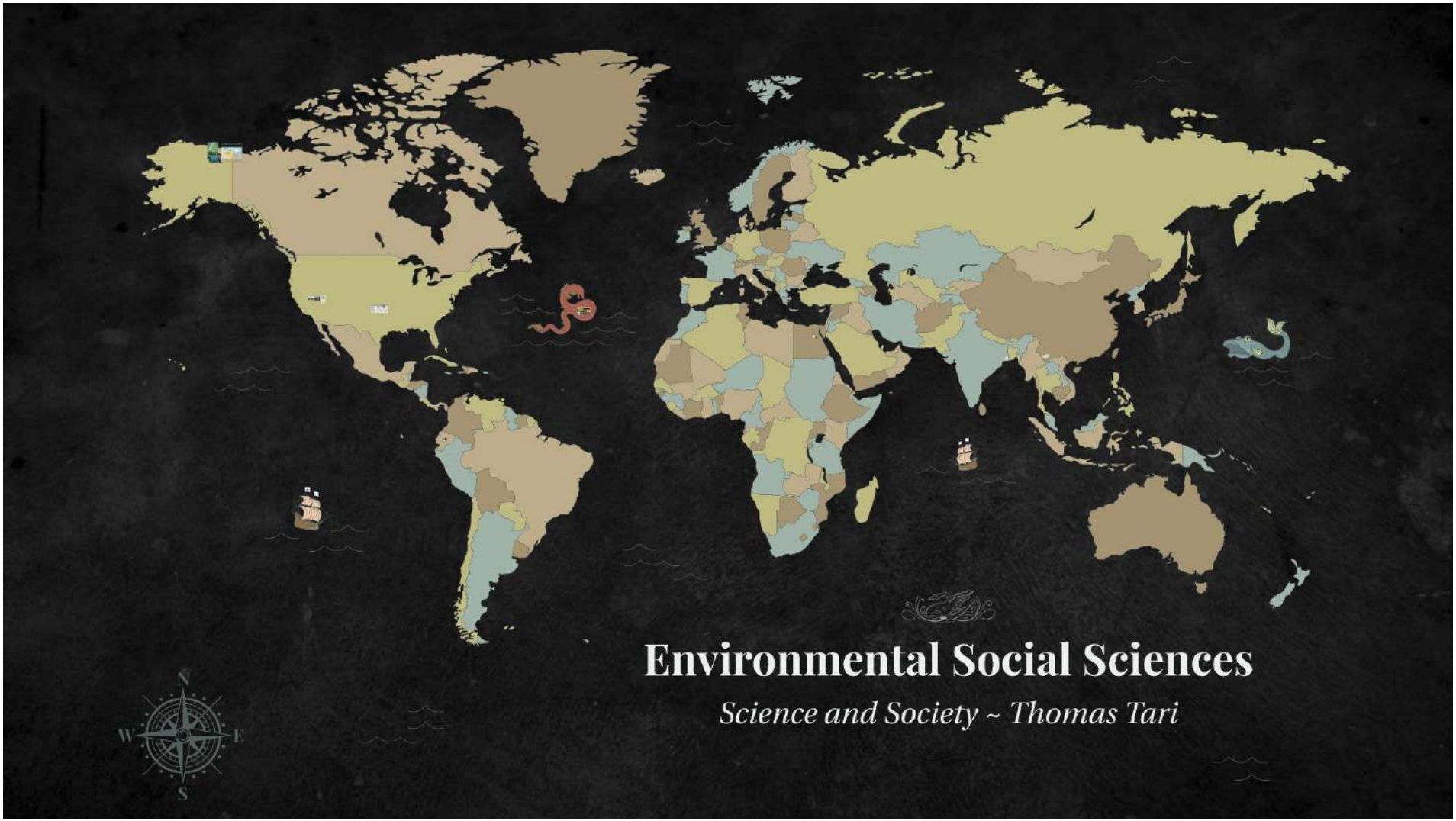
Environmental Social Sciences
Science and Society ~ Thomas Tari
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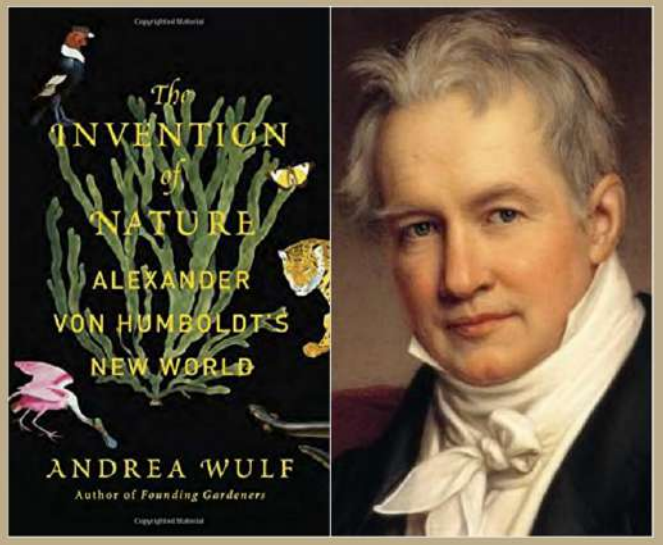
The Invention of Nature



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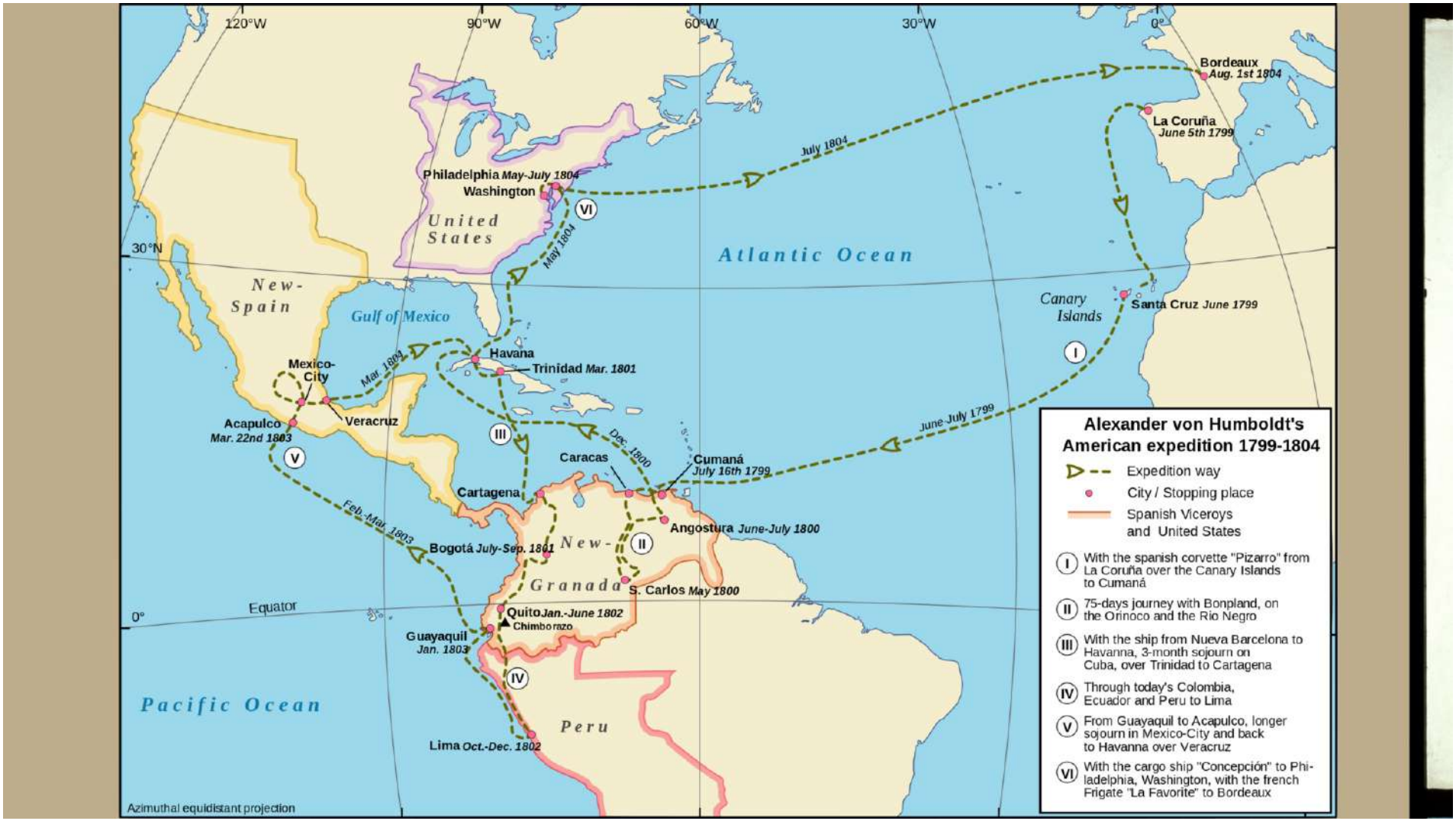
Humboldt saw "unity in the immense variety of phenomena". Instead of confining plants to innumerable taxonomic categories, he divided them according to climate and environment: a revolutionary idea that we still find today in our conception of ecosystems.

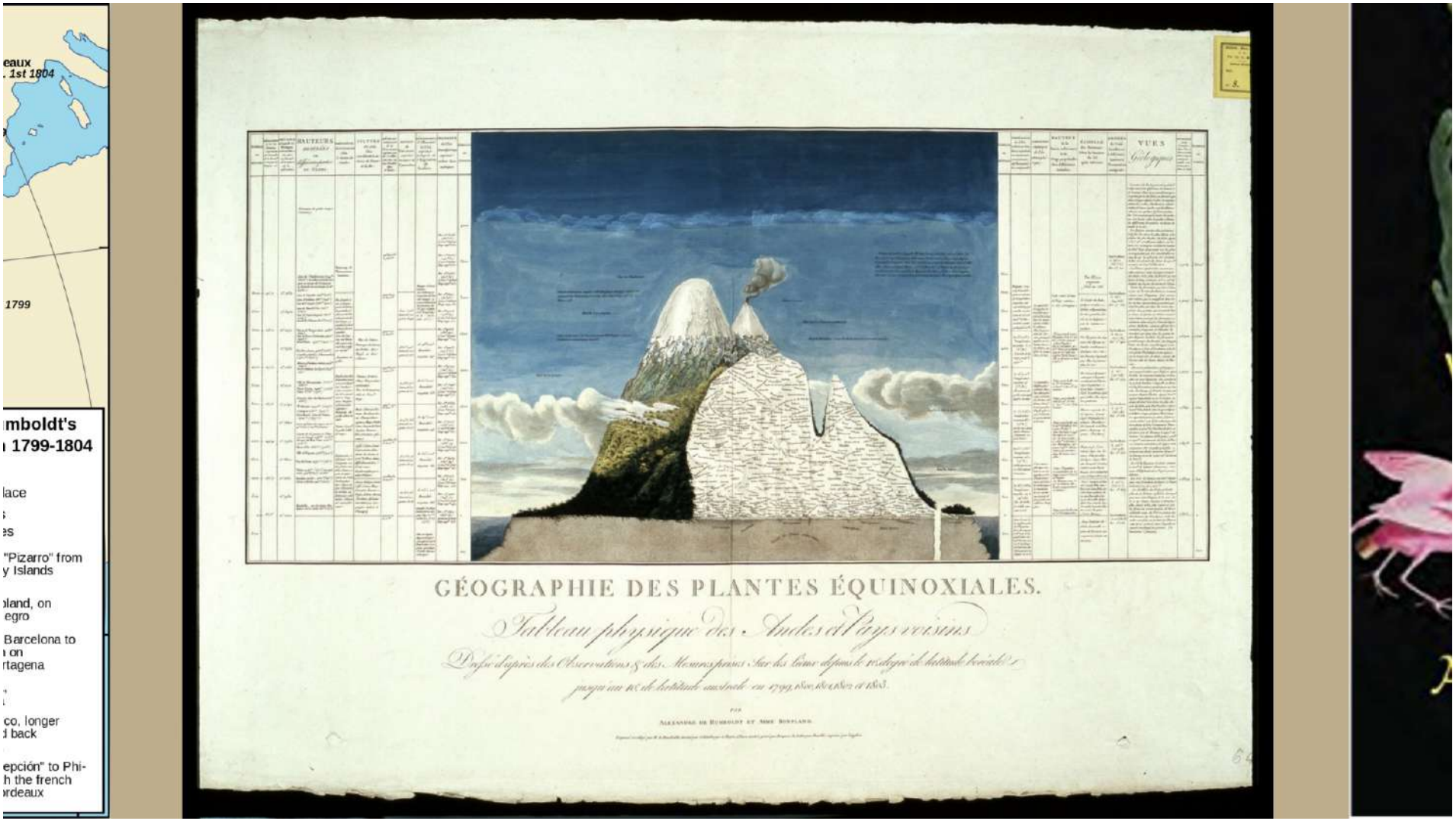
Andrea Wulf, The Invention of Nature, [2015]

"When the forests are destroyed as the European settlers are doing everywhere in America with reckless haste, the springs dry up entirely or become less abundant."

