

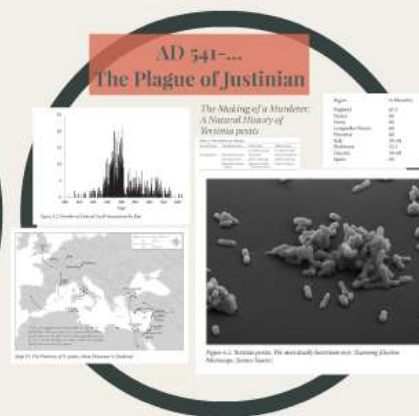
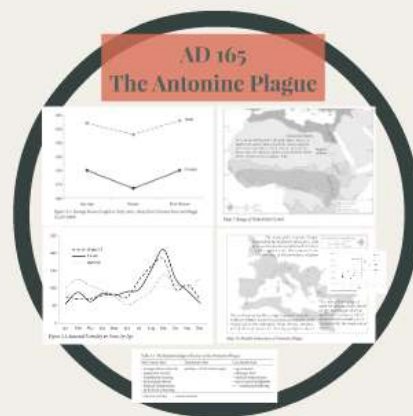
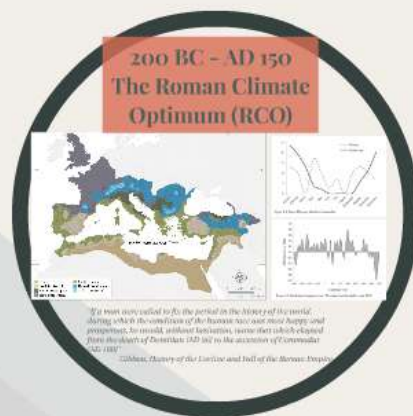
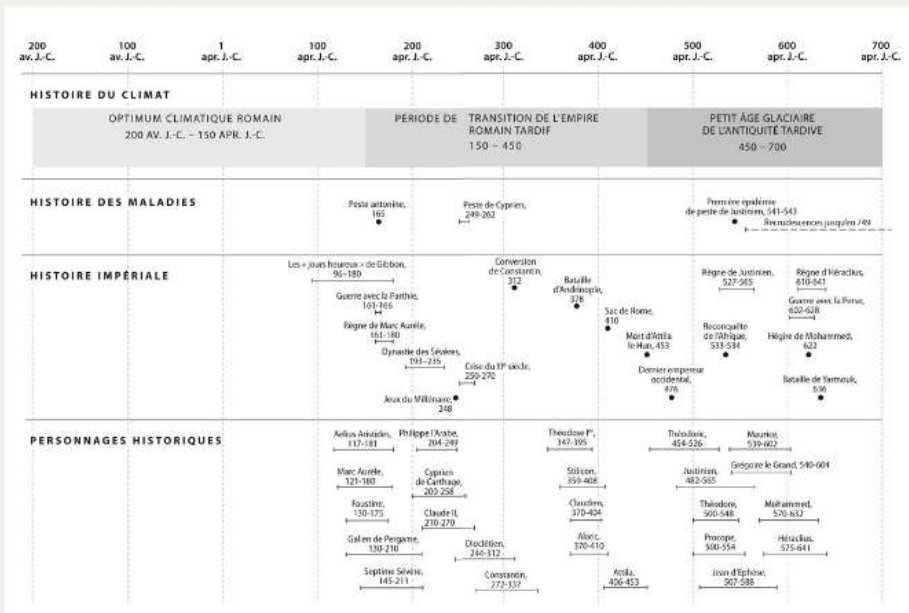


*1. Acknowledging
the complexity of
the world*

Environmental Social Sciences

Science and Society ~ Thomas Tari

The Fate of Rome



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

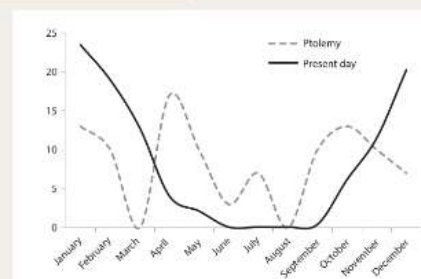
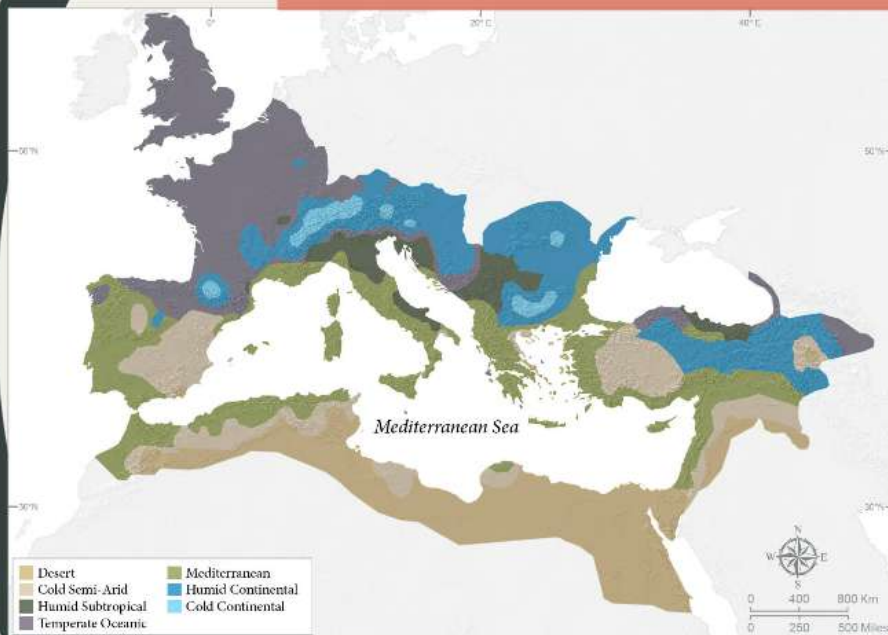


