed.

This is the spot where one may enjoy a marvelous view. All at once, a roiling mile-long surface offers itself to the eye. From this surface, iron-black cliffs tower like ruins and fortresses. Each island, each stone is adorned by lushly thriving forest trees. Thick fog drifts eternally over the water's surface. Through the steaming cloud from the foam the tops of the tall palms emerge. When a ray of the glowing evening sun penetrates the damp vapors, there begins an optical magic. Colorful rainbows disappear and then return. The ethereal image fluctuates in the play of the airs.

Here and there on the naked rock, the trickling waters of the long rainy season have heaped up islands of topsoil. Bedecked with *Melastoma* and *Drosera*, with small, silver-leaved mimosas and ferns, they form flowerbeds on the desolate stone. To the European, they call to mind the memory of those plant groups that the people of the Alps call *Courtils*: blocks of granite that protrude, lonely and adorned with flowers, out of the Savoyan glaciers.

In the blue distance, the eye comes to rest upon the Cunavami mountain range, a long mountain ridge that ends in a steep and truncated cone. This last (which has the Indian name *Calitamini*) we saw glowing like red fire in the setting sun. This spectacle returns daily. No one has ever been close to this mountain. Perhaps its gleam arises from a reflective decomposition of talc or mica slate.

During the five days that we spent in the area around the cataracts, it was striking how one perceived the roaring of the rushing stream to be three times louder by night than by day. The same phenomenon may be noted at all European waterfalls. What might the cause for this be in a remote area where nothing disturbs the peace of Nature? It is probably the currents of warm rising air which, through the disparate admixture of the elastic medium, impede the propagation of sound, continually breaking up the sound waves, and which then cease this action during the nightly cooling of the Earth's crust.

The Indians showed us traces of wagon tracks. They speak with amazement of the horned animals (oxen) that pulled the canoes on wagons along the left bank of the Orinoco from the mouth of the Cameji to that of the Toparo in the days when the Jesuits were pursuing their business of proselytizing. In those days, the canoes remained loaded and, unlike today, were not worn away by the continual beaching and dragging along on the rough cliffs.

The plan of the surrounding area that I drew up shows that a canal could be opened up from the Cameji to the Toparo. The valley in which those

water-rich streams flow is smoothly flat. The canal, the building of which I have recommended to the governor general of Venezuela, would serve as a navigable adjacent arm of the river and would thus render the old, dangerous riverbed unnecessary.

The *raudal* of Atures is quite similar to the *raudal* of Maypures: again, an island world through which the river presses on for a distance of three to four thousand toises, a grove of palms rising right from the middle of the foaming water's surface. The best-known steps of the cataract lie between the islands of Avaguri and Javariveni, between Suripamana and Uirapuri.

When we, Mr. Bonpland and I, returned from the banks of the Rio Negro, we decided to risk navigating the last or lower half of the *raudal* of Atures in the laden canoe. Several times we climbed out onto the rocks, which, like causeways, join island to island. Sometimes the water crashes over these rocks; other times it falls into the hollows in the rocks with a dull roar. Thus whole stretches of riverbed are often dry, for the stream now makes its way through subterranean canals. The golden-yellow cliff hens (*Piprarupicola*) nest here—one of the most beautiful birds of the tropics, with a double-rowed crest of movable feathers, and as aggressive as the East Indian rooster.

In the Canucari *raudal*, piles of granite boulders form the rock dam. There we crawled into the interior of a cavity, the damp walls of which were covered with conferva and luminescent *Byssus*. With a dreadful roaring, the river rushed on above us. By chance we were presented with the opportunity to observe this great nature scene longer than we could have wished. The Indians left us there in the middle of the cataract. The canoe was supposed to navigate in a long detour around a narrow island, in order to pick us up again. For one and a half hours we waited under a fearful rainstorm. Night fell, and in vain we sought shelter between the cloven masses of granite. The plaintive cries of the little monkeys in woven cages that we had carried with us for months enticed the crocodiles, whose size and lead-gray color indicated great age. I would not mention this occurrence, so common in the Orinoco, had the Indians not assured us that a crocodile had never been seen in the cataracts; indeed, trusting in their assertion, we had even dared several times to bathe in this section of the river.

Meanwhile, the worry increased with each passing moment that we, soaked to the skin and deafened by the thundering of the crashing water, would have to wait through a sleepless tropical night in the middle of the *raudal*—until the Indians finally appeared with our canoe. They had found the step down which they had intended to ride impassable due to the water's being far too low. The pilots were thus compelled to seek a more navigable passage through the labyrinth of channels.

At the southern entrance to the *raudal* of Atures, on the right bank of the river, is the cavern of Ataruipe, famed far and wide amongst the Indians. The surrounding region is Nature of a great and solemn character, making it a suitable place for a national cemetery. One must laboriously scale a sheer wall of granite, not without danger of a great fall. It would hardly be possible to gain a firm foothold on the flat surface were it not for the large feldspar crystals that protrude an inch or more from the stone, defying the erosive effects of weather.