All over the world "hydrological engineers had committed similar follies, guilty of a short-term view only".

In Cuba he writes how much "each drop of sugarcane juice cost blood and groans".


120°W
90°W
60°W
30°W
0°
30°N
0°
Equator
Bordeaux
Aug. 1st 1804
La Coruña
June 5th 1799
July 1804
Philadelphia May-July 1804
Washington
United States
May 1804
Atlantic Ocean
New-Spain
Gulf of Mexico
Canary Islands
Santa Cruz June 1799
Havana
Trinidad Mar. 1801
Mexico-City
Mar. 1804
Veracruz
Acapulco
Mar. 22nd 1803
June-July 1799
Dec. 1800
Caracas
Cumaná
July 16th 1799
Cartagena
Angostura June-July 1800
Feb-Mar. 1803
Bogotá July-Sep. 1801
New-Granada
S. Carlos May 1800
Quito Jan.-June 1802
Chimborazo
Guayaquil
Jan. 1803
Pacific Ocean
Peru
Lima Oct.-Dec. 1802
Azimuthal equidistant projection
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


GÉOGRAPHIE DES PLANTES ÉQUINOXIALES.
Tableau physique des Andes et Pays voisins

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A. Goering
Leipzig 1882

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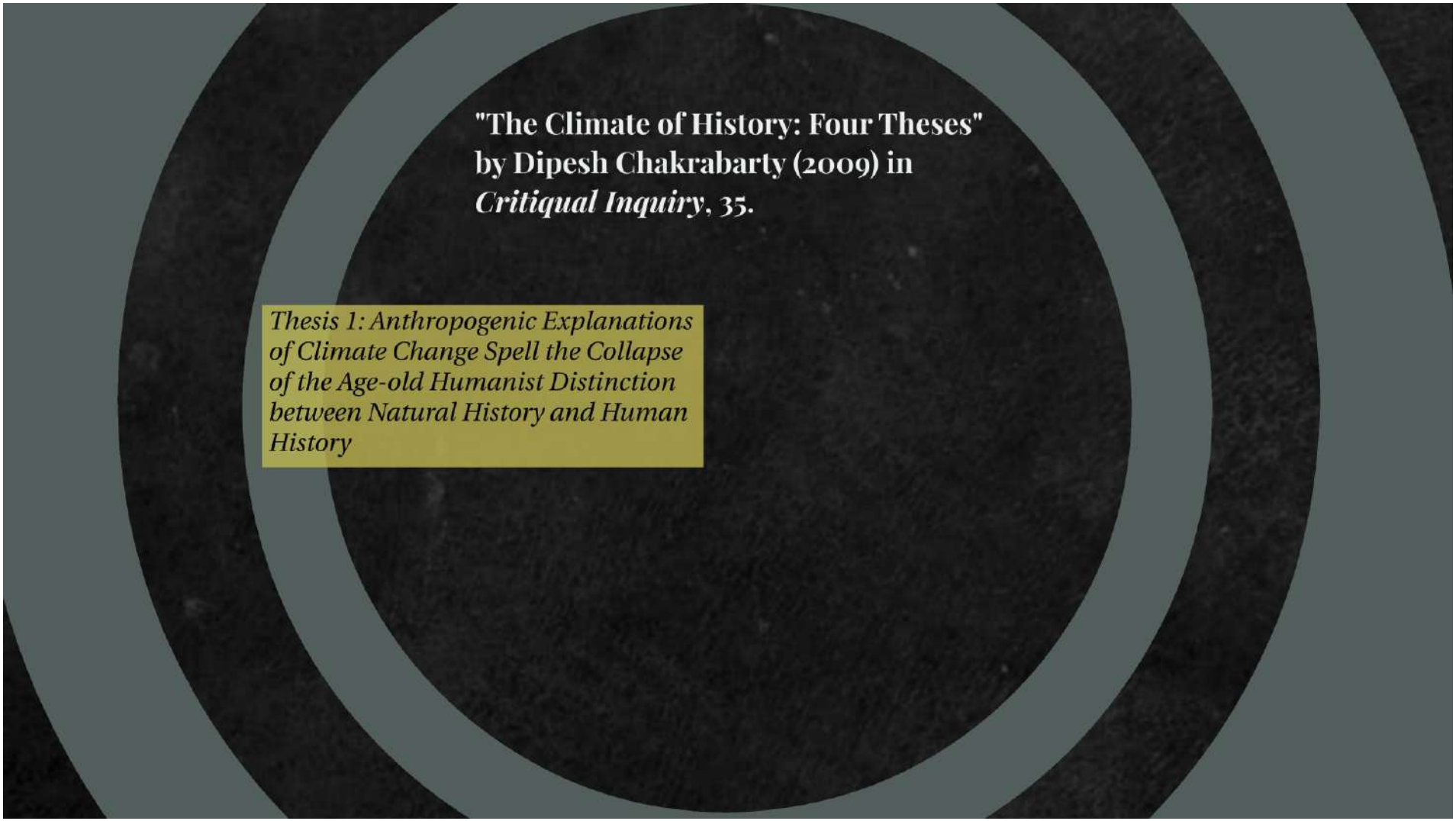
"The Climate of History: Four Theses"
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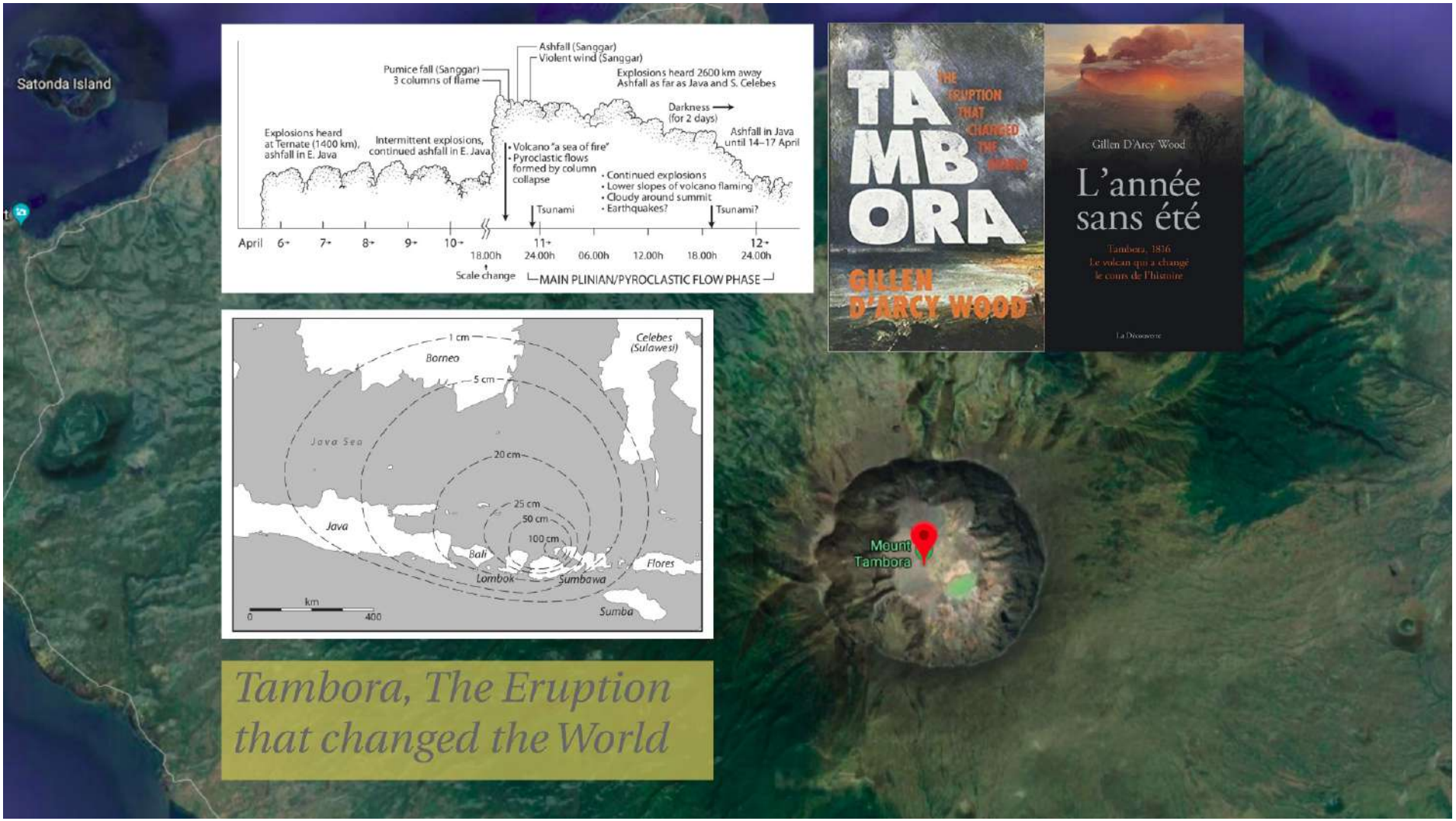
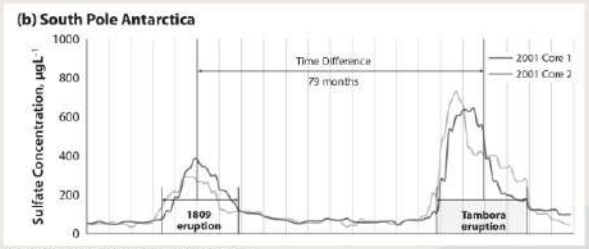
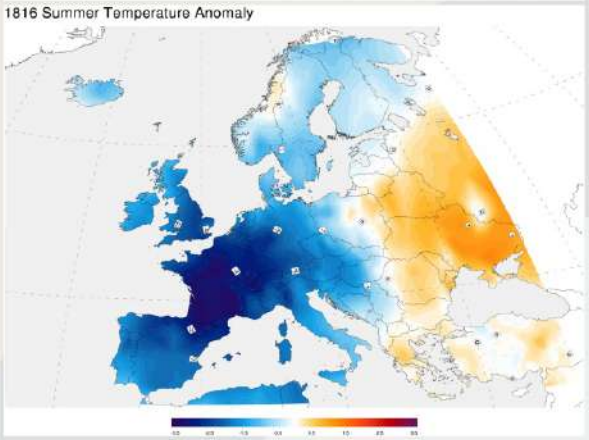


Tambora, The Eruption that changed the World

The Little (Volcanic) Ice Age

In June 1816, "incessant rainfall" during that "wet, ungenial summer" forced Mary Shelley, and her friends to stay indoors at Villa Diodati overlooking Lake Geneva for much of their Swiss holiday.





