

The Mapmakers by John Noble Witford

The Mapmakers is a thorough, research-based approach to the history of mapmaking, tracing back to its ancient origins. Witford proposes to explore the map's "promise of places to go and things to see and do" (ix). As we have often discussed the complex relationship between reality and maps, and how one can define the other and vice versa, Witford proposes "world was more familiar to us as a map than as a reality" until fairly recently (x), using the anecdote of astronauts being surprised to find that the outlines of the continents do in fact resemble the outlined shapes upon a map as a point of consideration. In addition to the traditional definition and mapping of the land, Witford suggests that the act of mapping is timeless, as there will always be "remaining unknowns" to be explored and mapped (x). Thus mapmaking will be an eternal impulse, as there will always be some uncharted depths of the sea, or corner of the universe.

Witford defines the act of mapping as making anything spatial "more understandable through a mosaic of points, symbols, lines, shadings, and coloring" (x). He emphasizes the importance of mapmakers themselves, as the title suggests, defining their role: "mapmakers through time have communicated a sense of where we live, where we have been and want to go, and where we are when we get there (2). I have included Chapter One in its entirety for you to consider, as it provides an excellent foundation for the history of mapmaking across cultures.

In Chapter Two, Witford discusses the original conceptions of Earth before maps were constructed, as well the steps we take for granted that were necessary via primitive mathematics and technology to begin to map the planet. I found the phrase provocative:

Before Earth could be mapped it had to be known, and the knowledge came slowly, at first indirectly, and only after the human mind could rise above myth and transcend narrow experience (18).

Considering mythology as an obstacle to the ability to map the world and a few of one's own world transcendent of immediate surroundings was interesting to me as it is something that modern readers of the book or those considering mapmaking would take for granted. In our time not only are we aware that there is a world that exists outside our immediate family and community, we have instantaneous access to it at any moment via the internet – to not just our state, country, continent, but our planet and to lesser degree of accuracy, our solar system and universe. This extremely expanded view of the macrocosm of existence we are provided and privileged to have inherited an awareness of, while original mapmakers did not.

The function of the map thus changed from the Chapter One functionality of recording and taxing land, to trying to understand the foundations of existence. Chapter Two addresses the understanding of the shape of Earth itself as the first of the fundamental issues of understanding experience as well as a starting place to establish the traditions of cartography.

Some of the original popular conceptions of Earth were (18):

- a flat platter floating on water
- a square
- flat, supported by four elephants standing on the back of a giant turtle

- Homer wrote that it was a flat disc surrounded by a flowing ocean, with the sky resting on its rim like a bowl

Witford adds that the Homeric model makes sense as a map that records the reality of experience as we perceive it – the Earth seemed flat everywhere, from horizon to horizon. This obvious fallacy calls into question maps as a true reflection of subjective reality, as well as their usefulness as reflections of reality, which is an interesting counterpoint (19).

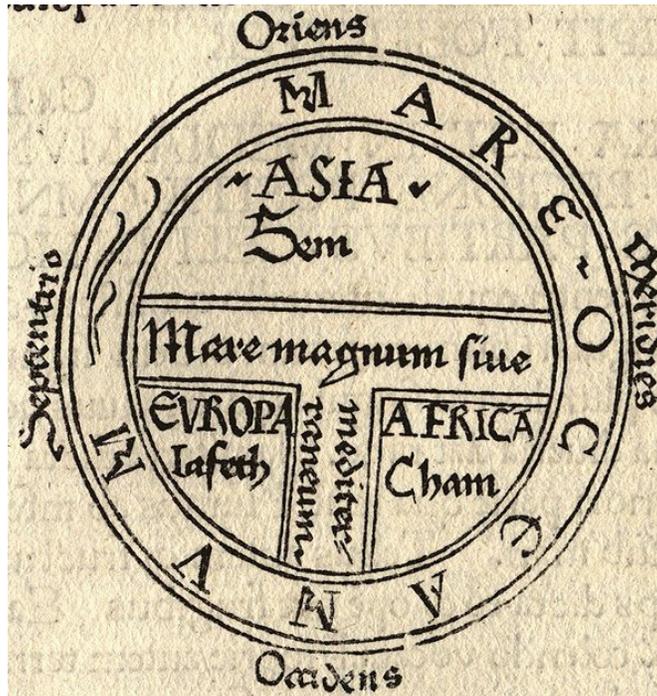
He credits the Greeks as providing a radical way of thinking about the world fundamental to modern-day mapmaking – that the universe itself was not based on myth and mystery, but comprehensible, as the Greek word for universe, *cosmos*, means order (19). As the Mesopotamians began to discover patterns in the movement of the sun, moon and stars used to determine the passage of time and seasons and provide the foundations for astronomy, the Sumerians and the Babylonians created writing and mathematics (19). Combined with Greek logic, these discoveries led to the first conception of the Earth as a sphere, and the measurement of its circumference, fundamental to mapping the rest of the world.