Immediately upon gaining the summit, one is surprised by a wide vista of the surrounding region. Rising from the foaming riverbed are hills ornamented with forest. On the opposite side of the river, beyond the western bank, one's view falls upon the immense grassland of Meta. Looming on the horizon like a bank of growing, threatening clouds are the Uniama mountain group. Such is the distant view; nearer at hand, all is bleak and closed in. In the deeply furrowed valley soar the lonely vulture and the cawing Caprimulgiformes. Their retreating shadows glide across the bare rock walls.

This kettle-shaped valley is surrounded by mountains whose rounded summits support granite boulders of monstrous size. The diameter of these boulders is around 40 to 50 feet. They appear to touch the ground below them with but a single point, as if they would come rolling down upon even the smallest tremor of the Earth.

The rear side of the rocky valley is covered in dense deciduous forest. In this shady spot is the opening of the cavern of Ataruipe—actually not a cavern but a sort of vault, a cliff with a very large overhang, a bight of sorts that the waters wore out in the days when they reached this height. This place is the tomb of an extinct tribe.[11] We counted approximately 600 well-preserved skeletons, each in a basket woven from the stalks of palm fronds. These baskets, which the natives call *mapires*, are in the shape of a sort of four-cornered sack, in different sizes depending upon the age of the deceased. Even newborn children have their own *mapire*. The skeletons are so complete that neither a rib nor a phalange is missing.

The bones are prepared in three ways: some are bleached, some are colored red with *Onoto*, the pigment of the *Bixorellana*, and some, in the manner of mummies, are rubbed with aromatic resins in pisang leaves. The Indians affirm that the fresh corpse is buried for some months in moist earth that gradually absorbs the muscle tissue; it is then exhumed, and any remaining tissue is scraped from the bones with sharp stones. This is still the practice of some tribes in Guyana. Next to the *mapires* or baskets, there are also half-fired clay urns that seem to contain the bones of entire families.

The largest of these urns are 3 feet high and 5½ feet long, of an attractive

oval shape, greenish, with handles in the shapes of crocodiles and snakes, and decorated around the rim with twining or labyrinthine designs. These decorations are quite similar to those that cover the walls of the Mexican palace of Mitla. Indeed, they are to be found in all zones, and at the most differing stages of human civilization: among the Greeks and Romans, as well as on the shields of the Tahitians and other Pacific Islanders—everywhere, the rhythmic repetition of regular forms is pleasing to the eye. The causes of these similarities, as I develop further in another work, rest on psychological bases, upon the inner nature of our mental faculties, more than being indicative of shared ancestry and ancient intercourse between the different peoples.

Our interpreters were unable to give us any reliable information regarding the age of these vessels. But the majority of skeletons appeared to be no more than one hundred years old. There is a legend among the Guarequena Indians that relates that the courageous people of Atures, pursued by cannibalistic Caribs, saved themselves on the cliffs of the cataracts—a sad place to settle, where the persecuted tribe and with them their language died out.[12] In the most inaccessible parts of the *raudal* there are similar tombs; it is indeed possible that the last of the Atures people did not die out until recently. For in Maypures (a curious fact), there lives an old parrot, of which the natives maintain that no one can understand him because he is speaking the language of the Atures people.

We left the cavern at nightfall, after collecting several skulls and the complete skeleton of an older man, much to the great irritation of our Indian guides. One of these skulls has been copied by Blumenbach and included in his excellent work on craniology. The skeleton, however, like a great portion of our collection of natural specimens (especially the entomological ones), was lost in a shipwreck on the African coast that also took the life of our friend and former traveling companion, the young Franciscan monk Juan Gonzalez.

As though with a premonition of this painful loss, it was in a somber mood that we left behind us this tomb of an extinct tribe. It was one of those serene and cool nights so common in the tropics. Surrounded by colorful rings, the disc of the moon stood high at the zenith. It illuminated the edge of the fog that, in sharp outline, covered the foaming river like clouds. Innumerable insects poured out their reddish phosphorescent light over the verdant earth. The ground glowed with this living fire, as though the starry roof of the heavens had laid itself down upon the grassland. Twining begonias, fragrant vanilla, and yellow-blossomed Banisteria adorned the entrance to the cavern. Over the graves, the tops of the palm trees rustled.

Thus do the races of men die away. The admirable lore of the different peoples fades away. But with the wilting of each blossom of the spirit, when-

ever, in the storm of the times, the works of creative art are scattered, so forever will new life sprout forth from the womb of the Earth. Restlessly, procreative Nature opens her buds: unconcerned whether outrageous humanity (a forever discordant race) should trample the ripening fruit.

Annotations and Additions

1. Across the peaceful arm of the ocean

Between the 23rd degree of southern and the 70th degree of northern latitude, the Atlantic Ocean has the form of a long, groove-shaped valley in which the jutting and receding profiles on opposite sides fit into one another. I first developed this idea in my *Essai d'un Tableau géologique de l'Amérique méridionale*, which is printed in the *Journal de Physique*, vol. LIII, p. 61 (*Geognostische Skizze von Südamerika* in Gilbert's *Annalen der Physik*, vol. XVI, 1804, pp. 394–449). From the Canary Islands, especially from the 21st degree of northern latitude and the 25th degree of western longitude to the northeast coast of South America, the surface of the ocean is so peaceful and moves with waves so gentle and low that an open boat could surely navigate it easily.

