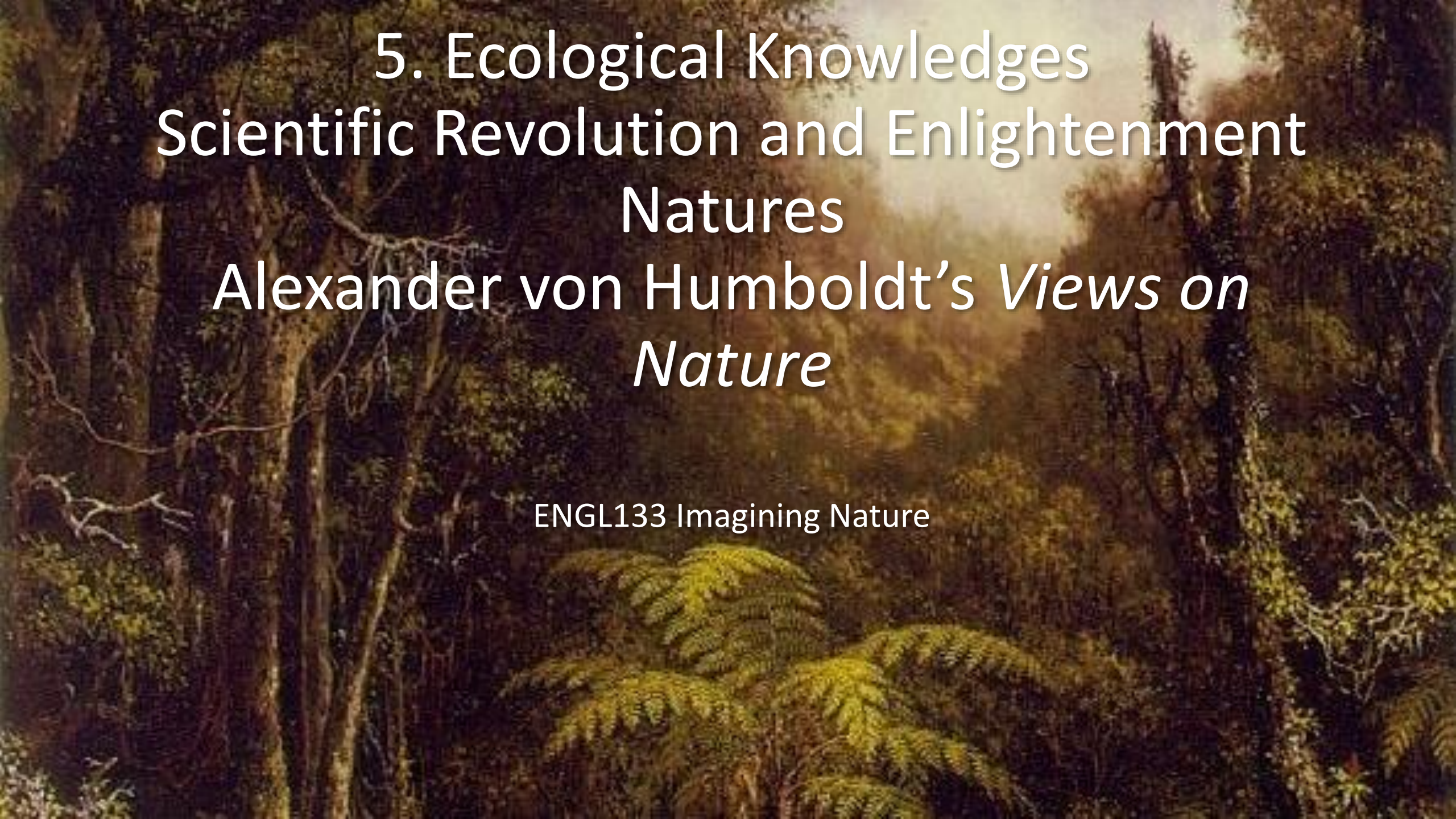


5. Ecological Knowledges Scientific Revolution and Enlightenment Natures Alexander von Humboldt's *Views on Nature*

ENGL133 Imagining Nature

Course Stuff

-Midterm Friday 3/7

-rubric under ‘Modules’ and ‘Assignments’

-list of concepts and titles by 2/25 under ‘Modules’ and ‘Assignments’

-Writing Assignment #1

-due Friday 3/14, uploaded to Canvas as a ‘doc’ file by 5 pm

-guidelines under ‘Assignments’

This week: What forms does knowledge about nature take? Why are they important?

Today: Why is Alexander von Humboldt important for modern natural sciences? What model of nature did he originate?

Alexander von Humboldt (1769-1859), *Views of Nature [Ansichten der Natur]* (1808)

