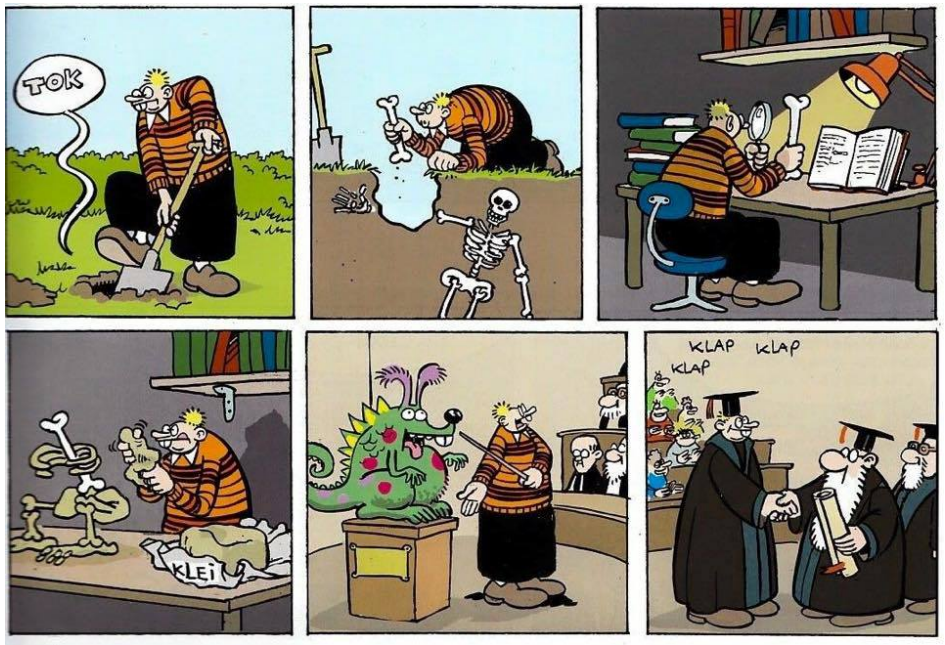
What happen with the History?

- No consensus (What explication is more plausible?)
- Too much theories and...not enough understanding
- Poor and limited data (fragmented sources)
- Necessity of an analytical and predictive history

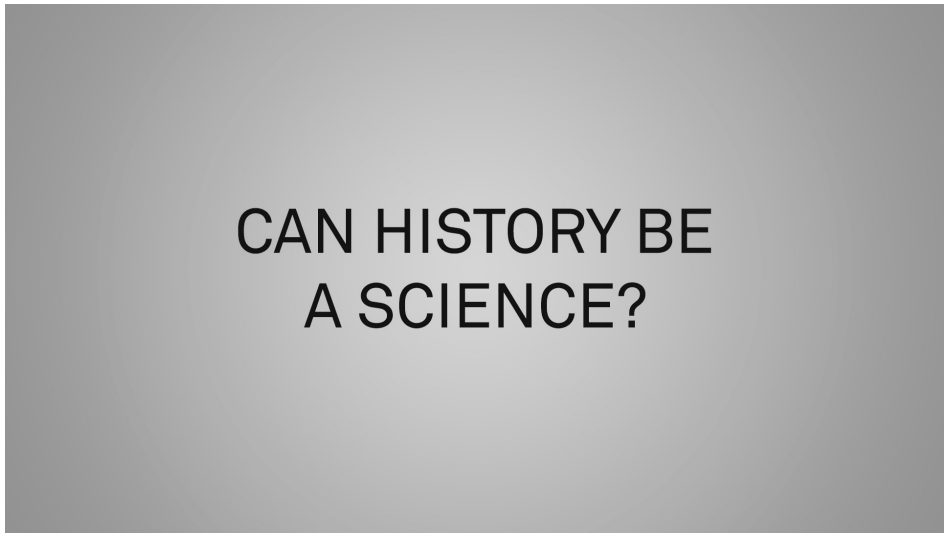


What did Turchin propose?

- Impossible to reform the historical approaches
- New discipline
- Necesity to apply analytical approaches to explain the past
- Be more lumpers, my friend

Is it feasible? What will be our challenges?

- Extremely complex to explain the human behaviour (unpredictable)
- Variability of social mechanisms
- Historical regularities can be studied (examples)
- Poor training of historians



Cliodynamics?

