



# A Historical Crisis Database for Testing Theories of Collapse

Peter Turchin

April 2019



# Two questions

- What is social complexity?
  - Quantifying the evolution of social complexity with the Seshat Databank
- What is collapse?
  - Building a Crisis/Recovery Database to test theories of state breakdown



THE EVOLUTION INSTITUTE  
UNDERSTANDING AND IMPROVING THE HUMAN CONDITION



## SESHAT: Global History Databank



The huge corpus of knowledge about past societies collectively possessed by academic historians is almost entirely in a form that is inaccessible to scientific analysis, stored in historians' brains or scattered over heterogeneous notes and publications. The huge potential of this knowledge for testing theories about political and economic development has been largely untapped.

### Project goals:

- Build a web of facts about past societies, connected along spatial, temporal, and conceptual dimensions
- Survey diversity in social evolutionary trajectories and identify general patterns
- Test and reject theories of sociocultural evolution



**Seshat**

*Seshat: The Global  
History Databank*

# World Sample-30

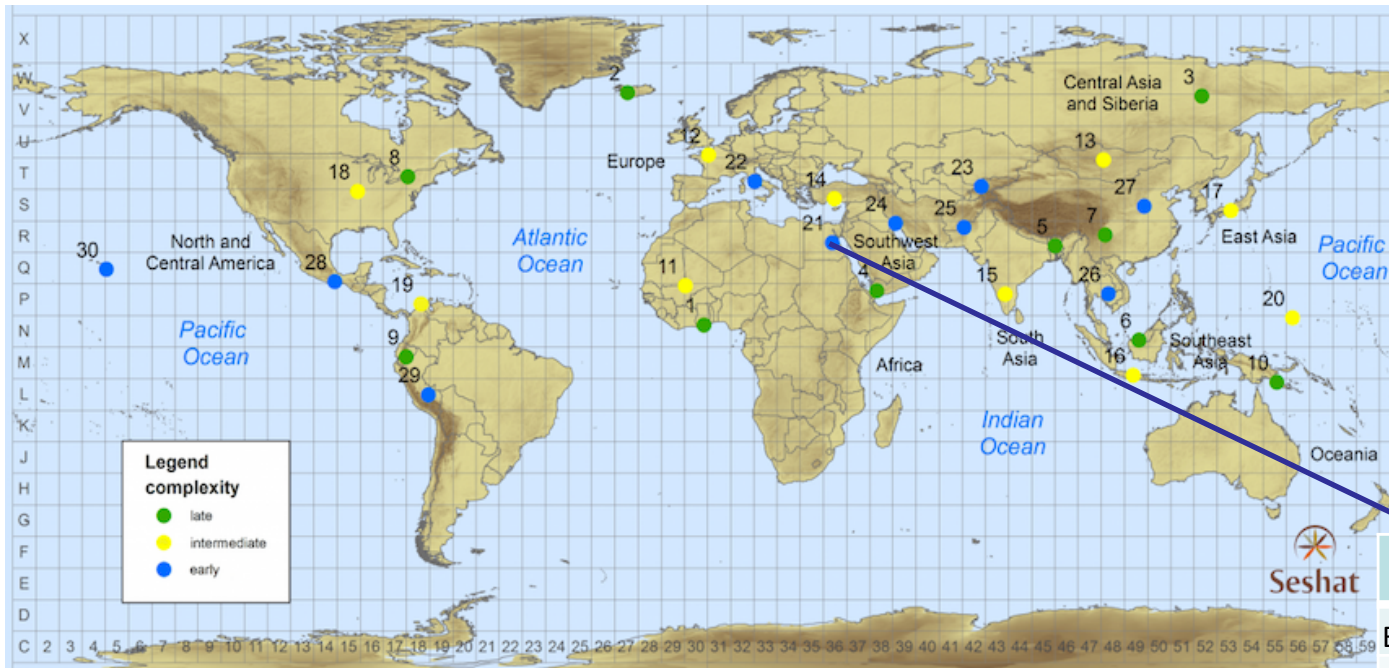


## Stratified sample

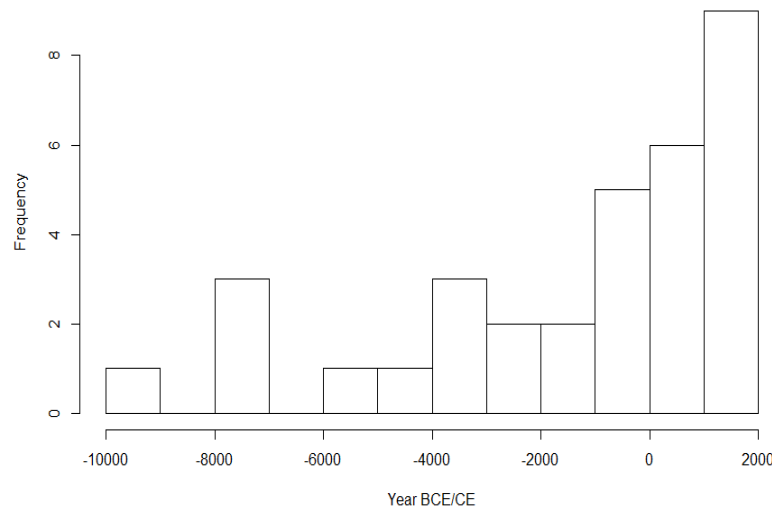
- by 10 world regions
- by the antiquity of centralized societies (early, intermediate, late)

## A Global Sample of the Historical and Archaeological Record

## Constructing a spatio-temporal dataset



At each sample point we code societies that occupied the area from the Neolithic to the Industrial Revolution. For example, Upper Egypt's polities range from the Badarian to the Ottoman Empire.



