

**ALEXANDER VON HUMBOLDT
AIMÉ BONPLAND**



**PERSONAL
NARRATIVE
OF TRAVELS TO THE
EQUINOCTIAL
REGIONS OF AMERICA**

1799-1804

Alexander von Humboldt, Aimé Bonpland

Personal Narrative of Travels to the Equinoctial Regions of America: 1799-1804

**Enriched edition. Expedition in Central & South
America**

Introduction, Studies and Commentaries by Logan Faraday

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Introduction

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Balancing the calibrated gaze of science with the restless curiosity of a traveler, *Personal Narrative of Travels to the Equinoctial Regions of America: 1799–1804* pursues an expedition in which instruments, measurements, and maps never quite contain the unruly profusion of equatorial landscapes, and the desire to systematize the world is continually unsettled—and made more humane—by encounters with terrains, climates, and communities that press the observer to think across scales, from a seed or a slope to continental patterns, until the journey becomes both a record of facts and a meditation on how knowledge, wonder, and responsibility might coexist.

Authored by Alexander von Humboldt with the collaboration of the botanist Aimé Bonpland, this work belongs to the tradition of the scientific travel narrative, recounting observations gathered during a multi-year exploration of northern South America, the Caribbean, and parts of New Spain at the turn of the nineteenth century. Composed after the expedition and issued in the early nineteenth century in multiple volumes, the *Personal Narrative* forms a central strand of Humboldt's broader publication project derived from the 1799–1804 journey. Its pages bridge scientific reportage and literary travel writing, situating readers in ports, rivers, forests, and highlands within a shifting imperial world.

Readers follow a first-person observer whose daily notebooks evolve into a textured narrative that alternates between on-the-spot description and reflective synthesis. River passages, overland traverses, and sojourns in colonial towns provide the scaffolding for a mosaic of scenes: a plant's form examined beside a basalt outcrop; a horizon measured, then marveled at; a conversation with local inhabitants recorded alongside a barometric reading. The prose is precise yet expansive, prone to digression when a detail opens into a larger pattern. The tone is sober, inquisitive, and occasionally rapt, inviting a pace of reading that mirrors the patient cadence of fieldwork.

At the heart of the book lies a comparative method that seeks the unity of nature across difference. Altitudes, temperatures, rocks, waters, and winds are placed in conversation, allowing patterns to emerge that link distant locales and seemingly disparate facts. Human activity appears within these networks, as cultivation, extraction, and settlement are read against soils, climates, and routes. The narrative treats measurement not as an end, but as a way to ask better questions, turning instruments into lenses for interpretation. This approach models a way of seeing in which natural history, geography, and astronomy cooperate to describe living, dynamic wholes.

The setting is inseparable from empire. Much of the journey unfolds within Spanish colonial jurisdictions, where administrative routines, missionary activity, and commercial circuits intersect with Indigenous territories and African diasporic communities. The Personal Narrative registers these realities through careful observation, noting how

roads, ports, and plantations reshape environments, and how local expertise guides movement and interpretation. While the book is anchored in European science, it repeatedly acknowledges knowledge learned in the field from guides, artisans, and cultivators. The result is a document of contact zones in which information circulates unevenly, and in which the making of science depends on collaboration.

For contemporary readers, the book offers both a historical record and a method. Baseline observations of rivers, forests, coastlines, and towns supply touchstones for thinking about environmental change, while the integration of data with narrative demonstrates how science can be communicated without losing complexity. Its attention to gradients, interdependence, and scale speaks directly to current conversations about biodiversity, climate, and resource use. Equally resonant is the model of research that listens to local knowledge and credits field labor. The *Personal Narrative* thus invites present-day scholars, travelers, and citizens to read landscapes with care and to connect particulars to systems.