-Humboldt was a geographer, naturalist, and explorer

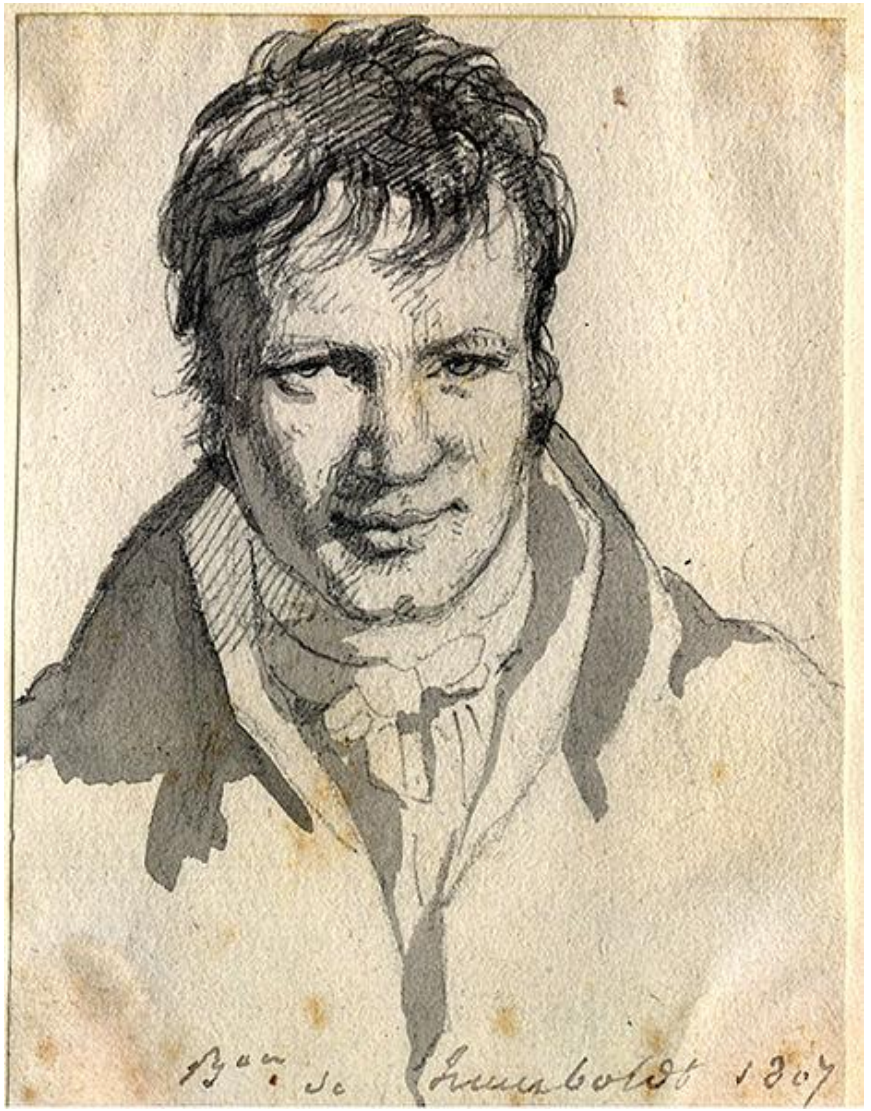
-called the “father of modern environmentalism”

-Humboldt’s 1799–1804 research expedition to Central and South America with botanist Aimé Bonpland is documented in *Views of Nature*

-the voyage into the tropics, an area that he describes as “the early age of humanity and its simple grandeur” (118)

-this book set the agenda for 19th c. scientific studies of nature that followed, such as Darwin, and in the literary world of the British Romantics and the American Transcendentalists

-Humboldt’s ideas emerge from the context of European science: Scientific Revolution (17th c.) and the Enlightenment (18th c.)



Frédéric Christophe de Houdetot. *Alexander von Humboldt*, in Berlin (1807).

16th and 17th c. Scientific Revolution Attitudes toward Nature

-nature is a predictable and orderly system that can be understood through empiricism

-empiricism=a scientific method that emphasizes careful observation and experimentation; became the primary tool for understanding nature

-rejection of the models of Plato and Aristotle and their medieval interpreters

-rejection of Aristotelian teleology, the idea that nature is purposeful and that natural things come to be and are present for the sake of a particular end (for example, wings are present in birds for the sake of flying)

-effect: the animacy of nature leaches out of the world; nature is imagined as inert and as an object

-only humans are subjects in their own right

-the animate models of the Book of Nature and the Ladder of Life are replaced by Cartesian rationalism

rationalism=a belief that the human intellect can deduce truths about the exterior world through abstract reason alone

-nature is a machine like a mechanical clock

-hence, Descartes (1596–1650) and other 17th c. natural philosophers are described as "mechanists" with respect to nature

-Descartes espoused "mind-body dualism," where the mind is seen as a distinct entity separate from the physical body and from the rest of nature

-For Descartes, humans are the "masters and possessors of Nature"

Frontispiece to *The History of the Royal-Society of London*, 1667

After the Scientific Revolution: The Enlightenment (late 17th and 18th c)

"Enlightenment is man's emergence from his self-imposed immaturity. Immaturity is the inability to use one's understanding without guidance from another. This immaturity is self-imposed when its cause lies not in lack of understanding, but in lack of resolve and courage to use it without guidance from another. *Sapere Aude*! [Dare to know!]"

-Immanuel Kant, from "What is Enlightenment?" (1784)

IMMANUEL KANT (1784)

Enlightenment Nature (late 17th c and 18th c in western Europe)

- the study of observable nature was divorced from the study of human beings (cf. Deloria, “Kinship with Nature”)
- wild nature is a force that needs to be to be controlled and harnessed for human use= instrumentalism

-but, at the same time, nature represented an ideal state of affairs that people should strive towards

-the laws of nature were discoverable and could be appealed to for models of human behavior: “natural law”

-for example, the philosopher John Locke argued that all people are naturally free and equal under the law of nature

-Locke believed that these "natural laws" were universal and applicable to all people, regardless of their culture or society

-Paradox 1: nature is divorced from the human but still serves as a universal model for behavior

Paradox 2: slavery and the oppression of Amerindians

Enlightenment Nature: Linnaean Taxonomy

-Taxonomy = a hierarchical classification system

-Linnaeus's *System of Nature* [*Systema Naturae]* (1735)