Figure 2.2. Rainy Days per Month in Alexandria

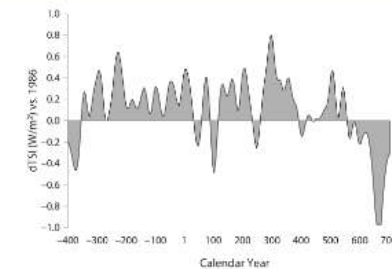


Figure 2.3. Total Solar Irradiance from ^{10}Be (data from Steinhilber et al. 2009)

"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

AD 165 The Antonine Plague

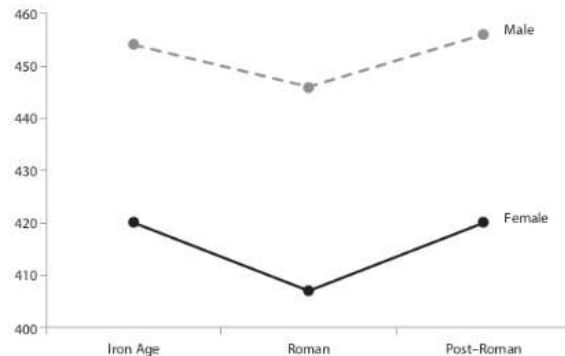


Figure 3.3. Average Femur Length in Italy (mm) (data from Giannecchini and Moggi-Cecchi 2008)

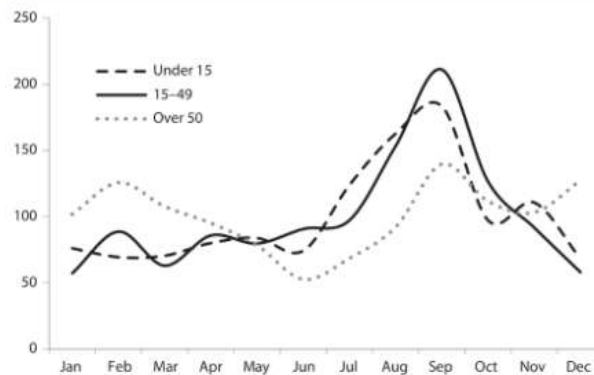
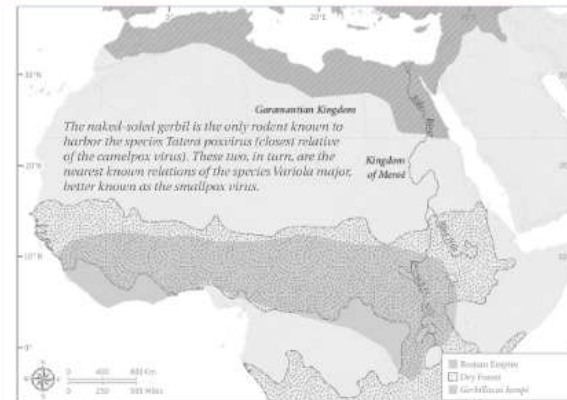
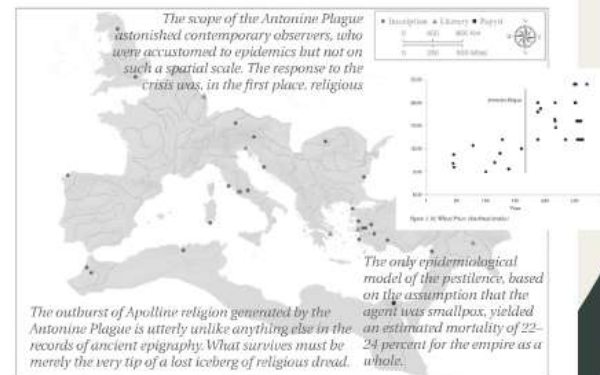


Figure 3.5. Seasonal Mortality in Rome, by Age



Map 7. Range of Naked-Sole Gerbil



Map 10. Possible Indications of Antonine Plague

Table 3.5 The Epidemiological Factors of the Antonine Plague

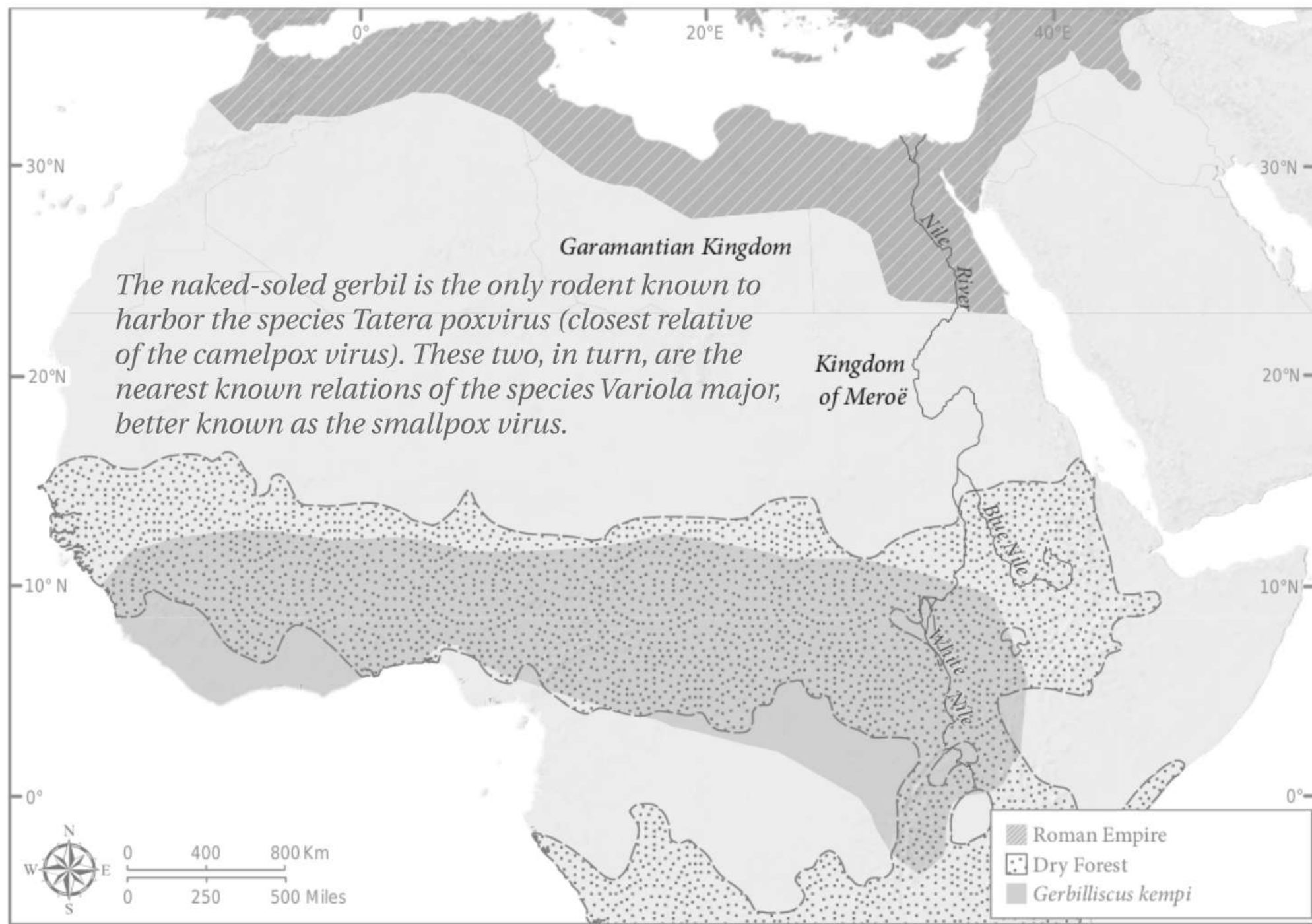
Total Contact Rate	Transmission Risk	Case Fatality Rate
+ transportation networks + population density + multifamily housing + lack of germ theory + medical infrastructure + lack of social learning	perhaps ~70 for <i>Variola major</i>	+ age structure + pathogen load - medical infrastructure - lack of social breakdown +/- nutritional buffering
+ enhanced mortality	- reduced mortality	