They decided to have a contest to see who could write the scariest story, leading Shelley to write Frankenstein and Lord Byron to write "A Fragment", which Polidori later used as inspiration for The Vampyre – a precursor to Dracula. In addition, Lord Byron was inspired to write the poem "Darkness", by a single day when "the fowls all went to roost at noon and candles had to be lit as at midnight".

1816, the year without a summer

- *6 inches of snow in June*
- *hard frost on every month*
- *3° Celsius on yearly average*

John Constable, The Weymouth Bay (Oct. 1816)

BRIDGEPORT:
WEDNESDAY, June 12, 1816.

The Weather.—The remarkable change of weather, from extreme heat to cold, was as great here as the following paragraphs describes it to have been at the eastward; all kinds of vegetation has suffered, and some plants been entirely destroyed by the cold and frost.

The Climate of London

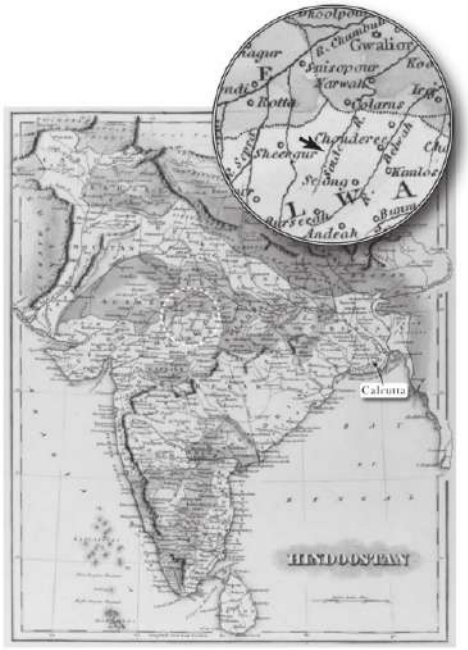
Blue Death in Bengal

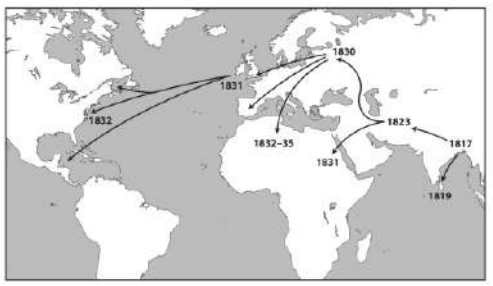
- *Cholera and climate change*

In 1817, the aquatic environment of the Bay of Bengal had deteriorated radically owing to the disrupted monsoon, a consequence of Tambora's dimming presence in the stratosphere. By a process that remains mysterious in its details, the altered estuarine ecology then stimulated an unprecedented event of genetic mutation of the cholera bacterium.

- *The year without a monsoon*

Droughts, by increasing the temperature of reduced standing bodies of water and concentrating the bacterial population, promote disease transmission.





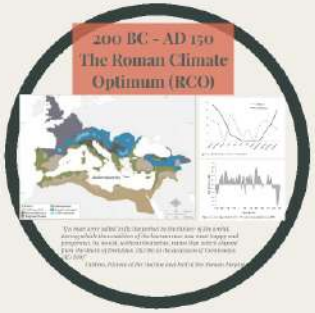
The Sorrows of Yunnan

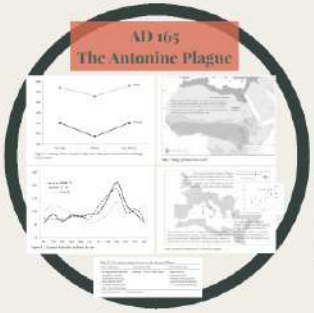
Golden Triangle opium trade is still expanding

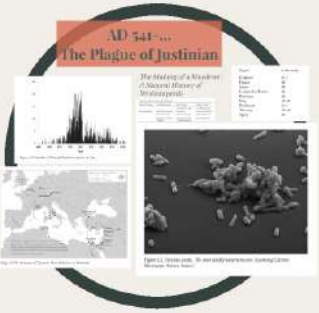
The clouds like a dragon's breath on the mountains,
Winds howl, circling and swirling,
The Rain God shakes the stars, and the rain
Beats down on the world. An earthquake of rain.
Water spilling from the eaves deafens me.
People rush from falling houses in their thousands
And tens of thousands, for the work of the rain
Is worse than the work of thieves. Bricks crack. Walls fall.
In an instant, the house is gone. My child catches my coat
And cries out. I am running in the muddy road, then
Back to rescue my money and grains from the ruins.
What else to do? My loved ones must eat.
There are no words for the bitterness of
An empty September. The flood-drowned fields
harvest three grains for every ten of a good year.
And from these three grains? Meals and clothes till next September.

Li Yuyang, A Sigh for Autumn Rain, September 1815

The Fate of Rome

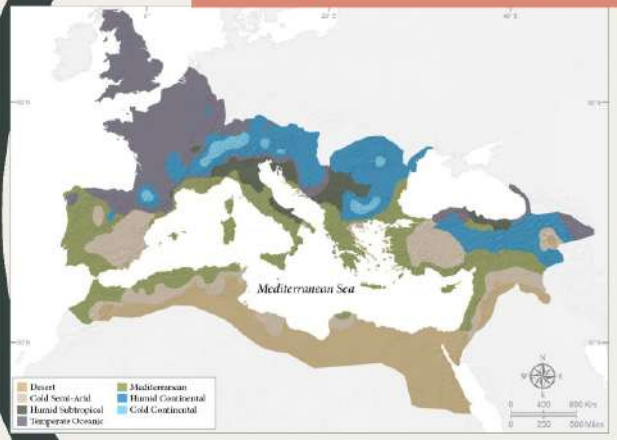


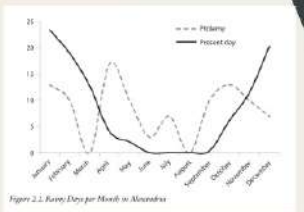





200 BC
100 BC
AD 1
AD 100
AD 200
AD 300
AD 400
AD 500
AD 600
AD 700
CLIMATE HISTORY
ROMAN CLIMATE OPTIMUM
200 BC – AD 150
LATE ROMAN TRANSITIONAL PERIOD
150 – 450
LATE ANTIQUE LITTLE ICE AGE
450 – 700
DISEASE HISTORY
Antonine Plague 165
Plague of Cyprian 249–62
Justinianic Plague
first outbreak 541–43
Subsequent outbreaks to 749
IMPERIAL HISTORY
Gibbon's "Happiest Era" 96–180
War with Parthia 161–66
Reign of Marcus Aurelius 161–80
Severan Dynasty 193–235
Millennium Games 248
Third-Century Crisis 250–70
Conversion of Constantine 312
Battle of Adrianople 378
Sack of Rome 410
Death of Attila the Hun 453
Last Western Emperor 476
Reign of Justinian 527–65
Reconquest of Africa 533–34
War with Persia 602–28
Reign of Heraclius 610–41
Hegira of Mohammad 622
Battle of Yarmouk 636
HISTORICAL FIGURES
Aelius Aristides 117–81
Marcus Aurelius 121–80
Faustina 130–75
Galen of Pergamum 130–210
Septimius Severus 145–211
Philip the Arab 204–49
Cyprian of Carthage 200–58
Claudius II 210–70
Diocletian 244–312
Constantine 272–337
Theodosius I 347–95
Stilicho 359–408
Claudian 370–404
Alaric 370–410
Attila 406–53
Theoderic 454–526
Justinian 482–565
Theodora 500–48
Procopius 500–54
John of Ephesus 507–88
Maurice 539–602
Gregory the Great 540–604
Mohammad 570–632
Heraclius 575–641

200 BC – AD 150
The Roman Climate Optimum (RCO)

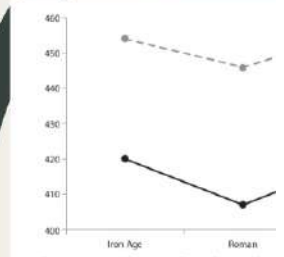


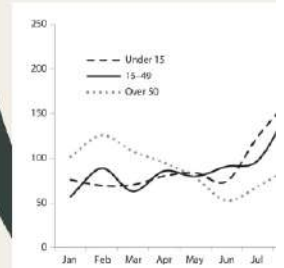


"If a man were called to fix the period in the history of the world, during which the condition of the human race was most happy and prosperous, he would, without hesitation, name that which elapsed from the death of Domitian [AD 96] to the accession of Commodus [AD 180]"

Gibbon, History of the Decline and Fall of the Roman Empire

The





AD 165
The Antonine Plague

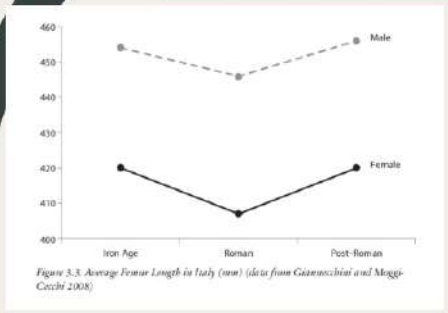
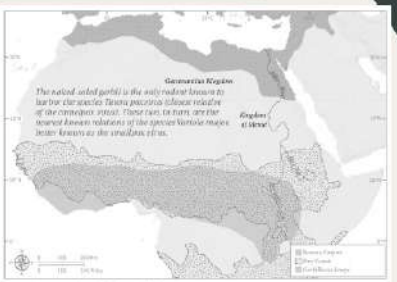


Figure 3.3. Average Femur Length in Italy (mm) (data from Giannecchini and Moggi-Cecchi 2008)



Map 7. Range of Naked-Sole Gerbil

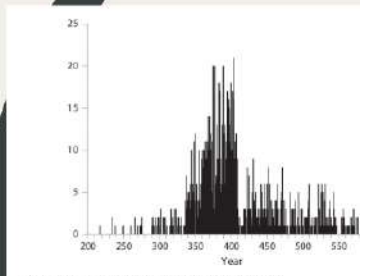


Figure 3.2. Number of Date-of-Death Inscriptions by Year

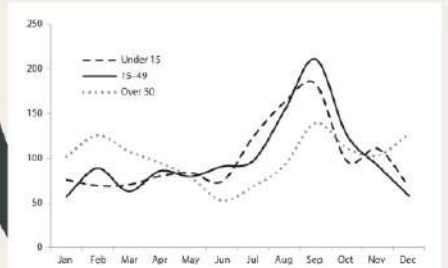
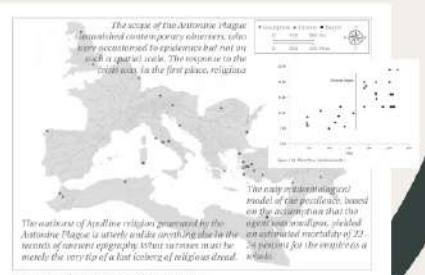