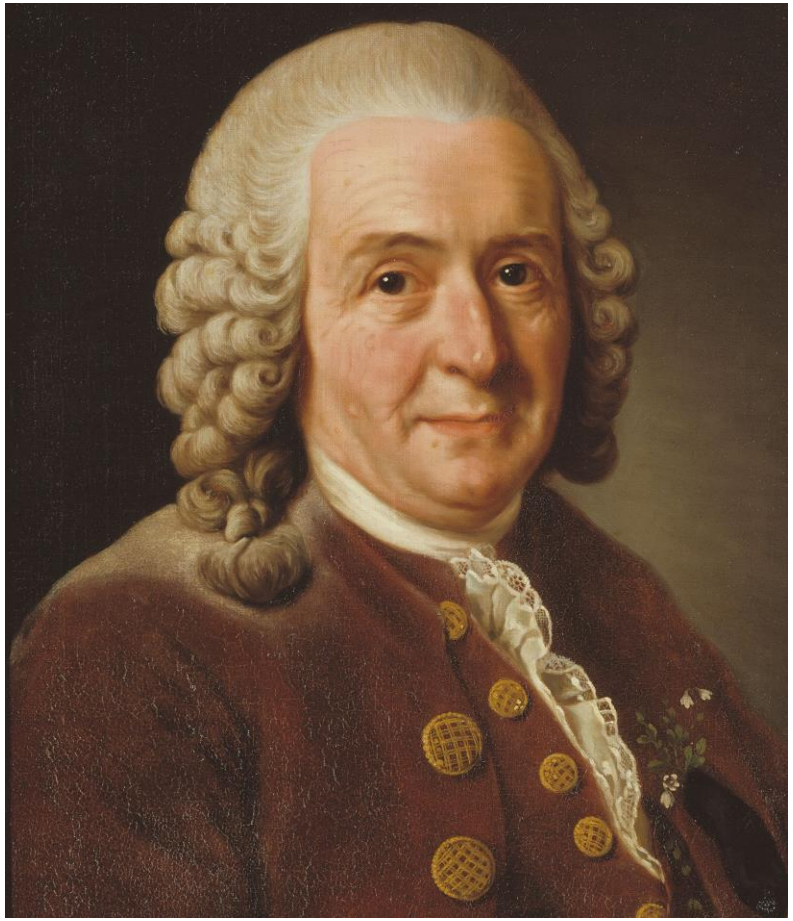
-Linnaeus classified living things according to observable characteristics

-Binomial Nomenclature = naming of plants and animals according to the Latinate names of their genus and species

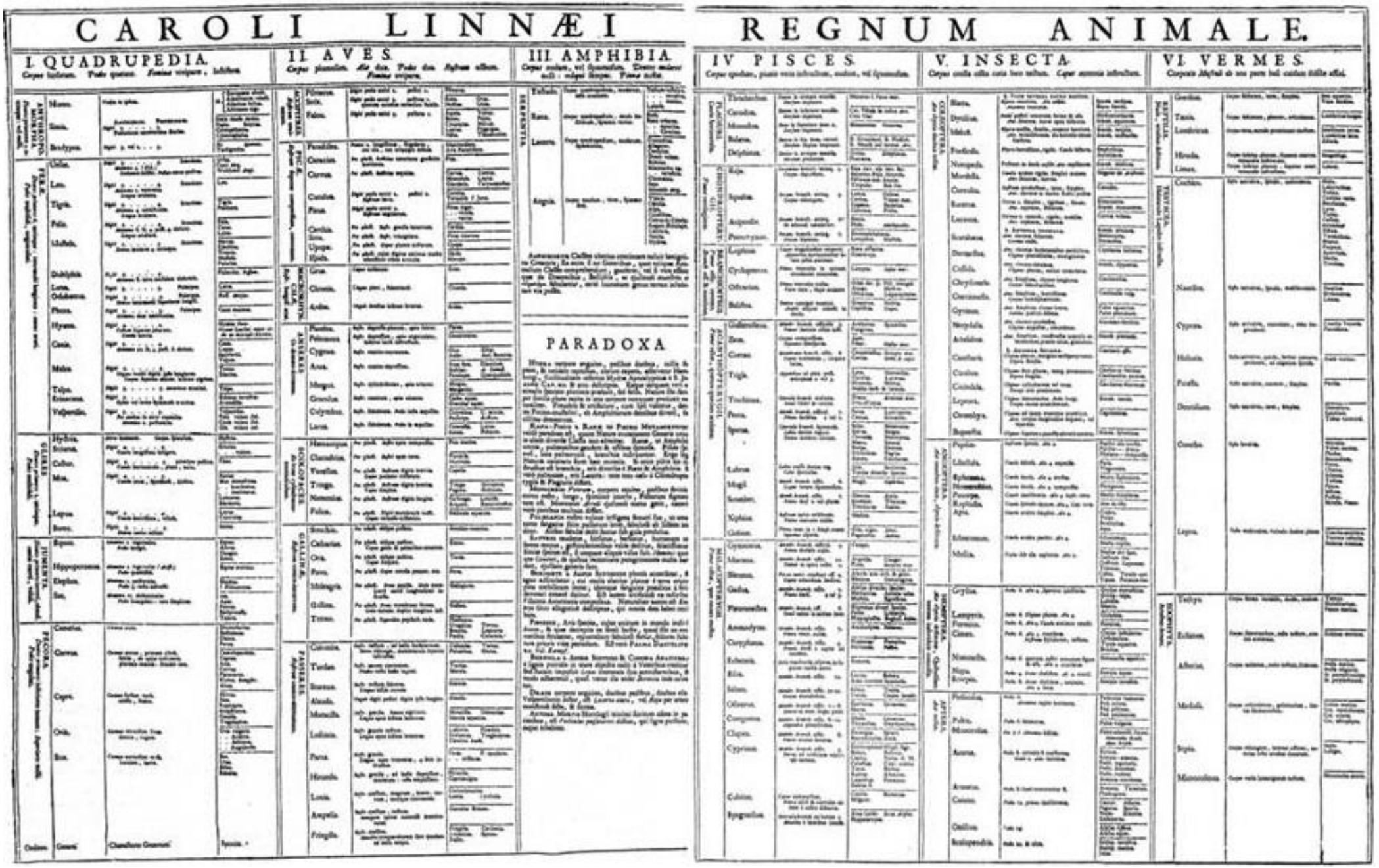
Linneaus was not the first to invent this system, but was the first to implement it consistently

-Included classifications for humans into distinct races. These races were based on skin tone and outlined the innate characteristics of members of each group.