Polity	Start date	End date
Badarian	-4400	-3801
Naqada IA-IIB	-3800	-3551
Naqada IIC-D	-3550	-3301
Dynasty 0 (Naqada IIIA-B)	-3300	-3101
Dynasty I (Naqada IIIC)	-3100	-2901
Dynasty II (Early Dynastic)	-2900	-2651
Classic Old Kingdom	-2650	-2351
Late Old Kingdom	-2350	-2151
First Intermediate	-2150	-2017
Middle Kingdom	-2016	-1700
Second Intermediate	-1720	-1567
New Kingdom-Thutmosid	-1550	-1294
New Kingdom-Ramesside	-1293	-1071
...		
Ottoman Empire III	1683	1839

# Seshat Status, April 2019

- 34 NGAs
- 450 (quasi)polities
- 1500 variables
- ~300,000 Seshat records



## **Social Scale**

Polity population

Polity territory

Capital population

## **Levels of hierarchy**

Admin levels

Military levels

Religious levels

Settlement hierarchy

# **Social Complexity**

## **Government**

ProfOfficers

ProfSoldiers

ProfPriest

Bureaucrats

ExamSyst

MeritProm

GovtBuilding

Court

LegCode

Judges

Lawyers

## **Writing**

Mnemonic

Lists

Records

Script

Alphabet

Non-phonetic

## **Texts**

Calendar

Sacred texts

Religious Lit

Practical Lit

Science Lit

History

Philosophy

Fiction

## **Infrastructure**

Irrigation

Water supply

Market

Food storage

Roads

Bridges

Canals

Ports

Mines

## **Money**

1. Articles

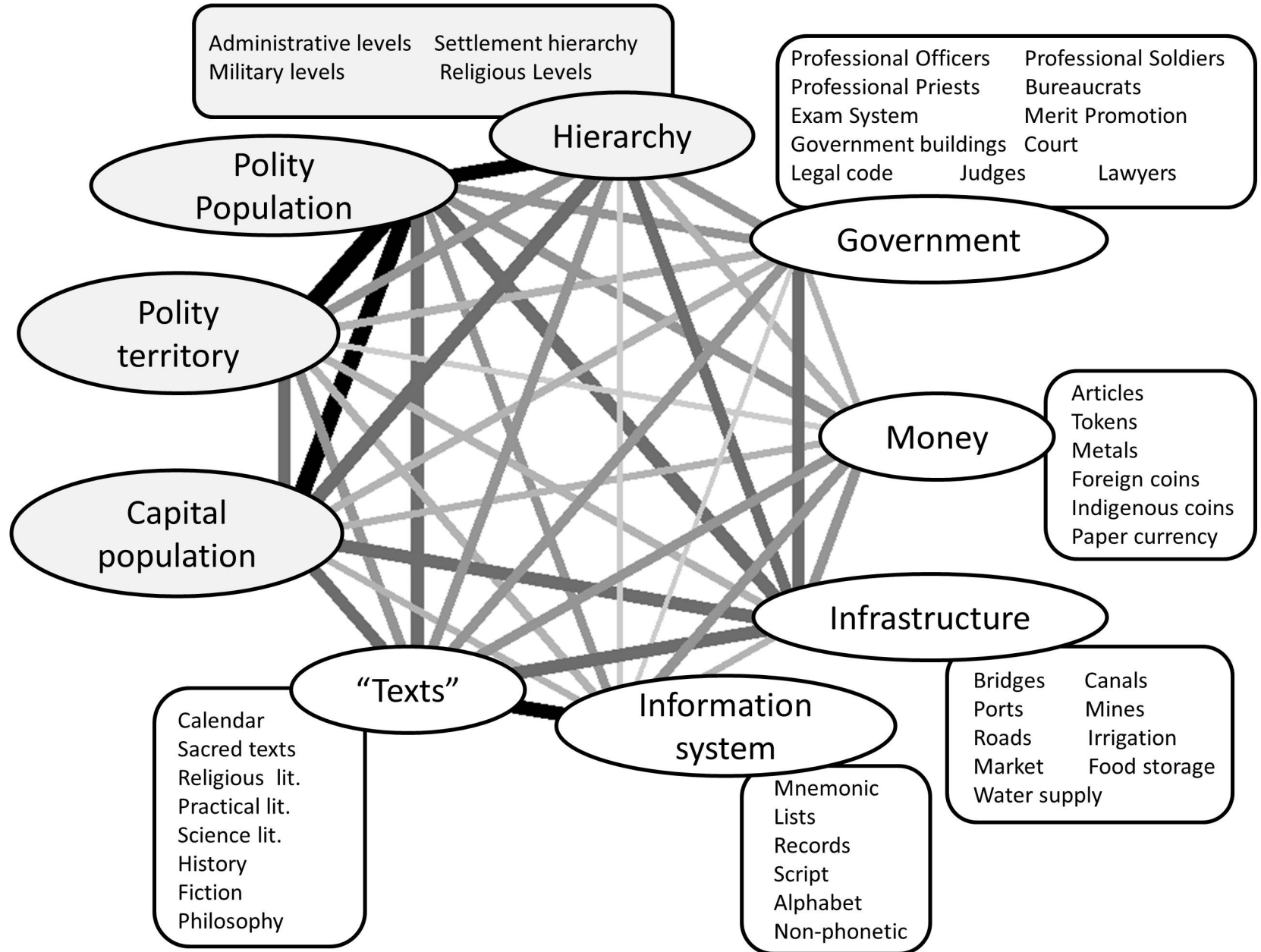
2. Tokens

3. Metals

4. Foreign coins

5. Indigenous coins

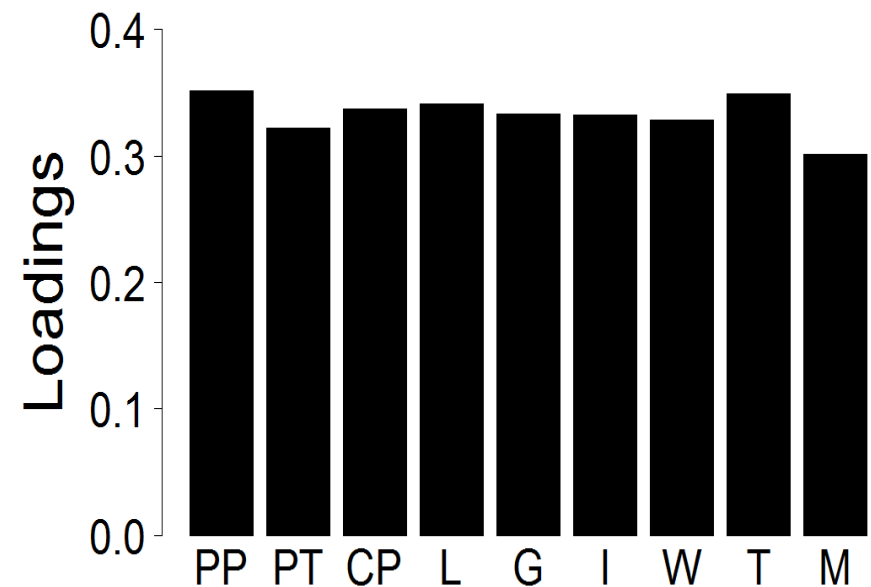
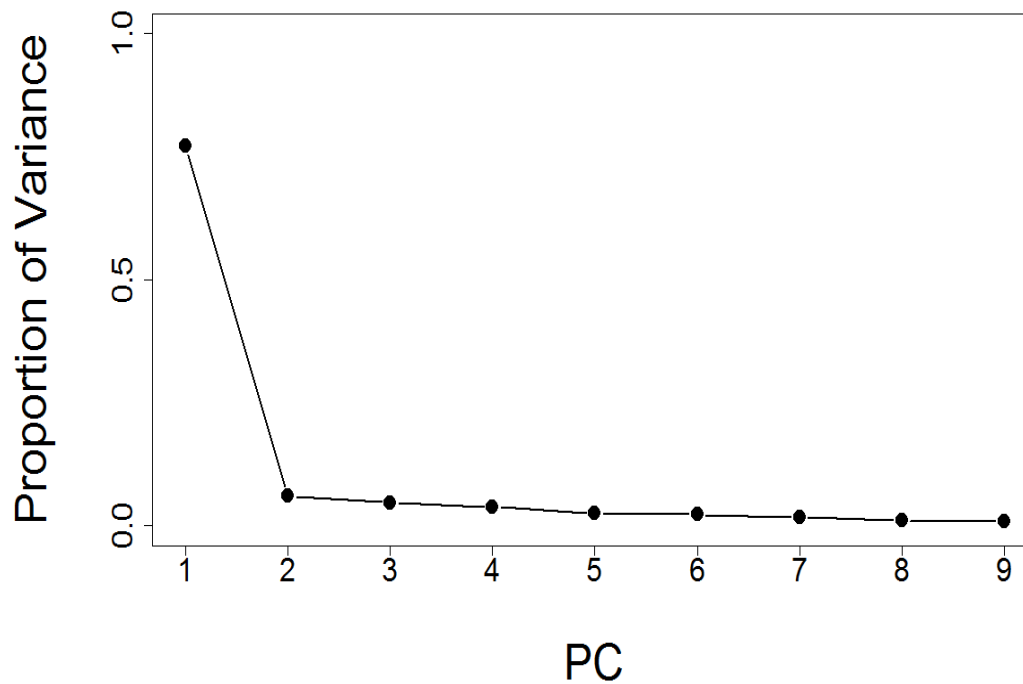
6. Paper currency