Figure 3.5. Seasonal Mortality in Rome, by Age



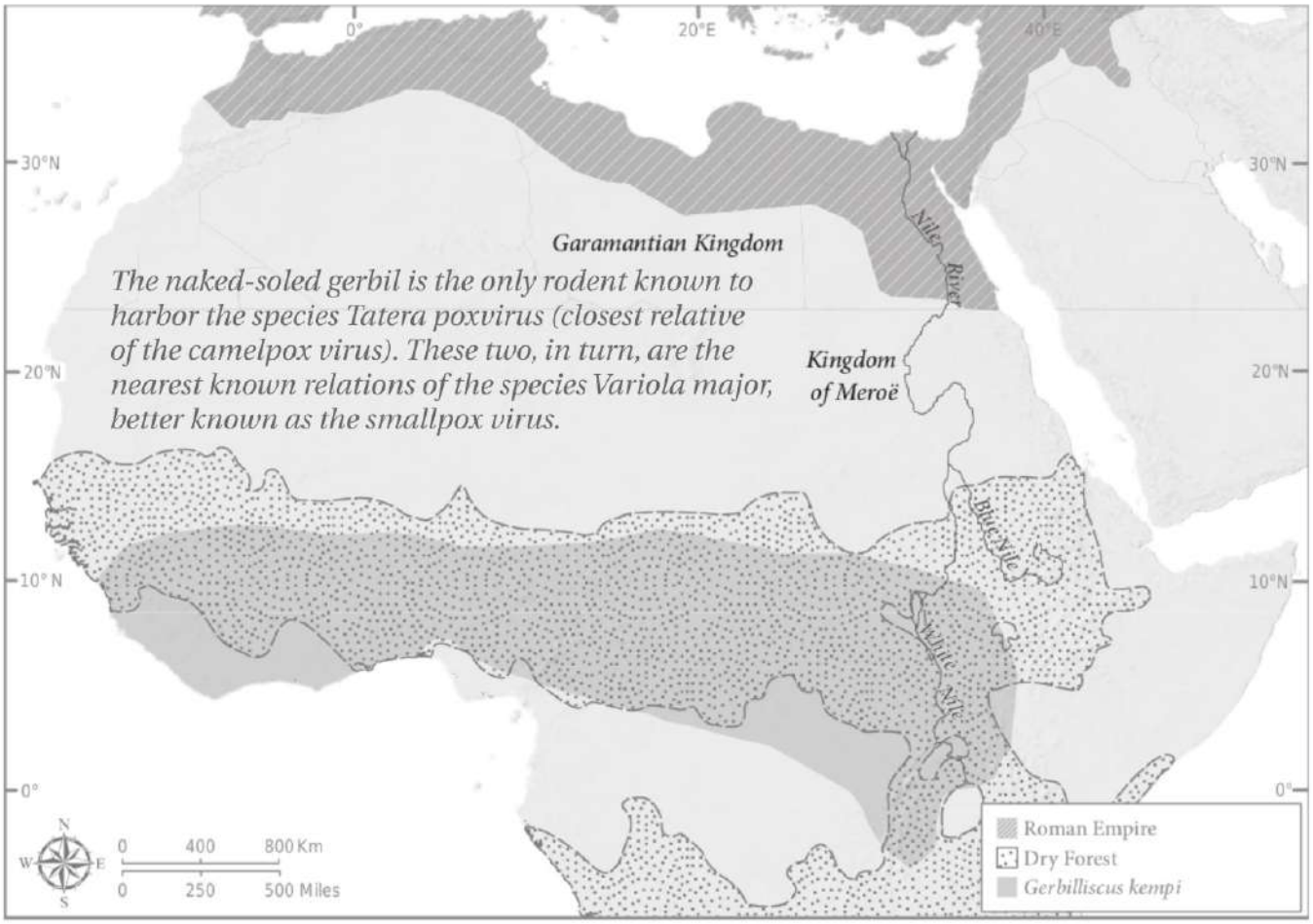
Map 10. Possible Indications of Antonine Plague

Map 19. The Itinerary of Y. pestis. From Pelusium to Pandemic

Table 3.5 The Epidemiological Factors of the Antonine Plague

Total Contact Rate	Transmissive Risk	Case Fatality Rate
+ transportation networks + population density + multifamily housing + lack of germ theory + medical infrastructure + lack of social learning	perhaps ~ 70 for Variola major	+ age structure + pathogen load – medical infrastructure – lack of social breakdown +/– nutritional buffering

+ enhanced mortality – reduced mortality



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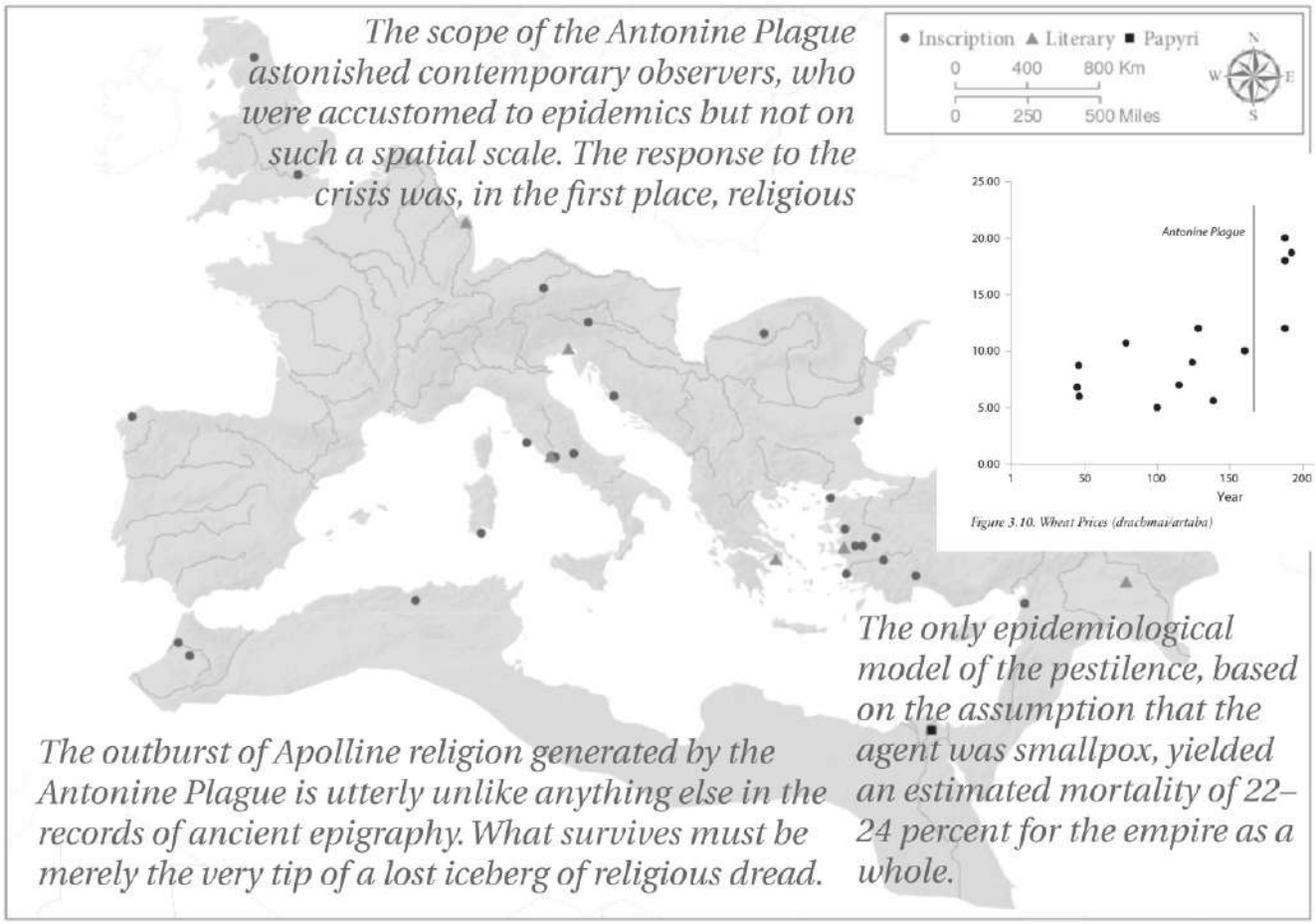

Map 10. Possible Indications of Antonine Plague

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+ population density		+ pathogen load
+ multifamily housing		– medical infrastructure
+ lack of germ theory		– lack of social breakdown
+ medical infrastructure		+ / – nutritional buffering
+ lack of social learning		

+ enhanced mortality – reduced mortality

AD 541–...
The Plague of Justinian

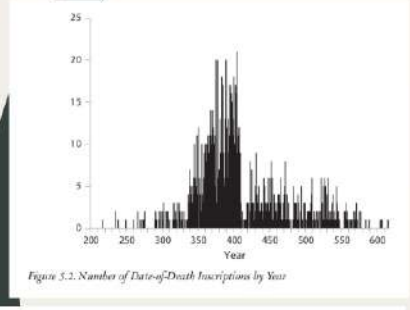


Figure 5.2. Number of Date-of-Death Inscriptions by Year

Map 19. The Itinerary of Y. pestis: From Pelusium to Pandemic

The Making of a Murderer: A Natural History of Yersinia pestis

Region	*% Mortality*
England	62.5
France	60
Savoy	60
Languedoc/Forais	60
Provence	60
Italy	50–60
Piedmont	52.5
Tuscany	50–60
Spain	60