-Believed that "all things [in nature] are made for the sake of man"=instrumentalism



The Swedish botanist Carl Linnaeus (1707-78)


CAROLI LINNÆI REGNUM ANIMALE.

I QUADRUPEDIA.

II AVES.

III AMPHIBIA.

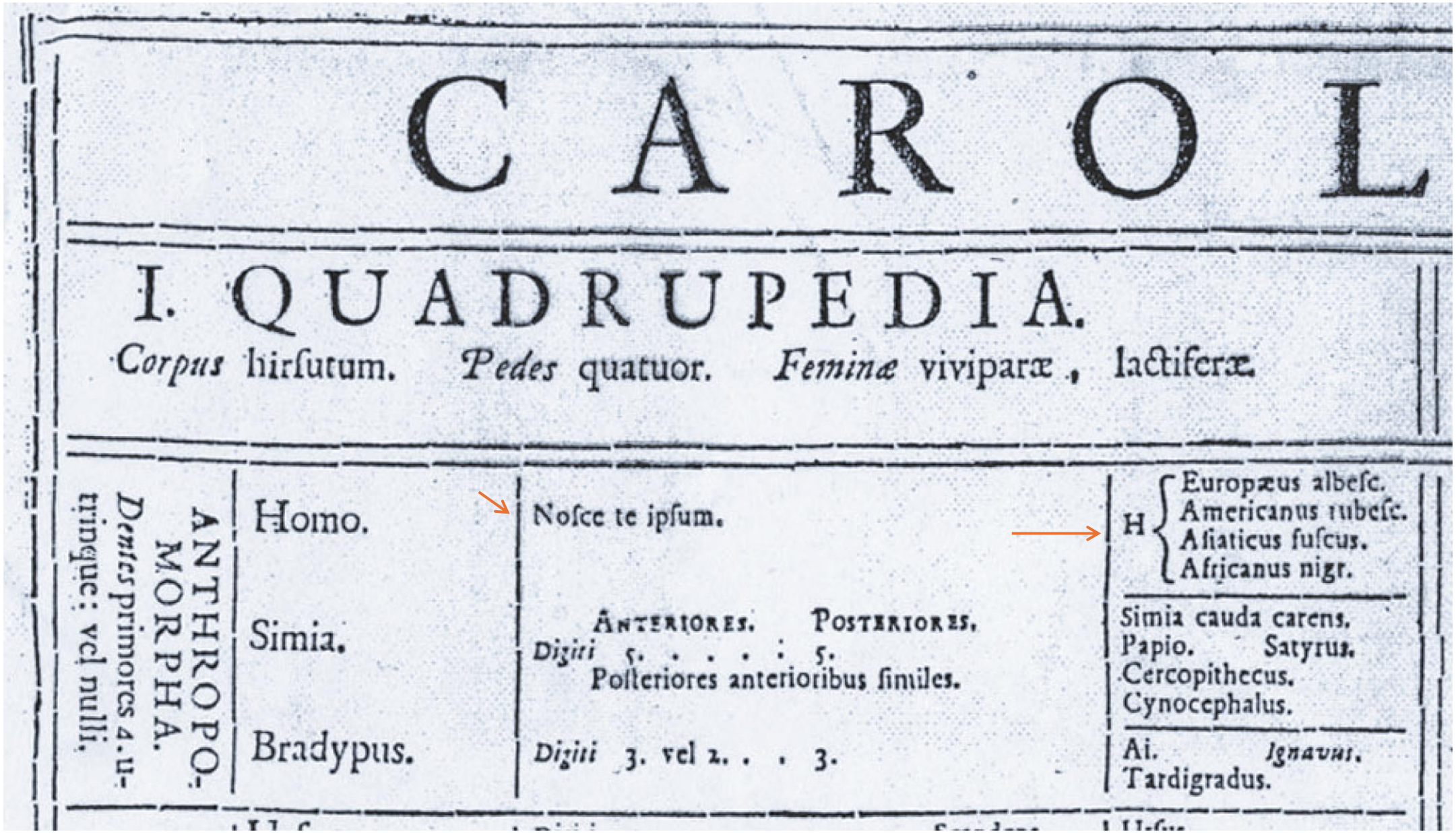
IV PISCES.

V. INSECTA.

VI. VERMES.

PARADOXA

The kingdom of animals ('Regnum Animale') in Linnaeus' first edition of *Systema naturae*, 1735



CAROL

I. QUADRUPEDIA.

Corpus hirſutum. *Pedes* quatuor. *Feminæ* viviparæ, lactiferæ.

ANTHROPOMORPHA. *Dentes primores 4. utrinque: vel nulli.*	Homo.	Noſce te ipſum.	H { Europæus albeſc. Americanus rubeſc. Aſiaticus fuſcus. Africanus nigr.
	Simia.	ANTERIORES. POSTERIORES. *Digiti* 5. . . . . 5. Poſteriores anterioribus ſimiles.	Simia cauda carens. Papio. Satyrus. Cercopithecus. Cynocephalus.
	Bradypus.	*Digiti* 3. vel 2. . . 3.	Ai. *Ignavus.* Tardigradus.