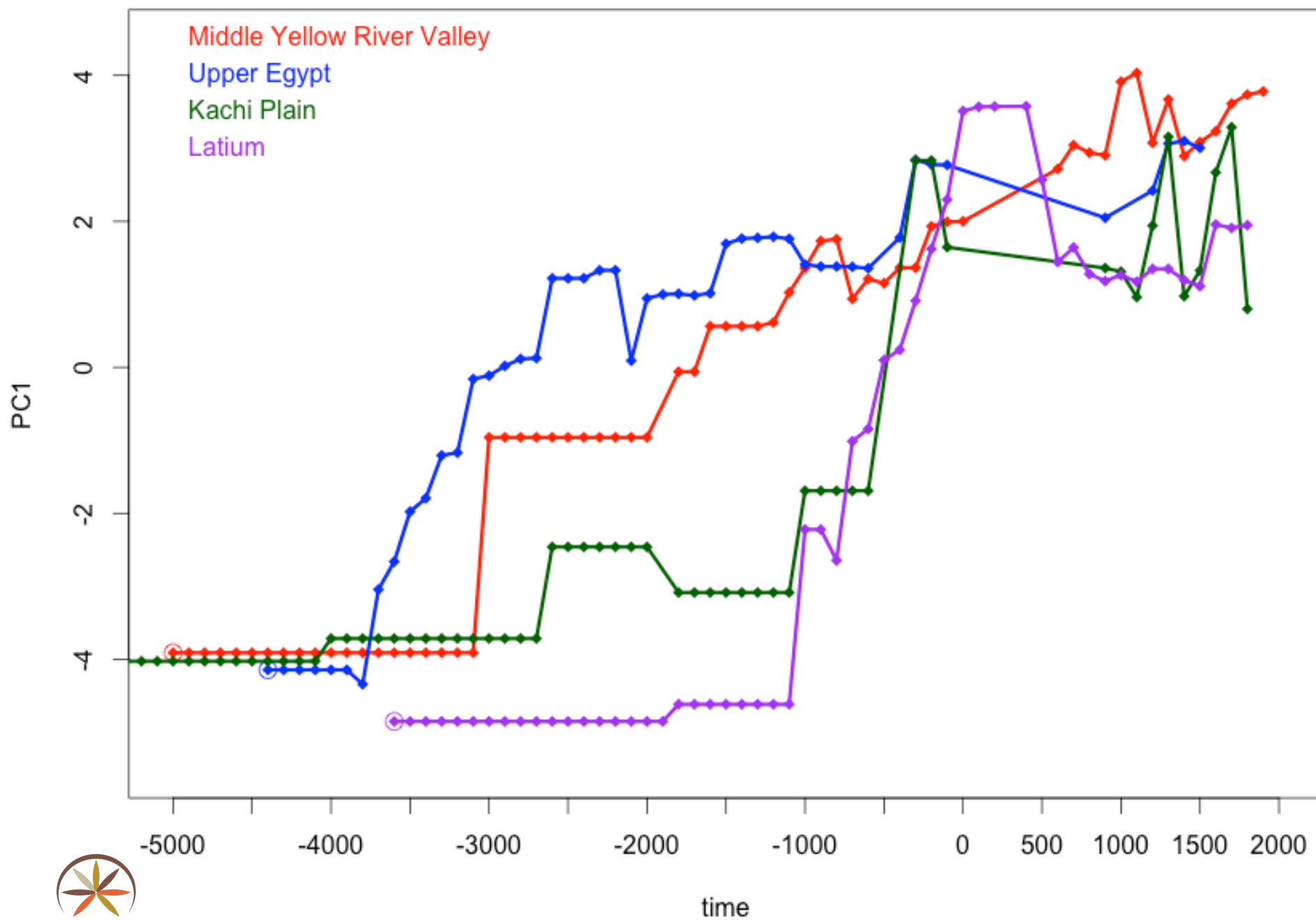




# Principal Component Analysis

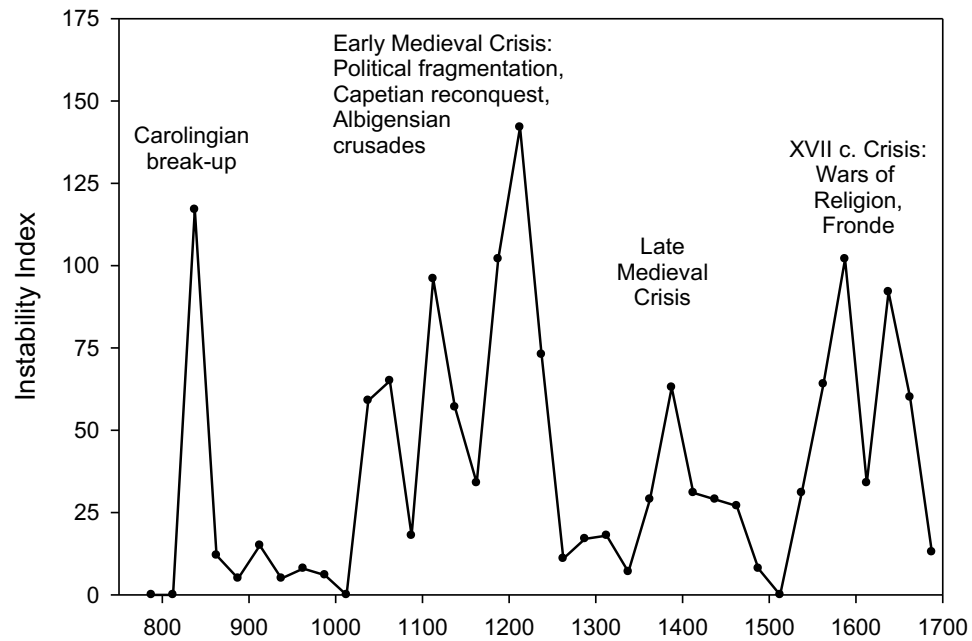
	PC1	PC2	PC3	PC4	PC5
<b>Proportion of Variance</b>	<b>0.77</b>	<b>0.06</b>	<b>0.05</b>	<b>0.03</b>	<b>0.02</b>
<b>Cumulative Proportion</b>	<b>0.77</b>	<b>0.83</b>	<b>0.88</b>	<b>0.91</b>	<b>0.94</b>





# Recurrent waves of state breakdown and civil war

Instability Waves in France (Sorokin's Index)