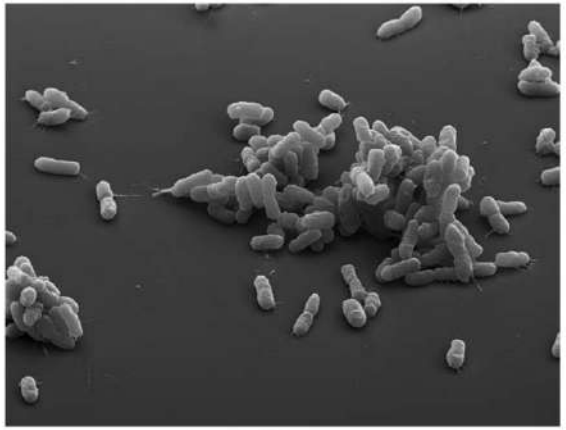
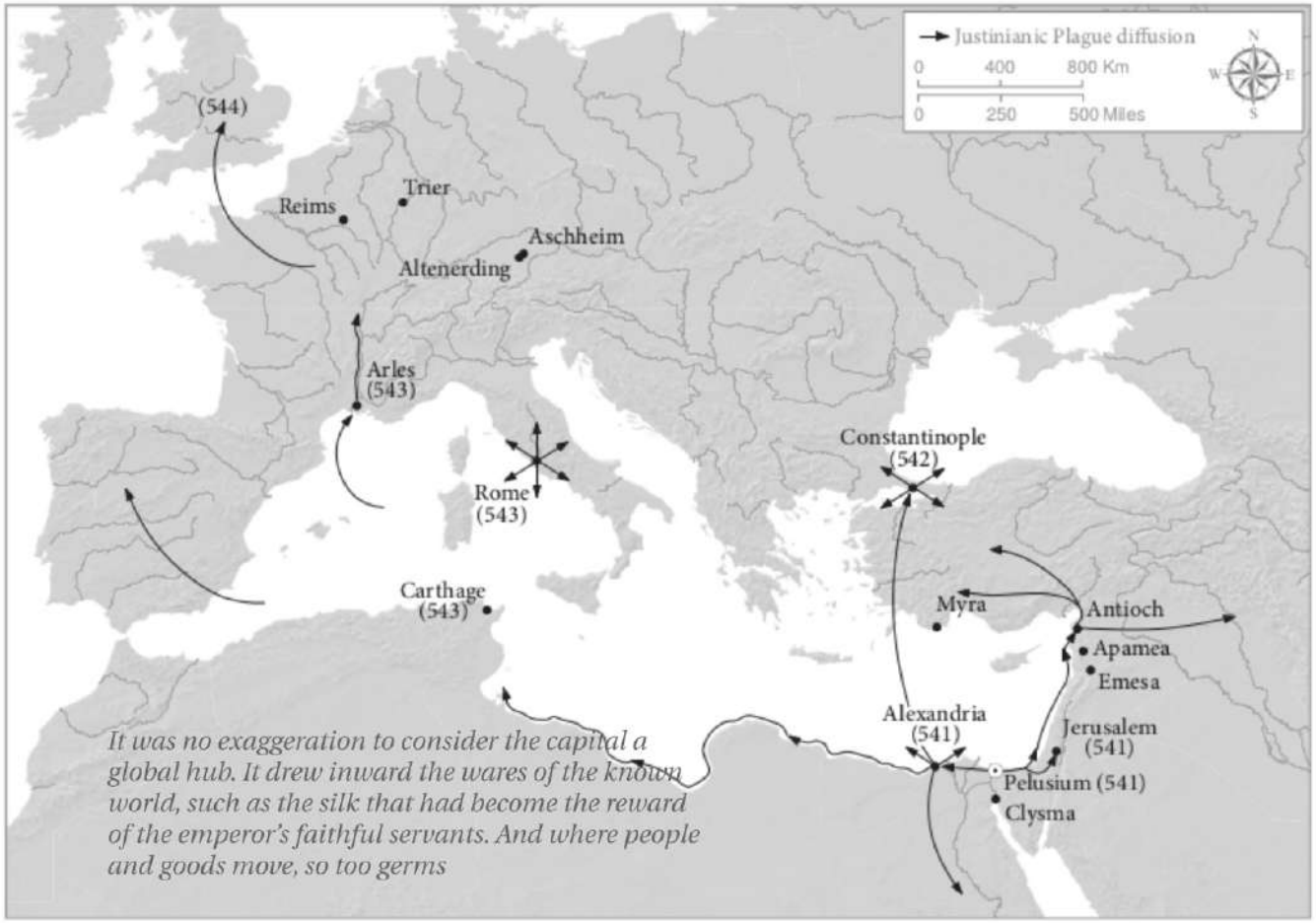


Figure 6.2. Yersinia pestis. *The most deadly bacterium ever. (Scanning Electron Microscope, Science Source)*



Map 19. The Itinerary of Y. pestis*: From Pelusium to Pandemic*

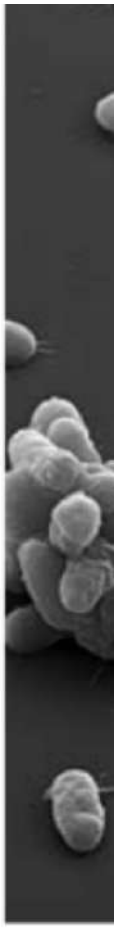
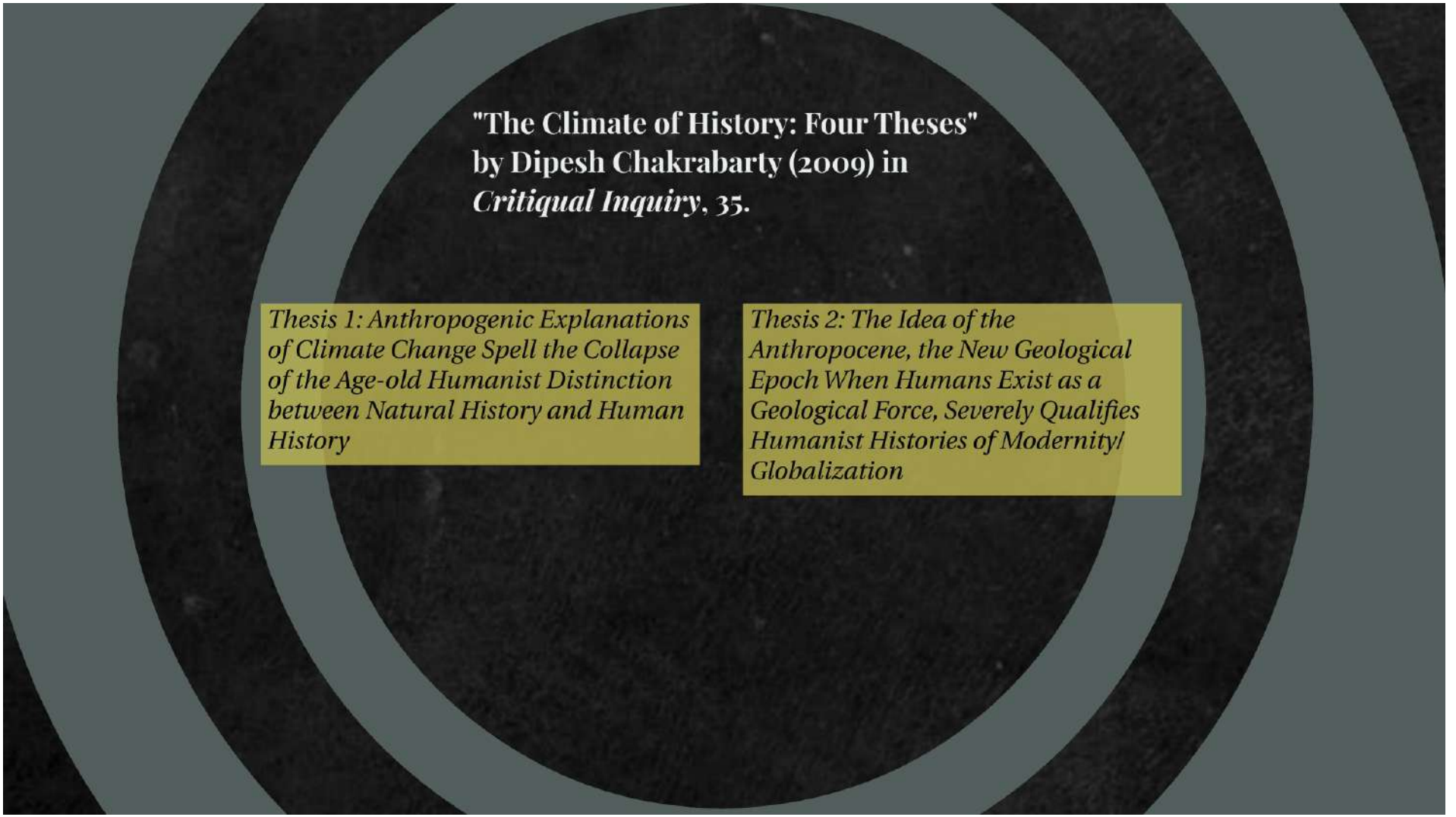


Figure
Micro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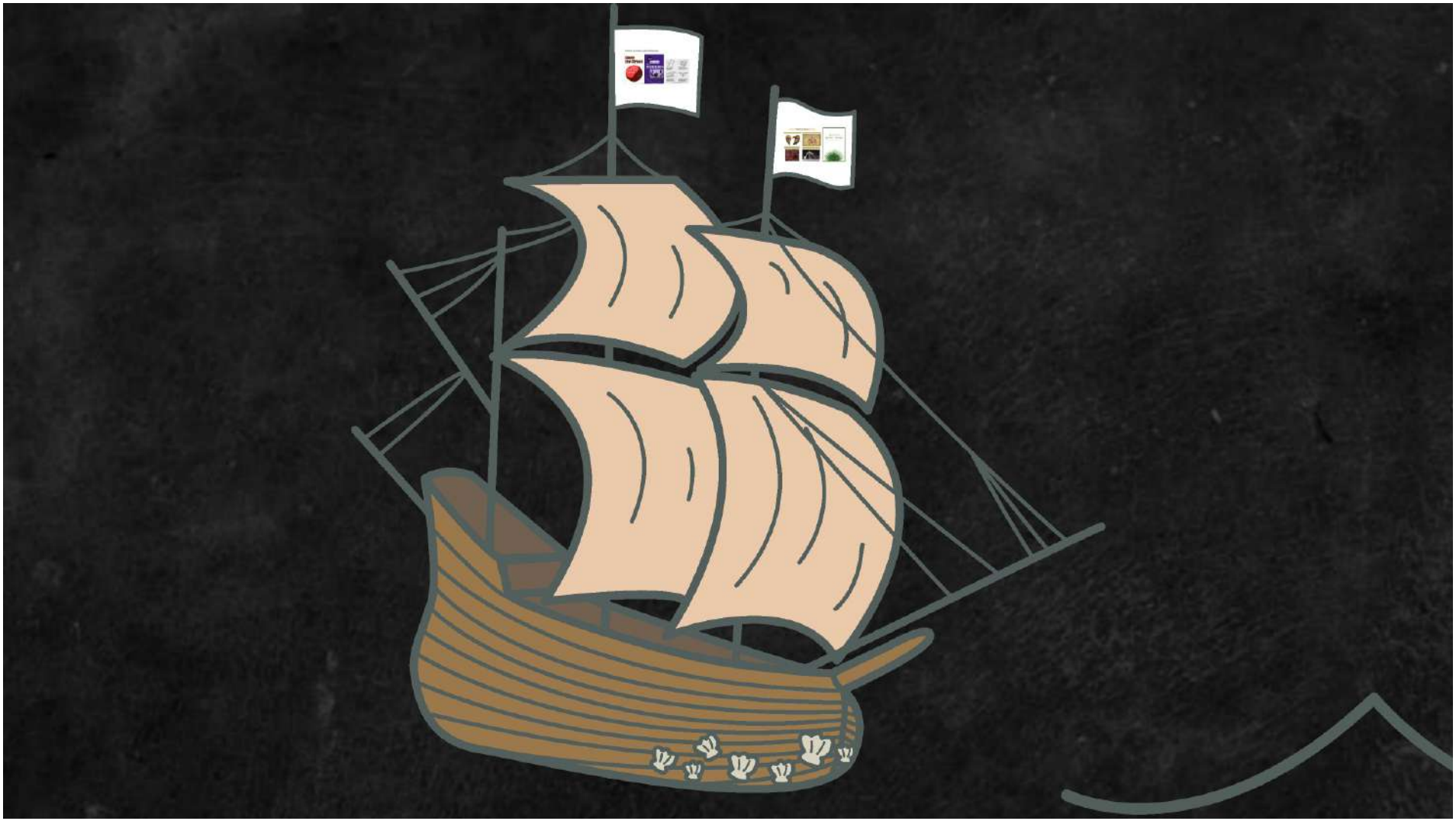
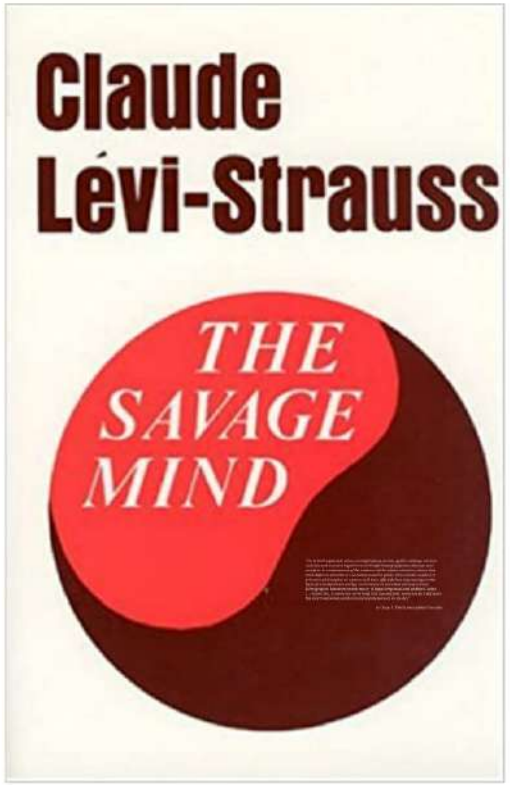
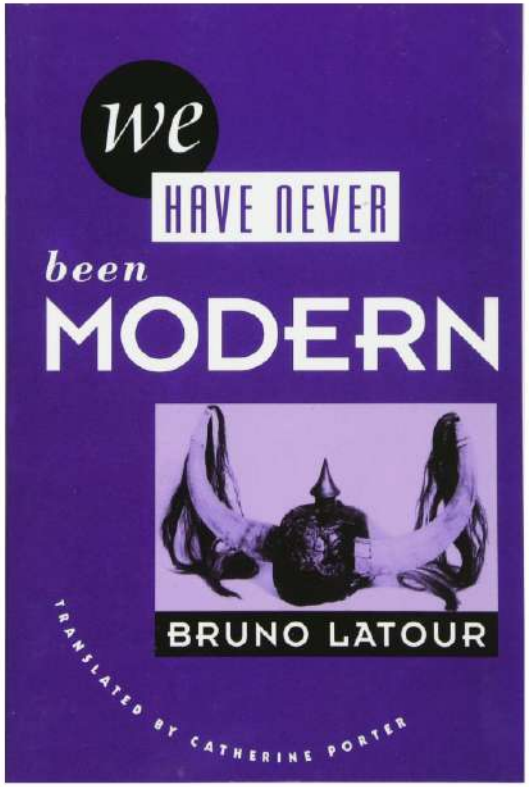
Thesis 2: The Idea of the Anthropocene, the New Geological Epoch When Humans Exist as a Geological Force, Severely Qualifies Humanist Histories of Modernity/ Globalization



