Introduction

Maps in Science and Society
Professor Keith C. Clarke
TA Matt Feliciano
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History of the Class

• First taught at UCSB by Waldo Tobler, using materials from George Kish at Michigan
• Paper presented in 1993

History of Cartography As Taught at UCSB

History of Cartography Conference, Chicago, June 1993

Waldo Tobler

As background to my course at the University of California, Santa Barbara, I should inform you that my training is in geographical cartography, and my specialties are the subjects of map projections, mathematical and computer cartography, and analytical geographical modeling. I teach courses in all of these areas. My language competence is limited to western tongues.

During a ten week quarter I present twenty-five lectures in a once-a-year course called “History of Cartography”. While at the University of Michigan I had the good fortune to audit the comparable course offered by the late Professor George Kish, and I use some slides from his
Geog 126

• Awarded a Fulbright Distinguished Chair in 2007 at the University of Trieste, Italy
• Used part of the time to build the class
• Chose to change chronology organization to development of mapping science and technology around 6 themes with labs
• Have taught the class since 2008 in alternate years
Mapping technology today
Maps in Science and Society

• This class is designed to show how technical and scientific development in cartography produced a series of instruments, practitioners, and ultimately maps that illustrate the strive for cartographic knowledge, accuracy and lucidity.

• In lectures, we will explore history by theme, tracing how developments in methods and ideas went hand in hand.

• In labs, we will build an experience through the analysis, replication and use of historical maps and mapping instruments.
Assessment

• There will be six laboratory assignments that will make practical the ideas introduced in lecture (each worth 10% of the grade)

• Also a brief paper, discussing a map or mapping method of particular interest to the student encountered during the course.

• The paper should be no longer than six pages, including references and illustrations, suitable for use as a Wiki entry. Worth 30%

• The papers will be reduced to Powerpoint (or equivalent) presentations: each with no more than four slides and lasting five minutes. This will take the place of the final (10%)
Maps in Science and Society

- TOPIC 1: Geographical Positioning and Maps
- TOPIC 2: Thematic cartography
- TOPIC 3: Exploration and the Expansion of Nation States
- TOPIC 4: Perceptions of Foreign Lands
- TOPIC 5: Toponymy
- TOPIC 6: Maps and Visualization
Resources

• Lectures
• Videos
• Laboratory exercises
• Web site and links
• Gauchospace
• Discussions
• References
The migration of anatomically modern humans has been a subject of much research and debate. Various theories and geographical routes have been proposed to explain how modern humans spread across the globe. Some key events and milestones include:

- **65-60K years ago**: Anatomically modern humans are believed to have first appeared in Africa, as evidenced by finds from sites like the Rift Valley in Kenya and Ethiopia.
- **50-50K years ago**: The spread of Homo sapiens from Africa is believed to have occurred, with evidence of early permanent settlements found in sites like South Africa.
- **40-40K years ago**: The Levantine corridor and the Nile corridor were significant migration routes out of Africa.
- **30-35K years ago**: The Upper Palaeolithic period saw significant cultural developments, including the creation of cave art and the use of advanced tools.
- **20-25K years ago**: The first evidence of modern humans in Europe and Asia, respectively, is found.
- **15-20K years ago**: The Younger Dryas event, a cold period, is believed to have influenced human migration patterns.
- **10-15K years ago**: The transition from the Palaeolithic to the Mesolithic is marked by changes in tool use and lifestyle.

The map highlights various migration routes, including the Levantine corridor, the Nile corridor, and the European and Asian routes. These routes were influenced by environmental factors, such as the availability of resources and changes in climate and geography. The study of human origins remains an active field of research, with new discoveries continually shedding light on our species' history.
Figure 3. Genetic matrilineal distances between 55 modern Western Eurasian populations (Table S6) and Neolithic LBK samples. Mapped genetic distances are illustrated between 55 modern Western Eurasian populations and the total of 42 Neolithic LBK samples (A) or the single graveyard of Derenburg (B). Black dots denote the location of modern-day populations used in the analysis. The coloring indicates the degree of similarity of the modern local population(s) with the Neolithic sample set: short distances (greatest similarity) are marked by dark green and long distances (greatest dissimilarity) by orange, with fainter colors in between the extremes. Note that green intervals are scaled by genetic distance values of 0.02, with increasingly larger intervals towards the “orange” end of the scale.
My conjecture

• 60000 years ago possibly no more than 200 HS families migrate from Africa to Arabian peninsula
• By 15000BP humans are everywhere on earth (32km/gen)
• Was this exploration possible without maps?
• Extensive ancient knowledge of world
• Then for millennia, people remained in place (with some exceptions)
• Age of Discovery and Exploration during the renaissance: Maps again critical
• Era of mass emigration spreads humanity a second time: Colonization and maps
• Contemporary period: Ubiquitous mapping and navigation
Earliest evidence
9,000 years before writing:

A team of Spanish archaeologists have matched marks on polished sandstone made 14,000 years ago in Navarre, northern Spain to the landscape in which it was found and claim to have the earliest known map, which appears to be a prehistoric hunting map. The map has depictions of reindeer, a stag and some ibex, plus the shapes of mountains, and the course of a river.
Abauntz Cave, Navarra, Spain
Some Amazing Maps
Ulm, Ptolemy (150 AD)
Hereford Cathedral Mappa Mundi 1300AD
Kwon Kun's Kangnido Map (1402)
America and Africa in Martin Waldseemuller's 1507 world map
Early Remote Sensing
Kok Tepa ruins near Samarkand, Uzbekistan
occupied c 500 BC to 1220 AD
Harry Beck: London Underground 1933
London: The Information Capital

Excerpted from *London: The Information Capital* by James Cheshire and Oliver Uberti (Particular Books, 30 October 2014)
Some questions to ponder

• If maps existed 60K years ago, what did they look like? What functions did they perform?
• Do maps today still serve the same functions?
• How has scientific progress changed map accuracy and function?
• Why do so few truly ancient maps survive?