# REVOLUTION AND REBELLION IN THE EARLY MODERN WORLD

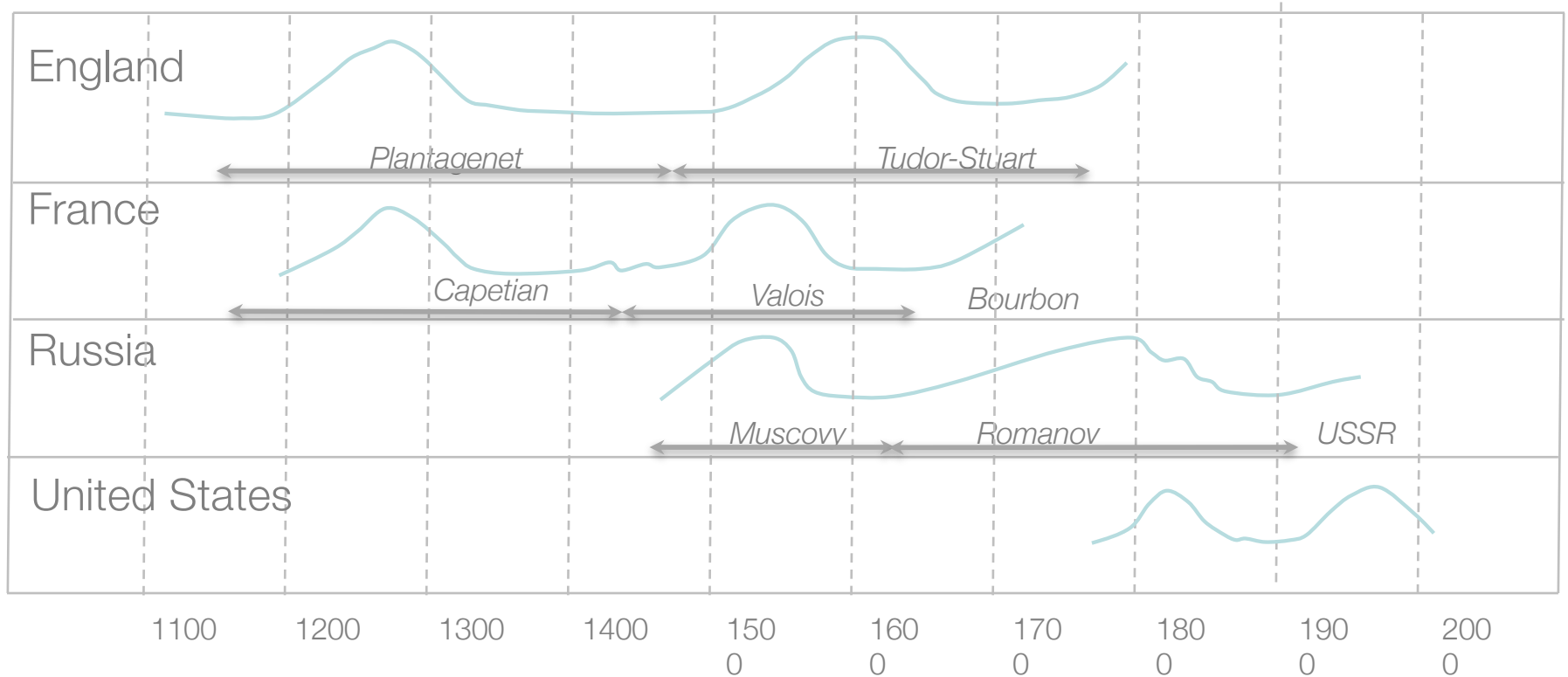
JACK A. GOLDSTONE

# SECULAR CYCLES

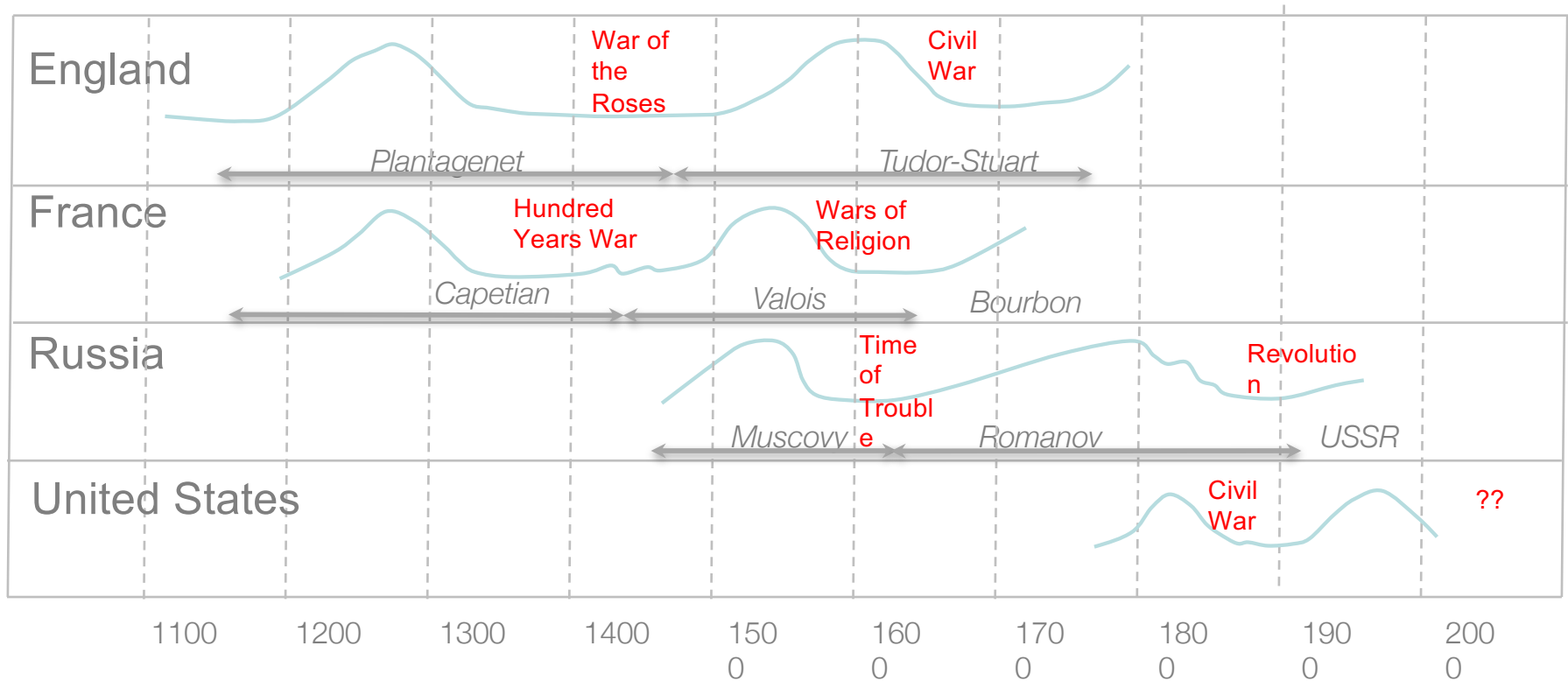
Peter Turchin and Sergey A. Nefedov



## Cycles of well-being/low inequality – immiseration/high inequality