2. Freshwater springs between the Antillean Islands

On the southern coast of the island of Cuba, southwest of Puerto Batabano in Xagua Bay, but at a distance of about two to three nautical miles from dry land and in the middle of salty ocean water, springs of freshwater burst forth from the seabed, probably as a result of hydrostatic pressure. This eruption occurs with such power that it is only with great caution that canoes will approach the place, famous for the height and crisscrossing motion of the waves there. Trade ships that sail along the coast and do not wish to land sometimes visit these springs in order to take on a supply of freshwater while still remaining out at sea. The deeper one scoops down to get the water, the more potable it is. Also, the "river cow" (*Trichecus manati*) is often taken by hunters there; this animal does not thrive in saltwater. This incredible phenomenon, of which mention has never been made until now, has been most carefully investigated by one of my friends, don Francisco Lemaur, who trigonometrically measured the Bahi de Xagua. I was farther south, in the so-called Gardens of the King on the Jardines del Rey island group in order to determine their positions through astronomical observations; I was not in Xagua itself.

3. The ancient dam of rock

Christopher Columbus, whose restlessly observant mind was directed toward all things, presents in his letters to the Spanish monarchs a geognostic hypothesis regarding the conformation of the Greater Antilles. Intensely occupied with the strength of the often westerly equinoctial current, he ascribes to it the fragmentation of the Lesser Antilles group and the remarkable latitudinally extended configuration of the southern coasts of Puerto Rico, Haiti, Cuba, and Jamaica, which follow the circles of latitude

almost exactly. On the third voyage (from the end of May 1498 to the end of November 1500), upon which, in traveling from the *Boca del Drago* to the island of Margarita, and later, from this island to Haiti, he felt the full power of the equinoctial current, the motion of the waters "in agreement with the motion of the heavens" (*movimiento de los cielos*), he expressly states that the violence of the current tore the island of Trinidad from the continent. He refers the monarchs to a map that he presents to them, a *pintura de la tierra* of his own devising, which will later be referred to frequently during the famous legal proceedings against don Diego Colon in regards to the first admiral's rights. "Es la carta de marear y figura que hizo el Almirante señalando los rumbos y vientos por los quales vino á Paria, que dicen parte del Asia" (It is the navigational chart that the admiral did indicating the course and winds by which he came to Paria, said to be part of Asia) (Navarrete, *Viages y Descubrimientos, que hiciéron por mar los Españoles*, vol. I, pp. 253 and 260, vol. III, pp. 539 and 587).

4. On crossing the snow-covered Parapanisus

There are some who see in Diodorus's description of the Parapanisus (Diodorus Siculus, lib. XVII, p. 553, Rhodom.) a depiction of the Peruvian Andes chain. The army marched through settled areas where snow fell daily!

5. Herrera in the Décadas

Historia general de las Indias occidentales, Dec. I, lib. III, cap. 12 (ed. 1601, p. 106); Juan Bautista Muñoz, *Historia del Nuevo Mundo*, lib. VI, c. 31, p. 301; Humboldt, *Examen crit.*, vol. III, p. 111.

6. The sources of the Orinoco

I wrote this about these sources in the year 1807 in the first edition of *Views of Nature*, and I can repeat the assertion today with the same validity, 41 years later. The journeys of the brothers Robert and Richard Schomburgk, journeys so important to all areas of natural science and geographical knowledge, have brought to light other (and more interesting) facts, but the problem of the location of the Orinoco sources has only been approximately determined by Sir Robert Schomburgk. Approaching from the west, Mr. Bonpland and I had pressed on as far as Esmeralda, or the confluence of the Orinoco and the Guapo. Through careful investigation, I was able to describe the upper course of the Orinoco to beyond the mouth of the Gehette, to the small waterfall Raudalde los Guaharibos. Approaching from the east, Robert Schomburgk, having come from the Majonkong Indians' mountainous territory, which, judging by the boiling point of water, he estimated to lie at 3,300 feet of elevation in its inhabited portion, succeeded in reaching the Orinoco via the Padamo, which the Majonkongs and the Guinaos call the Paramu (*Reisen in Guiana*, 1841, p. 448). In my Atlas, I had estimated the position of this confluence of the Padamo and the Orinoco to be 3°12′ lat., 68° 8′ long.; by immediate observation, Robert Schomburgk finds 2°53′ lat., 68°10′ long. The primary objective of this traveler's undertaking was in the discipline of natural history. It was to find the solution to a problem presented in a prize competition, which was sponsored by the Royal Geographical Society in London in 1834: to connect the eastern littoral of British Guyana to the easternmost point that I had reached on the Upper Orinoco. After many tribulations, the attempt to find this solution met with complete success. On the 22nd of February, 1839, Robert Schomburgk arrived, with his instruments, in Esmeralda. His calculations of the longitude and latitude of the place agreed with mine