As a reading experience, this is a steady immersion rather than a single arc, accumulating significance through juxtaposition and return. Its enduring appeal lies in the way it exemplifies a bridge between Enlightenment empiricism and Romantic attentiveness, pairing measurements with carefully rendered scenes. That balance makes the book foundational for disciplines that study earth and life, and rewarding for anyone seeking to understand how knowledge travels. *Personal Narrative of Travels to the Equinoctial*

Regions of America remains significant not simply as a record of where two naturalists went, but as an argument—by example—for how to see, compare, and care.

Synopsis

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Alexander von Humboldt's *Personal Narrative of Travels to the Equinoctial Regions of America: 1799–1804* recounts, with Aimé Bonpland, a multi-year expedition designed to observe nature across geography, geology, botany, zoology, and human society. Framed as a continuous journey rather than a set of isolated reports, the work intertwines daily travel episodes with measurements and comparative analysis. It outlines the instruments used, the constraints of navigation and climate, and the authors' guiding question: how the diverse phenomena of the tropics relate as parts of a single natural system. Published in installments after their return, the narrative seeks to make raw observation intelligible without sacrificing precision.

The voyage begins with departure from Europe and a scientific stop at Tenerife, where the stratified flanks of Teide introduce the team's geological method and barometric altitude measurements. Crossing to the mainland, they reach the coasts of present-day Venezuela, establishing base observations on temperature, pressure, magnetism, and species assemblages. Early chapters describe shorelines, mangroves, and savannas, set against colonial settlements and missions. The authors move between cataloging plants and reconstructing terrain histories, using volcanic rocks, soils, and fossils to infer past environments. A constant attention to instruments and error estimates

underpins their travel, linking narrative impressions to reproducible data.

Penetrating inland by river and overland across the Llanos, they undertake a demanding canoe expedition along the Apure and Orinoco. The narrative balances logistical hazards—floods, insects, scarcity—with structured surveys of currents, sediment, and riverine forests. Encounters with Indigenous communities and missionaries appear alongside notes on languages, foodways, and technology, embedded within a cautious ethnographic perspective. A central geographical result is the documentation of the Casiquiare connection between the Orinoco and the Amazon basin, presented through bearings, water levels, and botanical transitions. The authors treat this finding not as a marvel but as evidence for continental-scale hydrographic continuity.

Turning westward, the travelers ascend from tropical lowlands to the Andes, using altitudes to organize observations of climate and life. The ascent toward high volcanoes furnishes data on boiling-point thermometry, respiration at elevation, and the stepped distribution of vegetation. Rock formations and crater morphologies are read against histories of earthquakes and eruptions, while measurements of magnetic inclination help map regional patterns. An attempted approach to very high summits becomes a test of method as much as endurance, supporting a picture of vertical zonation that links temperature, pressure, flora, and human settlement. Botanical collecting proceeds in tandem with sketch maps and profiles.

From the equatorial highlands the route reaches the Pacific, where coastal observations broaden into oceanography, including the characterization of a cold current along western South America. Subsequent chapters carry the journey to New Spain, with traverses from Acapulco to Mexico City and across mining districts and volcanic chains. Urban surveys combine altitude, climate, and public health notes with statistics on population and production. Visits to volcanoes and high plateaus supply further comparisons between Old and New World mountain systems. Interim stays in Cuba allow the authors to juxtapose island ecologies and economies with continental ones, sharpening their comparative approach.

Throughout, the Personal Narrative extends beyond itinerary to advance a synthetic view of nature. Plant geography emerges from tables of elevation and temperature, relating physiognomy to climate rather than taxonomy alone. Faunal distributions are placed within habitat mosaics shaped by relief and water. Discussions of colonial governance, forced labor, and mission life are aligned to environmental constraints without reducing social complexity to geography. Maps, star positions, and magnetic readings anchor a network of coordinates, while appendices stabilize names and measures. The book models an empirical style that holds together measurement, description, and cautious generalization, inviting future verification.