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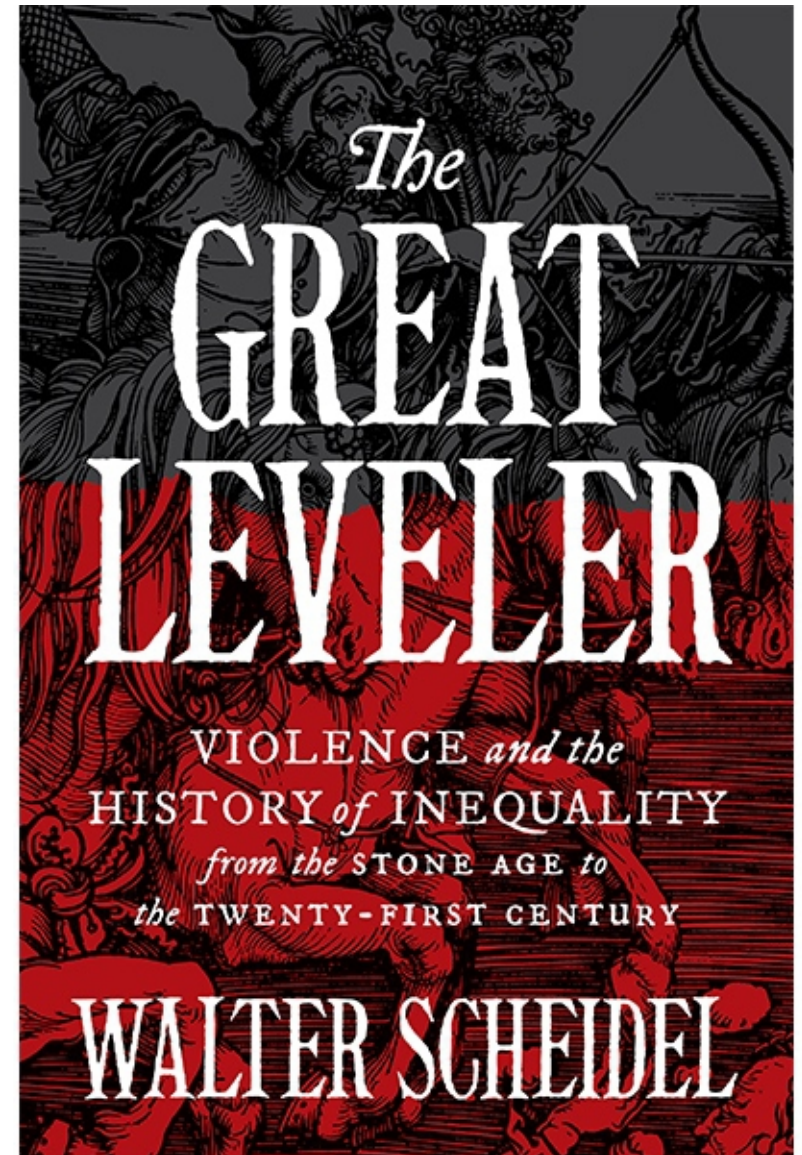


The pessimistic view:  
“Death is the Great Leveler”

Inequality can decrease only by  
major, violent shocks:

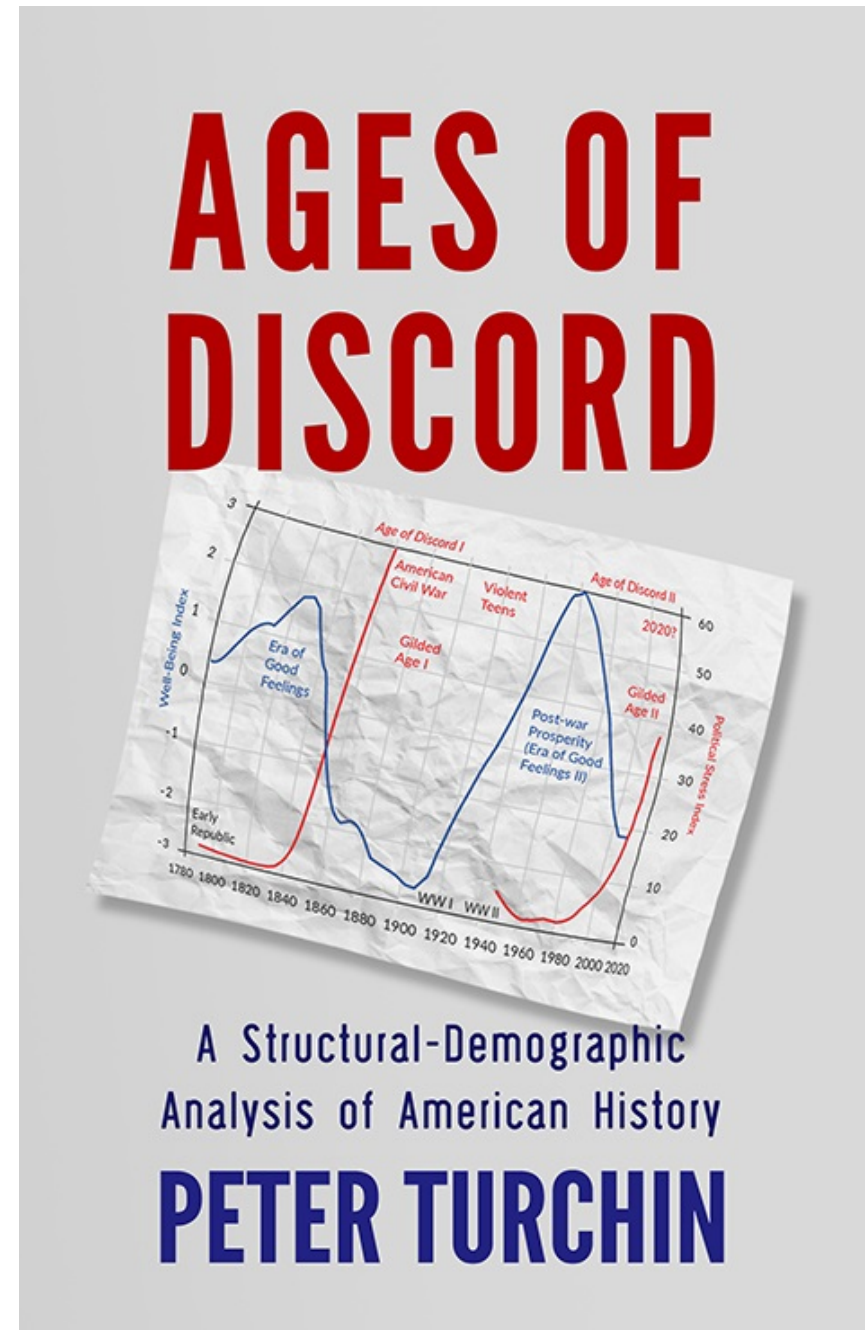
- Mass-mobilization warfare
- Transformative revolution
- State failure/collapse
- Lethal pandemic