Nature, Societies, and Modernity





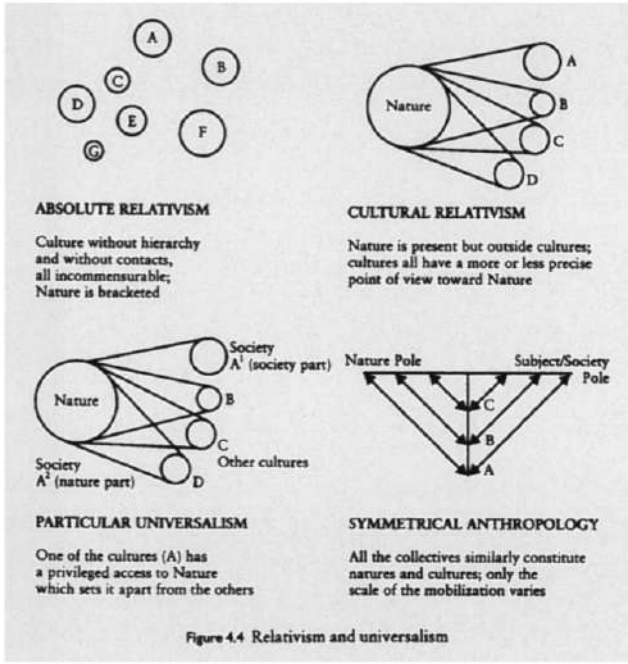


Figure 4.4 Relativism and universalism

"On intuitive grounds alone we might group onions, garlic, cabbage, turnips, radishes and mustard together even though botany separates liliaceae and crucifers. In confirmation of the evidence of the senses, chemistry shows that these different families are united on another plane: they contain sulphur. A primitive philosopher or a poet could have effected these regroupings on the basis of considerations foreign to chemistry or any other form of science. Ethnographic literature reveals many of equal empirical and aesthetic value. [...] Given this, it seems less surprising that the aesthetic sense can by itself open the way to taxonomy and even anticipate some of its results."

in Chap. 1, The Science of the Concrete

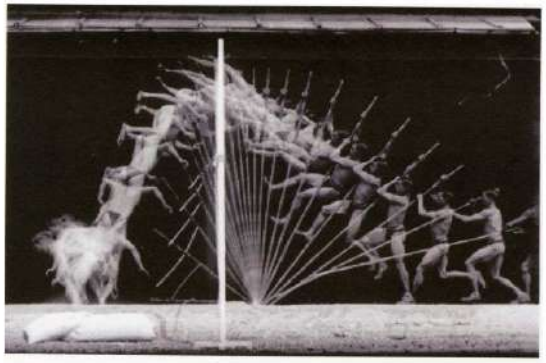
Who Owns Nature?

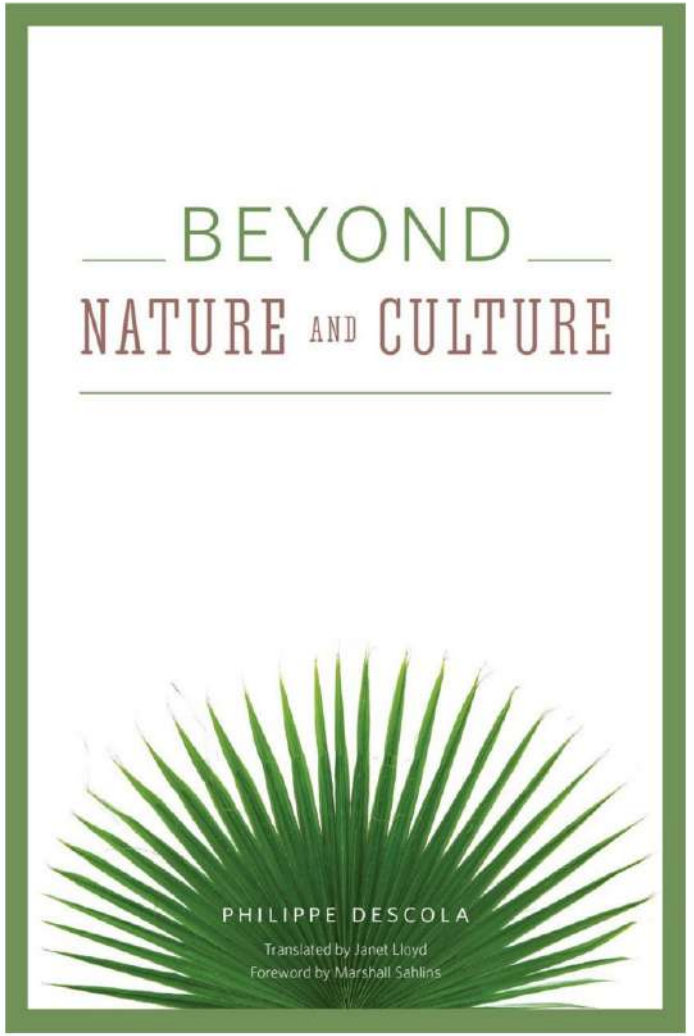
Animism: an animated world

Analogism : an entangled world

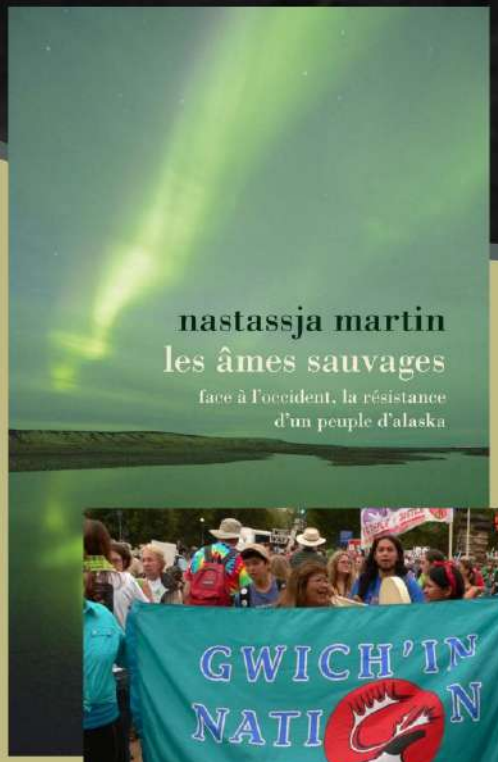
Totemism: a divided world

Naturalism: an objective world





Ecological Domestications



Animism vs the kingdom of God

Hunting caribous vs farming potatoes

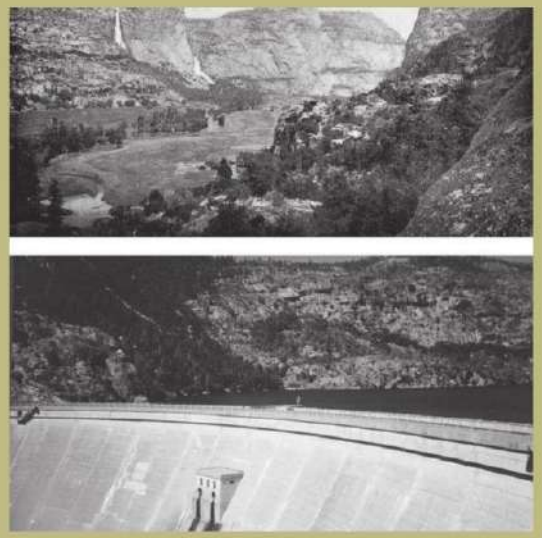
The Trouble with Wilderness or, Getting Back to the Wrong Nature

William Cronon, 1995

Damming the Tuolumne River in Hetch Hetchy valley, within the boundaries of Yosemite National Park

John Muir :"Their arguments are curiously like those of the devil, devised for the destruction of the first garden-so much of the very best Eden fruit going to waste; so much of the best Tuolumne water and Tuolumne scenery going to waste."

