

**The genesis of governments in human history:  
seeking the human face of complexity in the past  
Samuel Wilson**



**Complexity  
Science and the  
Exploration of the  
Emerging World,  
April 04**





THE CHINESE FACTORY in the Street of Temu-chan at Nagasaki. Founded in 1638.

# Social Hierarchy



# Economy



# Political org.

- Bureaucracy
- Decision making hierarchies
- Taxation
- Storage

1948 U.S. Individual Income Tax Return 2000

Label: [Name, Address, City, State, ZIP]

Personal Information: [Name, Social Security Number, Date of Birth, Marital Status]

Filing Status: [Single, Married, etc.]

Exemptions: [Number of Exemptions]

Income: [Wages, Dividends, etc.]

Deductions: [Mortgage Interest, Charitable Contributions, etc.]

Taxes: [Federal Income Tax, State Income Tax, etc.]



# Urbanism



# Urban architecture



Tenochtitlan, 500 A.D.



Catal Hüyük, 4000 B.C.



# Markets



# Religion



# Military



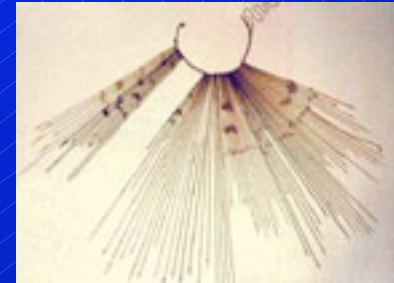
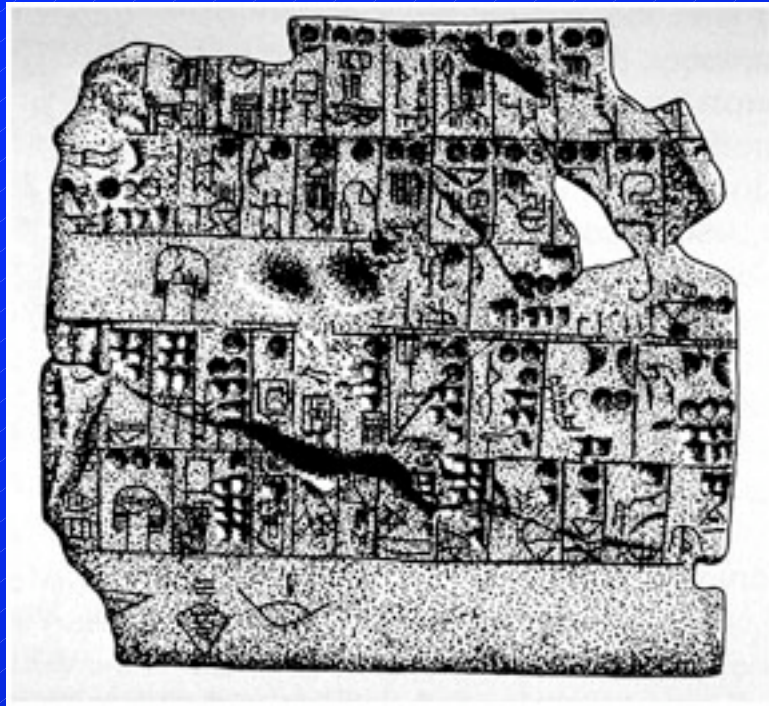
Mayan



Sumerian



# Literacy



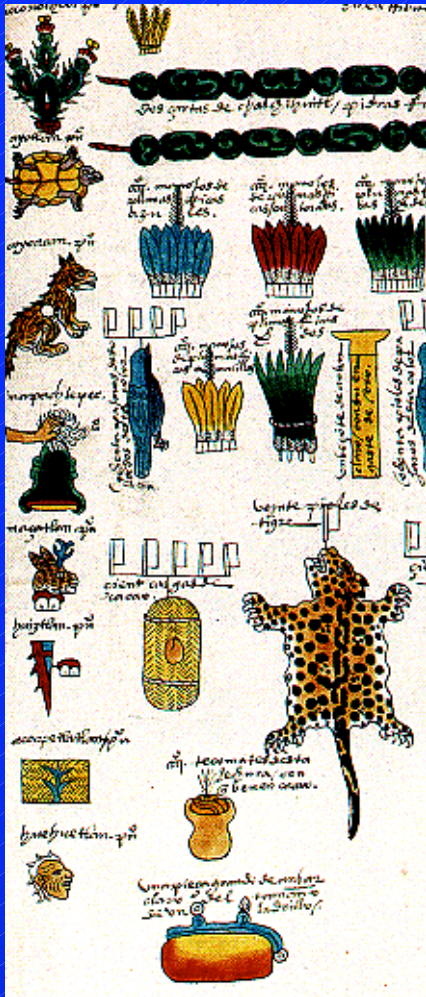
From Uruk, 3200 B.C.