more exactly than I had expected (pp. XVIII and 471). Let us allow the observer himself to speak here: "I cannot find the words to describe the feelings that overwhelmed me as I sprang out onto the bank. My goal was attained, and my observations, which had begun on the coast of Guyana, were now brought to a connection with those of Humboldt at Esmeralda, and I freely admit that at a time when nearly all of my physical powers had left me, when I was surrounded by dangers and difficulties that were of no typical nature, it was only through the hope of recognition from him that I was encouraged to unshakable perseverance in pursuing the goal that I had now achieved. The emaciated appearance of my Indians and faithful guides indicated more clearly than any words could ever describe the difficulties there were to overcome, and that we had overcome." After these words, so kind to me, I must be allowed to insert here the opinions concerning the great undertaking that had been initiated by the London Geographical Society that I expressed in 1841 in the preface to the German edition of Robert Schomburgk's travel writings: "Immediately upon my return from Mexico, I made suggestions as to the direction and ways by which the unknown portions of the South American continent between the sources of the Orinoco, the Pacaraima mountain range, and the seacoast near Essequibo might be opened up. These wishes, which I expressed so avidly in my historical travel reports, have now, after nearly half a century, been to a large extent fulfilled. I have had the joy of experiencing such an important expansion of our geographical knowledge; also the joy of seeing that such a bold and well-led undertaking, demanding the most self-sacrificing endurance, should be accomplished by a young man with whom I feel myself connected as much by a similarity of our efforts as by the connection of a common fatherland. These conditions alone could move me to overcome the aversion and disinclination that I, perhaps unfairly, feel toward introductory prefaces from a strange hand. I needed to express publicly my sincere respect for a talented traveler who was led by one idea: the intention of pushing his way, from east to west, from the valley of the Essequibo to Esmeralda; and who, after five years of effort and suffering (the excessive extent of which I, to some degree, know from my own experience), reached the goal set before him. It is easier to find courage for the daring act of a moment, and it requires less inner strength, than does the long patience of enduring physical suffering, deeply driven by a spiritual interest to move forward, disregarding the certainty of encountering again, but with weakened faculties, the same deprivations on the return trip. A cheerful temperament, possibly the first requirement for an undertaking in inhospitable regions, a passionate love for all classes of scientific work (be they of a natural historical, astronomical, hypsometric, or magnetic nature), a pure sense of the enjoyment that open Nature provides: these are the elements that, when they meet within one individual, will assure the success of a great and important journey."

I will begin with my own assumptions regarding the location of the sources of the Orinoco. The dangerous path taken in 1739 by the surgeon Nicolas Hortsmann of Hildesheim, in 1775 by the Spaniards don Antonio Santos and his friend Nicolas Rodriguez, in 1793 by Lt. Col. don Francisco José Rodrigues Barata of the First Line Regiment of Para, and, according to manuscript maps (for which I am grateful to the former Portuguese ambassador to Paris, Chevalier de Brito), by several English and Dutch colonists who arrived in Para in 1811, by way of the portage of Rupunuri and the Rio Branco of Suriname—this dangerous path divides the terra incognita of the Parima into two uneven halves; in so doing it sets boundaries for a place that is very important

to the geography of this region, the place of the sources of the Orinoco: boundaries that one may no longer possibly push back eastward into the blue without intersecting the Rio Branco, which flows from north to south through the river system of the Upper Orinoco, while the Upper Orinoco itself follows an east-west direction. Since the beginning of the 19th century, the Brazilians have, for political reasons, shown a lively interest in the broad plains east of the Rio Branco. See the memoir that I prepared in 1817 at the request of the Portuguese court: *Sur la fixation des limites des Guyanes française et portugaise* (Schoell, *Archives historiques et politiques, ou Recueil de Pièces officielles, Mémoires etc.*, vol. I, 1818, pp. 48–58). Due to the position of Santa Rosa on the Uraricapara, whose course seems to have been quite accurately plotted by the Portuguese engineers, the sources of the Orinoco cannot lie east of the meridian of 65½°. This is the eastern limit beyond which they may not be presumed to be, and considering the condition of the river at the *raudal* of the Guaharibos (above Caño Chiguire, in the land of the unusually white-skinned Guaica Indians, 52′ east of the great Cerro Duida), it strikes me as probable that the upper course of the Orinoco reaches at most the meridian of 66½°. By my calculations, this point is 4°12′ farther west than little Amucu Lake, which was reached by Mr. Schomburgk.

I will now follow my own, older assumptions with those of this gentleman. According to Mr. Schomburgk, the course of the Upper Orinoco east of Esmeralda is oriented from southeast to northwest, as my estimates of the mouths of the Padamo and the Gehette seem to be 19′ and 36′ short in terms of latitude. Robert Schomburgk assumes that the sources of the Orinoco lie at 2°30′ latitude (p. 460), and the fine map *Map of Guyana, to illustrate the route of R. H. Schomburgk*, which is included in the magnificent English work *Views in the Interior of Giana*, sets the geographical position of the sources at 67°18′, i.e., 1°6′ west of Esmeralda, and only 0°48′ Parisian longitude farther west than I believed myself allowed to push against the Atlantic littoral. Through astronomical calculations, Robert Schomburgk placed the nine- to ten-thousand-foot Maravaca mountain at 3°41′ lat. and 68°10′ long. The width of the Orinoco at the mouth of the Padamo, or Paramu, is barely 300 yards, and where it expands west of there to four to six hundred yards, it is so shallow and full of sandbars that the expedition had to dig canals, for the riverbed itself had a depth of barely 15 inches. The freshwater dolphins still showed themselves in abundance: an occurrence in the Orinoco and the Ganges for which zoologists of the 18th century would not have been prepared.