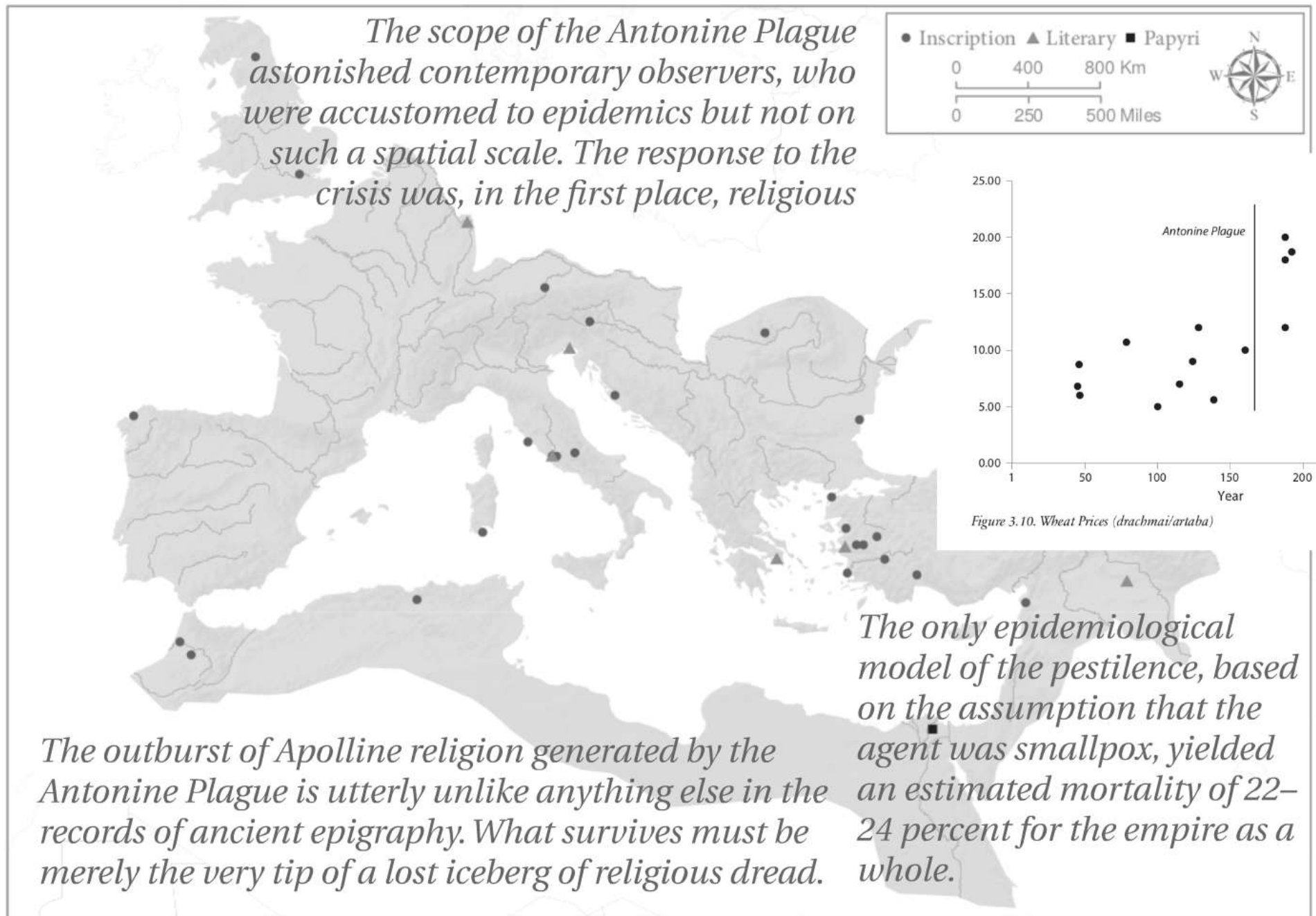
Figure 5.2. Number of...