Frederick Jackon Turner - the myth of the Frontier

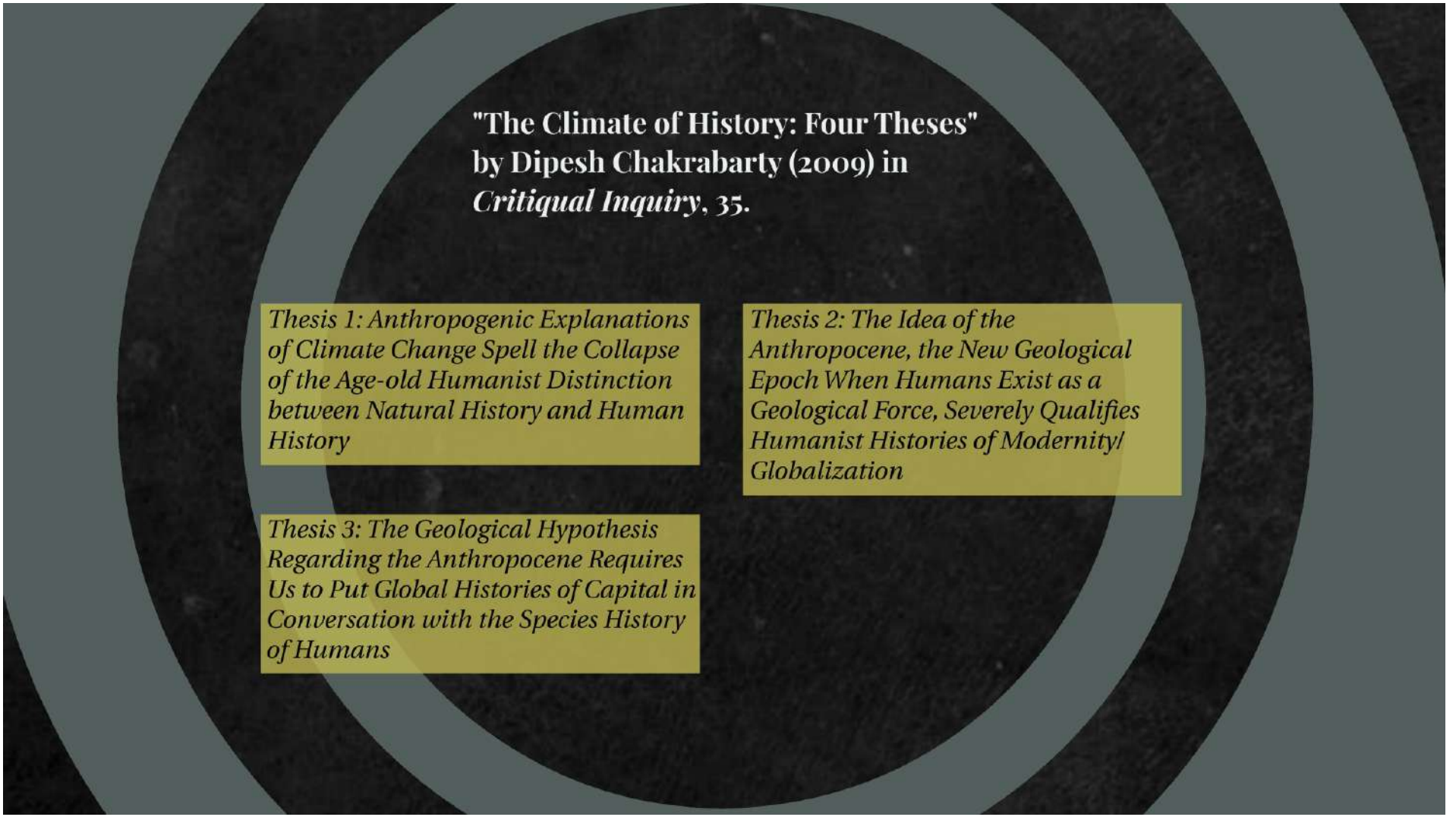


Henry David Thoreau :"In Wildness is the preservation of the World."

THE TROUBLE WITH

WILDERNESS

If wildness can stop being (just) out there and start being (also) in here, if it can start being as humane as it is natural, then perhaps we can get on with the unending task of struggling to live rightly in the world–not just in the garden, not just in the wilderness, but in the home that encompasses them both.


"The Climate of History: Four Theses"
by Dipesh Chakrabarty (2009) in
Critiqual Inquiry, 35.
Thesis 1: Anthropogenic Explanations of Climate Change Spell the Collapse of the Age-old Humanist Distinction between Natural History and Human History
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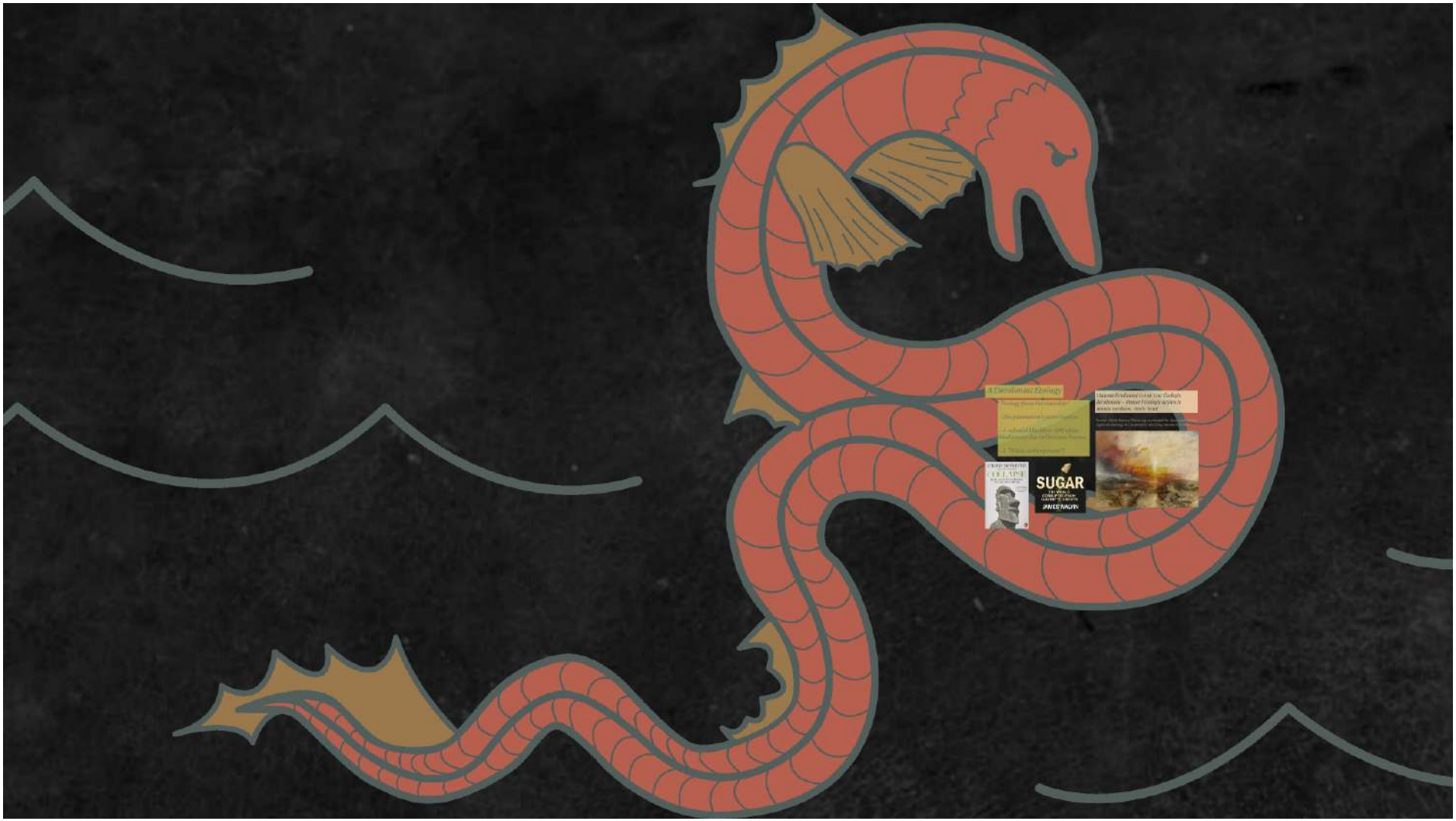

SUGAR

A Decolonial Ecology

"Ecology from the slaveship"

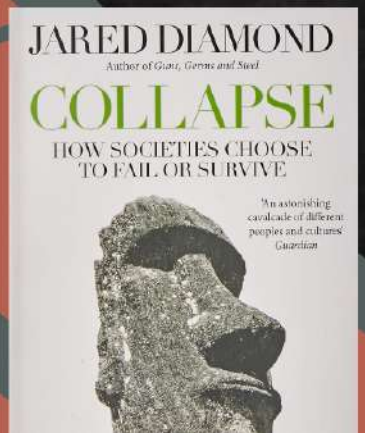
- The plantation system / native

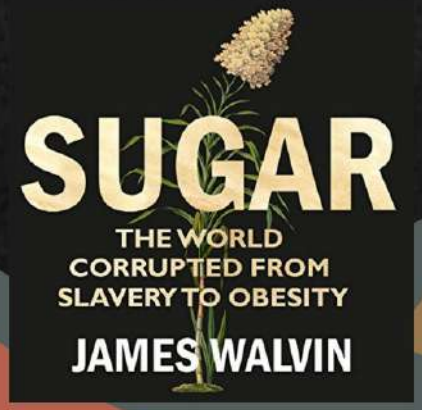
- A colonial blackbox: 80% of its biodiversity lies in Overseas France.

- A "White Anthropocene"?

Malcom Ferdinand (2019) Une Écologie décoloniale – Penser l'écologie depuis le monde caribéen. Paris: Seuil.

Turner (1840) Slavers Throwing overboard the Dead and Dying - Typhoon coming on | inspired by the Zong Massacre (1781)





Can the Mosquito Speak?

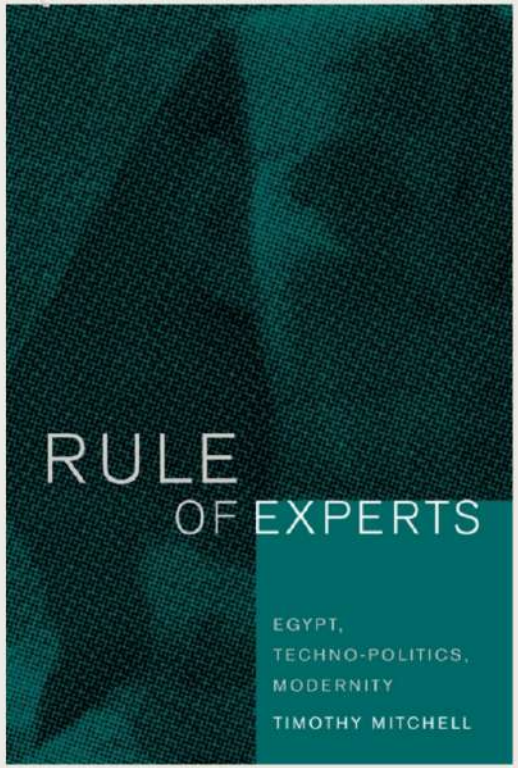
Anopheles gambiae
&
Treponema Plasmodium falciparum

By refusing to recognize these interrelations, by seeing the fight against mosquitoes like the battle against tanks, decision-makers and experts reinforced the interrelations between multiple factors, thus making it harder to manage them.

Whoever wants to write this history must take into account not only the interventions by experts and policymakers but also the interrelations between the forces to be fought. The experts overlooked these interrelations, since they considered these forces to be independent.

The social sciences would err in darkness if they remained blind to these sociotechnical patterns and separated, like the experts and decision-makers, the social from the natural sphere.

