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The SESHAT Databank Project: the 2014 Report

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Project Goals

There is a huge corpus of collectively-possessed knowledge about past societies held by academic historians and archaeologists. Unfortunately, it is almost entirely in a form that is inaccessible to scientific analysis—stored in historians' brains or scattered over isolated notes and publications. This knowledge has enormous potential for testing hypotheses that explain various aspects of cultural evolution and cliodynamics, but it has been largely untapped. The goal of the SESHAT: Global History Databank is to build a historical/archaeological database that will enable our research group and others to test such hypotheses and build overarching theories. For example, what were the processes responsible for the rise of large-scale societies in human history? This is just one example of the many questions we will address with the database.

The SESHAT project has been tremendously productive this year (2014). In previous years, our efforts have been primarily focused on developing the conceptual framework for coding 'theoretically-relevant' variables, those which help us answer focal questions. During 2014, however, the primary focus of our work has shifted to data collection within this framework. Additionally, much energy has been devoted to writing grant proposals. The shift from conceptual framework to data collection was enabled by generous support from several funding sources. Below, I provide additional information on our funding situation (Resources), our current data collection efforts (Data), the key project meetings (Workshops), and personnel changes (People).

Resources

From its establishment in 2009, the initial development of SESHAT was funded by several small grants from the Evolution Institute. In 2011, the research consortium on Ritual, Community, and Conflict, led by the co-editor of SESHAT, Harvey Whitehouse, was funded by a large grant from the Economic and Social Research Council (ESRC; UK). Part of this grant was earmarked for the development of the SESHAT databank, with a focus on social complexity, warfare, and ritual variables.

Since early 2014, additional work at SESHAT has been made possible due to generous support from the Tricoastal Foundation for the project The Deep

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Roots of the Modern World: Investigating the Cultural Evolution of Economic Growth and Political Stability (Co-PIs: Peter Turchin and Tom Currie). Later in 2014, we received a large grant from the John Templeton Foundation for Axial-Age Religions and the Z-Curve of Human Egalitarianism (Co-PIs: Peter Turchin, Tom Currie, and Harvey Whitehouse). These two grants allowed us to expand the list of coded variables to include agriculture and resources; legal, political, and cultural institutions; equality/inequality (forms of structural inequality, equity-promoting social norms, especially those that are religiously motivated); and economic productivity and well-being. Additionally, the new grants have allowed us to intensify data collection across the whole spectrum of variables due to synergistic spillovers (when coding a specific society's institutions, for example, research assistants simultaneously encounter information about other related variables, e.g., social complexity).

Early 2015 will see a new phase of the SESHAT database implementation; by the end of 2016 the data will be migrated to an RDF database (resource description framework, also known as a 'TripleStore'). This development is a result of new funding from the EC Horizon 2020 program to create a research consortium that includes several members of the SESHAT team, led by the computer scientist Rob Brennan at Trinity College Dublin. The project, entitled ALIGNED: Quality-Centric Software and Data Engineering, will start in February 2015 and will use the SESHAT project as a rich, real-world case study for testing the tools developed by the ALIGNED consortium for collecting and curating high-quality historical and archaeological data.

Data

The long-term goal of the SESHAT project is to develop a general resource for testing theories about sociocultural evolution and cliodynamics. Ultimately, we would like to include all kinds of theoretically relevant data in it. In the medium term, however, we need to prioritize which variables to code first, and rather than trying to collect data from all inhabited regions of the world, our initial focus is on a representative sample of past societies.

The list of variables on which we currently collect data is primarily determined by successful grant proposals. These variables are summarized below.

Social Complexity. This bundle of variables includes social scale (polity territory and population, population of the largest settlement), hierarchical or vertical complexity (the number of levels in administrative, religious, and military chains of command), occupational or horizontal complexity (measures of division of labor, professionalization of different economic and political roles), characteristics of bureaucracy and the legal system (e.g., full-time professional bureaucrats and judges, merit promotion, examination systems),

various informational aspects (writing, literacy, etc.), and archaeological proxies (settlement hierarchy, monumental architecture, specialized buildings).

Warfare. Under this heading, we code military technologies (metal weapons and armor, projectiles, naval technologies), military organization (professional soldiers and officers, the scale of armies, equipment and logistics), and various measures of warfare intensity.

Rituals. We identify the largest scale, the most widespread, and the most frequent collective rituals of the official cult, or of the ritual system followed by the majority of the population. We are also interested in the most euphoric (positive emotionally arousing) and the most dysphoric (negative emotionally arousing) rituals. These rituals are then coded for a variety of features (frequency, duration, inclusiveness, and dysphoric and euphoric elements).