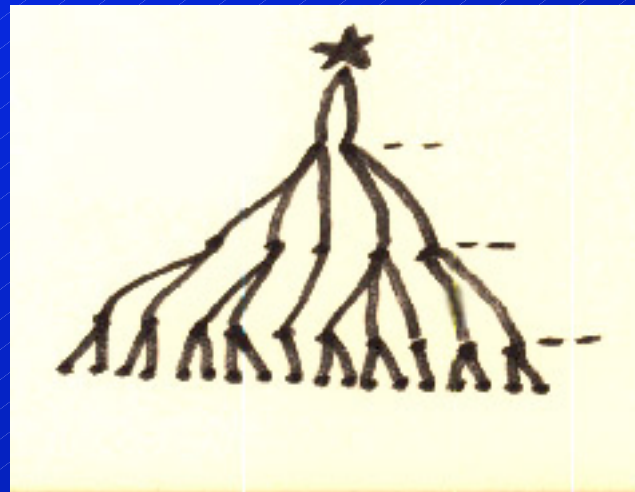
# Justice

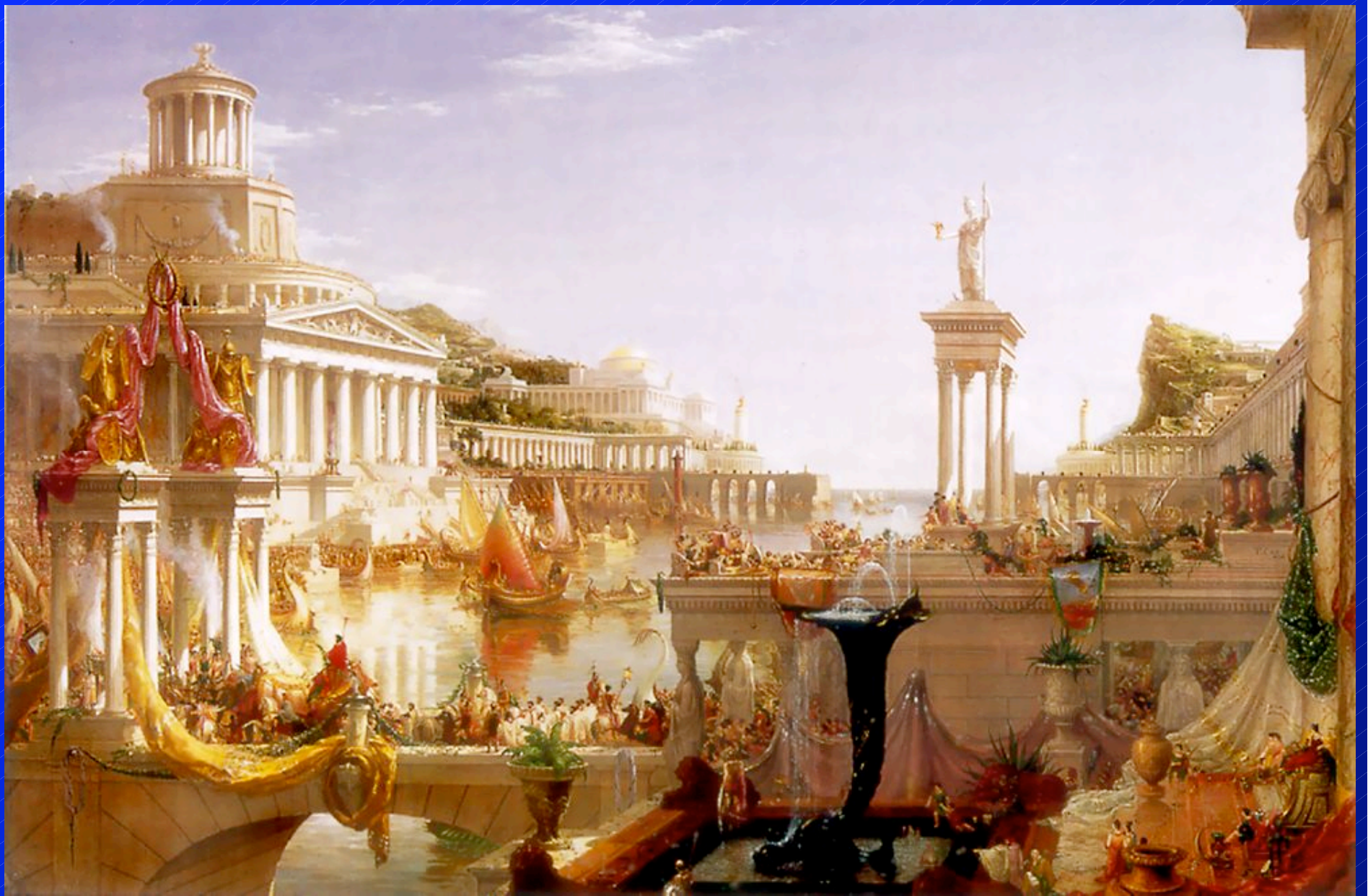


# Taxes



Aztec tribute roles

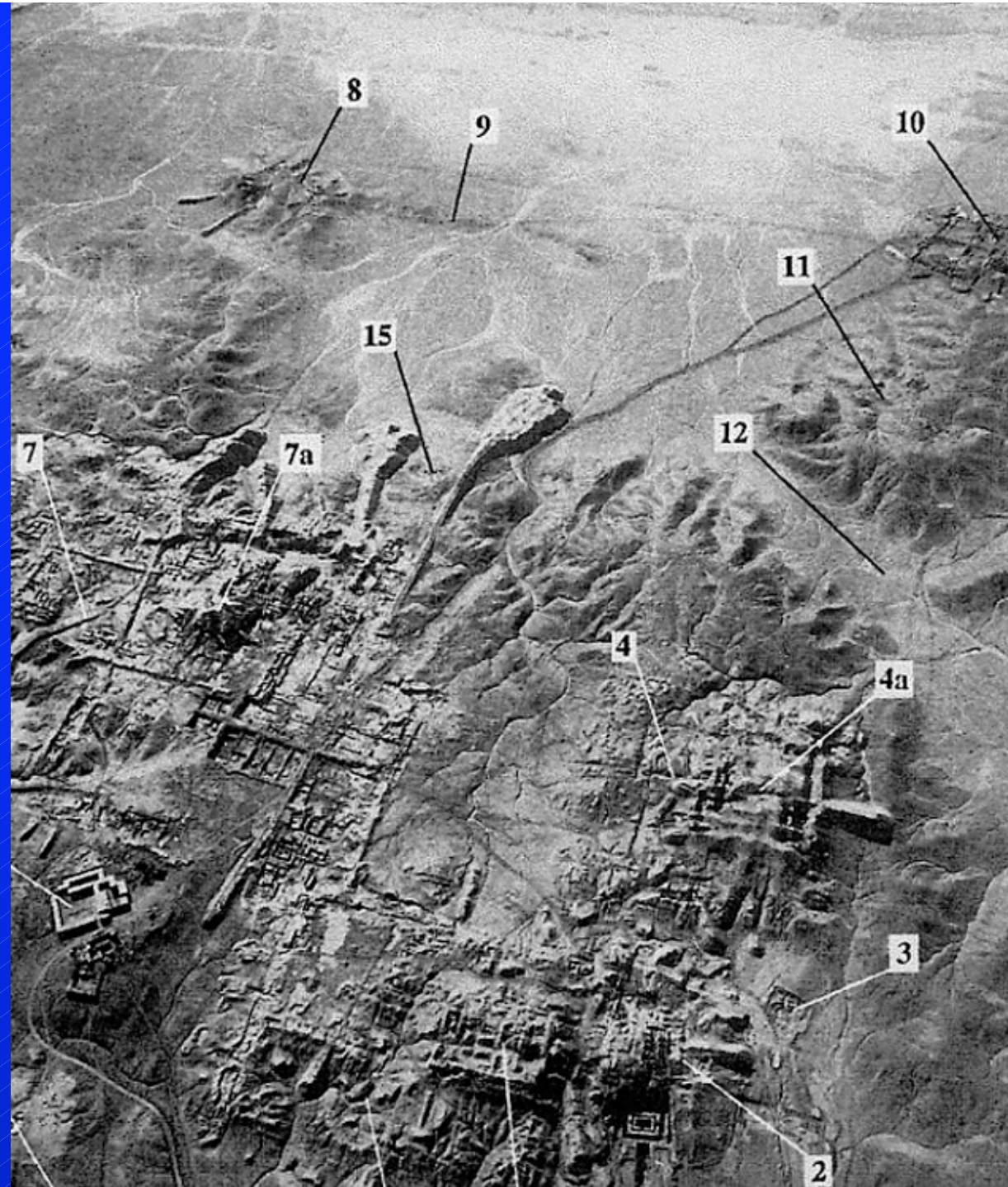
A scan of a 1940 US Individual Income Tax Return form. The form is titled '1940' and 'U.S. Individual Income Tax Return - 1940'. It contains various sections for reporting income, deductions, and tax payments. The form is filled out with handwritten and printed information, including the taxpayer's name, address, and income details. The form is a standard 1040 form from that era.