Map 19. The Itinerary of *Y. pestis*



Map 7. Range of Naked-Sole Gerbil



Map 10. Possible Indications of Antonine Plague

Jul Aug Sep Oct Nov Dec

records of ancient epigraphy.
merely the very tip of a lost ice

Map 10. Possible Indications of A

Table 3.5 The Epidemiological Factors of the Antonine Plague

<i>Total Contact Rate</i>	<i>Transmission Risk</i>	<i>Case Fatality Rate</i>
<ul style="list-style-type: none">+ transportation networks+ population density+ multifamily housing+ lack of germ theory+ medical infrastructure+ lack of social learning	perhaps $\sim .70$ for <i>Variola major</i>	<ul style="list-style-type: none">+ age structure+ pathogen load– medical infrastructure– lack of social breakdown+ / – nutritional buffering
+ enhanced mortality	– reduced mortality	

AD 541-... The Plague of Justinian

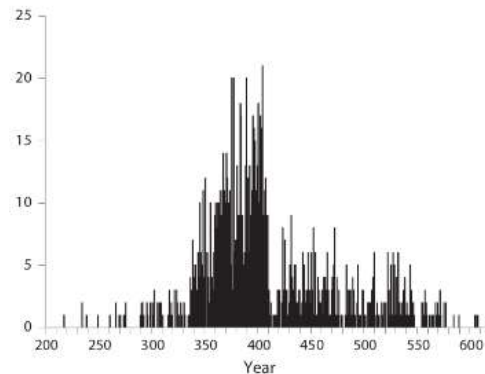


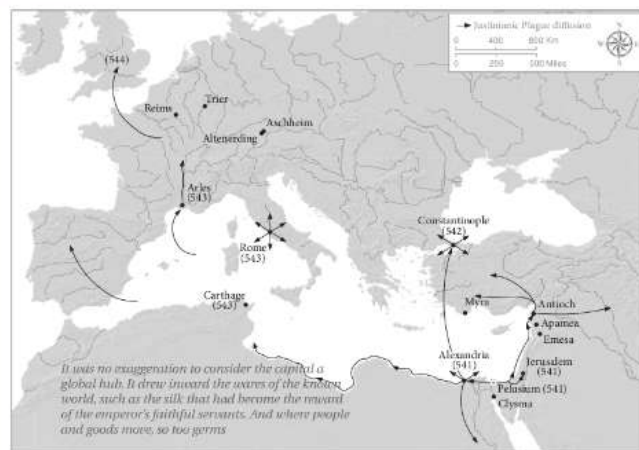
Figure 5.2. Number of Date-of-Death Inscriptions by Year

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

Table 6.1. The Evolution of a Monster

Ancestral <i>Yersinia</i>	<i>Y. pseudotuberculosis</i>	Early <i>Y. pestis</i>	Modern <i>Y. pestis</i>
Non-pathogenic	Self-limiting enteric pPV (builds T3SS) Fights gastric immune defense	ca. 55,000 years ago Pneumonic pPCP1 (builds pti) Aggressively invades and destroys tissue	ca. 3,000 years ago Pneumonic/bubonic pMT1 (builds ymt) Survives in flea gut