Resources and Agriculture. Our primary interest is to estimate the amount of resources available for supporting dense populations, urbanization and division of labor, and government, elites, and rulers. The basic data that feed into this estimate are the characteristics of the agricultural system (crop varieties, arable area, intensity of cultivation), agricultural technology (soil preparation, cropping techniques, storage, and post-harvest processing), and climate fluctuations. Additionally, we collect direct data on population and urbanization, where available.

Institutions and Equity. Formal and informal limits on the executive power, efficiency of governance (government and non-government oversight of bureaucracy, control of corruption and power abuse, accessibility of the legal system), property rights, equity and inequality (discrimination on the basis of sex, class, and ethnic group; serfdom and slavery; human sacrifice and deification of rulers), and prosocial behavior (charity, social cooperation, production of public goods). In all of these, we are particularly interested to code whether religion played a role in promoting equity and prosocial institutions; or vice versa, whether it reinforced/legitimized inequality.

Economic and Technical Development. Estimates of such measures of economic development as Gross Domestic Product become increasingly tenuous as we go back in time. For this reason, we are developing a set of proxies that can give us an indication of the degree of development and sophistication in a set of economic sectors for which archaeological or historical data are reasonably abundant. These sectors include: energy and fuel, metallurgy and mining, housing and construction, transport and trade, and information and entertainment. We have also put together a list of professions (potter, weaver, tanner, shoemaker, blacksmith, etc.) and we code

each society for whether there is historical or archaeological (e.g., presence of a workshop) evidence for the presence of each profession in the list.

World Sample-30. As I stated above, instead of attempting to collect data for all past societies, we are doing so for a sample of them. Because our goal is to test theories that apply globally, to human societies found on all continents, we divided the world into ten regions: Europe, Southwest Asia, South Asia, Southeast Asia, East Asia, Central and Northern Eurasia, Africa, North America, South America, and Oceania (including Australasia). Additionally, the theories, on which we are currently focusing, all involve social complexity— it is either something we are trying to explain, or it is one of the most important explanatory factors. Thus, our sample needed to include both regions where complex societies arose early and recurred more or less continuously and regions where, for whatever reasons, complex societies arose very late (or even not at all prior to the arrival of European colonizers). Accordingly, within each of the ten world regions, we chose three spatial locations representing one region with the most complex societies, another with the least complex societies, and a third one that was intermediate. Thus, our World Sample-30 is stratified by world region and the antiquity of complex societies. Note that social complexity is relative and varies with region. For example, Hawaii, the high complexity sampling point in Oceania, would qualify as, at most, a medium complexity society when compared to, say, East Asia. This is not a problem, because the main goal of our stratified sample is to ensure as much variation as possible, which is necessary for increasing the statistical power of the sample for testing theories.

Each of the 30 locations in the sample constitutes a Natural Geographic Area (NGA) possessing a certain degree of geographic unity and historical continuity. For example, NGAs can be river valleys (e.g., Upper Egypt, Middle Yellow River Valley), islands (Iceland, Hawaii), or plains surrounded by hills (Konya Plain, Lazio). We code resources and agriculture variables with NGAs as the spatial units, but other variables, such as social complexity, institutions, and equity, are coded for polities that occupied NGAs at different points in their history (a polity is a politically independent community, which can vary in scale from a village or a simple chiefdom to a states or an empire). In other words, NGAs are a sampling device. We start with whatever polity occupied it in the modern period and then drill back in time, sampling all previous polities as far back as data allows (where possible, all the way back to the Neolithic). Thus, once the World Sample-30 is completed, we will have spatio-temporal data concerning how each of our variables evolved over time in 30 locations spread across the world. Of course, depending on the variable, time period, and world region, many of our variables cannot be quantified. Thus, the

statistical analysis of these data needs to deal with missing values, as well as with temporal and spatial autocorrelations (Turchin et al. 2012).

Workshops

First Deep Roots Workshop. Storrs, CT; May 6–7, 2014.

Participants: Peter Turchin, Tom Currie, Doug White, Enrico Spolaore, Dan Hoyer
Agenda: Complete the design of a conceptual framework for the Tricoastal Foundation-funded project, The Deep Roots of the Modern World. The goals of the workshop were: (1) To define the set of theories that we will test and predictions they make; (2) To define/operationalize the variables that we will need to code to test theories; (3) To design the statistical approach we will use to analyze the data.

First Axial-Age Workshop. Oxford, UK. September 2–3, 2014.