Thomas Cole, 1836, The Course of Empire

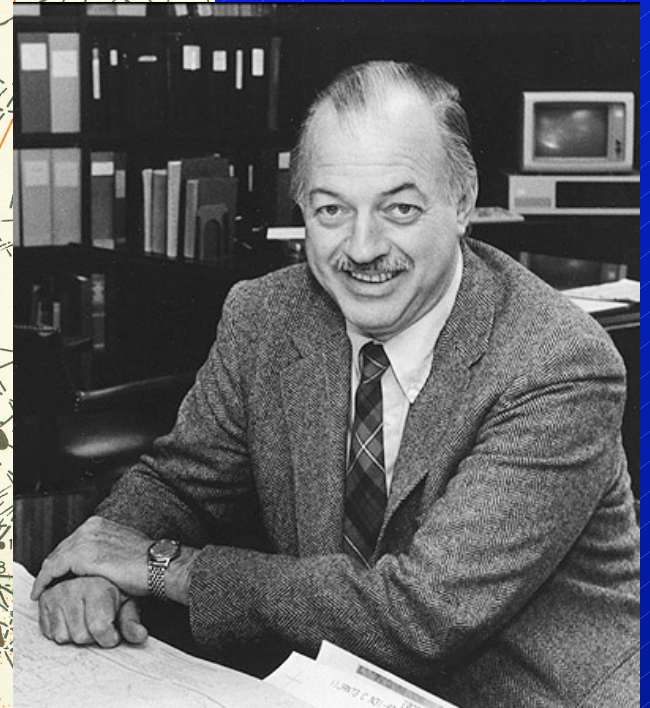
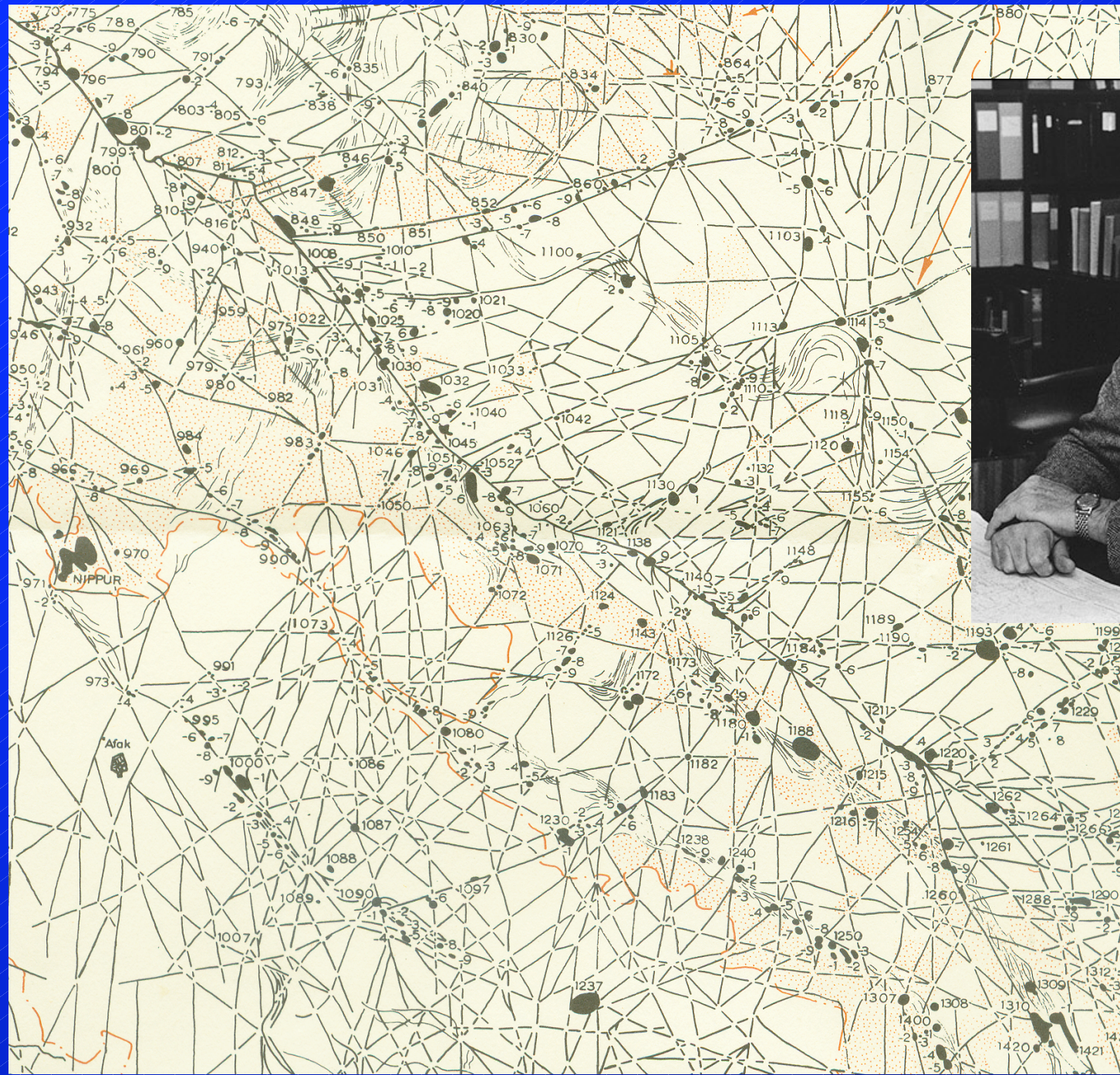
# Uruk