7. The mightiest product of the tropical world

The *Bertholletia excelsa* (Juvia; Brazil-nut tree), of the family *Myrtaceae*, and in the subcategory described by Richard Schomburgk of *Lecythidaceae*, was first described by us in *Plantes équinoxiales*, vol. I, 1808, p. 122, tbl. 36. The enormous, majestic tree, through its coconutlike round fruit with its dense, woody shell that encases the three-sided, again woody, seed pods, presents a most remarkable example of advanced organic development. The Bertholletia grows in the forests of the Upper Orinoco between the Padamo and the Ocamu, not far from the mountain Mapaya, and also between the Amaguaca and Gehette rivers (*Relation historique*, vol. II, pp. 471, 496, 558–562).

8. Grass stalks, which have segments of more than 17 feet from knot to knot

Robert Schomburgk, when he visited the small mountain country of the Majonkongs on his way to La Esmeralda, was so fortunate as to designate the species *Arundinaria*,

which provides the material for their blowguns. He says of the plant: "It grows in large clumps, like the *Bambusa*; the first segment rises without knots from the old reed for 15 or 16 feet, and only then produces leaves. The full height of the *Arundinaria* at the foot of the large Maravaca mountain reaches 30 to 40 feet, with a diameter thickness of barely one-half inch. The top is always bowed, and this variety of grass is native only to the sandstone mountains between the Ventuari, Paramu, and Mavaca Rivers. The Indian name is *curata*; because of the excellence of these widely celebrated long blowguns, the Majonkongs and Guinaus of this region have been given the name 'Curata People'" (*Reisen in Guiana und am Orinoko*, p. 451).

9. The Orinoco originating in a lake is therefore fantasy

The lakes of this region, of which theorizing geographers have invented some and exaggerated others, may be divided into two groups. The first of these groups comprises those that have been determined to lie between Esmeralda, the easternmost mission on the Upper Orinoco, and the Rio Branco; to the second group belong the lakes that have been assumed to lie in the tract of land between the Rio Branco and the French, Dutch, and British Guyanas. This overview, which travelers should always bear in mind, indicates that the question of whether there is a Lake Parime east of the Rio Branco other than Lake Amucu (which has been seen by Hortsmann, Santos, Colonel Barata, and Mr. Schomburgk), has nothing to do with the problem of the Orinoco sources. As the name of my famous friend don Felipe Bauza, the former director of the Hydrographic Bureau in Madrid, is so important in the field of geography, I am obligated by the objectivity that should dominate every scientific debate to mention that this learned man was inclined to believe that west of the Rio Branco, rather near to the sources of the Orinoco, there must be lakes. Shortly before his death, he wrote me from London: "I wish that you were here, that I might discuss with you the geography of the Upper Orinoco, which has occupied you so much. I was so lucky as to have saved from complete destruction the documents belonging to Marine General don José Solano, the father of the Solano who perished so sadly at Cadiz. These documents pertain to the drawing up of borders by the Spanish and the Portuguese, to which Solano, in connection with *Chef d'escadre* Yturriaga and don Vicente Doz, had been assigned since 1754. On all of these plans and drawings I see a Laguna Parime, designated sometimes as a source of the Orinoco, other times as being totally separate from these sources. But may one admit, above all, that east and northeast of Esmeralda, some sort of lake exists?"

As the botanist to this last-mentioned expedition, Linné's famous pupil Löffling came to Cumana. He died, after having been to the missions on the Piritu and the Caroni, on the 22nd of February, 1756, at the mission of Santa Eulalia de Murucuri, somewhat south of the confluence of the Orinoco and the Caroni. The documents of which Bauza speaks are the same ones that form the basis of the great map of de la Cruz Olmedilla. They became the model for all maps of South America that appeared before the end of the last century in England, France, and Germany; they also contributed to the two maps drawn in 1756 by Father Caulin, historiographer of the Solano expedition, and by Mr. de Surville, archivist of the State Secretariat of Madrid and an unskilled compiler. The contradiction that these maps present evinces the unreliability of the mapping surveys that arise from that expedition. Moreover, Father Caulin, the expedition's historiographer, unveils with acuity the circumstances that gave rise to the legend of Lake