Participants: Peter Turchin, Harvey Whitehouse, Pieter Francois, Tom Currie, Kevin Feeney, Rob Brennan, Peter Peregrine, Dan Hoyer
Agenda: Discussion of the core hypotheses that we will test under the Axial-Age Religions and the Z-Curve of Human Egalitarianism project, funded by the John Templeton Foundation. Generate the list of variables that we will code, discuss sampling issues, outline personnel and collaborative arrangements, and establish the timeline for accomplishing these tasks.

Archaeology Workshop. Oxford, UK. September 4, 2014.

Participants: Arek Marciniak, Peter Peregrine, Amy Bogaard, Mick Gantley, Peter Turchin, Harvey Whitehouse, Tom Currie, Pieter Francois, Dan Hoyer
Agenda: Discussion of the draft of an archaeological version of the Code Book that is suitable for coding societies known only archaeologically. What are the potential archaeological proxies that we can develop to capture data on variables of interest? How can we link to the growing body of archaeological databases that are increasingly posted on the Web?

Egypt Workshop. Oxford, UK. September 6–7, 2014.

Participants: Joe Manning, John Baines, Juan Carlos Moreno Garcia, Brendan Haug, Andrey Korotayev Julia Zinkina, Peter Turchin, Harvey Whitehouse, Tom Currie, Pieter Francois, Dan Hoyer
Agenda: Introduction of the project, its aims and the results so far. A discussion of the Seshat databank and methodology with respect to specific periods of Egyptian history. How can the approach be improved: what is missing, what is incorrect? Can these data help us understand Egyptian history in the long run and make comparisons with other regions?

Agriculture Workshop. Oxford, UK. September 8-9, 2014.

Participants: Tom Currie, Amy Bogaard, Philip Holden, Cameron Petrie, Dorian Fuller, Juan Carlos Moreno Garcia, Rudy Cesaretti, Alice Williams, Peter Turchin, Pieter Francois, Dan Hoyer

Agenda: The conceptual development of the coding sheet for resources and agriculture variables. A discussion of how we can code data that would enable comparisons to be made over long periods of time and across different regions.

People

SESHAT: Global History Databank is governed by the Board of Editors, which includes Peter Turchin (founding editor and overall coordinator), Harvey Whitehouse (founding editor and editor for ritual variables), Pieter François (founding editor and historical coordinator), Thomas Currie (editor for resources, agriculture, and population variables), and Kevin Feeney (editor for information technology). The SESHAT board is advised by a number of consultants. Data collection for a specific NGA is coordinated by a Regional Editor, and data entered for a specific polity is vetted by expert historians and archaeologists. For a list of consultants and the Regional Editors for each NGA, see Who We Are; the rapidly growing list of experts is posted on our List of Contributors. Much of the hands-on work of populating the databank is, of course, accomplished by the project's Research Assistants and Postdoctoral Research Associates. Below, I detail some of the personnel changes that took place during 2014.

- Dr. Pieter François, member of the Seshat Editorial Board, who has been a Postdoctoral Research Associate supported by the Ritual, Community, and Conflict grant, has started a tenured position at the University of Hertfordshire. In September 2014 he also took up the role of Research Coordinator of the Cultural Evolution Lab at Oxford University.
- Dr. Daniel Hoyer has been appointed as the Postdoctoral Research Associate supported by the Deep Roots grant.
- Dr. Daniel Mullins has been appointed as the Postdoctoral Research Associate, supported by the Axial Age grant. His appointment at the University of Oxford will start in January 2015.
- A further Postdoctoral Research Associate supported by the Axial Age grant will be appointed at the University of Exeter in January 2015. Additional researchers will be hired at the University of Oxford on the ALIGNED grant, as well.
- Dr. Brittany Sears has been appointed as Operations Manager. She is supported by the Axial Age grant and the Evolution Institute.

- Mr. Edward A. L. Turner, who has been associated with the Seshat project since its inception, has been appointed as Principal Research Assistant.
- Ms. Rosalind Purcell has been appointed as Research Assistant.
- Mr. Odhran Gavin has been appointed as a Research Assistant on the Axial Age grant and will transition to a position in the Horizon 2020 ALIGNED project at Trinity College Dublin.
- Two of the former RAs in the Seshat project, Rudolf Cesaretti and Alice Williams, entered Ph.D. programs at the Arizona State University and the University of Exeter, respectively. They will both continue to contribute to SESHAT by collecting data and participating in workshops relevant to their Ph.D. projects.

Acknowledgments

Reference

Turchin, P., H. Whitehouse, P. Francois, E. Slingerland, and M. Collard. 2012. A Historical Database of Sociocultural Evolution. *Cliodynamics* 3:271-293.