Southern Mesopotamia





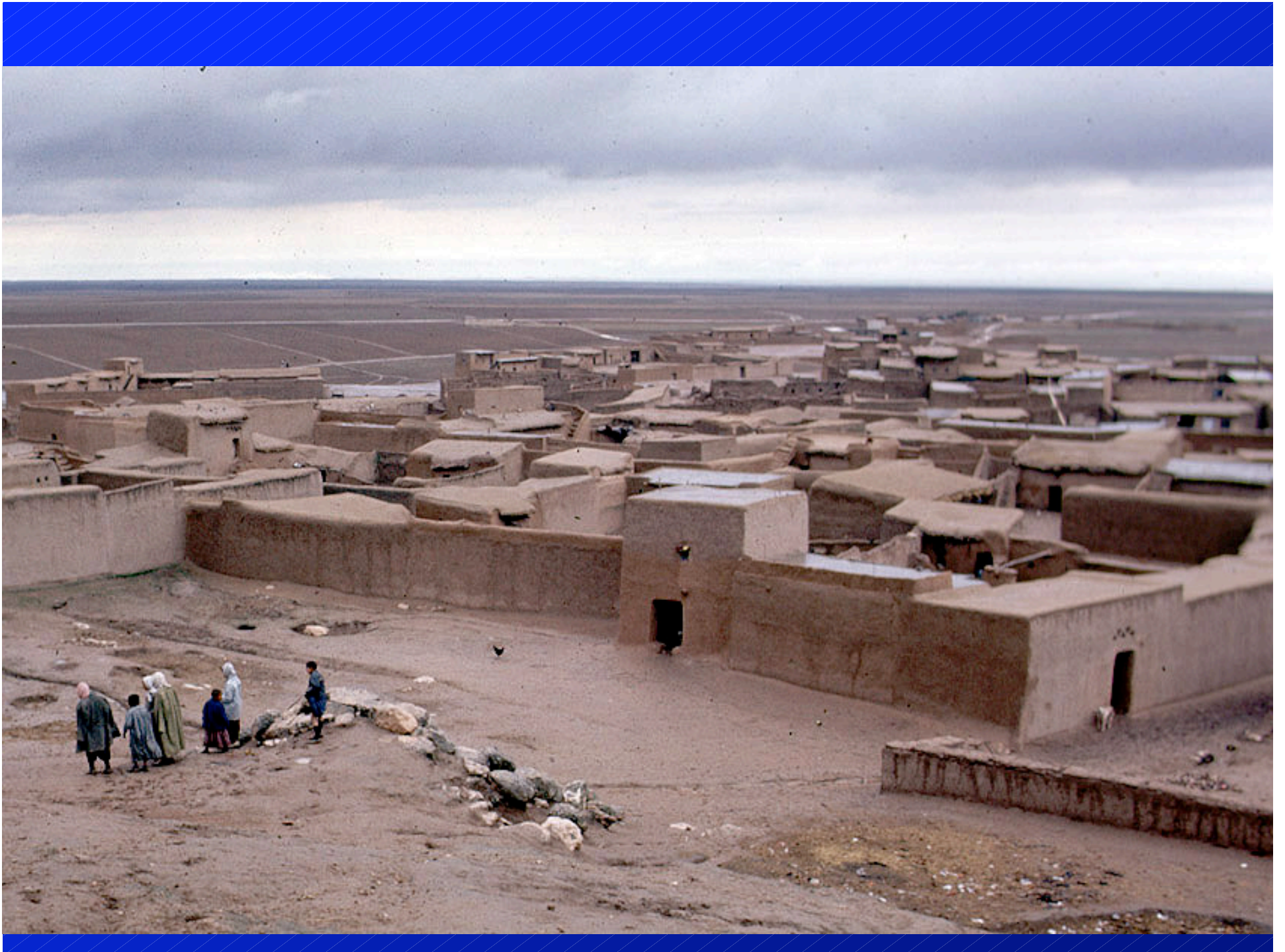


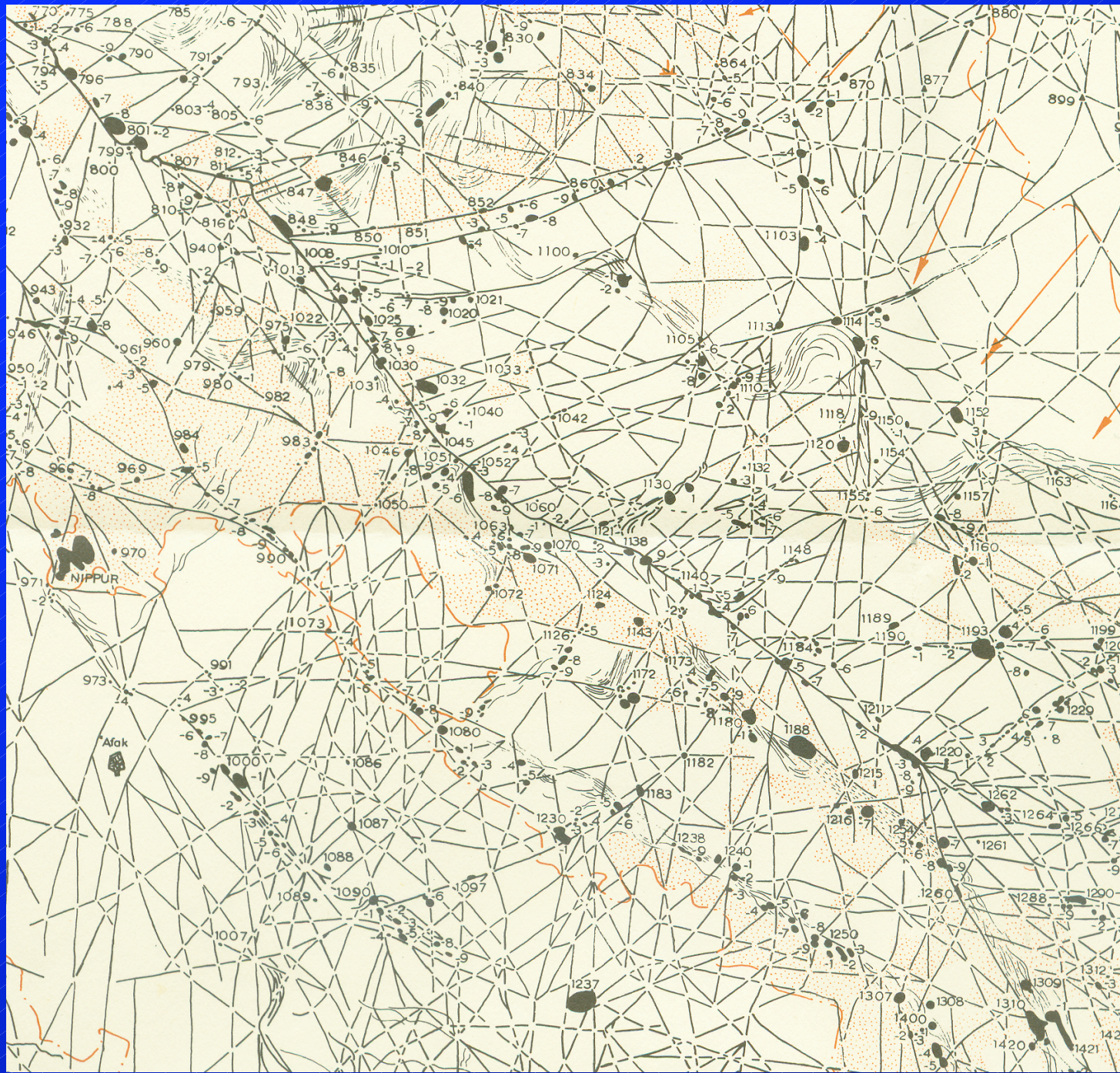


Robert McC. Adams









Mesopotamian  
canals





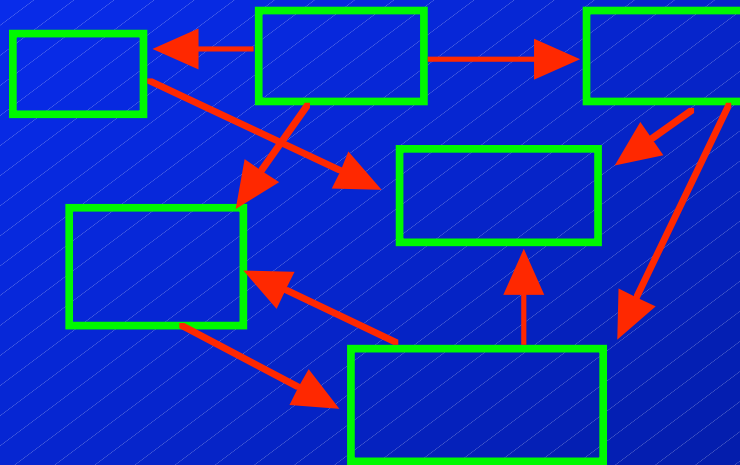


## Wittfogel and Oriental Despotism



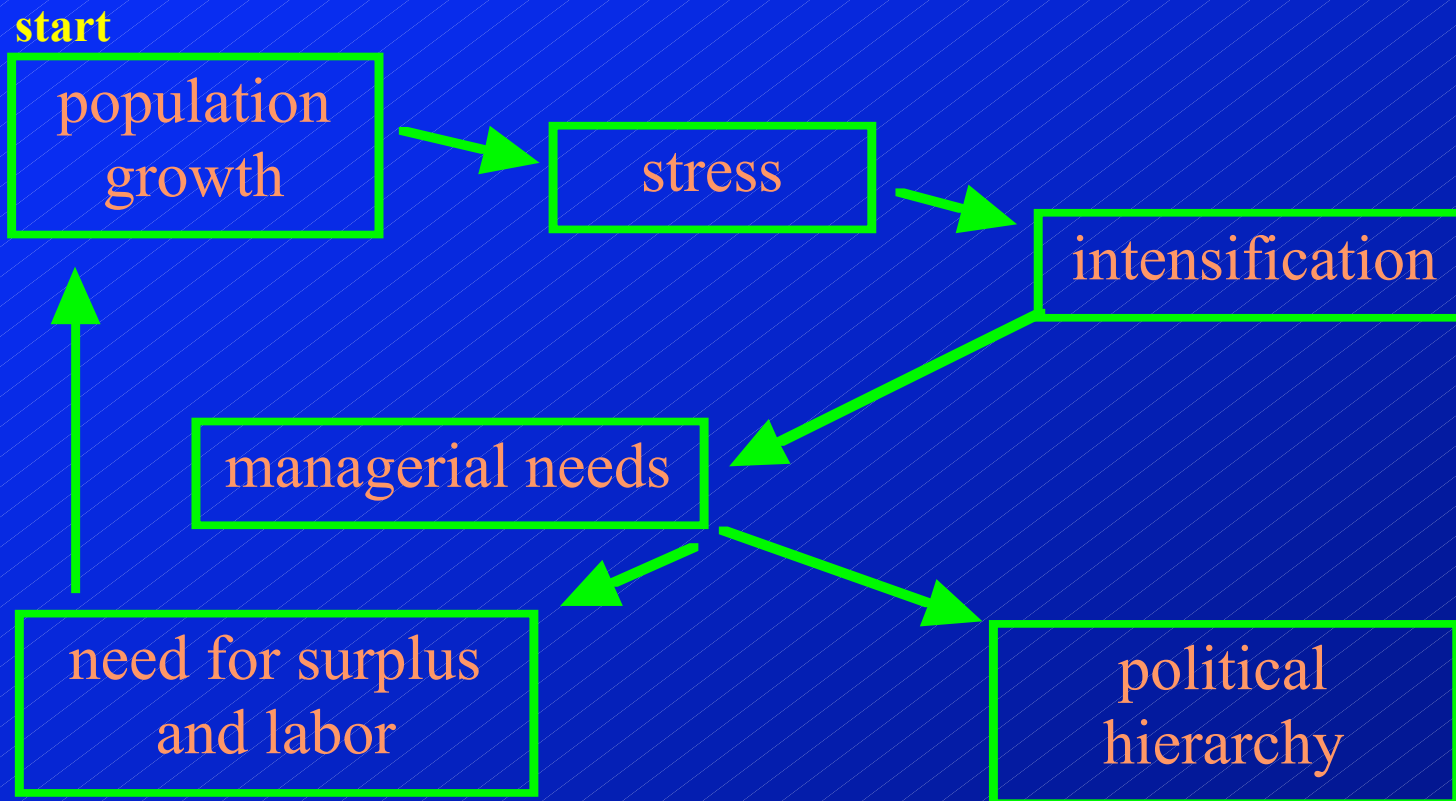
# Prime Movers - Debates of the 1950s-1970s

Agreeing that a broadly similar pattern of changes took place in many areas, the debate centered on the most important causes