As the expedition draws to a close, the authors turn from separate scenes to connections that give the tropics coherence without oversimplification. Without resolving

every question it raises, the work leaves a durable framework: climates as gradients, mountains as comparative laboratories, rivers as continental systems, and cultures as historically situated within environments. Its influence extends across natural history, physical geography, and ecology, demonstrating how rigorous travel can function as a scientific instrument. The Personal Narrative remains significant for its integration of observation and method, offering insights whose relevance persists beyond the itinerary itself.

Historical Context

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Alexander von Humboldt, a Prussian naturalist, and Aimé Bonpland, a French botanist trained at the Muséum national d'Histoire naturelle in Paris, undertook a scientific expedition to Spanish America from 1799 to 1804. Backed by passports from King Carlos IV of Spain and access arranged through Madrid's ministries and the Real Jardín Botánico, they could travel unusually freely through the empire's colonies. Their route centered on equinoctial regions—Venezuela, New Granada, Quito, coastal Peru, Cuba, and New Spain—where they applied late Enlightenment methods: precise astronomical positioning, barometric altimetry, and systematic collecting. The Personal Narrative recounts this research journey within these institutional and geographic frameworks.

The expedition unfolded within the late Bourbon monarchy's drive to catalog and rationalize its American domains. After mid-eighteenth-century reforms, Spain sponsored surveys, botanical expeditions, and new intendancies that reorganized administration and resource extraction. Humboldt and Bonpland moved through these structures, consulting archives, mining records, and mission registers. The earlier Franco-Spanish geodesic mission to Quito (1735–1745) and the Royal Botanical Expedition of New Granada under José Celestino Mutis provided precedents and contacts. Jesuit expulsions in 1767 had shifted mission control to other orders, altering frontier

governance they observed along rivers and plains. Their narrative shows science operating within this imperial apparatus while documenting its practical limits.

In 1799–1801 they explored coastal Venezuela, the Llanos, and the Orinoco basin, then visited Cuba. These areas were tied to Atlantic markets in cacao, cattle, and, increasingly, sugar. The Haitian Revolution (1791–1804) reshaped Caribbean trade and security, spurring plantation expansion in Cuba and intensifying enslaved labor. Humboldt's recordings of demographics, prices, and customs-house data contextualized his denunciations of slavery and the slave trade. He described colonial urban life in Cumaná and Caracas, riverine missions, and port economies that responded to wartime blockades and shifting imperial regulation. The Personal Narrative's scenes emerge from this volatile, interconnected Caribbean world.

Scientific purpose anchored every stage. The travelers carried precision chronometers, sextants, barometers, and a cyanometer, enabling calibrated observations of latitude, altitude, temperature, and humidity. In 1800 they navigated and confirmed the Casiquiare canal linking the Orinoco and Rio Negro basins, a natural waterway long reported by Indigenous pilots and missionaries. They measured magnetic declination, mapped river courses, and studied flora and fauna using Linnaean and Jussieuan frameworks. Their observational discipline responded to Europe's push for standardized data while relying on local pilots, guides, and knowledge networks. The Personal Narrative presents these measurements alongside the logistics and hazards of their acquisition.

In 1801 Humboldt reached Bogotá, where Mutis opened his extensive herbarium and drawings from the Royal Botanical Expedition; the exchange strengthened botanical identifications and routes. Proceeding south to Quito in 1802, Humboldt and Bonpland explored Andean volcanoes such as Pichincha and Cotopaxi, and attempted Chimborazo, gathering barometric readings that informed altitudinal plant geography. In Quito they encountered the Creole savant Francisco José de Caldas, whose geodesy and climate studies intersected with their own. They also examined cinchona stands near Loja, central to quinine production. The Andes thus provided both a testbed for new physical measurements and a crucible for regional scientific collaboration.