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



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

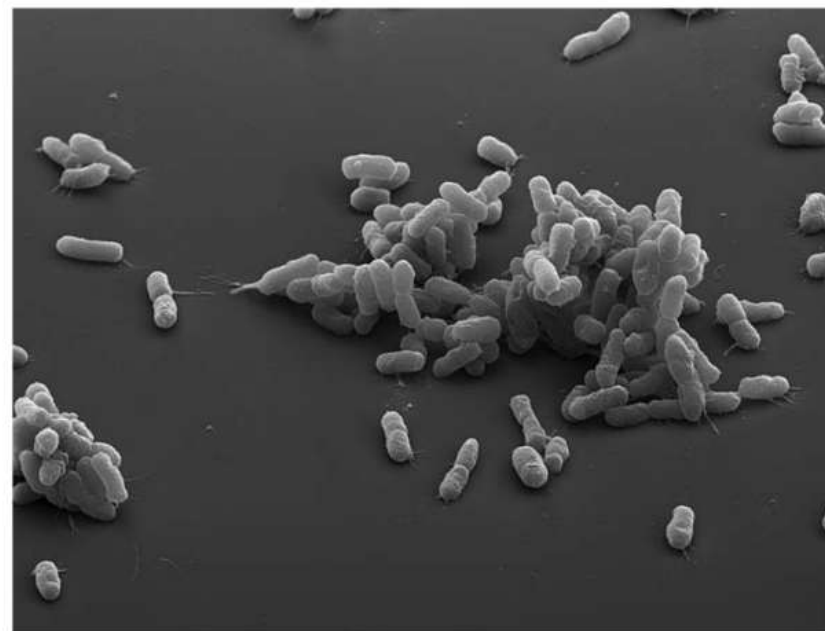
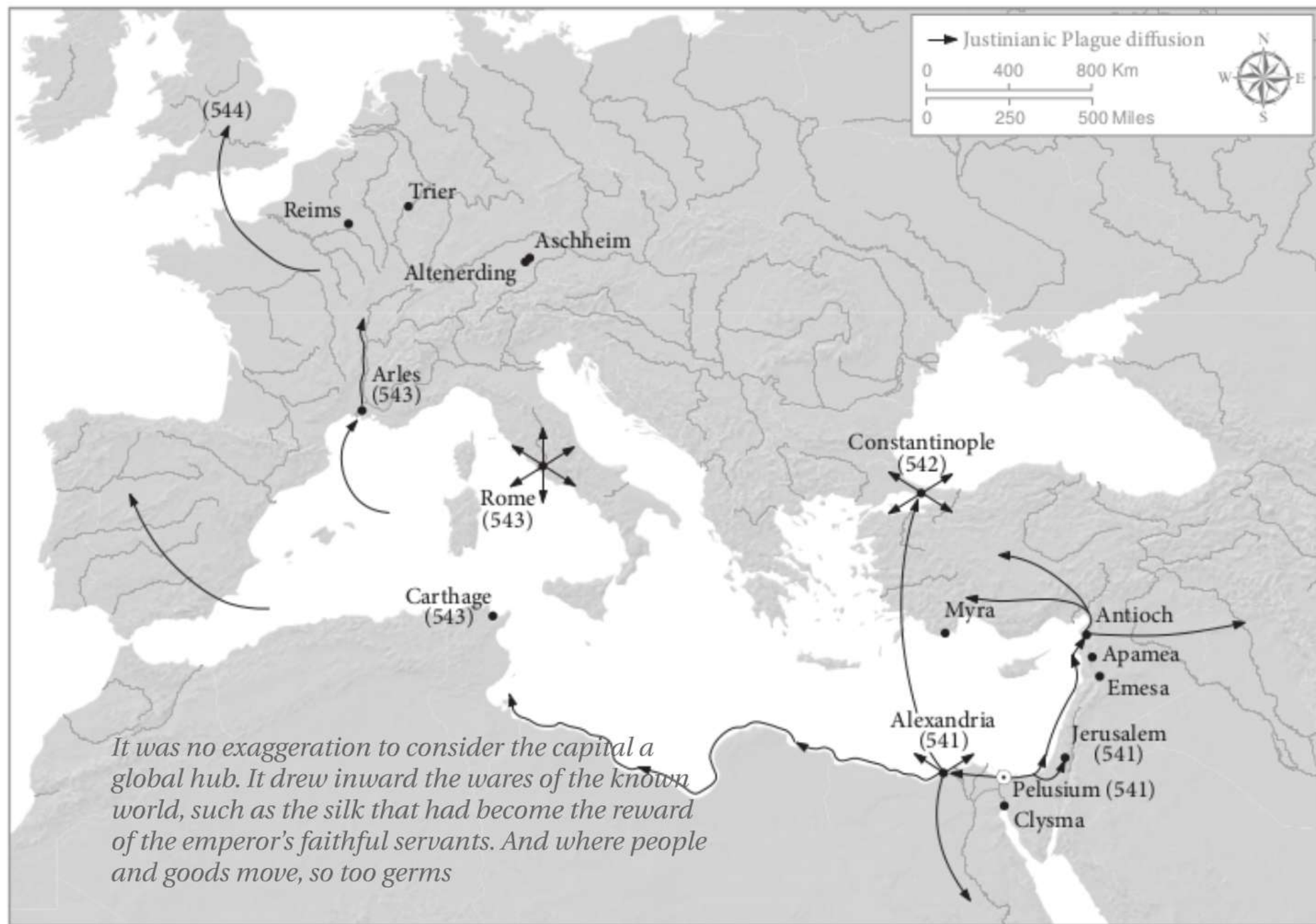
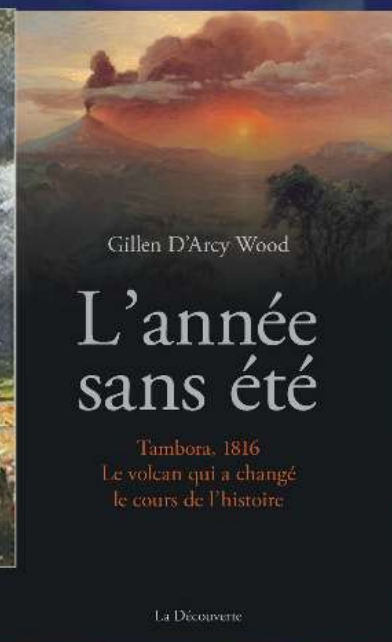
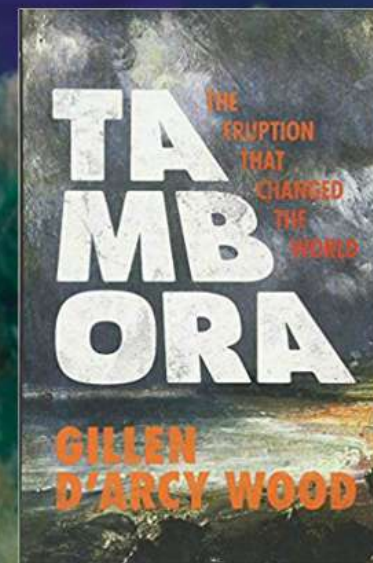
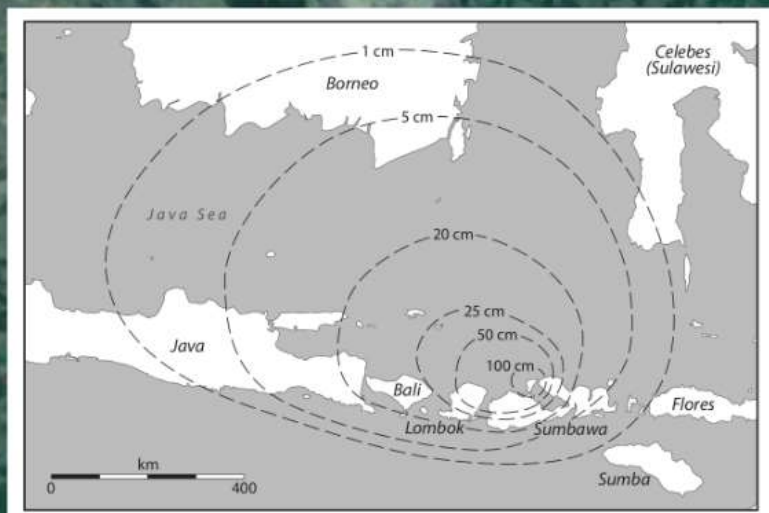
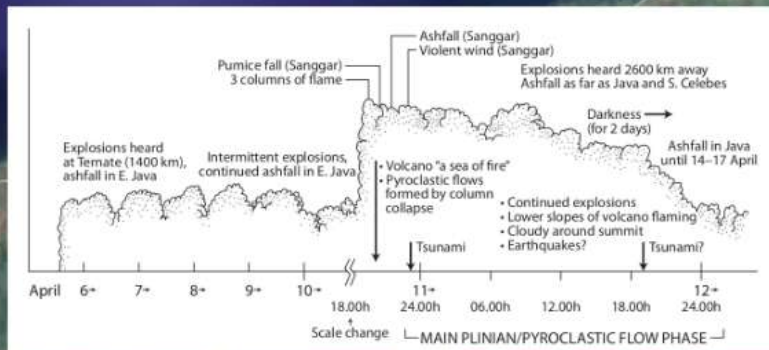


Figure 6.2. *Yersinia pestis*. The most deadly bacterium ever. (Scanning Electron Microscope, Science Source)