I decided to focus my report on the struggles and conflicting conclusions and discoveries of the early mapmakers. I found their process of trying to create a vocabulary and tools to explore something completely uncharted really inspiring for the project we are approaching theatrically. Here is a brief history of the earliest mapmakers covered in the book.

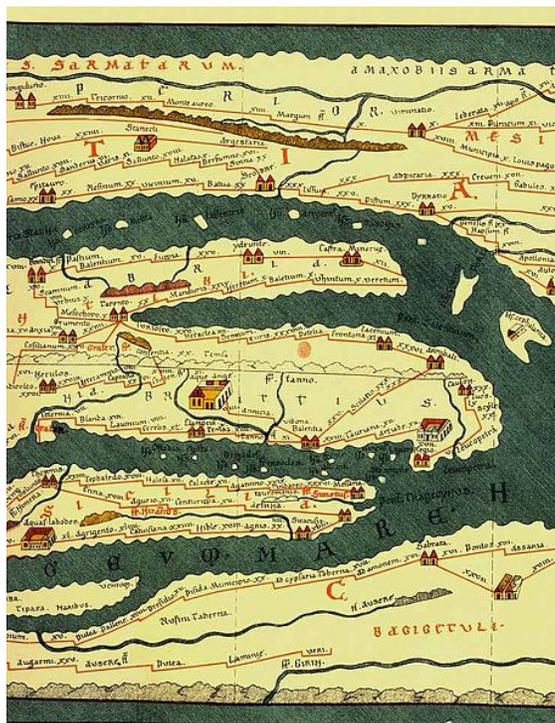
- Thales of Miletus - 6th century B.C. (20)
 - studied Egyptian geometry and Babylonian astronomy
 - sought observable unifying explanation for all things
 - tried to dismiss mythology and observe nature
 - concluded everything originated from water
 - believed in flat disc Earth floating on water
- Anaximander believed “Earth was a cylinder, on the top of which existed a disc-shaped habitable world” (20)
- Anaximenes “conceived of Earth as a rectangle buoyed up by compressed air” (20)
- Pythagoras, Samos - 6th century B.C. (20)
 - decided Earth was spherical, by observing sphere was “perfect” shape and observing Sun and Moon are spheres
- Aristotle – end of 4th century B.C. (20)
 - established idea of “sphericity” in his writings and thus Western thinking
 - noticed stars in the sky were in different positions at different spots on Earth, suggesting Earth is a small sphere
 - saw ships vanished on horizon in whatever direction they traveled
 - saw shadow of Earth was a circle on the moon during lunar eclipses
- Eratosthenes, Alexandria - 3rd century B.C. (22)
 - chief librarian of Alexandrian Museum Library
 - knew grammar, poetry, philosophy, science, math

- heard story that up Nile in Syene the Sun reportedly shone directly into a well at noon on the longest day of the year, which he deducted meant it was at the northern boundary of the tropics (23)
- measured angle of shadow in Alexandria at noon of that day and basic mathematics to determine circumference of Earth (26)
- considered the father of geodesy, the science of Earth measurement (28)
- Ptolemy, Alexandria (Chapter Three)
 - “best remembered for rejecting Aristarchus's theory that the Earth revolves around the Sun” (29)
 - geocentric, Earth centered concept of universe
 - “modern navies still find it more convenient to navigate by Ptolemaic astronomy, and each day we speak of the rising and setting of the Sun rather than the turning of the Earth” (30)
 - major book *Geography* rejected Eratosthenes measurement of Earth, thought world was $\frac{3}{4}$ its actual size
 - invented use of minutes and seconds as subdivisions of a degree
 - collected maps thusfar of Western world
 - included instructions of how to make geography more systematic and scientific
 - “Geography is a representation in pictures of the whole known world together with the phenomena which are contained therein” he said (31)
 - said maps must be drawn to scale
 - a larger map should be supplemented with regional maps so detail is not sacrificed
 - maps should be drawn with coordinates that establish latitude and longitude
 - also first to deal with problem of projecting round sphere on flat surface
 - first “equal-area” projection: what are equal areas on Earth's surface appear as equal areas on the map (37).
- Gaius Julius Solinus, Roman 3rd century B.C. (41)
 - wrote one of most popular books of Middle Ages, *Polyhistor*, that spread many misinformations about geography of world
 - spread mythology of strange beasts living in East, Africa, even Germany
- Cosmas - 6th century Christian monk (43)
 - took literally biblical description that tabernacle is shape of Earth
 - Earth was “a flat parallelogram twice as long as it is wide” - “tabernacle concept”
 - thought round Earth was ridiculous idea
- Saint Brendan - 6th century Irish monk (45)
 - tried to find physical location of Paradise
 - dreamt of island west of Ireland – would appear on maps for the next 1200 years
- Isidore of Seville, early 7th century (45)
 - fixed location of Paradise in the far East
- Fra Mauro, monk, Venice, 1459 (52)
 - made world map based on Marco Polo's explorations in the East, the *mappamundi*
- Richard of Haldingham, monk, Hereford Cathedral, 1275 (55)