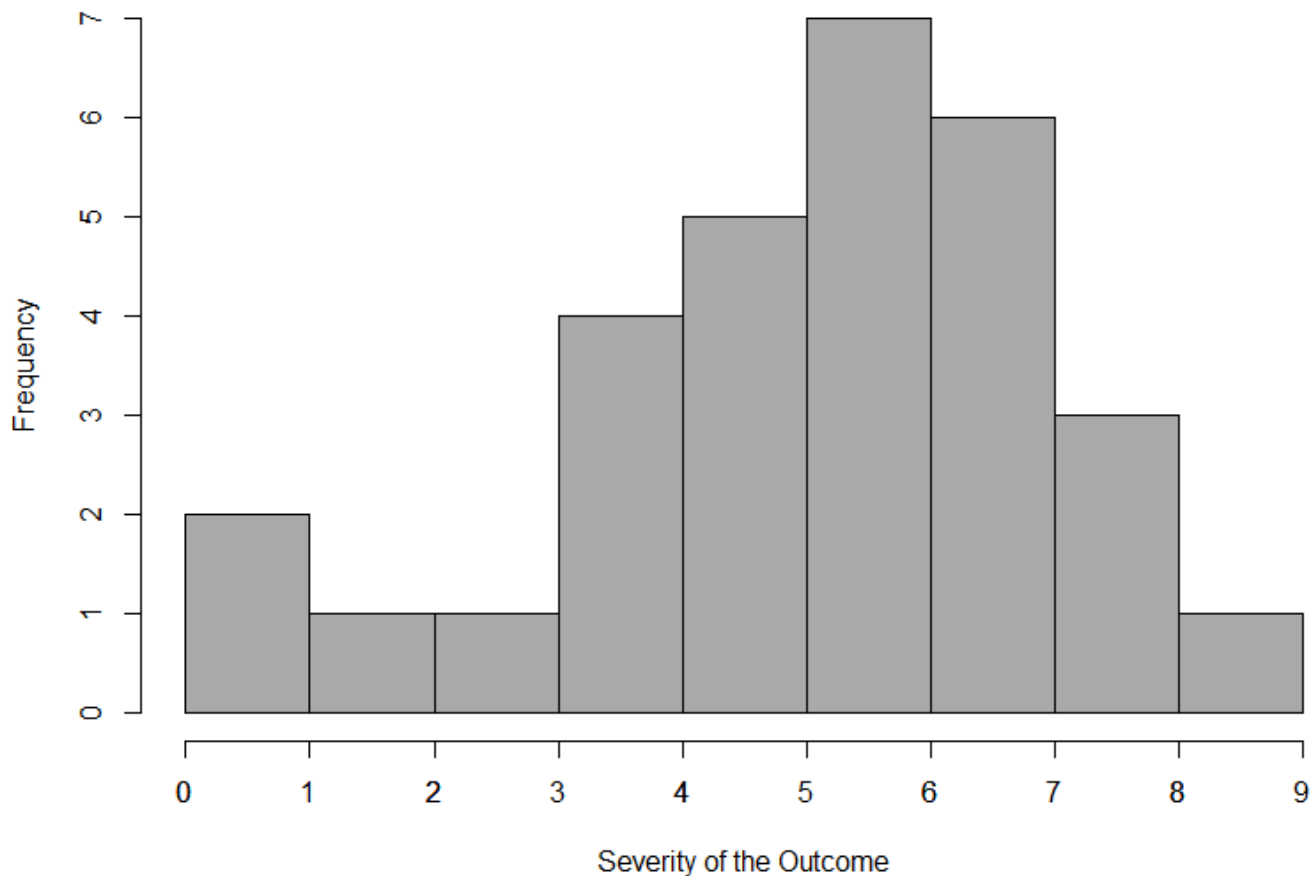
Note: I see inequality as a “proxy” (indicator) of  
social pressures undermining stability, rather than a  
direct cause of it



## A somewhat less pessimistic view

- Entry into crisis (“revolutionary situation”) is relatively stereotypical
  - mass-mobilization, intra-elite conflict, state fragility
- The exit from the crisis is hugely contingent
  - a “fan” of possible outcomes: from relatively mild to catastrophic





## Sample:

30 societies experiencing revolutionary situations (Europe, Russia, Middle East, India, China, US)