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



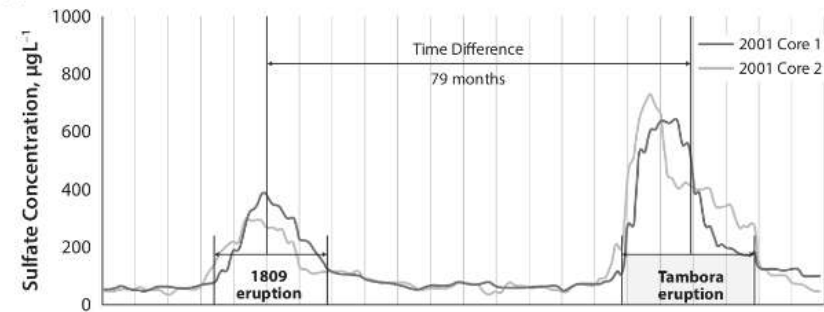
Mount
Tambora

The Little (Volcanic) Ice Age

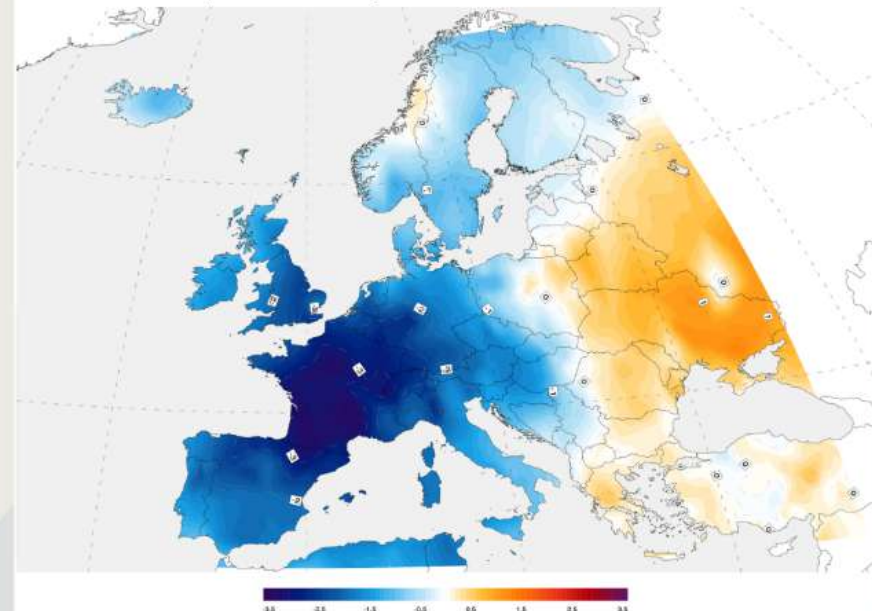


In June 1816, "incessant rainfall" during that "wet, ungenial summer" forced Mary Shelley, Percy Bysshe Shelley, Lord Byron and John William Polidori, and their friends to stay indoors at Villa Diodati overlooking Lake Geneva for much of their Swiss holiday.

(b) South Pole Antarctica



1816 Summer Temperature Anomaly



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*



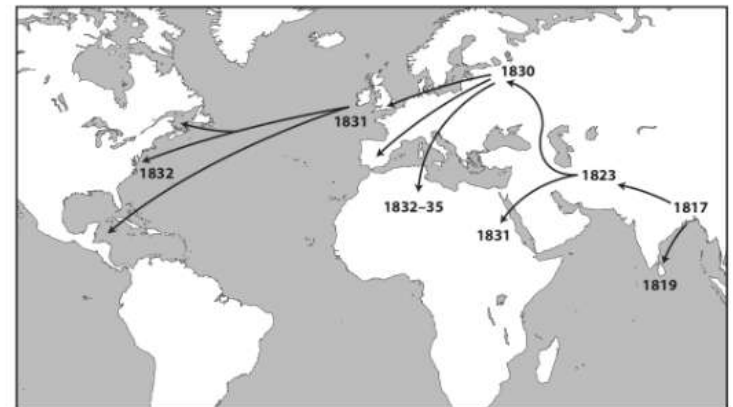
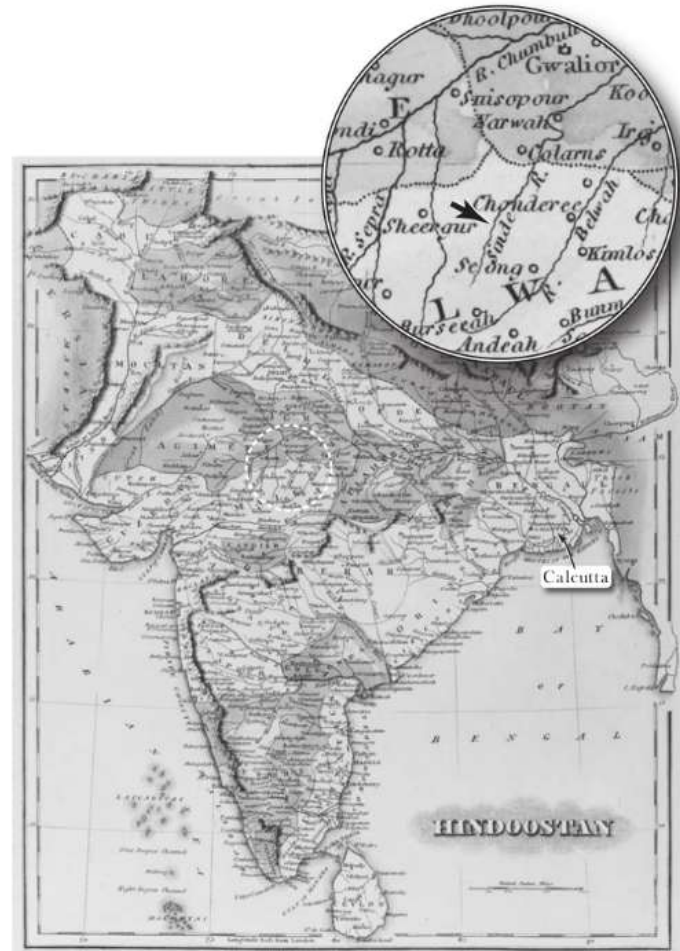
Blue Death in Bengal

- 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



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

RULE OF EXPERTS

EGYPT,
TECHNO-POLITICS,
MODERNITY
TIMOTHY MITCHELL

Environmental Social Sciences

Science and Society

2. Objectivity beyond Nature and Culture



Thomas Tari

Historicizing Objectivity

WHAT IS OBJECTIVITY ?

the absence of bias a rational method
non-subjectivity an ideal
an universal point of view an empirical approach of facts
a moral requirement
the prerogative of the hard sciences

OBJECTIVITY IS NOT A GIVEN... IT HAS AN HISTORY

Truth to Nature?