-Humans (“homo) differ from other mammals because of their ability to “know thyself”
-Humans divided into 4 groups based on skin colors

Linnaeus Classifies Us

Carolus Linnaeus
(1707-1778)

Amerind: Obstinate, contented, free. *Ruled by custom*

European: Active, clever, inventive. *Ruled by laws*

East Asian: Severe, haughty, desirous. *Ruled by opinion*

Sub-Saharan African: Crafty, slow, foolish. *Ruled by caprice*

— *System of Nature* (1758)

“[**Nanabozho] walked the land, handing out names to all he met, an Anishinaabe Linnaeus. I like to think of the two of them walking together. Linnaeus the Swedish botanist and zoologist, in his loden jacket and woolen trousers, with felt hat cocked back on his forehead and a vasculum under his arm, and Nanabozho naked but for his breechcloth and a single feather, with a buckskin bag under his arm. They stroll along discussing the names for things.** They’re both so enthusiastic, pointing out the beautiful leaf shapes, the incomparable flowers. Linnaeus explains his *Systema Naturae,* a scheme designed to show the ways in which all things are related. Nanabozho nods enthusiastically, “Yes, that is also our way: **we say, ‘We are all related.’” He explains that there was a time when all beings spoke the same language and could understand one another, so all of Creation knew each other’s names. Linnaeus looks wistful about that. “I ended up having to translate everything into Latin,” he says of binomial nomenclature. “We lost any other common language long ago.” Linnaeus lends Nanabozho his magnifying glass so he can see the tiny floral parts. Nanabozho gives Linnaeus a song so he can see their spirits. And neither of them are lonely.**”

-Kimmerer, “In The Footsteps of Nanabozho: Becoming Indigenous to Place”

Humboldt, *Views of nature, or, Contemplations on the sublime phenomena of creation: With scientific illustrations* (1850)

Alexander von Humboldt's "Physical Geography"

-physical geography: "an idea of the whole, in terms of area"

-the world as integrated, unified, interconnected whole

-against the idea of dividing off parts of nature, esp humans from the rest of nature (against mechanist philosophers and Linnaeus in this respect)

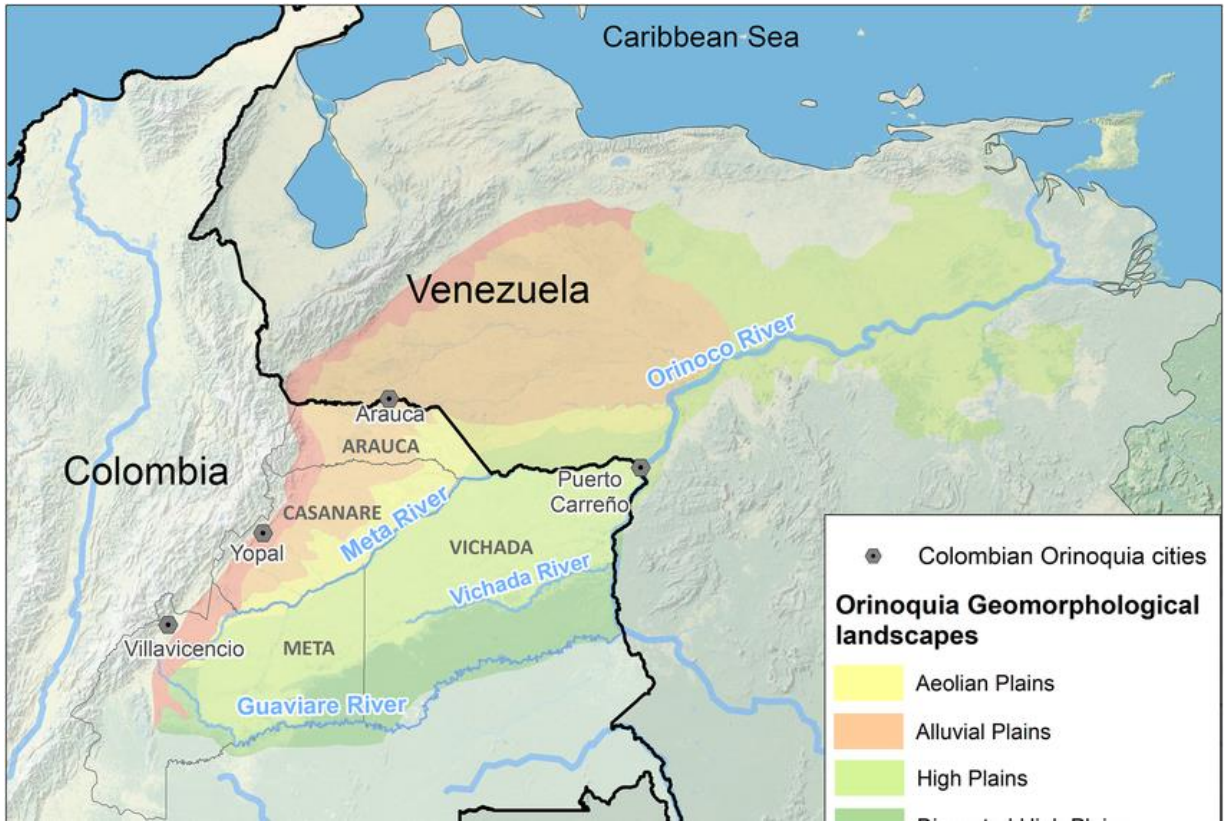
-often referred to as the "Father of ecology" or the "Father of environmentalism"