Parime, and Surville's map, which accompanies his work, not only reinserts this lake (under the name of White Sea and *Mar Dorado*) but also includes another, smaller one, from which arise, fed partly by side branches, the rivers Orinoco, Siapa, and Ocamo. I was able to convince myself on site of the fact that is well known in the missions: that don José Solano had merely passed the cataracts of Atures and Maypures but had not reached the confluence of the Guaviare and the Orinoco at 4°3′ lat. and 70°31′ long., and that the astronomical instruments of the border expedition were not carried as far as the isthmus of Pimichin and the Rio Negro, nor to the Cassiquiare, and, on the Upper Orinoco, not even past the mouth of the Atabapo. This immense country, in which no exact observations had been attempted before my journey, was crossed since Solano's time only by a few soldiers who had been sent out on discovery missions; meanwhile, don Apolinario de la Fuente, whose journals I obtained from the archives of the Province of Quixos, collected without critique everything from the tall tales of the Indians that could flatter the gullibility of Governor Centurion. No member of the expedition saw a lake, and don Apolinario could come no farther than the Cerro Yumariquin and the Gehette.

Now that a dividing line that forms the basin of the Rio Negro has been established within the expanse of this land (to which it would be desirable to direct the inquisitive enthusiasm of explorers), it remains only to remark that for the last century our geographical knowledge of the country west of this valley, between 64° and 68° longitude, has in no way advanced. The attempts that the government of Spanish Guyana has repeatedly made since the expeditions of Iturria and Solano to reach and cross over the Pacaraima Mountains has been crowned only with truly insignificant success. The Spanish, on the way to the missions of the Catalonian Capuchins of Barceloneta at the confluence of the Caroni and the Paragua, in sailing southward up the latter river to its intersection with the Paraguamusi founded at this intersection the Guirion mission, which at the beginning was given the ostentatious name "Ciudad de Guirion." I place it at approximately 4½° northern lat. From there, Governor Centurion, who was incited to seek El Dorado by the exaggerated tales of Paranacare and Arimuicaipi, two Indian chiefs of the mighty Ipurucoto people, extended what they then called the "spiritual conquests" to beyond the Pacaraima Mountains, where he founded the two villages Santa Rosa and San Bautista de Caudacala: the first on the high eastern bank of the Uraricapara, a tributary of the Uraricuera, which I find under the name Rio Curaricara in the travel reports of Rodriguez; the second, six to seven miles farther east-southeast. The astronomer-geographer of the Portuguese Border Commission, Frigate Captain don Antonio Pires de Sylva Pontes Lema, and the captain of engineers don Ricardo Franco d'Almeida de Serra, who from 1787 to 1804 mapped out with the utmost care the entire run of the Rio Branco and its upper branches, call the western portion of the Uraricapara the "Valley of Inundation." They situate the Spanish mission of Santa Rosa at 3°46′ northern lat. and indicate the path that leads north over the mountain range to the Caño Anocapra: a tributary of the Paraguamusi by way of which one may travel from the basin of the Rio Branco to that of the Caroni. Two maps by these Portuguese officers, which contain all details of the trigonometric data concerning the windings of the Rio Branco, the Uraricuera, the Tacutu, and the Mahu, were most helpfully shared with me and Colonel Lapie by Count von Linhares. These valuable, unprinted documents which I used remain in the hands of the learned geographer who long ago had

engravings begun at his own cost. The Portuguese sometimes call the entire Rio Branco "Rio Parime"; sometimes they restrict this name to the single tributary, the Uraricuera, somewhat below Caño Mayare and above the old Mission San Antonio. Since the words Paragua and Parime can at once mean "water," "big water," "lake," and "ocean," it should surprise no one to find the words so often repeated among the Omaguas on the Upper Marañon, among the western Guarani, and among the Caribs—in short, among peoples who live very far from one another. In all zones, as I mention above, the greatest rivers, among the people who inhabit their banks, are called "the River," with no other special designations. Paragua, a branch of the Caroni, is also the name that the natives give to the Upper Orinoco. The name *Orinucu* is Tamanac, and Diego de Ordaz heard it spoken for the first time in 1531, when he sailed to the mouth of the Meta. Beside the above-mentioned Valley of Inundation, one may find other large lakes between the Rio Xumuru and the Parime. One of these bays is a tributary to the Tacutu and the other to the Uraricuera. Even at the foot of the Pacaraima Mountains the rivers are susceptible to periodic massive flooding, and Lake Amucu, of which more will be said later, brings this very characteristic to its position at the beginning of the plains. The Spanish missions of Santa Rosa and San Bautista de Caudacacla or Cayacaya, founded in 1770 and 1773 by the governor don Manuel Centurion, were destroyed before the end of the last century, and since that time, no new attempt has been made to penetrate from the basin of the Caroni to the southern slope of the Pacaraima Mountains.