The typical, the ideal,
the characteristic, the average.

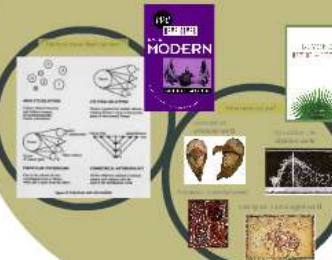


Mechanical Objectivity



Objectivity
L. Daston & P. Galison,
MIT Press, 2007

PERSPECTIVES IN ANTHROPOLOGY



OBJECTIVITY IN SOCIETY

Objectivity is produced in scientific,
political and social places :

- labs
- regulatory agencies
- courts
- media...



All encyclopedic content on
Wikipedia must be written from
a neutral point of view (NPOV),
which means "representing
fairly, proportionately, and, as
far as possible, without editorial
bias, all of the significant views
that have been published by
reliable sources on a topic."



YouTube

WHAT IS OBJECTIVITY ?

the absence of bias

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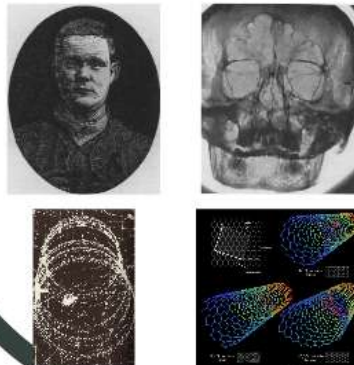
IT HAS AN HISTORY

Truth to Nature?

The typical, the ideal,
the characteristic, the average



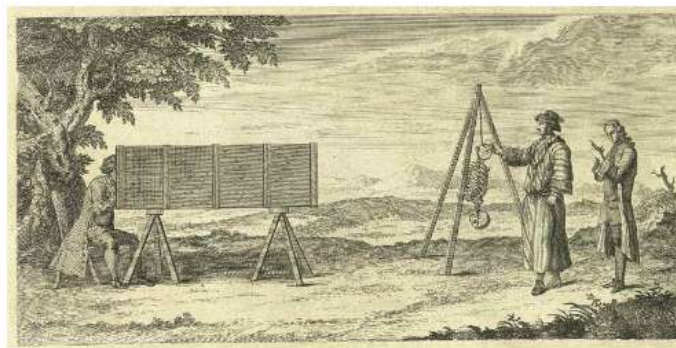
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Objectivity
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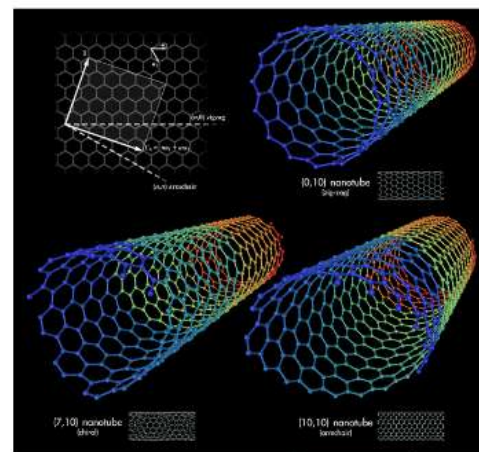
The typical, the ideal,
the characteristic, the average



Mechanics

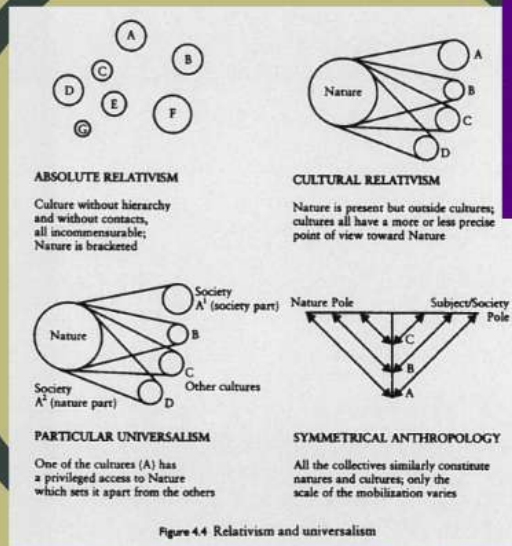


Mechanical Objectivity



PERSPECTIVES IN ANTHROPOLOGY

We have never been modern



Who owns nature?

Animism: an animated world



Naturalism: an objective world



Totemism: a divided world



Analogism: an entangled world



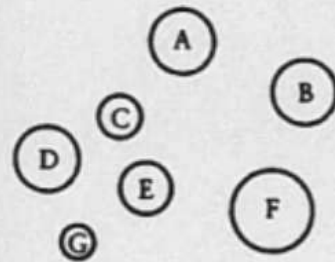
We have never been modern

HAVE NEVER
been
MODERN



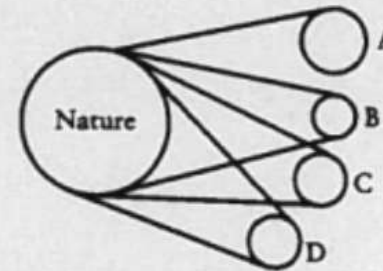
BRUNO LATOUR

TRANSLATED BY CATHERINE PORTER



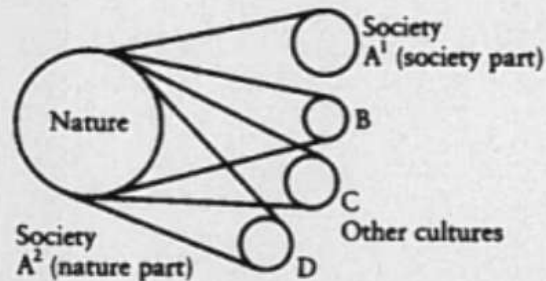
ABSOLUTE RELATIVISM

Culture without hierarchy and without contacts, all incommensurable; Nature is bracketed



