Ptolemy's Geography *and Renaissance Mapmakers*
TEACHER EXHIBIT OVERVIEW

EXHIBIT INTRODUCTION:

The Renaissance idea that "good" maps should be based on direct observation and compiled according to mathematical and scientific rules and standards has not only governed the way we make maps, but also the way in which we view the world. The "rediscovery" of Claudius Ptolemy's *Geography* (or *Geographia*) by Renaissance scholars lies at the center of this story. Originally composed in the second century CE, the *Geography* described in words, tables of geographic locations, and maps the entire *oikumene,* or habitable world as Ptolemy knew it, in unrivaled detail. But it was equally important as a model for mapmaking. Many of the fundamental ideas about modern cartography are traceable to the *Geography* and its interpretation by Renaissance geographers.

By looking at numerous editions of the *Geography* published throughout the Renaissance we can trace Ptolemy's influence on the way maps were produced and published, and on Europeans' view of the wider world. At the same time, we can see how the *Geography* was transformed by some of the greatest geographical thinkers and mapmakers of the age, who were responding to the world-changing events of the 15th and 16th centuries.

The Newberry's renowned cartographic collection includes nearly all of the printed Renaissance editions of the *Geography*. Most of the editions were acquired by Edward E. Ayer and given to the Library with the bulk of the Ayer Collection in 1911. We have arranged highlights from this collection chronologically and geographically. As you move through the exhibition, you will not only trace the Renaissance interpretation of Ptolemy's work, but will also make a circuit around Ptolemy's world as represented by the twenty-six regional maps that form the Ptolemaic canon.

WHO WAS PTOLEMY?

- Claudius Ptolemy (ca. 90 – 168 BCE) was a mathematician, astronomer, and geographer who lived in Alexandria, Egypt.

WHAT IS THE *GEOGRAPHY*?

- *Geography* is the common name for the body of work produced by Ptolemy in the 2nd century BCE. The Latin title for the work is *Geographia*; some Renaissance editions were titled *Cosmographia*.
- *Geography* literally means "writing the world" and Ptolemy's *Geography* is essentially a mapmaking manual. Many of the fundamental ideas about modern cartography are traceable to the *Geography* and its interpretation by Renaissance geographers.
- The *Geography* is comprised of three parts: tables of geographic coordinates (the largest part), instructions for mapmaking, and maps.
    - Ptolemy used information collected by people traveling the world for the geographic coordinates of nearly eight thousand locations in the known Greek world (the *oikumene*) and included then in the *Geography*. He was not the first or only person to do this, but his work included a far greater number of coordinates than any other before or in his time. Ptolemy did not calculate all of the coordinates himself. He collected them from his colleagues, local scholars, and explorers and sailors from through the Greek world.
    - Greeks scholars (such as Ptolemy) and Reniassance scholars and educated laymen (such as our mapmakers) knew that the earth was round. Contrary to historical myth, Columbus too

knew this prior to his voyage in 1492. Ptolemy's instructions for mapmaking included how to use projections to create world maps and regional maps that to some degree reflected the spherical shape of the earth.
    - No ancient Greek copies of *Geography* still exist, making it is impossible to know if Ptolemy did or did not make maps in addition to the coordinates.
    - All of the coordinates Ptolemy provides in *Geography* are for locations in the northern hemisphere or near the equator.
    - All printed copies of the *Geography* made during the Renaissance are printed with north at the top of the page, beginning the tradition of orienting the top of the map due north. Ptolemy did not specify this orientation in his mapmaking instructions.
- Ptolemy wrote his *Geography* in Greek, and the oldest surviving copies are written in Greek. During the Renaissance, most printed editions were made using Latin translations of the text, with some editions in other languages.
- In the 3rd century BCE, Eratosthenes first explained how to construct maps based on parallels of latitude and meridians of longitude.
    - In order to determine the distance between each parallel of latitude and meridian of longitude, Eratosthenes first needed to determine the circumference of the earth.
        - First he noticed that at noon on the summer solstice, the sun was directly overhead in the town of Syene.
        - Believing that Syene was due south of Alexandria, Egypt, Eratosthenes measured the location of the sun in the sky at noon on the summer solstice, and determined that the distance between Alexandria and Syene was 1/50 of a full circle.
        - In total, his measurements determined that total circumference of the earth was 46,620 km, or 28,968 miles, around. This is approximately 16.3%, or one-sixth, too large, but a significant advancement for the time, nonetheless.
    - The parallels that Erastothenes originally developed were called *stades* or *stadium*, an ancient Roman unit of measurement approximately 185 meters long.
    - Through his measurements, Erastothenes predicted that the earth was 252,000 stades in total circumference.
    - He began to show *stades* on his maps in order to help identify distance for the user.
- Ptolemy was primarily known to medieval scholars through his astronomical work, the *Mathematike Syntaxis* (Mathematical Treatise). It was later translated into Latin under the title *Almagest*. Fifteenth century scholars "rediscovered" medieval copies of the *Almagest* (which is a corruption of the Arabic title of the work) and *Geography*, and the text and maps quickly became a model for Renaissance cartography.