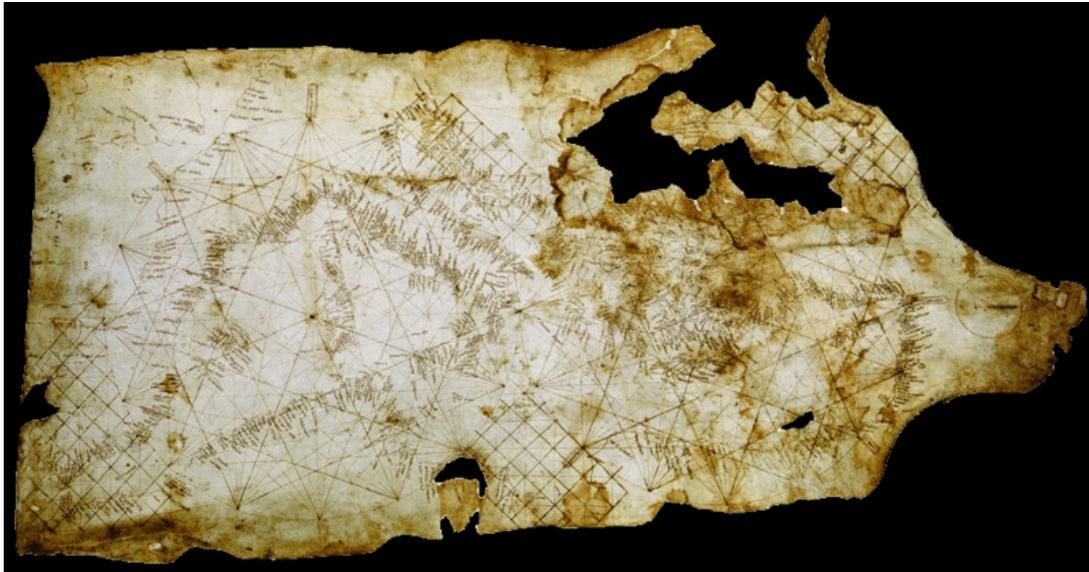
- most common shape of medieval map was circular disk or wheel form, T-O map
- preserved biblical “circle of the Earth”



- Earth surrounded by circle of ocean (O) with three continents in shape of T, Asia in top.
- should be judged as work of art, not of real information (56)
- road map and sailing chart also evolved during Middle Ages (57)
- Marcus Agrippa, Roman (57)
 - surveyed thousands of kilometers of highways from Britain to Middle East
 - placed benchmarks of Roman roads
 - then created master map
 - one copy may have survived as Peutinger Table



- pilgrim maps – used for pilgrims to travel through Europe in 300's.
- Matthew Paris, English monk (59)
 - drew strip maps of pilgrimage routes within England
 - modern day automobile maps would descend from these
- 14th century developed seafaring maps, “cosmographers” emerged as first full-time mapmakers (60)
 - created “portolan charts”, sailing and harbor guides
 - oldest surviving nautical chart, The Pisan Chart, 1300



- referred to Ptolemy by referring to charts as north, south, east and west (62)
- Amalfi credited with inventing mariner's magnetic compass early in 14th century (62)
- developed compass cards, compass circles
- “now possible to base maps on direct observation by means of an instrument” (64)
- Abraham Cresques, a Jew of Palma, Catalan school of cartographers (65)
 - 1375 made Catalan Atlas
 - six colored maps combining accuracy with scope of mappamundi



- Martin Behaim, German, 1492
 - oldest globe we have, called the *Erdapfel*, “Earth apple” (71)



- globemakers now in demand
- trying to map the New World posed new set of questions
 - what did Christopher Columbus know about world before 1492 expedition? (80)
 - made his own charts, also charts by Juan de la Cosa exist of the voyages



- Gerardus Mercator, 16th century cartographer
 - made new up-to-date maps of world
 - created his own projection with distortion of lines of latitude running parallel to the equator and lines of longitude intersecting at right angles (90)
 - conformal, orthomorphic, correct form map (92) - “preserves shapes of small parts of the mapped surface”
- Jean Fernel, French, 1500s (111)
 - first surveyor to try to determine length of degree of latitude
 - surveying become possible and instrumental to geodesy

These earliest mapmakers were most interesting to me because they mapped the Earth with surprising accuracy without sophisticated tools or technology. The book concludes with a discussion of the modern tools of mapmaking, from mapping the moon, to Mars, to the universe. Like these historical cartographers, there is still an uncharted frontier for us to explore to try to discover ways to represent and understand the world around us. I found understanding the impulses that led cartography to begin as a practice a great place for us as a class to think about what we want to communicate to audiences, and what the “cartography of the imagination” might mean. Just as the first cartographers needed to discover the tools and terminology with which to map the physical world, we too need to discover these tools for ourselves, a really exciting connection that places us on the forefront of discover along with these mapmakers Witford discusses.

