

Cataracts of the Orinoco

—A Science Classic

Geography

VIEWS OF NATURE: or Contemplations on the Sublime Phenomena of Creation. With scientific illustrations. By Alexander von Humboldt. Translated from the German by E. C. Otté and H. G. Bohn. London, 1850.

THE name Orinoco, which the first discoverers gave to this river, and which probably owes its origin to some confusion of language, is unknown in the interior of the country. For in their condition of animal rudeness, savage tribes only designate by peculiar geographical names, those objects which might be confounded with others. Thus the Orinoco, the Amazon, and the Magdalena, are each simply termed *The River*, the *Great River* and *The Great Water*; whilst, those who dwell on the banks of even the smallest streams distinguish them by special names. . . .

The Orinoco is one of those remarkable rivers which, after numerous windings, first towards the west and then to the north, finally returns towards the east in such a manner as to bring both its estuary and its source into nearly the same meridian. From the Chiguire and the Gehette as far as the Guaviare, the course of the Orinoco inclines westward, as if it would pour its waters into the Pacific. Here branches off to the south, the Cassiquiare, a remarkable river, but little known to Europeans, which unites with the Rio Negro, or as the natives call it, the Guainia: furnishing the only example of a bifurcation which forms in the very interior of a continent a natural connection between two great river valleys.

The nature of the soil, and the junction of the Guaviare and Atabapo with the Orinoco, cause the latter to deflect suddenly northwards. From a want of correct geographical data, the Guaviare, flowing in from the west, was long regarded as the true source of the Orinoco. The doubts advanced since 1797 by an eminent geographer, M. Buache, regarding the possibility of a connection with the Amazon, have, I trust, been completely set at rest by my expedition. In an uninterrupted voyage of 920 miles, I penetrated through a remarkable network of rivers, from the Rio Negro, along the Cassiquiare, into the Orinoco;

"The twofold object of this work," states the author, "—an anxious endeavour to heighten the enjoyment of nature by vivid representations, and at the same time to increase, according to the present state of science, the reader's insight into the harmonious co-operation of forces,—was pointed out by me in the preface to the first edition, nearly half a century ago. . . . In my eightieth year I have still the gratification of completing a third edition of my work." The first edition appeared in 1807, the second in 1826, and the third, from which the translation here quoted was made, in 1849.

across the interior of the continent, from the Brazilian boundary to the coast of Caracas. . . .

To this point, that is, as far as the mouth of the Guaviare, the Orinoco flows along the southern declivity of the chain of the Parime. From its left bank, across the equator, and as far as the parallel of 15° south lat., extends the boundless wooded plain of the river Amazon. At San Fernando de Atabapo the Orinoco, turning off abruptly in a northerly direction, intersects a portion of the mountain chain itself. Here are the great waterfalls of Atures and Maypures, and here the bed of the river is everywhere contracted by colossal masses of rocks, which give it the appearance of being divided by natural dams into separate reservoirs.

At the entrance of the Meta stands, in the midst of an enormous whirlpool, an isolated rock, which the natives very aptly term the "Rock of Patience," because when the waters are low, it sometimes retards for two whole days the ascent of the navigator. Here the Orinoco, biting deep into its shores, forms picturesque rocky bays. Opposite the Indian mission of Carichana, the traveler is surprised by a most remarkable prospect. Involuntarily his eye is arrested by a steep granite rock, "El Mogote de Cocuyza," a cubiform mass, which rises precipitously to a height of more than 200 feet; and whose summit is crowned with a luxuriant forest. Like a Cyclopic monument of simple grandeur, this bold promontory towers high above the tops of the surrounding palms, cutting the deep azure of the sky with its strongly marked out-

lines, and lifting, as it were, forest upon forest.

On descending beyond Carichana, the traveler arrives at a point where the river has opened itself a passage through the narrow pass of Baraguan. Here we everywhere recognize traces of chaotic devastation. To the north, towards Uruana and Encaramada, rise granite rocks of grotesque appearance, which, in singularly formed crags of dazzling whiteness, gleam brightly from amidst the surrounding groves.

At this point, near the mouth of the Apure, the stream leaves the granitic chain, and flowing eastward, separates as far as the Atlantic, the impenetrable forests of Guiana from the Savannas, on whose far distant horizon the vault of heaven seems to rest. Thus the Orinoco surrounds on the south, west, and north, the high mountain chain of the Parime, which occupies the vast space between the sources of the Jao and of the Caura. No cliffs or rapids obstruct the course of the river from Carichana to its mouth, excepting, indeed, the "Hell's Mouth" (Boca del Inferno) near Muitaco, a whirlpool occasioned by rocks, as at Atures and Maypures, which does not, however, block up the whole breadth of the stream. In this district, which is contiguous to the sea, the only dangers encountered by the boatmen arise from the natural timber-floats, against which canoes are often wrecked at night. These floats consist of forest trees which have been uprooted and torn away from the banks by the rising of the waters. They are covered, like meadows, with blooming water-plants, and remind us of the floating gardens of the Mexican lakes.

After this brief glance at the course of the Orinoco and its general features, I pass to the waterfalls of Maypures and Atures. . . .

The geognostical aspect of this region, the insular form of the rocks of Keri and Oco, the cavities worn in the former by the current, and which are situated at exactly the same level as those in the opposite island of Uivitari; all these indications tend to prove that the Orinoco once filled the whole of this now dried-up bay. It is probable that the waters formed a wide lake, as long as the northern dam withstood their passage. When this

barrier gave way, the Savannah now inhabited by the Guareke Indians emerged as an island. The river may perhaps long after this have continued to surround the rocks of Keri and Oco, which now picturesquely project, like castellated fortresses, from its ancient bed. After the gradual diminution of the waters, the river withdrew wholly to the eastern side of the mountain chain.