- Population Growth
- Circumscription
- Warfare
- Trade
- Managerial Needs

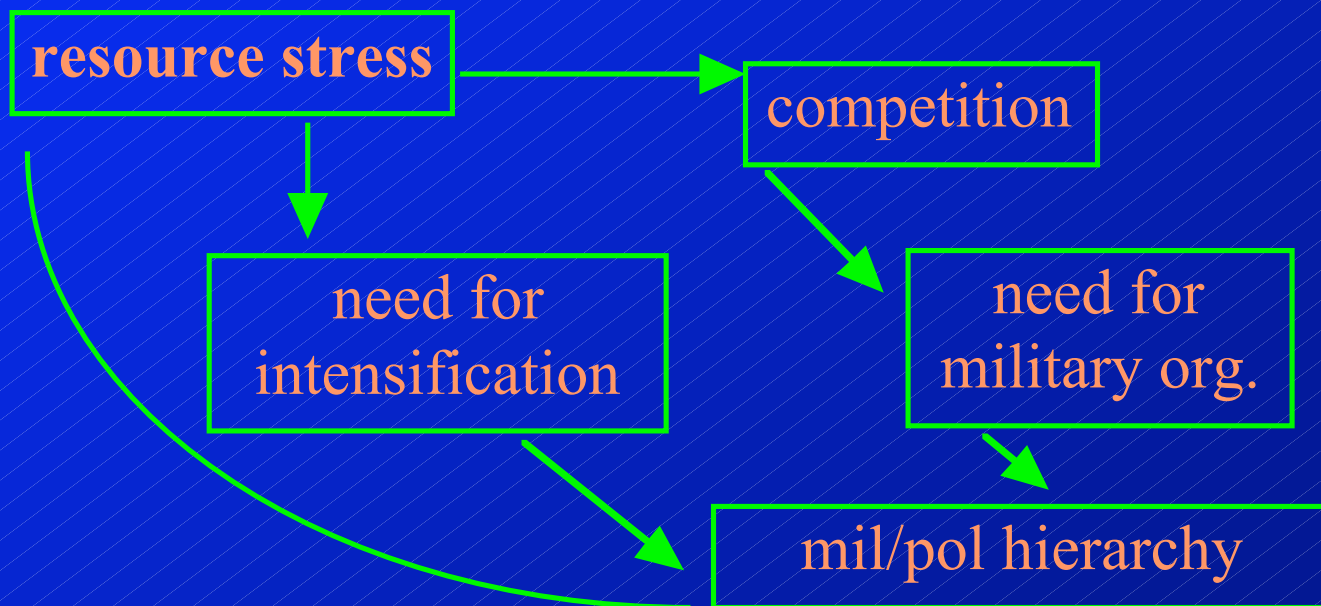
# A critical variable in nearly all models for complex society emergence



# Circumscription (env. or social)

A twist added by Robert Carneiro, in part to explain cases (e.g. Peru) in which there was little evidence of large populations

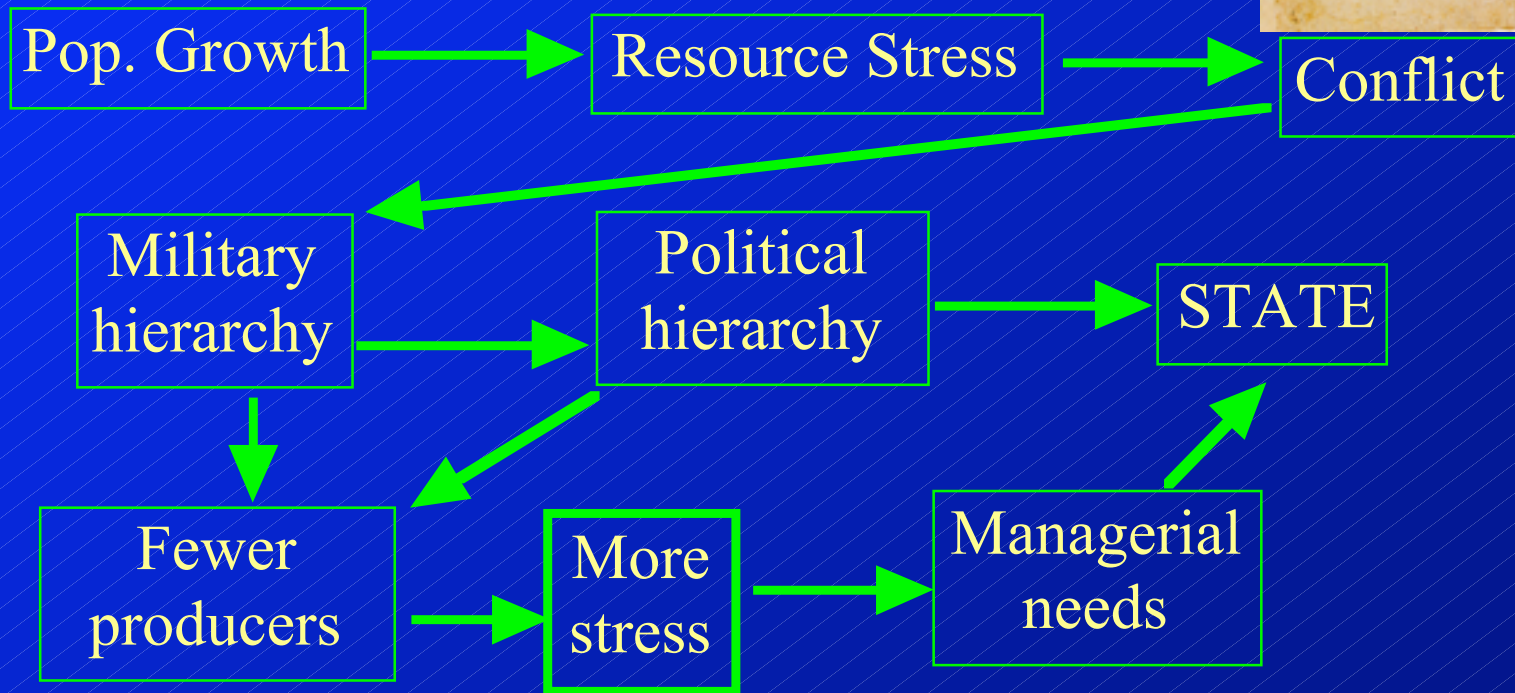
start





# Warfare

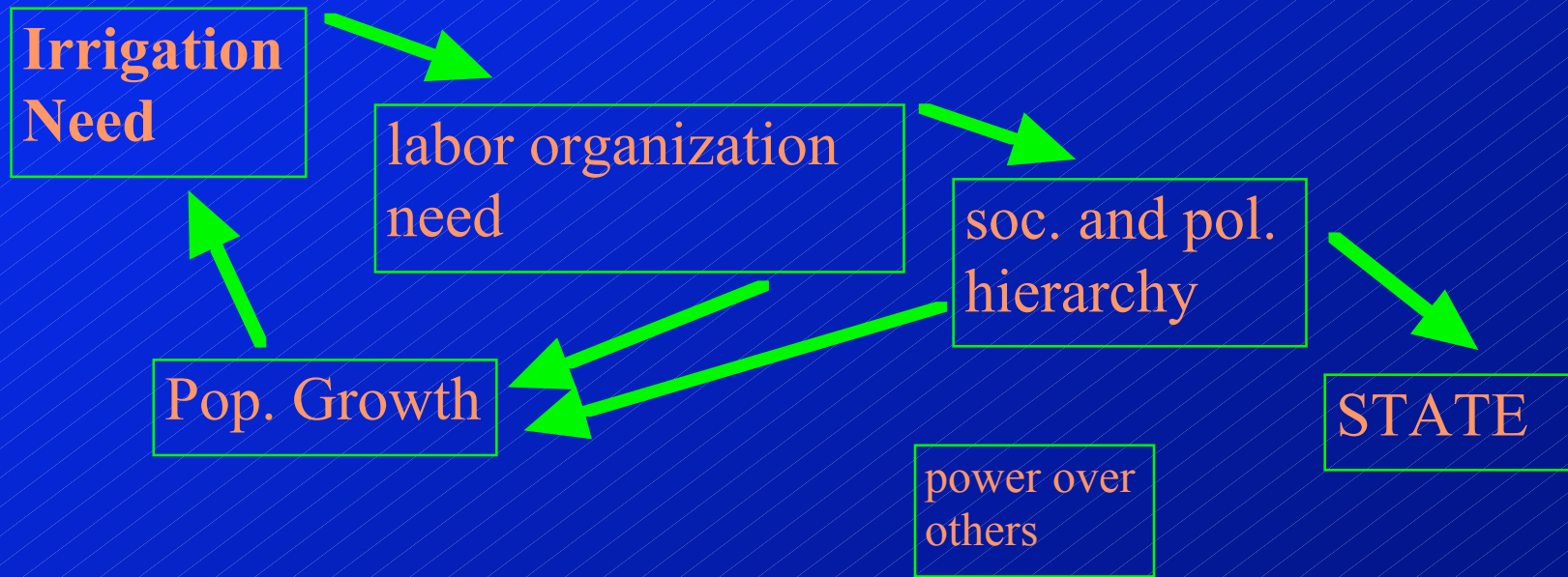
Conflict and early complex societies often go together ...  
cause or effect?