The terrain spreading to the east of the valley of the Rio Branco has in recent years been the object of successful exploration. Mr. Hillhouse has navigated the Massaruni as far as the Bay of Caranang, from which a path, he says, is supposed to have led travelers in two days to the source of the Massaruni and in three days to the feeders of the Rio Branco. In reference to the windings of the large river Massaruni, which Mr. Hillhouse described, he remarks in a letter to me (Demerary, January 1st, 1831): "The Massaruni, measured from its sources on, flows first to the west, then for a degree of latitude to the north, thereafter almost 200 English miles to the east, and finally north and north-northeast to join the Essequibo." Since Mr. Hillhouse was unable to reach the southern slope of the Pacaraima range, he is not familiar with Lake Amucu; in his published report, he himself relates that he, "upon the advice received from the Akawais, who continually travel across the land that lies between the Amazon and the shore . . . became convinced that there is no lake in these regions." This assurance surprised me somewhat; it directly contradicted the ideas that I had gained regarding Lake Amucu—from which, according to the travel reports of Hortsmann, Santos, and Rodriguez (which gave me even more confidence when they agreed completely with the new Portuguese manuscript map), the Caño Pirara was said to flow. Finally, after five years of anticipation, Mr. Schomburgk's journey removed all doubt.

"It is hard to believe," says Mr. Hillhouse, in his interesting memoir about the Massaruni, "that the legend of a great inland sea should have absolutely no basis. In my opinion, the following circumstances can perhaps have contributed to the origination of the belief in the existence of the fabled Lake Parime. At a rather great distance from the rockfall of Teboco, the waters of the Massaruni present to the eye no stronger movement than the quiet surface of a lake. When, in a more or less distant epoch, the horizontal granite beds of Teboco were fully compact and without fissures, the waters must have risen at least 50 feet over their present level, which would then have formed a gigantic

lake of 10 to 12 English miles width and 1,500 to 2,000 English miles length" (*Nouvelles Annales des Voyages*, 1836, Sept., p. 316). It is not the extensive length of this flooded region alone that hinders me from supporting this explanation. I have seen plains (Llanos) where the rainy season annually gives the flooding of the feeder streams of the Orinoco a surface area of 400 square geographical miles. The labyrinth of branches between the Apure, Arauca, Capanaparo, and Cinaruco (see maps 17 and 18 of my geographical and physical atlas) disappears then completely; the shape of the riverbeds is obliterated, and everything has the appearance of a tremendous lake. But the locality of the myth of El Dorado and Lake Parime belongs historically to a completely different region of Guyana, that is, to the southern end of the Pacaraima Mountains. As I believe I established in another work (already 30 years ago), the glittering rocks of Mount Ucucuamo, the name of the Parime River (the Rio Branco), the flooding of its tributaries, and especially the existence of Lake Amucu, which lies near the Rio Rupunuwini (Rupunuri) and is connected via the Pirara with the Rio Parime—these have given rise to the legend of the White Sea and El Dorado of Parime.

I have seen with pleasure how the journey of Mr. Schomburgk perfectly confirms these views. The part of his map that shows the course of the Essequibo and the Rupunuri is all new and of great importance to geography. It depicts the Pacaraima range at 3°52′ to the 4th degree of latitude; I had given it a position of 4° to 4°10′. The range reaches the confluence of the Essequibo and the Rupunuri at 3°57′ north latitude and 60°23′ west longitude (calculated, as always, from the Paris meridian); I had placed this point one-half of a degree too far north. Schomburgk gives the name of the latter river as "Rupununi," following the accent of the Macushis; as synonyms, he offers "Rupunuri," "Rupunuwini," and "Opununy," the Cariban tribes here having some difficulty pronouncing the letter *r*. The orientation of Lake Amucu and its relationship to the Mahu (Maou) and the Tacutu (Tacoto) consistently agree with my 1825 map of Colombia. Similarly, we are in agreement regarding the latitude of Lake Amucu. The explorer finds it to be 3°33′, while I believed the point at which I had to stop was 3°35′; but the Caño Pirara (Pirarara), which connects Lake Amucu with the Rio Branco, flows northward out of the lake, not westward. The Sibarana of my map, which Hortsmann has rising near a beautiful mine of rock crystal somewhat north of Cerro Ucucuamo, is the same as the Sibarana of Schomburgk's map. His "Waa-Ekuru" is the same as the "Tavaricuru" of the Portuguese geographer Pontes Leme; it is the tributary of the Rupunuri that most closely approaches Lake Amucu.

The following remarks from the reports of Robert Schomburgk shed some light upon this object that had occupied our attention. "Lake Amucu," says the traveler, "is without dispute the nucleus of Lake Parime and the alleged White Sea. In December and January, when we visited it, it was barely one English mile long, and half-covered with rushes." (This expression was already to be found on d'Anville's map of 1748.) "The Pirara flows from the lake west-northwest of the Indian village of Pirara and falls into the Maou or Mahu. This latter river, according to information I gathered, springs up north of the swell of the Pacaraima Mountains, which in their eastern portions ascend to only 1,500 feet. The sources are located on a plateau upon which the river makes a beautiful waterfall called Corona. We were in the very act of going to visit this place when, on the third day of this excursion, up in the mountains, the illness of one of my companions obliged me to return to the station at Lake Amucu. The Mahu has black

(coffee-colored) water, and its current is more rapid than that of the Rupunuri. In the mountains through which it forges its way, it has a width of about 60 yards, and its surroundings are uncommonly picturesque. This valley, like the banks of the Buro Buro, which flows to the Ciparuni, is inhabited by the Macushis. In April, the savannas are entirely flooded and present the peculiar phenomenon of the waters of two different river systems intermingling. The enormous extent of this intermittent flooding has probably given rise to the Myth of Lake Parime. During the rainy season, the interior of the country features a water connection of the Essequibo with the Rio Branco and the Gran Para. Some copses of trees rise like oases from the sand hills of the savanna, and during the time of flooding give the appearance of being islands scattered in a sea; these are without a doubt the Ipomucena Islands of don Antonio Santos."