## Severity components of the outcome:

Population decline

Population decline > 50%

Lethal epidemic

Elite: massive downward mobility

Elite: dispossession or extermination

Ruler executed or assassinated

Transformative revolution

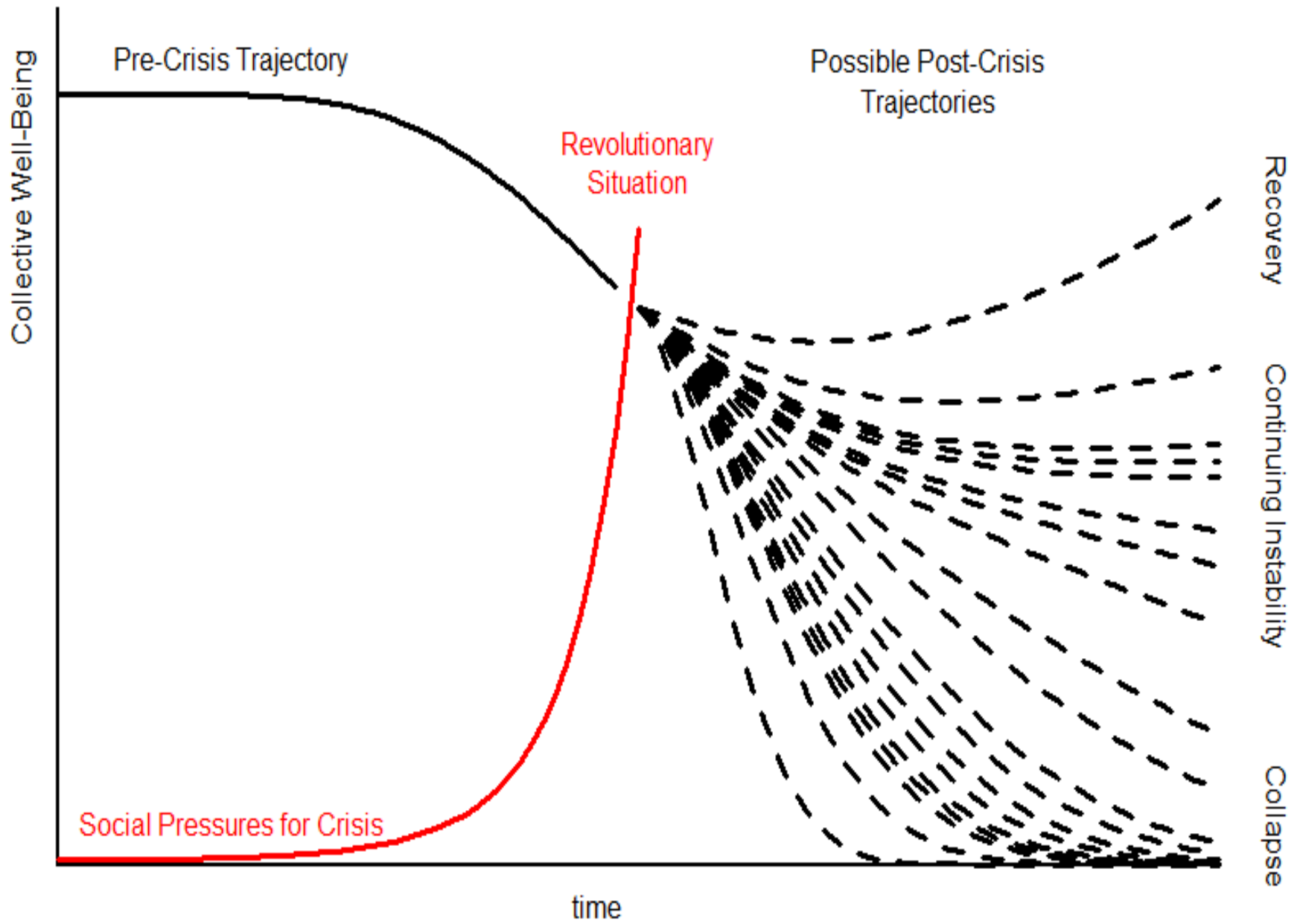
Civil war

Prolonged civil wars (>100 years)

Territorial fragmentation

External conquest





# Forecast: growing political instability to the 2020s

OPINION

NATURE|Vol 463|4 February 2010

## CORRESPONDENCE

Our decadal research predictions ('2020 visions' *Nature* **463**, 26–32; 2010) provoked ideas — and ire.

### Political instability may be a contributor in the coming decade

The next decade is likely to be a period of growing instability in the United States and western Europe, which could undermine the sort of scientific progress you describe in the Opinion collection of '2020 visions'.

Quantitative historical analysis reveals that complex human societies are affected by recurrent — and predictable — waves of political instability (P. Turchin

burgeoning public debt, can be addressed by making tax rates more progressive. And we should not expand our system of higher education beyond the ability of the economy to absorb university graduates. An excess of young people with advanced degrees has been one of the chief causes of instability in the past.

**Peter Turchin** Department of Ecology and Evolutionary Biology, University of Connecticut, Storrs, Connecticut 06269, USA  
e-mail: [peter.turchin@uconn.edu](mailto:peter.turchin@uconn.edu)

therefore support development of as many technologies as possible.  
**Dietrich Leibfried** National Institute of Standards and Technology, Boulder, Colorado 80305, USA  
e-mail: [dil@boulder.nist.gov](mailto:dil@boulder.nist.gov)

### Expanded view of universities would be more realistic

Tertiary education is poised for greater changes during the next decade than John Hennessey's vision implies (*Nature* **463**, 28–29;

for better representation.

Diversity among thought leaders is there if you look for it. You no longer have to look far among academics. Today, for example, women of vision are heads of the Massachusetts Institute of Technology; Harvard, Princeton and Brown universities; and the universities of Michigan, Pennsylvania and Cambridge.

Consider the Nobel prize. In 2009, it was awarded to five women (three of them scientists) and eight men, the narrowest gender gap since its inception.

The scientific community in