# Managerial needs . . .

...a reason to have some sort of political organization. E.g. the “hydraulic hypothesis” and the need for irrigation



# Leslie White

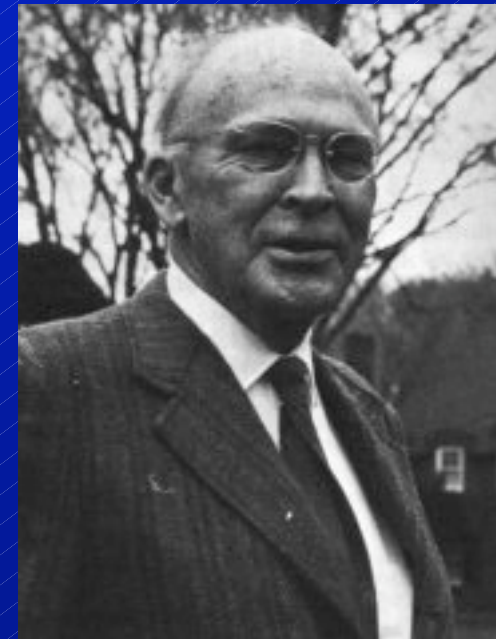
$$E \times T = P$$

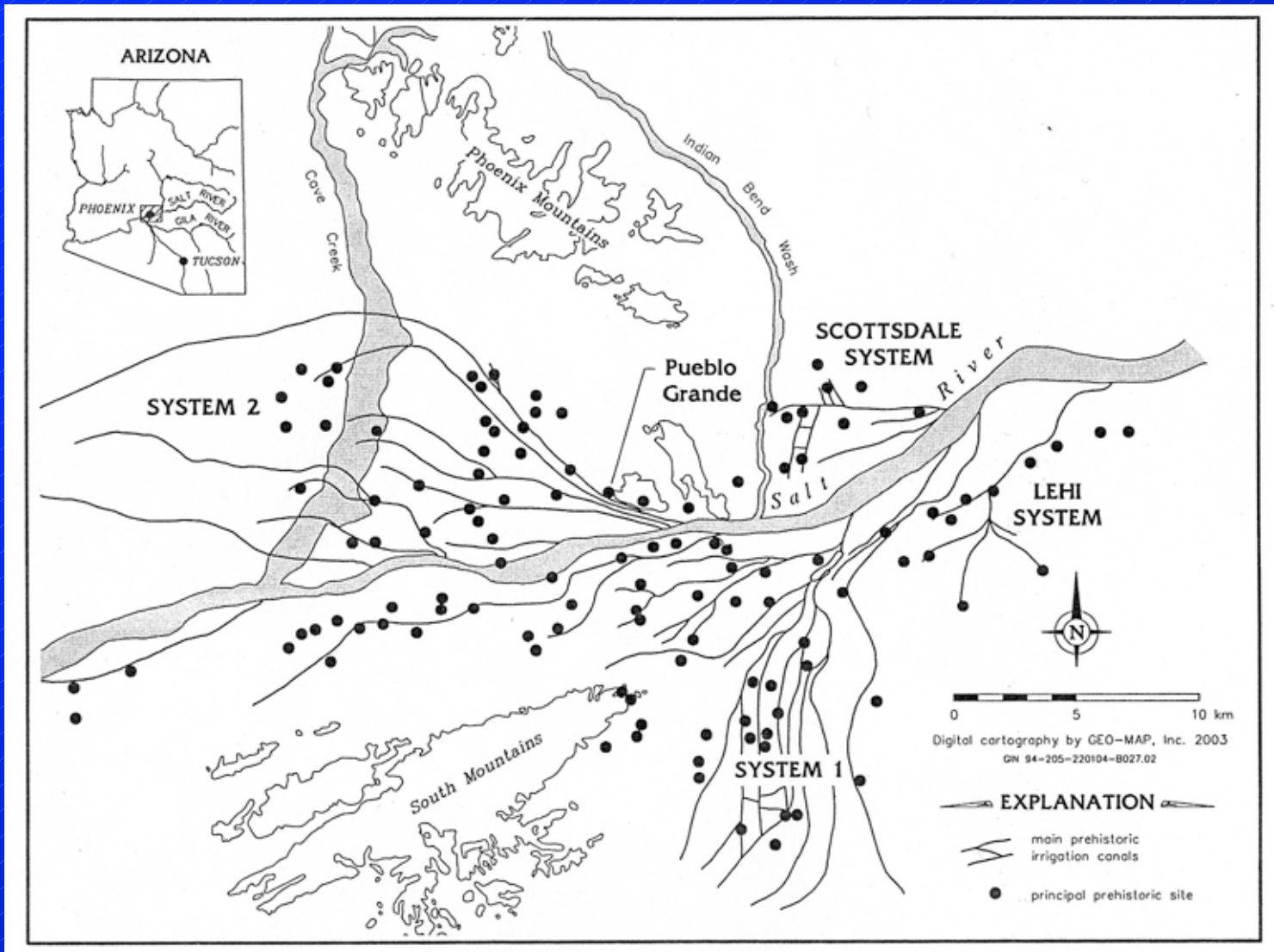
Where:

E = energy expended

T = technology employed

P = product per unit of time



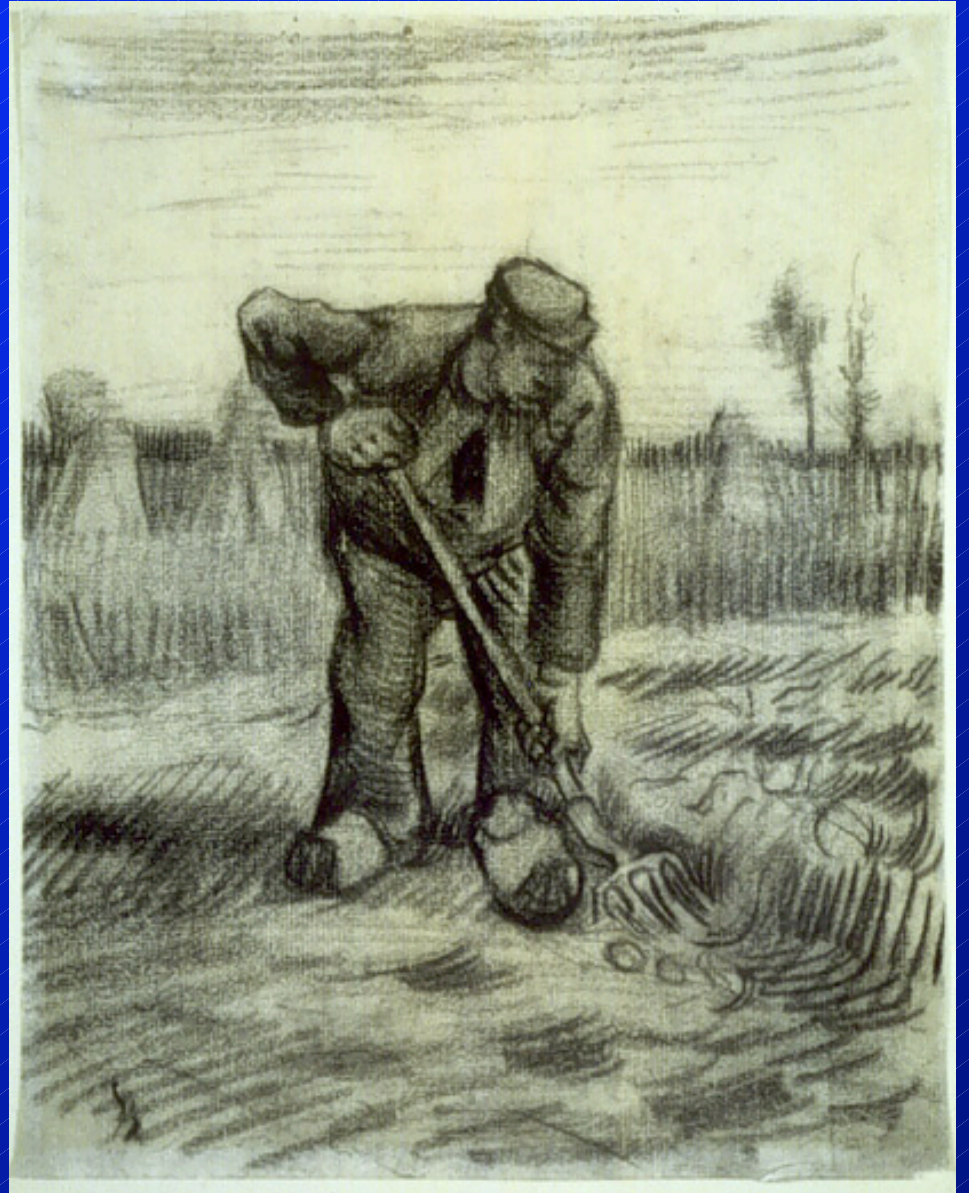




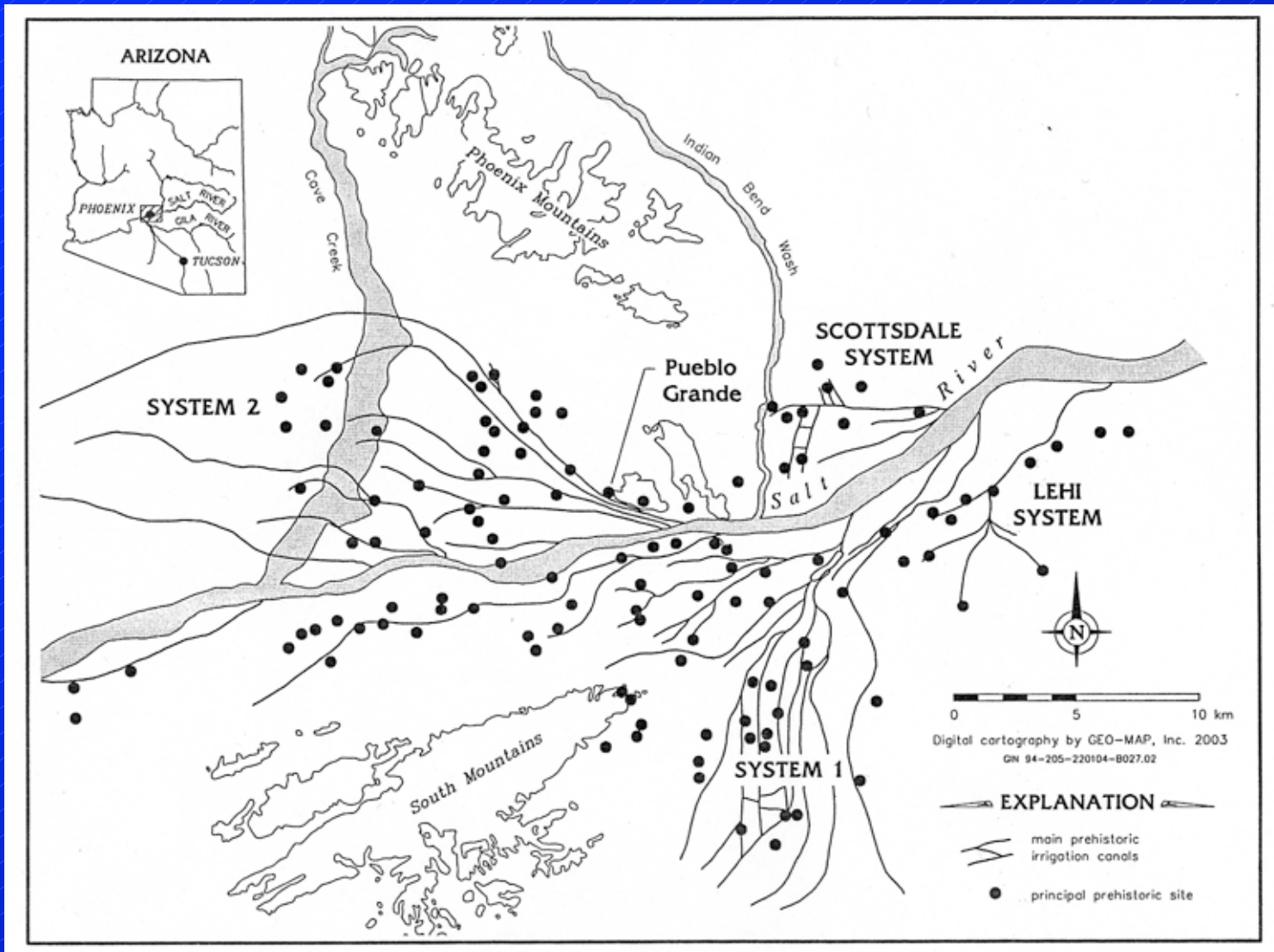




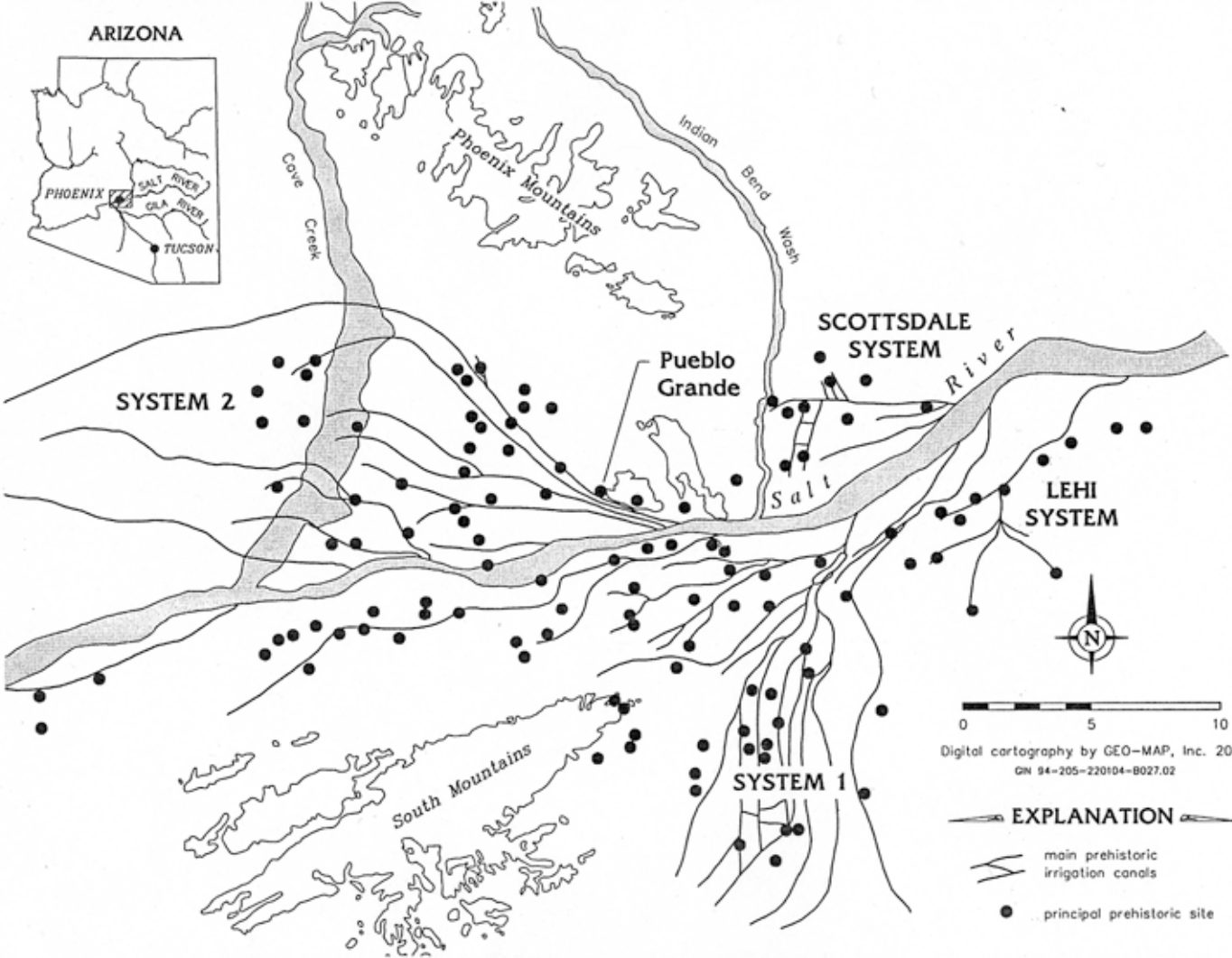
Napoléon Premier Empereur des Français  
*Pro d'Unité et Protecteur de la Confédération en Albanie*