From 1803 to 1804 they traversed New Spain, studying silver mining districts like Guanajuato and Pachuca and compiling statistics on production, trade, and population through the intendancy system. They surveyed the Valley of Mexico's lakes, pre-Hispanic causeways, and seismic and volcanic features, relating elevation to climate and agriculture. Observations of Popocatepetl and Jorullo complemented broader notes on metallurgical practice and mercury use in amalgamation. These inquiries would underpin Humboldt's Political Essay on the Kingdom of New Spain, while the Personal Narrative records the routes, landscapes, archives, and laboratories through which the data were assembled, showing colonial science embedded in everyday administration.

The voyage closed with a North American link. In 1804 Humboldt visited the United States, meeting President

Thomas Jefferson in Washington and exchanging geographic and statistical information relevant to the recently purchased Louisiana Territory. He consulted with members of the American Philosophical Society in Philadelphia, integrating his New World datasets into transatlantic scientific debates on mapping, magnetism, and natural history. Returning to Europe, he and Bonpland began publishing the *Voyage aux régions équinoxiales du Nouveau Continent*. Helen Maria Williams's English translation, *Personal Narrative*, appeared in installments in the 1810s and 1820s, carrying their findings to Anglophone readers and shaping subsequent Americanist scholarship.

Composed amid the late Enlightenment's empiricism and early Romanticism's sensitivity to landscape, the *Personal Narrative* blends numerical exactitude with aesthetic description and ethical judgment. It registers admiration for Indigenous knowledge, critiques forced labor and slavery, and assesses missionary and colonial institutions through comparative data rather than polemic alone. By tracing climate, elevation, and biogeographic patterning across riverine and Andean transects, it helped inaugurate ecological thinking while exposing the extractive logics of empires. The work's method and stance—cosmopolitan, data-rich, and reformist—mirror and interrogate its age, transforming a travel account into an enduring map of science, society, and power.

Personal Narrative of Travels to the Equinoctial Regions of America: 1799- 1804

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INTRODUCTION BY THE AUTHOR.

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Many years have elapsed since I quitted Europe, to explore the interior of the New Continent. Devoted from my earliest youth to the study of nature, feeling with enthusiasm the wild beauties of a country guarded by mountains and shaded by ancient forests, I experienced in my travels, enjoyments which have amply compensated for the privations inseparable from a laborious and often agitated life. These enjoyments, which I endeavoured to impart to my readers in my 'Remarks upon the Steppes,' and in the 'Essay on the Physiognomy of Plants,' were not the only fruits I reaped from an undertaking formed with the design of contributing to the progress of natural philosophy. I had long prepared myself for the observations which were the principal object of my journey to the torrid zone. I was provided with instruments of easy and convenient use, constructed by the ablest makers, and I enjoyed the special protection of a government which, far from presenting obstacles to my investigations, constantly honoured me with every mark of regard and confidence. I was aided by a courageous and enlightened friend, and it was singularly propitious to the success of our participated labour, that the zeal and equanimity of that friend never failed, amidst the fatigues and dangers to which we were sometimes exposed.

Under these favourable circumstances, traversing regions which for ages have remained almost unknown to most of the nations of Europe, I might add even to Spain, M.

Bonpland^[1] and myself collected a considerable number of materials, the publication of which may throw some light on the history of nations, and advance the study of nature.

I had in view a two-fold purpose in the travels of which I now publish the historical narrative. I wished to make known the countries I had visited; and to collect such facts as are fitted to elucidate a science of which we as yet possess scarcely the outline, and which has been vaguely denominated Natural History of the World, Theory of the Earth, or Physical Geography. The last of these two objects seemed to me the most important. I was passionately devoted to botany and certain parts of zoology, and I flattered myself that our investigations might add some new species to those already known, both in the animal and vegetable kingdoms; but preferring the connection of facts which have been long observed, to the knowledge of insulated facts, although new, the discovery of an unknown genus seemed to me far less interesting than an observation on the geographical relations of the vegetable world, on the migrations of the social plants, and the limit of the height which their different tribes attain on the flanks of the Cordilleras.