Michel Callon on Timothy Mitchell, Rules of Experts



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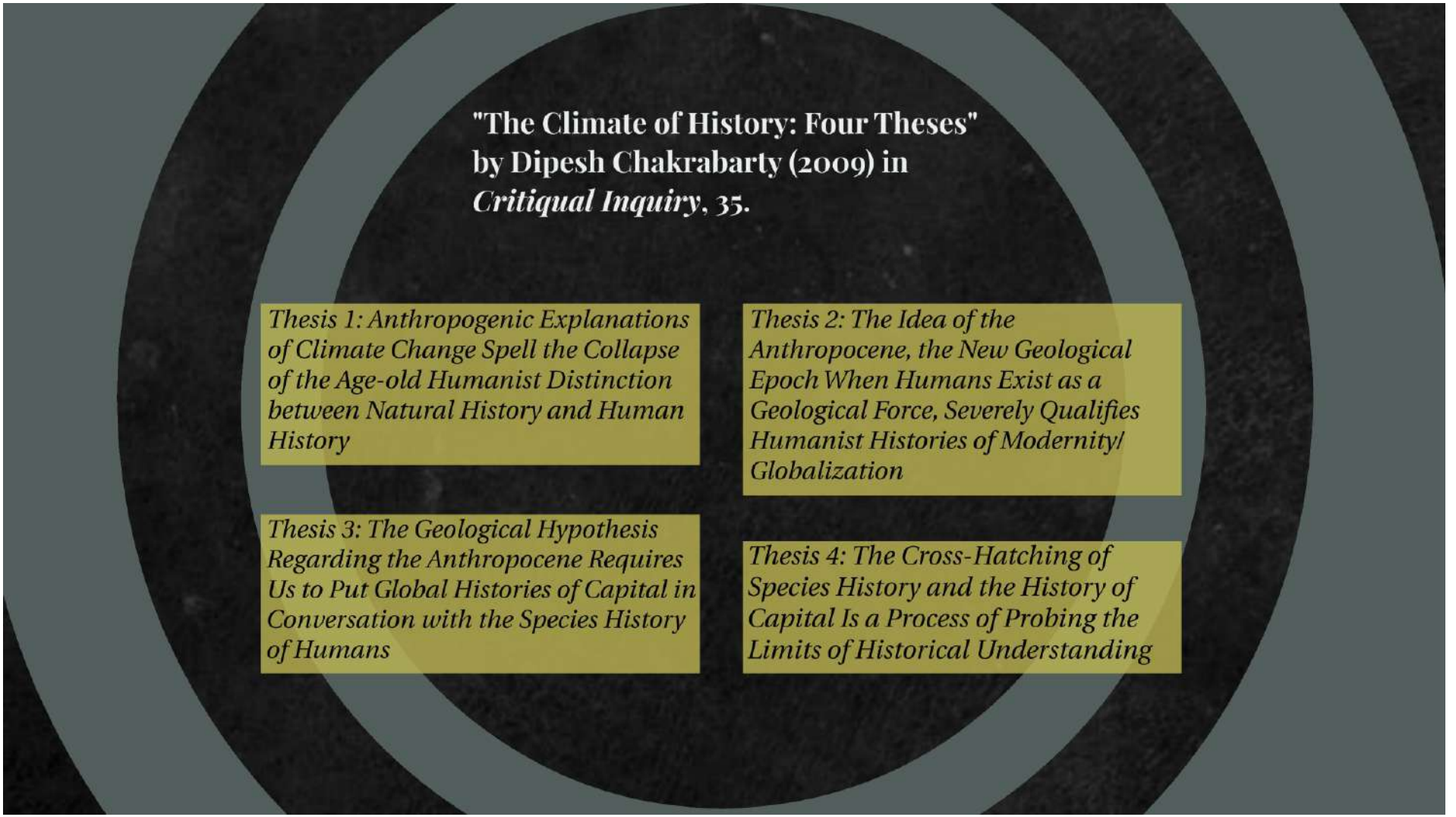
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Thesis 4: The Cross-Hatching of Species History and the History of Capital Is a Process of Probing the Limits of Historical Understanding

An Environmental History of Political Ideas

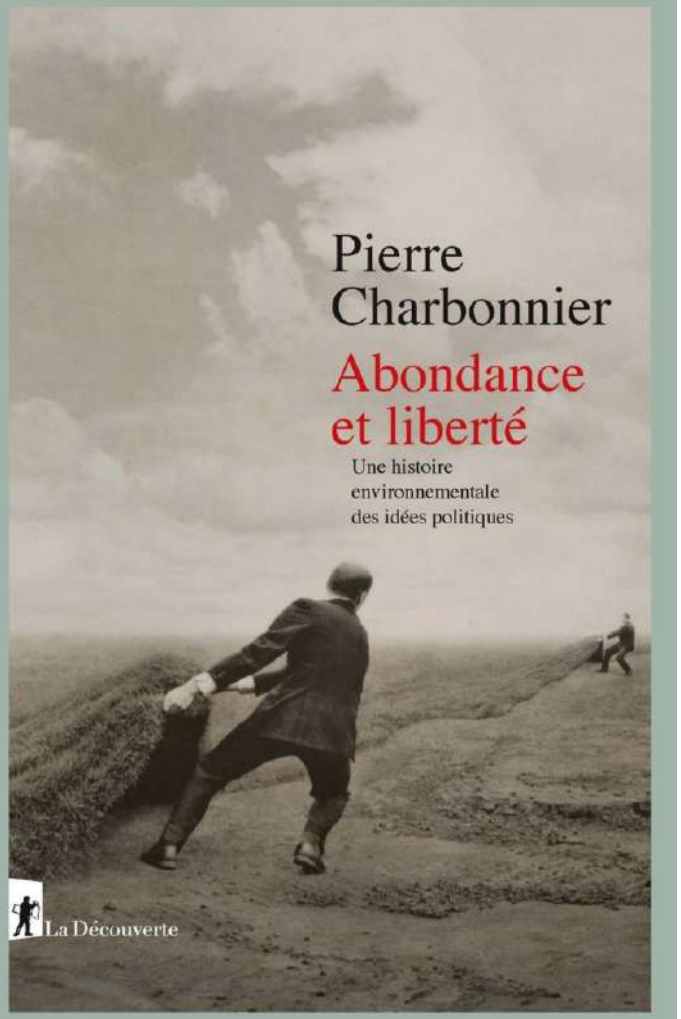
For Chakrabarty: "Most of our freedoms so far have been energy-intensive"

From Timothy Mitchell "Carbon Democracy" to the analysis of ***Durkheim "Carbon Sociology"***

Industrial Democracy and Division of Labour

"The social" as Durkheim defines and objectifies it, cannot be thought without a conflict between abundance and freedom.

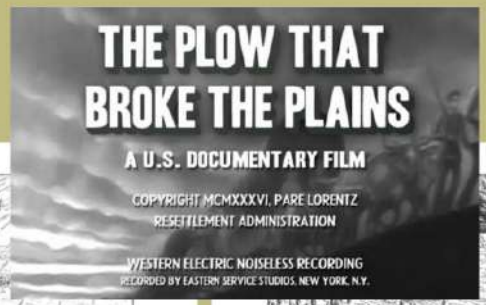
Durkheim unknowingly writes an environmental history of autonomy

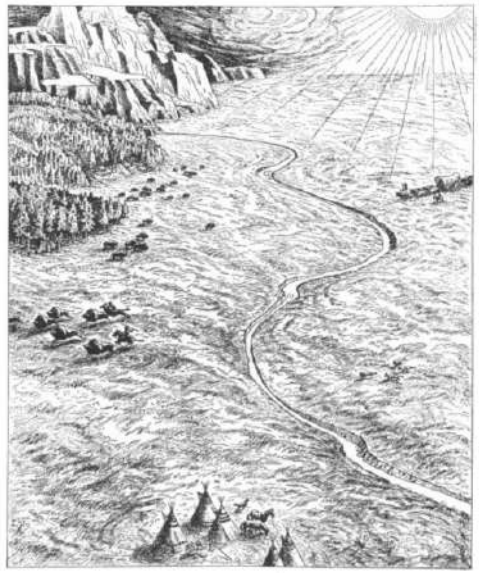


A Place for Stories: Nature, History, and Narrative

William Cronon
in The Journal of American History
Vol. 78, No. 4 (1992),
pp. 1347-1376

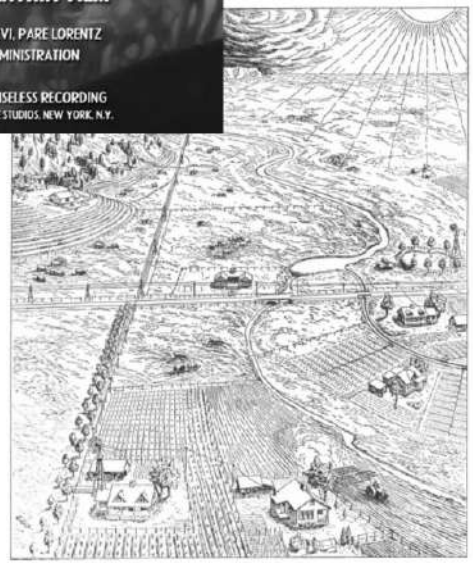
Bonnifield (1979), The Dust Bowl | Worster (1979) Dust Bowl





"The Great Plains of the Past," an illustration for *The Future of the Great Plains* (1936). This and its companion illustrations on the following pages illustrate the New Deal story of the Great Plains. The caption for this one reads, in part, "As the first white settlers drove their covered wagons slowly westward . . . they found the Red Man living in rude but productive harmony with Nature."

"The Great Plains of the Present."
The original caption was, in part, "The White Man . . . came as a conqueror first of the Indian, then of Nature. . . . The plough ignores Nature's 'Keep Off' signs; communities, for all the courage of their people, fall into decay."

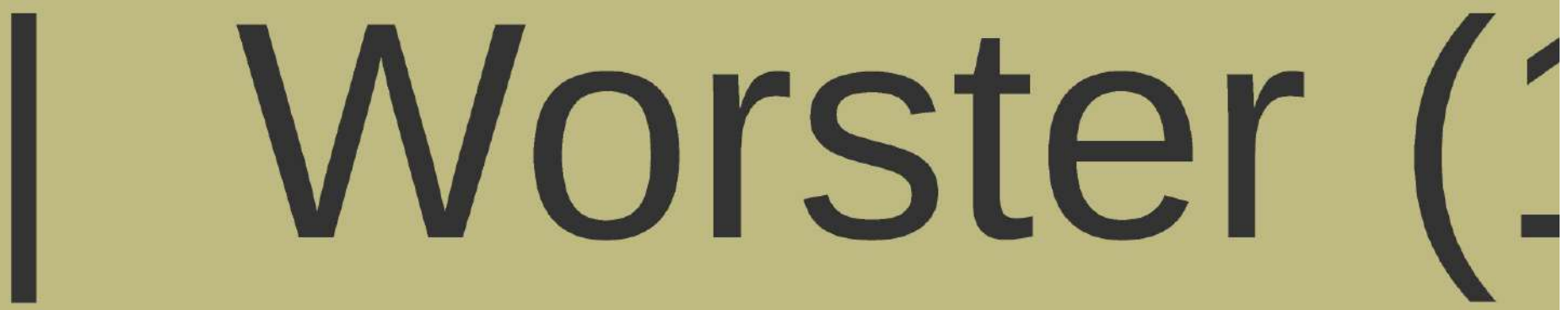


"The Great Plains of the Future."
The original caption was, in part, "The land may bloom again if man once more makes his peace with Nature. Careful planting will give him back the foothill trees; . . . fewer and larger farms on scientifically selected sites may yield . . . a comfortable living. . . . This is no Utopian dream. It is a promise, to be realized if we will."

In the final analysis, the story of the dust bowl was the story of people, people with ability and talent, people with resourcefulness, fortitude, and courage... The people of the dust bowl were not defeated, poverty-ridden people without hope. They were builders for tomorrow. During those hard years they continued to build their churches, their businesses, their schools, their colleges, their communities. They grew closer to God and fonder of the land. Hard years were common in their past, but the future belonged to those who were ready to seize the moment.... Because they stayed during those hard years and worked the land and tapped her natural resources, millions of people have eaten better, worked in healthier places, and enjoyed warmer homes. Because those determined people did not flee the stricken area during a crisis, the nation today enjoys a better standard of living.

Bonnifield (

The Dust Bowl was the darkest moment in the twentieth-century life of the southern plains. The name suggests a place - a region whose borders are as inexact and shifting as a sand dune. But it was also an event of national, even planetary significance. A widely respected authority on world food problems, George Borgstrom, has ranked the creation of the Dust Bowl as one of the three worst ecological blunders in history. . . It cannot be blamed on illiteracy or overpopulation or social disorder. It came about because the culture was operating in precisely the way it was supposed to. . . The Dust Bowl . . . was the inevitable outcome of a culture that deliberately, self-consciously, set itself [the] task of dominating and exploiting the land for all it was worth.




The End
Thank you !