ARIZONA



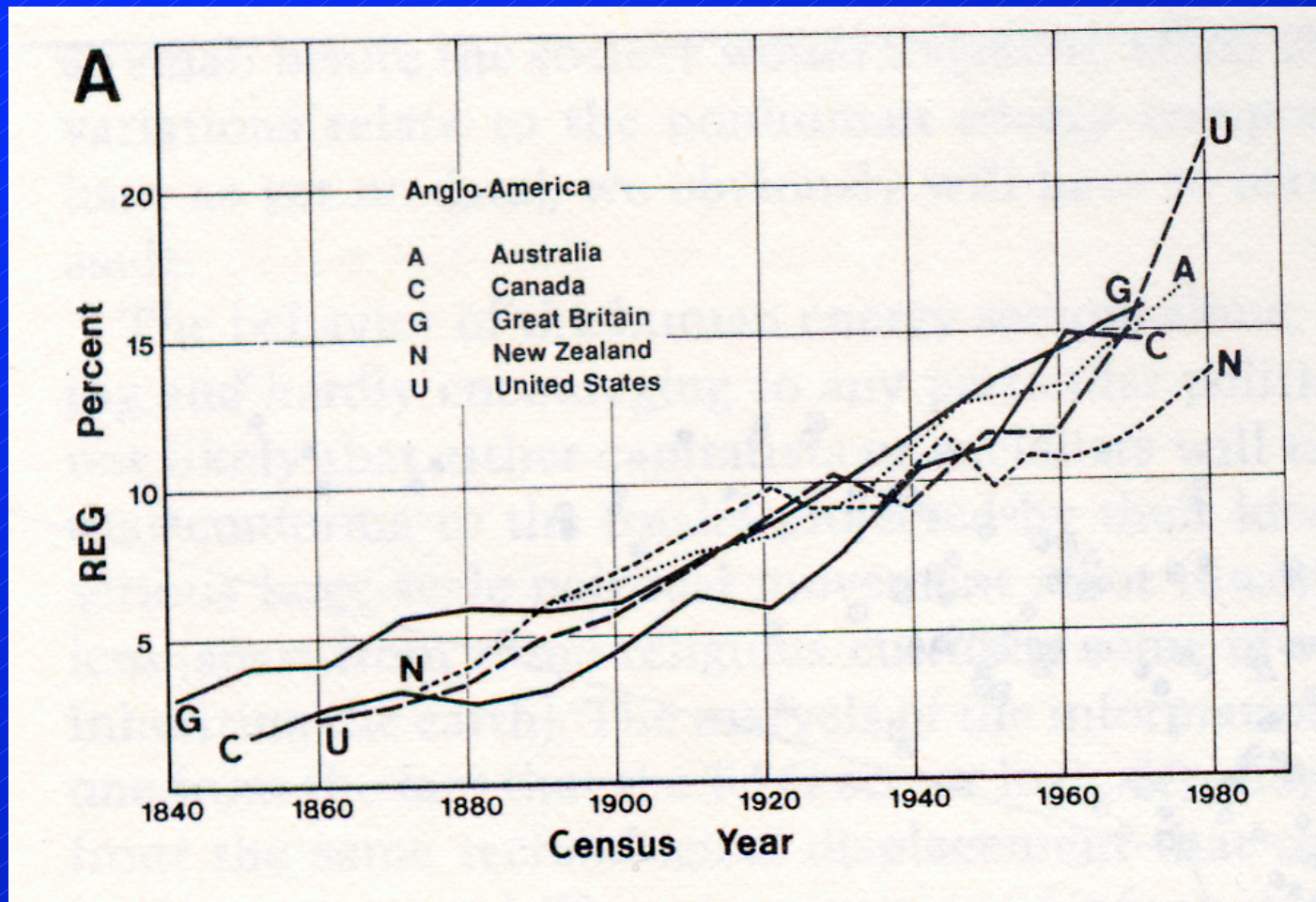
0 5 10 km

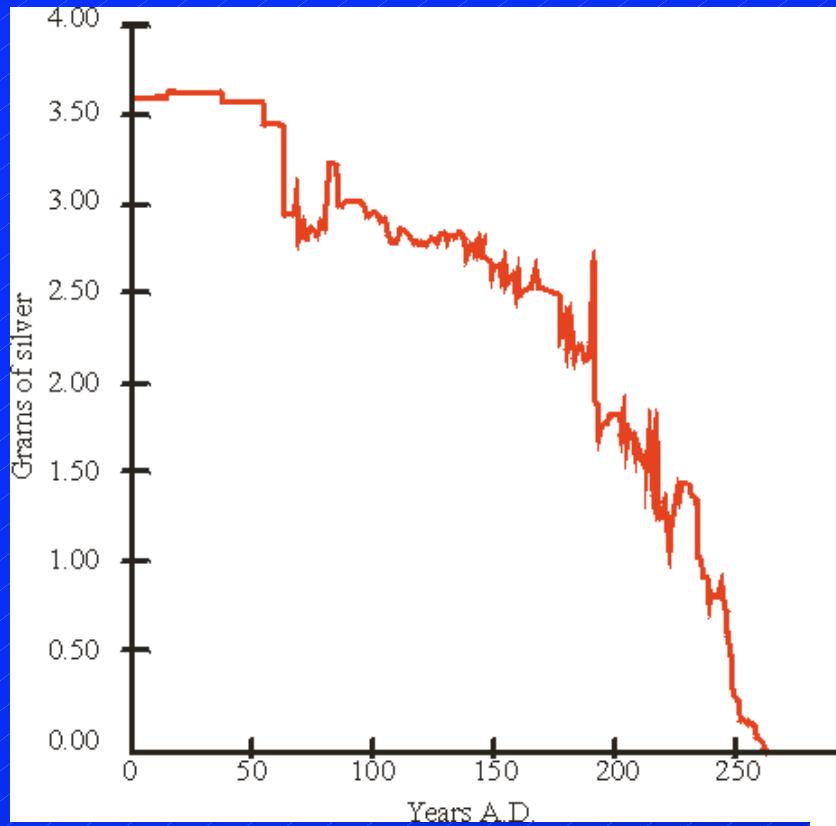
Digital cartography by GEO-MAP, Inc. 2003  
GN 94-205-220104-B027.02

**EXPLANATION**

- main prehistoric irrigation canals
- principal prehistoric site

# Growth of regulatory sectors





Joseph Tainter (1996), and the debasement of Roman currency as a way to subsidize the complex administration

His argument about how the benefits of complexity ultimately become very costly.