The natural sciences are connected by the same ties which link together all the phenomena of nature. The classification of the species, which must be considered as the fundamental part of botany, and the study of which is rendered attractive and easy by the introduction of natural methods, is to the geography of plants what descriptive mineralogy is to the indication of the rocks constituting the exterior crust of the globe. To comprehend the laws

observed in the position of these rocks, to determine the age of their successive formations, and their identity in the most distant regions, the geologist should be previously acquainted with the simple fossils which compose the mass of mountains, and of which the names and character are the object of oryctognostical knowledge. It is the same with that part of the natural history of the globe which treats of the relations plants have to each other, to the soil whence they spring, or to the air which they inhale and modify. The progress of the geography of plants depends in a great measure on that of descriptive botany; and it would be injurious to the advancement of science, to attempt rising to general ideas, whilst neglecting the knowledge of particular facts.

I have been guided by these considerations in the course of my inquiries; they were always present to my mind during the period of my preparatory studies. When I began to read the numerous narratives of travels, which compose so interesting a part of modern literature, I regretted that travellers, the most enlightened in the insulated branches of natural history, were seldom possessed of sufficient variety of knowledge to avail themselves of every advantage arising from their position. It appeared to me, that the importance of the results hitherto obtained did not keep pace with the immense progress which, at the end of the eighteenth century, had been made in several departments of science, particularly geology, the history of the modifications of the atmosphere, and the physiology of animals and plants. I saw with regret, (and all scientific men have shared this feeling) that whilst the number of accurate

instruments was daily increasing, we were still ignorant of the height of many mountains and elevated plains; of the periodical oscillations of the aerial ocean; of the limit of perpetual snow within the polar circle and on the borders of the torrid zone; of the variable intensity of the magnetic forces, and of many other phenomena equally important.

Maritime expeditions and circumnavigatory voyages have conferred just celebrity on the names of the naturalists and astronomers who have been appointed by various governments to share the dangers of those undertakings; but though these eminent men have given us precise notions of the external configuration of countries, of the natural history of the ocean, and of the productions of islands and coasts, it must be admitted that maritime expeditions are less fitted to advance the progress of geology and other parts of physical science, than travels into the interior of a continent. The advancement of the natural sciences has been subordinate to that of geography and nautical astronomy. During a voyage of several years, the land but seldom presents itself to the observation of the mariner, and when, after lengthened expectation, it is descried, he often finds it stripped of its most beautiful productions. Sometimes, beyond a barren coast, he perceives a ridge of mountains covered with verdure, but its distance forbids examination, and the view serves only to excite regret.

Journeys by land are attended with considerable difficulties in the conveyance of instruments and collections, but these difficulties are compensated by advantages which it is unnecessary to enumerate. It is not by sailing along a

coast that we can discover the direction of chains of mountains, and their geological constitution, the climate of each zone, and its influence on the forms and habits of organized beings. In proportion to the extent of continents, the greater on the surface of the soil are the riches of animal and vegetable productions; the more distant the central chain of mountains from the sea-shore, the greater is the variety in the bosom of the earth, of those stony strata, the regular succession of which unfolds the history of our planet. As every being considered apart is impressed with a particular type, so, in like manner, we find the same distinctive impression in the arrangement of brute matter organized in rocks, and also in the distribution and mutual relations of plants and animals. The great problem of the physical description of the globe, is the determination of the form of these types, the laws of their relations with each other, and the eternal ties which link the phenomena of life, and those of inanimate nature.

Having stated the general object I had in view in my expeditions, I will now hasten to give a slight sketch of the whole of the collections and observations which we have accumulated, and the union of which is the aim and end of every scientific journey. The maritime war, during our abode in America, having rendered communication with Europe very uncertain, we found ourselves compelled, in order to diminish the chance of losses, to form three different collections. Of these, the first was embarked for Spain and France, the second for the United States and England, and the third, which was the most considerable, remained almost constantly under our own eyes. Towards the close of

our expedition, this last collection formed forty-two boxes, containing an herbal of six thousand equinoctial plants, seeds, shells, insects, and (what had hitherto never been brought to Europe) geological specimens, from the Chimborazo[2], New Grenada, and the banks of the river Amazon.