120°W
90°W
60°W
30°W
0°
30°N
0°
Equator
Atlantic Ocean
Pacific Ocean
United States
New-Spain
Gulf of Mexico
New-Granada
Peru
Canary Islands
Philadelphia May-July 1804
Washington
Bordeaux Aug. 1st 1804
La Coruña June 5th 1799
Santa Cruz June 1799
July 1804
May 1804
Havana
Trinidad Mar. 1801
Mexico-City
Mar. 1804
Veracruz
Acapulco Mar. 22nd 1803
Caracas
Cumaná July 16th 1799
June-July 1799
Dec. 1800
Cartagena
Feb.-Mar. 1803
Angostura June-July 1800
Bogotá July-Sep. 1801
S. Carlos May 1800
Quito Jan.-June 1802
Chimborazo
Guayaquil Jan. 1803
Lima Oct.-Dec. 1802
I
II
III
IV
V
VI
Alexander von Humboldt's American expedition 1799-1804
Expedition way
City / Stopping place
Spanish Viceroys and United States
I With the spanish corvette "Pizarro" from La Coruña over the Canary Islands to Cumaná
II 75-days journey with Bonpland, on the Orinoco and the Rio Negro
III With the ship from Nueva Barcelona to Havanna, 3-month sojourn on Cuba, over Trinidad to Cartagena
IV Through today's Colombia, Ecuador and Peru to Lima
V From Guayaquil to Acapulco, longer sojourn in Mexico-City and back to Havanna over Veracruz
VI With the cargo ship "Concepción" to Philadelphia, Washington, with the french Frigate "La Favorite" to Bordeaux
Azimuthal equidistant projection

Eduard Ender, *Alexander von Humboldt and Aimé Bonpland in the Amazon jungle* (ca. 1850)

Orinoco River and the Atures and Maypures rapids

“Concerning the Waterfalls of the Orinoco near Atures and Maypures” from Humboldt’s *Views of Nature*



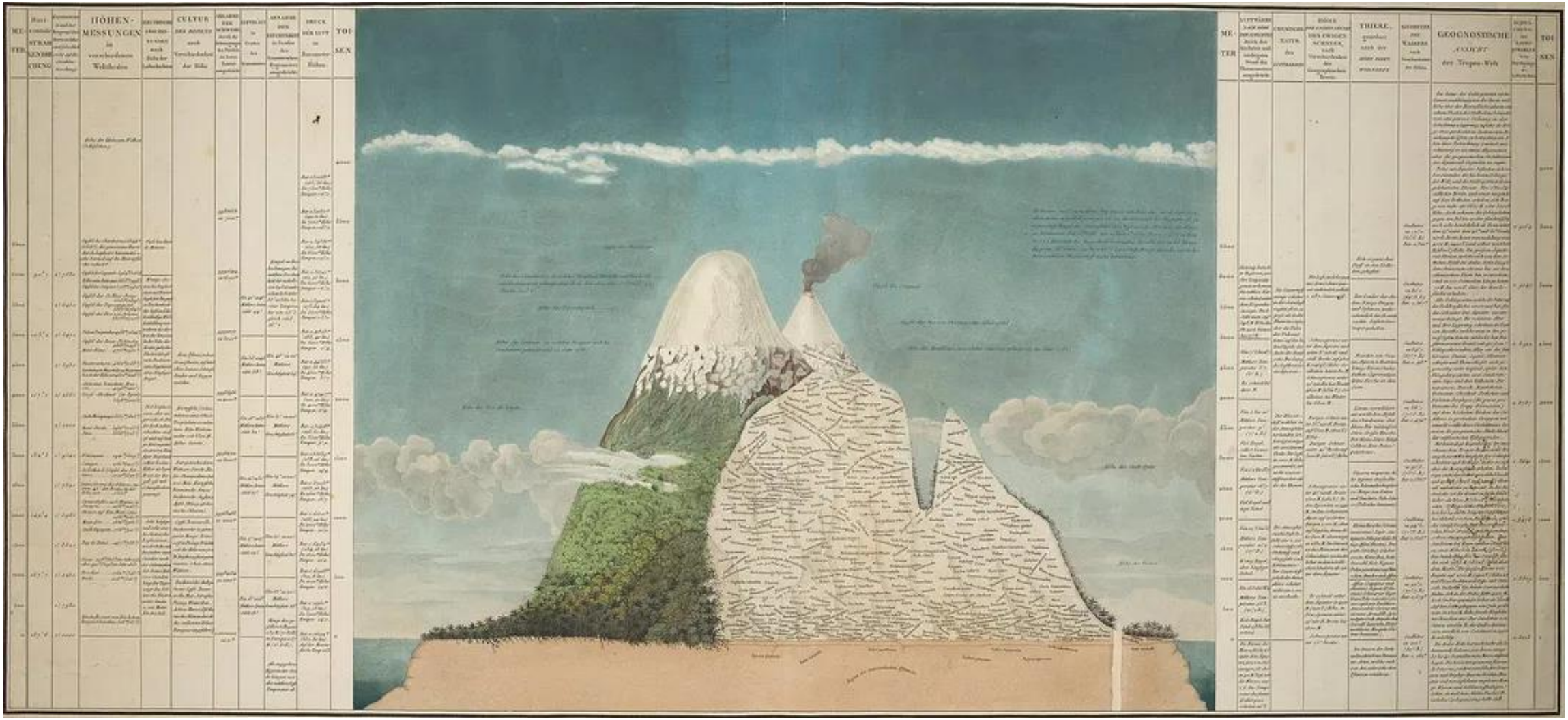
Views of Nature, or, Contemplations on the sublime phenomena of creation

What is the Sublime?

"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."

-"Concerning the Waterfalls of the Orinoco near Atures and Maypures" from Humboldt's *Views of Nature*117-118

Humboldt's *Naturgemälde* ["painting of nature, unification”]
Mt. Chimborazo in Ecuador (19,000+ feet)



Humboldt’s way of visualizing his theory that all of nature is connected. From *Essai sur la géographie des plantes* (1805).