This conjecture is confirmed by various circumstances. Thus, for instance, the Orinoco, like the Nile at Philæ and Syene, has the singular property of colouring black the reddish-white masses of granite, over which it has flowed for thousands of years. As far as the waters reach one observes on the rocky shore a leaden-coloured manganeseous and perhaps carbonaceous coating which has penetrated scarcely one-tenth of a line into the stone. This black coloration, and the cavities already alluded to, show the former water level of the Orinoco.

These black cavities may be traced at elevations of from 160 to 192 feet above the present level of the river on the rocks of Keri, in the islands of the cataracts; in the gneiss-like hills of Cumadanimari, which extend above the island of Tomo; and lastly at the mouth of the Pao. Their existence proves, what indeed we learn from all the river-beds of Europe, that those streams which still excite our admiration by their magnitude, are but inconsiderable remains of the immense masses of water belonging to a former age.

These simple facts have not escaped even the rude natives of Guiana. Everywhere the Indians drew our attention to these traces of the ancient water-level. Nay, in a Savannah near Uruana there rises an isolated rock of granite, which, according to the testimony of persons worthy of credit, exhibits at an elevation of between 80 and 90 feet, a series of figures of the sun and moon, and of various animals, especially crocodiles and boa-constrictors, graven, almost in rows. At the present day this perpendicular rock, which well deserves the careful examination of future travelers, cannot be ascended without the aid of scaffolding. In a similarly remarkable elevated position, the traveler can trace hieroglyphic characters carved on the mountains of Uruana and Encaramada.

If the natives are asked how these characters could have been graven there, they answer that it was done in former times, when the waters were so high that their fathers' canoes

floated at that elevation. Such lofty condition of the water level must therefore have been coeval with these rude memorials of human skill. It indicates an ancient distribution of land and water over the surface of the globe widely different from that which now exists; but which must not be confounded with that condition when the primeval vegetation of our planet, the colossal remains of extinct terrestrial animals, and the oceanic creatures of a chaotic world, found one common grave in the indurating crust of our earth. . . .

The lofty falls of Niagara, which are 150 feet in height, derive their origin, as is well known, from the combined precipitation of one enormous mass of water. Such, however, is not the case with respect to the cataracts of Maypures, nor are they narrow straits or passes through which the stream rushes with increasing velocity, like the Pongo of Manseriche on the Amazon, but rather to be regarded as a countless number of small cascades succeeding each other like steps. The *Raudal*, (as the Spaniards term this kind of cataract,) is formed by an archipelago of islands and rocks, which so contract the bed of the river that its natural width of more than 8500 feet is often reduced to a channel scarcely navigable to the extent of 20 feet. At the present day the eastern side is far less accessible and far more dangerous than the western.

At the mouth of the Cameji the boatmen unload their cargo that they may leave the empty canoe, or, as it is here called, the *Piragua*, to be piloted by Indians well acquainted with the *Raudal*, as far as the mouth of the Toparo, where all danger is supposed to be past. Where the rocks or shelvy ledges, (each of which has its particular name,) are not above two or three feet in height, the natives venture to shoot the rapid with their canoes. When, however, they have to ascend the stream, they swim in advance of the *piragua*, and after much labour, and, perhaps, many unsuccessful efforts, succeed in throwing a rope round a point of rock projecting above the breakers, and by this means draw the canoe against the stream, which, in this arduous operation, is often water-logged, or upset.

Sometimes the canoe is dashed to pieces on the rock, and this is the only danger the natives fear. With bleeding bodies they then strain every nerve to escape the fury of the whirlpool and swim to land. Where the rocky ledges are very high and form a barrier by extending across the en-

tire bed of the river, the light canoe is hauled to land and dragged for some distance along the shore on branches of trees which serve the purpose of rollers.

The most celebrated and most perilous ledges are those of Purimarimi and Manimi, which are between nine and ten feet in height. It was with surprise I found, by barometrical measurements, that the entire fall of the *Raudal*, from the mouth of the Cameji to that of the Toparo, scarcely amounted to more than 30 or 32 feet. (A geodesic levelling is not practicable, owing to the inaccessibility of the locality and the pestiferous atmosphere, which swarms with mosquitoes.) I say with surprise, for I hence discovered that the tremendous roar and wild dashing of the stream arose from the contraction of its bed by numerous rocks and islands, and the counter-currents produced by the form and position of the masses of rock. The truth of my assertion regarding the inconsiderable height of the whole fall will be best verified by observing the cataracts, in descending to the bed of the river, from the village of Maypures, across the rocks of Manimi.

At this point the beholder enjoys a most striking and wonderful prospect. A foaming surface, several miles in length, intersected with iron-black masses of rock projecting like battle-mented ruins from the waters, is seen at one view. Every inlet and every rock is adorned with luxuriant forest trees. A perpetual mist hovers over the watery mirror, and the summits of the lofty palms pierce through the clouds of vapoury spray. When the rays of the glowing evening sun are refracted in the humid atmosphere, an exquisite optical illusion is produced. Coloured bows appear, vanish, and reappear, while the ethereal picture dances, like an ignis fatuus, with every motion of the sportive breeze.

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Furniture shipments from the United States to Canada increased 41 per cent. last year.

Evergreen trees lose a crop of leaves each year, but not all at once, like the deciduous trees.

The gecko, one of the rarest of lizards, lives in the African desert and yet has webbed feet.

Compulsory medical supervision of women working in candy industries has been recommended by the Consumers' League of Massachusetts.