Maps and Spatial Reasoning

Instructor: Professor Keith Clarke
TAs: Dan Ervin, Yingjie Hu, Olaf Menzer

To set the stage

- In the beginning was the word….. “It is generally agreed that true writing of language was invented independently in at least two places: Mesopotamia 3200 BC and Mesoamerica 600 BC.” (numbers are earlier)
- Maybe, in the beginning was the MAP!

Spatial Thinking

- But did writing develop before SPATIAL REASONING?
- Spatial thinking: Reasoning and thinking using graphics (can also use spoken word, written word, numbers & symbols)
- Visual tools are drawings, photos, charts, graphs and maps

Perhaps the first maps were…

Let’s see what the authorities say…
Çatalhöyük: 6000 BCE

Drawing of the central portion of the Çatalhöyük map. The twin peaked volcano is a reasonable representation of the way Hasan Dagi looked 8000 years ago. It has been extinct since the second millennium BCE.

But is it a map?

A bird’s eye view - of a hunter’s spot. The Çatalhöyük ‘map’ and the development of cartographic representation in prehistory.

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Abstract: The Çatalhöyük map preserved in the archaeological Çatalhöyük type (formed archaeologically and constructed diagrammatically) and more interpretations of their content and representation provides new insights into the development of cartographic representation, including the interpretation of maps made in the Mesolithic period.

Even older, 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

My assertion

• Humans could make and interpret maps thousands of years before they could write
• Use was for hunting, safety? migration?
• Major portion of the human brain deals with vision and space
• Spatial thinking can be tapped for memory, learning and reasoning!
• In the beginning, was the MAP

What you will learn

• Spatial reasoning and thinking
• Map geometry, construction and content
• Practical map use, reading and navigation
• Map representation
• Cartometry and map analysis
• Basics of cartography’s sister disciplines

How you will learn it

• Textbook
• Lectures
• Labs and Gauchospace
• Supplemental materials
• Exercises in lab
• Evaluations
What I expect from you

• Attend lecture
• Attend lab
• Submit labs in a timely fashion
• Read the book and materials
• Ask questions
• Think spatially!