After our journey to the Orinoco, we left a part of these collections at the island of Cuba, intending to take them on our return from Peru to Mexico. The rest followed us during the space of five years, on the chain of the Andes, across New Spain, from the shores of the Pacific to the coasts of the Caribbean Sea. The conveyance of these objects, and the minute care they required, occasioned embarrassments scarcely conceivable even by those who have traversed the most uncultivated parts of Europe. Our progress was often retarded by the necessity of dragging after us, during expeditions of five or six months, twelve, fifteen, and sometimes more than twenty loaded mules, exchanging these animals every eight or ten days, and superintending the Indians who were employed in driving the numerous caravan. Often, in order to add to our collections of new mineral substances, we found ourselves obliged to throw away others, which we had collected a considerable time before. These sacrifices were not less vexatious than the losses we accidentally sustained. Sad experience taught us but too late, that from the sultry humidity of the climate, and the frequent falls of the beasts of burden, we could preserve neither the skins of animals hastily prepared, nor the fishes and reptiles placed in phials filled with alcohol. I enter into these details, because, though little interesting in

themselves, they serve to show that we had no means of bringing back, in their natural state, many objects of zoology and comparative anatomy, of which we have published descriptions and drawings. Notwithstanding some obstacles, and the expense occasioned by the carriage of these articles, I had reason to applaud the resolution I had taken before my departure, of sending to Europe the duplicates only of the productions we collected. I cannot too often repeat, that when the seas are infested with privateers, a traveller can be sure only of the objects in his own possession. A very few of the duplicates, which we shipped for Europe during our abode in America, were saved; the greater part fell into the hands of persons who feel no interest for science. When a ship is condemned in a foreign port, boxes containing only dried plants or stones, instead of being sent to the scientific men to whom they are addressed, are put aside and forgotten. Some of our geological collections taken in the Pacific were, however, more fortunate. We were indebted for their preservation to the generous activity of Sir Joseph Banks, President of the Royal Society of London[\[4\]](#), who, amidst the political agitations of Europe, unceasingly laboured to strengthen the bonds of union between scientific men of all nations.

In our investigations we have considered each phenomenon under different aspects, and classed our remarks according to the relations they bear to each other. To afford an idea of the method we have followed, I will here add a succinct enumeration of the materials with which we were furnished for describing the volcanoes of Antisana and Pichincha, as well as that of Jorullo[\[3\]](#): the latter, during the

303 A 16th-century Spanish conquistador and explorer active in the Caribbean and southeastern North America, noted here for having arrived circa 1539 and for actions associated with harsh treatment of indigenous peoples.

304 An agreement (commonly called the Asiento) under which the Spanish crown granted a foreign power or company the monopoly right to supply enslaved Africans to Spanish American colonies; it shaped 18th-century transatlantic slave trade activity.

305 In Spanish colonial usage the Consulado was a commercial body or merchant guild (and sometimes a tribunal) that regulated trade and represented merchant interests in ports such as Havana.

306 A *cédula* (royal decree) dated 23 March 1812 mentioned in the text; in this instance it refers to a Spanish royal order that reorganized Cuban territorial administration into intendencias or provincias.

307 An archaic Spanish spelling of 'ingenio', used here to denote a sugar-mill estate or plantation complex where sugar was processed and refined.

308 A colonial Spanish term for an African-born enslaved person recently arrived in the Americas (not acclimated or Creole); the phrase appears in period commercial and legal contexts.

309 A traditional Iberian unit of weight used in Spanish America (here defined as 25 Spanish pounds or about 11.49 kilograms) commonly used in the chapter for measuring sugar, coffee, and other commodities.