-a cross-section of Chimborazo showing which different plants grew at different altitudes and temperatures
-on the sides were comparisons to other mountains around the world and their plants and climate zones at similar heights.
-first comparative visualization of climates and geography for biological and meteorological climate zones
-demonstrates that plants, animals, and climate are related in global ecosystems organized by altitude and rock type
-cf. Linnaeus's divided taxonomy that is interested in how things differ rather than what they have in common

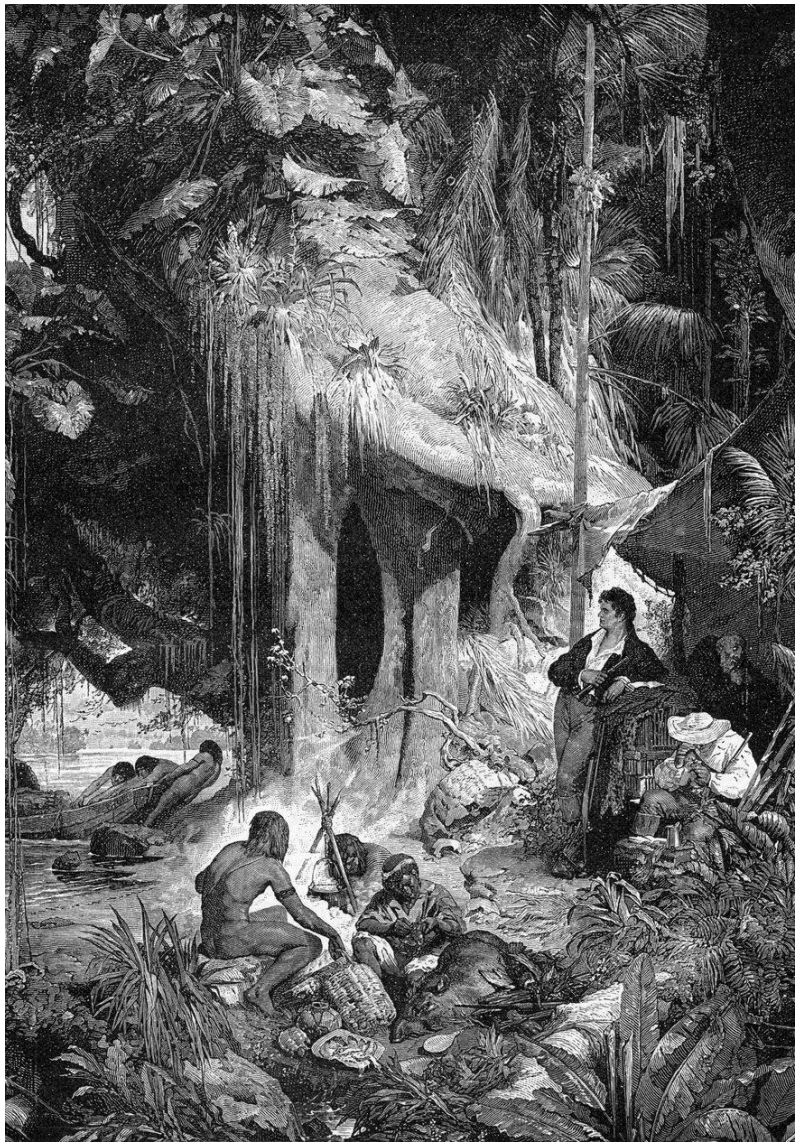
Humboldt's Views of Nature

- the unity of nature
- Humboldt's ideas laid the foundation for modern concepts of ecosystems, climate science, and geography
- Comparative (he often compares what he sees in South America to Europe and other parts of the world)
- holistic web of connections where all organisms are related
- Against the dominant paradigm (such as that of Carl Linnaeus) that focused on organisms at the level of the individual, with humans set apart
- Humboldt resisted the notion of human exceptionalism
- he was one of the first Europeans to highlight the effects of human-induced land-use and climate change on the natural world
- He lamented that European colonial draining of wetland and forest clearance for agriculture— particularly the production of cash crops for the European and American textile markets —scarred the landscape and destroyed natural vegetation;

Humboldt on Slavery

“Nowhere else in the world seems more appropriate to dissipate melancholy and restore peace to troubled minds than Tenerife and Madeira. These effects are due not only to the magnificent situation and to the purity of air, but above all to the absence of slavery, which so deeply revolts us in all those places where Europeans have brought what they call their 'enlightenment’ and their 'commerce' to their colonies.”

-Alexander von Humboldt, *Personal Narrative of Travels to the Equinoctial Regions of America, During the Year 1799-1804*



Alexander von Humboldt and Aimé Bonpland on the Orinoco River, 1800-1804 (Engraving, ca.1900)

Contradictions: Humboldt and his Indigenous guides

"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. … We counted approximately 600 well-preserved skeletons, each in a basket woven from the stalks of palm fronds. … 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. … [I]t was in a somber mood that we left behind us this tomb of an extinct tribe. …

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, whenever, 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." (*Views of Nature*, 129-130)