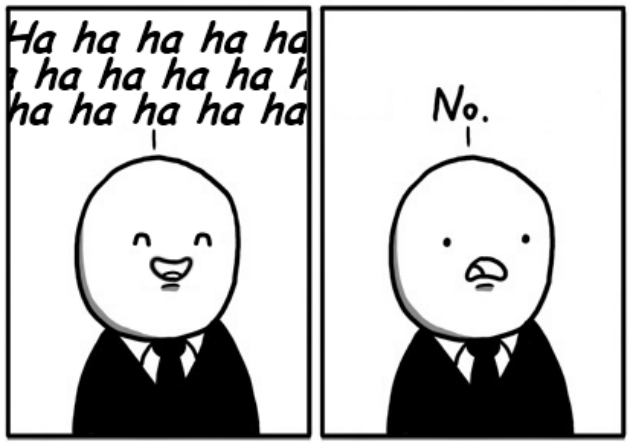
- Theoretical historical social science
- Dynamics are included to explain the varying processes
- Unified theories using archaeological and history data (collected data)
- Idenfity patterns and natural laws in human behaviour (predictive)

Why Cliodynamics?

- Posibility to become in a predictive science (searching the best data)
- Objectivity and Transdisciplinarity
- Test empirically all the collected data
- History must be transformed in a Science to be learned

Why NOT Cliodynamics?

- Is it possible to create patterns? (freewill)
- Is it possible to change our way of working? (hypothesis.. what?)
- Physics envy?



One exemple of a "Cliodynamic Study"

Recently, Turchin et al. (2013) developped the idea of Turchin in a article. We were lucky enough, Currie present it to us.

Historical Problem and Hypotheses

How human societies evolve from small group to huge society?

- Intense competition (Warfare) between society justify the use and maintain of costly institutions (ultrasocial norms and institutions, Turchin 2013).
- Warfare depend on technological spread an geographic factors

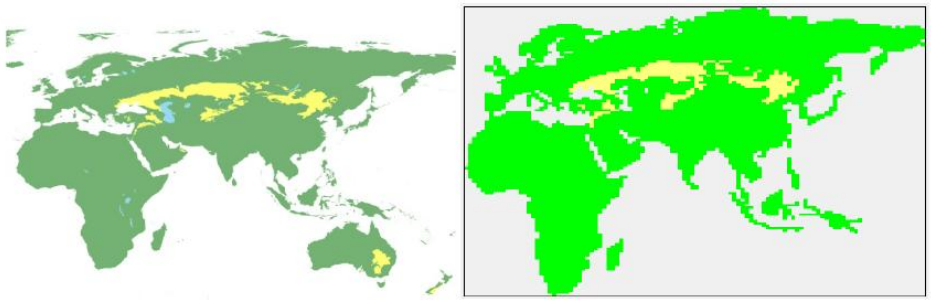
Why use a Model

"Mathematical are important part of any mature science"(Turchin 2013, p 110):

1. Make assumption and mechanisms explicits
   →evaluation of the theories
2. Quantitative prediction that can be tested against data
   →comparaison of alternatives hypotheses

The Model

"cultural evolution model" that use "Agent Based Modelisation". Spatially distributed on Afroeurasian landmass on $100 \times 100 km$ squares



In each cell
- agriculture or not
- biome (desert, steppe...)
- elevation

Simulation

Initialization

- Steppe cells : initialize military technology traits (MilTech traits) that diffuse gradually.
- Agricultural cells : communities with particular polity

$$\text{community} \begin{cases} \text{- } (x, y) \text{ coordinates} \\ \text{- } n_{ultra} \text{ ultrasocial traits } (U_{i,x,y}) \\ \text{- } m_{mil} \text{ MilTech traits } (M_{i,x,y}) \end{cases}$$

Critics

Thomas (2014) critics of the previous article (PNAS).
One can notice that Thomas believe in the methods of Turchin but think that some choice are not good :

1. Abstraction problem (too abstract)
2. Inovation process problem
3. Fact that elevation $\uparrow$ defense
4. random seeding alternativE
5. too big (in term of time and space)
6. no alternative causal pathway

Answer to critics

Turchin et al. (2014): Answer to thomas (in PNAS but also in the Turchin's blog)

- Basically : Thomas didn't understand the paper
- Main arguments : it's the best way to do and the best hypothesis so far tested (do better and I will be happy).

General Critics

"Turchin's own example in the Nature article is really confined to uncovering a pattern, not testing an explanation."
Massimo Pigliucci

Thomas, R. C. (2014). Does diffusion of horse-related military technologies explain spatiotemporal patterns of social complexity 1500 BCE-AD 1500? *Proceedings of the National Academy of Sciences*, 111(4):E414–E414.

Turchin, P. (2008). Arise 'cliodynamics'. *Nature*, 454(7200):34–35.

Turchin, P., Currie, T., Turner, E. A. L., and Gavrilets, S. (2014). Reply to Thomas: Diffusion of military technologies is a plausible explanation for the evolution of social complexity, 1500 BCE-AD 1500. *Proceedings of the National Academy of Sciences*, 111(4):E415–E415.

Turchin, P., Currie, T. E., Turner, E. A. L., and Gavrilets, S. (2013). War, space, and the evolution of Old World complex societies. *Proceedings of the National Academy of Sciences*, 110(41):16384–16389.