VOCABULARY WORDS:

Absolute Location—a unique or exact position on the Earth's surface; for example, a classroom number or home addresses are examples of an actual location; the longitude and latitude reference system on maps and globes gives an absolute location.

Coordinates—a pair of numbers and/or letters that show the exact position of a point on a map or a graph.

Distance—the extent or account of space between two things, points, lines, etc.

Equator—an imaginary line drawn around the middle of the Earth an equal distance from the North Pole and the South Pole.

Latitude—the position north or south of the equator measured from 0º to 90º.

Longitude—the position to the east or west of an imaginary line on the Earth's surface.

Map—a graphic representation that facilitates a spatial understanding of things, concepts, conditions, processes, or events in the human world.

Oikumene—Ancient Greek term for the known or habitable world

Peninsula—an area of land almost completely surrounded by water but connected to a larger piece of land.

Portolan Chart—a hand-drawn navigational chart drawn made in Mediterranean ports and used by Mediterranean sailors from the thirteenth century to the seventeenth century and characterized by a grid of intersecting rhumblines (or loxodromes) and scalloped coastlines with the names of ports of landmarks and ports written at right angles to the coasts.

Ptolemaic—of or relating to Ptolemy.

Relative Location—the location of a point expressed in relationship to the location of other points or in relation to a geographic reference system, such as the USPLS.

Stade—an ancient Roman unit of measurement, equaling approximately 185 meters.

Terra Incognita—an unknown, or unexplored land, territory, or region.

Trapezoidal—of or relating to a trapezoid, which is a shape with four sides, two of which are parallel and two of which are nonparallel.

Wayfinding—signs, maps, and other graphic or audible methods used to convey location and directions to travelers.

BIBLIOGRAPHY & ADDITIONAL RESOURCES:

Berggren, J. Lennart and Alexander Jones. *Ptolemy's* Geography*: An Annotated Translation of the Theoretical Chapters*. Princeton: Princeton University Press, 2000.

Harley, J.B. and Woodward, David eds. *The History of Cartography*. Vols. 1 and 2. Chicago: University of Chicago Press, 1987.

Historic Maps in K-12 Classrooms (www.newberry.org/k12maps). Produced by the Newberry's Hermon Dunlap Smith Center for the History of Cartography, this free web resource for teaching the geographical dimensions of history includes four lesson plans based on one of the Ptolemaic world maps in the exhibit (Ptolemy Transparency #1).

Mapline vol. 106 (Fall 2007). Mapline is a subscription journal published by the Smith Center. Please contact the Smith Center for subscription information at smithctr@newberry.org or (312) 255-3659.

Ptolemy, Claudius. *The Geography*. New York: Dover Publications, 1991. This is a reprint of a 1932 translation of the *Geography,* which includes black and white map images.

Snyder, John P. *Flattening the Earth: Two Thousand Years of Map Projections*. Chicago: University of Chicago Press, 1993.

Stevenson, Edward Luther. *Claudius Ptolemy* The geography. New York: Dover Publications, Inc., 1991.

Toomer, G.J. *Ptolemy's* Almagest. Princeton: Princeton University Press, 1998.