European Enlightenment science and the invisibility of indigenous people

-Humboldt's *Views of Nature* as a document of Euroimperialism

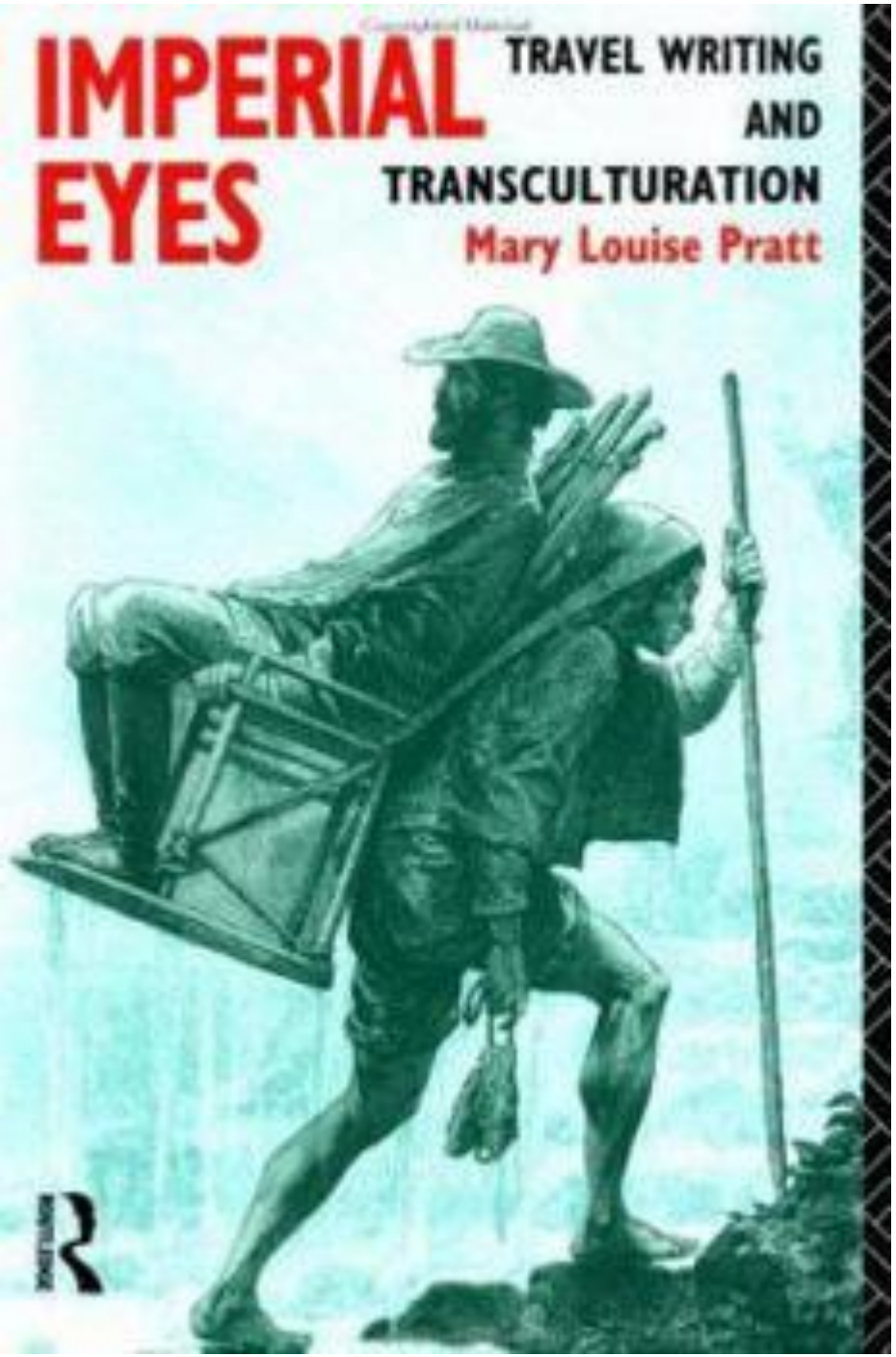
-the "seeing-man is the protagonist of the anti conquest"

-the scientific hero is usually a European male subject whose "imperial eyes … passively look out and possess" (7)

-the landscape must be evacuated of humans

-Humboldt does this by focusing largely on flora and fauna

-also the wistful thoughts on the "extinct tribe" of the cemetery at Ataruipe



The ending of *Views of Nature*

Humboldt asks his young guide: “Do you and your parents not feel … an occasional desire, in light of your want, to dig for the treasures that lie so near? The boy’s answer was so simple, so much the expression of the quiet resignation that characterizes the aboriginal people of this land, that I put it down in my journal in Spanish: “Such a desire .. Does not come to us; my father says that it would be a sin … If we had all of the golden branches with all of their golden fruite, then our white neighbors would hate us and harm us. We possess a little field and good wheat.” (*Views of Nature* 280-281.

What is the effect of this as an ending?

-Humboldt ends not with a paeon to science and natural collecting but a personal anecdote

-he reminds us of the extinction of a formerly powerful people and the extractive goals of European colonialism

-seems to be some awareness of how his scientific exploration contributes to both of these

Indigeneous Survivance

-how the ending of *Views of Nature* acknowledges 'survivance' of indigenous peoples of Central and South America

-Survivance= survival + resistance

- "Survivance is an active sense of presence over absence, deracination, and oblivion; survivance is the continuance of stories, not a mere reaction, however pertinent. Survivance is greater than the right of a survivable name."

-from Gerald Robert Vizenor, ed., *Survivance: Narratives of Native Presence* (Lincoln: University of Nebraska Press, 2008)

Why should we care about Alexander von Humboldt and the contradictory legacy of European Enlightenment science that he largely shaped?

-He was characterized by liberalism (anti-slavery and highlighted the plight of indigenous peoples), love of adventure, obsession with quantification of nature, and awe at its beauty even as he sometimes treated indigenous knowledge and artifacts with a lack of respect

-first to see nature as a global force since climate zones were similar in different parts of the world

-his observations become the model for subsequent natural history, biology, and botany

-his fusion of literature and science was an argument for how science had to spark the imagination not just quantify or describe nature

-he influenced not just scientists like Darwin but poets and artists (British Romanticism and American Transcendentalism)