In the manuscripts of d'Anville, which his heirs most generously permitted me to peruse, I found that the surgeon Hortsmann of Hildesheim, who described these regions with great care, saw a second alpine lake, which he places two days' travel above the confluence of the Mahu and the Parime (Tacutu?) Rivers. It is a black-water lake on the summit of a mountain. He definitively differentiates it from Lake Amucu, which he describes as "covered in rushes." The travel reports of Hortsmann and Santos allow as little for the idea of an enduring connection between the Rupunuri and Lake Amucu as the Portuguese manuscript maps at the Marine Bureau in Rio de Janeiro. In this respect, the drawings of the rivers on d'Anville's maps in the first edition of the *Amerique Meridionale* of 1748 are better than those of the more widely distributed 1760 edition. Schomburgk's journey completely confirms the independence of the basin of the Rupunuri and the Essequibo, but points out that "during the rainy season, the Rio Waa-Ekuru, a tributary of the Rupunuri, becomes connected with the Caño Pirara." This is the situation of these basins of rivers that are not highly developed and are almost completely devoid of separating ridges (combs).

The Rupunuri and the village of Annai (3°56′ lat., 60°56′ long.) are currently recognized as the political border between the British and Brazilian territories of these desolate regions. Mr. Schomburgk, being very ill, was compelled to remain for an extended period in Annai; he bases the chronometric positioning of Lake Amucu on the mean of several lunar distance readings which he measured (from east to west) during his stay in Annai. The longitudes of this traveler for these points on the Parime are in general almost one degree farther east than the longitudes on my map of Colombia. Far from casting doubt upon the lunar readings made in Annai, I wish only to point out that the calculation of these distances becomes important if one wishes to carry over the time reading of Lake Amucu to Esmeralda, which I found to be at 68°23′19″ longitude.

Thus then do we see through recent research how the great *Mar de la Parima*, which had been so difficult to remove from our maps, and which at the time of my return from America was still ascribed a length of 40 miles, has been traced back to Lake Amucu, at a length of two to three English miles! The delusions that were nourished throughout nearly two centuries (the last Spanish expedition to seek El Dorado in 1775 cost more than one hundred people their lives) have ended in such a manner that the study of geography gained some fruits from it. In 1512, thousands of soldiers died on the expedition undertaken by Ponce de Leon to discover the Fountain of Youth on an island in the Bahamas named Bimini, which can hardly be found on our maps. This expedition led to the conquest of Florida and to the recognition of the great ocean current, the Gulf

Stream, that flows through the Bahama Channel. The thirst for treasures and the desire for regained youth: El Dorado and the Fountain of Youth have incited the passions of humanity as though in competition with one another.

10. One of the noblest forms of all palm plants, the piriguao

Compare Humboldt, Bonpland, and Kunth, *Nova Genera Plant. Aequinoct.*, vol. I, p. 315.

11. The tomb of an extinct tribe

While I sojourned in the forests of the Orinoco, investigations of these bone-filled caves were initiated by royal decree. The missionary of the cataracts was falsely accused of having discovered treasure in these caverns, supposedly hidden there by the Jesuits before they fled the region.

12. And with them their language died out

The Atures Parrot has been made the object of a charming poem for which I am indebted to my friend Professor Ernst Curtius, tutor to the young and promising Prince Friedrich Wilhelm of Prussia. He will forgive me if I insert his poem, which was not intended for publication and was merely sent to me in a letter, here at the end of the first volume of *Views of Nature*.

In the Orinoco forest
An old parrot sits alone,
Never stirring, like the poorest
Little statue carved in stone.

Its course through rock-dams laying
Foams the river's wild flow,
While above the palms are swaying
In the sun's quiescent glow.

How the waves strive on, all acting
Like their race may yet be won;
In the water's mist refracting,
Flash the colors of the sun.

Down below where swells are breaking,
There a tribe speaks nevermore;
As the foe their lands were taking,
Fled to cliffs along the shore.

And the bold Atures perished
As they lived, both free and brave;
And the last things that they cherished
Now lie hidden in a cave.

For the last, now absent members
Of the tribe the parrot grieves,
Hones his beak, and he remembers,
And his cry sounds through the leaves.

Oh, all the boys who trained him
In the phrases they thought best,

And the women who sustained him
With good food and cozy nest.

Now they all lie dead and broken,
Stretched out on the rocky shore;
Despite every word he's spoken,
He can't wake them anymore.

And now no one comprehends him
When he calls; alone he is.
Hears the water, but it sends him
Not a soul to comfort his.

And the savage who, unwilling,
Spies him, paddles fast to go;
All who see it find it chilling:
The Atures Parrot's woe.