310 A well-known headland on the southern tip of Africa (near present-day Cape Town), historically a major maritime

landmark for sailing between Europe and Asia.

311 The southernmost headland of the Tierra del Fuego archipelago, long recognized as the challenging southern passage for vessels rounding South America.

312 The principal mountain chain running along the western margin of South America, extending from Tierra del Fuego in the south to the Isthmus of Panama in the north.

313 An isolated, snow-capped mountain massif near the Caribbean coast of northern Colombia, distinct from the Andean cordilleras and noted for its abrupt rise from low coastal plains.

314 A major river of Colombia that flows northward to the Caribbean, historically an important route for inland transport and exploration.

315 A lake referenced as a local geographic feature east of the Andes ridge in Venezuela; in Humboldt's work it marks part of the drainage divide — the exact modern name and location may vary in later maps.

316 A coastal mountain system on the Paria Peninsula in eastern Venezuela, forming part of the littoral ranges facing the Caribbean Sea.

317 A steep mountain ridge overlooking Caracas, Venezuela; Humboldt reports barometric measurements for this summit, which was an important local high point in his surveys.

318 The highest peak of the White Mountains in New Hampshire, USA, cited here as a comparative summit for height measurements in Humboldt's era.

319 Humboldt's (older) spelling of Mauna Roa, a large shield volcano on Hawai'i (the Sandwich Islands in older

sources); known for its extensive lava flows and prominence in Pacific volcanism.

320 Refers to Mount Teide on Tenerife in the Canary Islands, a volcanic peak long known to European navigators and naturalists.

321 A volcano and province in northern Ecuador (near Ibarra); mentioned among Andean summits in Humboldt's descriptions of the Quito region.

322 A major active volcano east-south-east of Mexico City (called here the Great Volcano of Mexico), historically prominent and often measured by early explorers and surveyors.

323 A large tributary of the Amazon River system (flowing through Colombia and Brazil), forming part of the central Amazon basin described by Humboldt.

324 A coastal mountain range in southeastern Brazil that runs parallel to the Atlantic coast and forms a major physical barrier between the interior and the littoral.

325 Refers to the Allegheny (Alleghenies) Mountains, a subrange of the Appalachian Mountains in eastern North America stretching through parts of the United States.

326 A historical name used in older sources for mountainous parts of the Guiana Shield in northern South America (roughly in the Orinoco/Guiana region); exact modern boundaries vary by account.

327 Abbreviation for the German naturalists Johann Baptist von Spix and Carl Friedrich Philipp von Martius, who conducted scientific exploration in Brazil and published botanical and zoological accounts in the early 19th century.

328 Names of naturalists/geologists cited by Humboldt; 'Saussure' denotes Horace-Bénédict de Saussure (a Swiss geologist and Alpine surveyor), while the identity of 'Palasson' as written in this text is less clear in modern bibliographies.

329 Derived from 'loxodrome' (rhumb line), here used to describe a consistent, nearly constant compass direction of geological strata observed over large areas.

330 A reference to the directional or bearing system associated with the mining academy at Freiberg (Saxony), used by miners and geologists for naming standard compass directions (as in 'hor. 3' and 'hor. 4').

331 Teufelsmauer ('Devil's Wall') is a well-known sandstone rock formation and ridgeline in the Harz region of Germany; Humboldt invokes it as an analogical example of a striking rocky escarpment.

332 A historical European geological term for late Permian (roughly 260–252 million years ago) evaporite and carbonate deposits in Central Europe; used in 19th-century geology to denote specific salt-bearing and carbonate layers.

333 A lithostratigraphic unit of the Middle Triassic in Central Europe (approximately 247–237 million years ago), composed mainly of marine limestones and dolomites; commonly used in older geological classifications.

334 Latin form of Peter Martyr d'Anghiera (c.1457–1526), an Italian-born Spanish chronicler who wrote early accounts of the Americas (*De Orbe Novo*), cited here for a historical report of large diamonds on the coast of Paria.