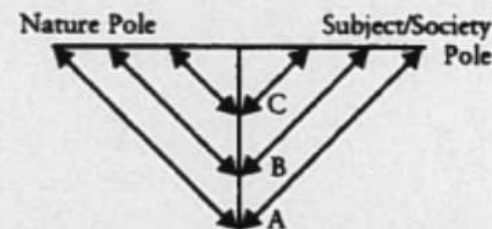
CULTURAL RELATIVISM

Nature is present but outside cultures; cultures all have a more or less precise point of view toward Nature



PARTICULAR UNIVERSALISM

One of the cultures (A) has a privileged access to Nature which sets it apart from the others



SYMMETRICAL ANTHROPOLOGY

All the collectives similarly constitute natures and cultures; only the scale of the mobilization varies

Figure 4.4 Relativism and universalism

Animism
animism



Totemism : a



c
D
A
de cultures;
less precise
re

Subject/Society
Pole

POPOLOGY

constitute
the
aries

BRUNO LATOUR

TRANSLATED BY CATHERINE PORTER

Who owns nature?

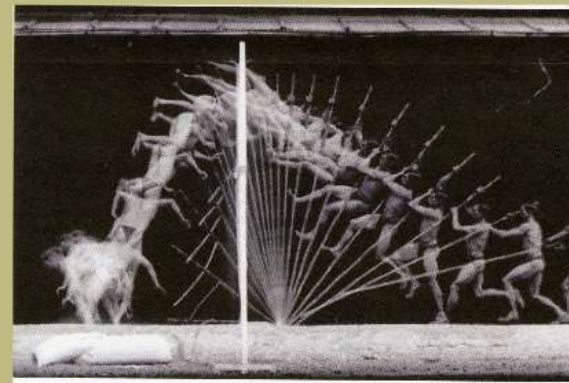
PHILIPPE DESCOLA

Translated by Janet Lloyd
Foreword by Marshall Sahlins

Animism: an
animated world



Naturalism : an
objective world



Totemism : a divided world



Analogism : an entangled world



OBJECTIVITY IN SOCIETY

Objectivity is produced in scientific, political and social places :

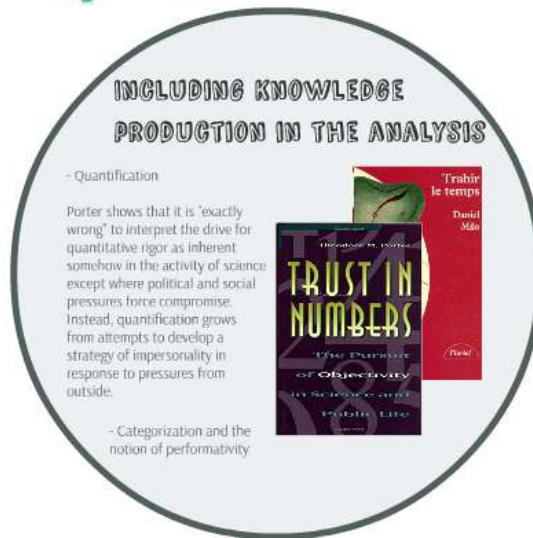
- labs
- regulatory agencies
- courts
- media...



All encyclopedic content on Wikipedia must be written from a neutral point of view (NPOV), which means "representing fairly, proportionately, and, as far as possible, without editorial bias, all of the significant views that have been published by reliable sources on a topic."



YouTube



CONCLUSION:

REFLEXIVE

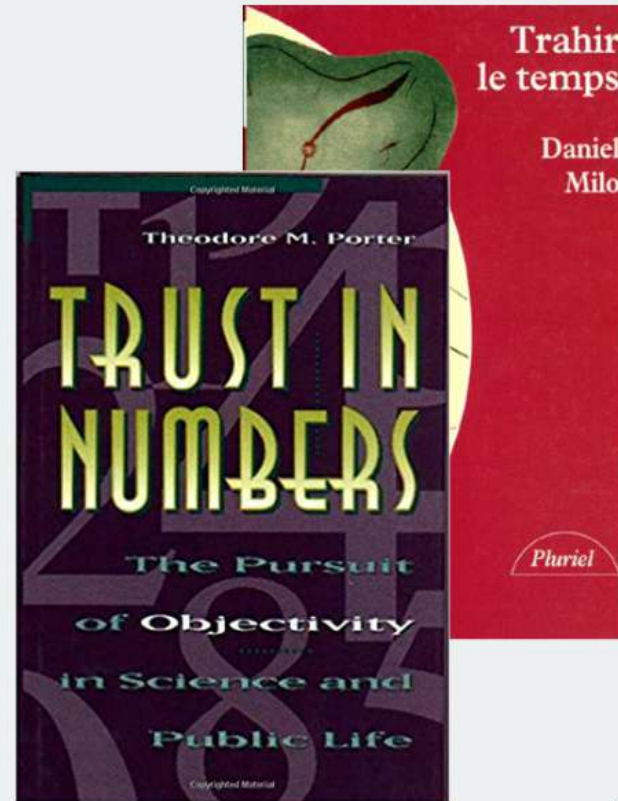
SOCIAL SCIENCES

INCLUDING KNOWLEDGE PRODUCTION IN THE ANALYSIS

- Quantification

Porter shows that it is "exactly wrong" to interpret the drive for quantitative rigor as inherent somehow in the activity of science except where political and social pressures force compromise. Instead, quantification grows from attempts to develop a strategy of impersonality in response to pressures from outside.

- Categorization and the notion of performativity



SCIENCE AND SOCIETY

In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.

*Principle 15
The Rio Declaration, 1992*

THANKS !

ACTING
IN AN
UNCERTAIN
WORLD

AN ESSAY ON TECHNICAL DEMOCRACY

Michel Callon, Pierre Lascoumes,
and Yannick Barthe

translated by Graham Burchell

