The Earth location scheme based upon spherical coordinates, known as latitude and longitude, was developed by the Greeks over two thousand years ago (National Geographic Society 1999). This system was applied and expanded to include arc minutes and seconds to the gazetteer and maps generated by Ptolemy (ca. 90-168 AD) (Wilford 2001). Accurately determining latitude and longitude has been a focus of geographic inquiry ever since, spanning the technological realm from protractors to the Global Positioning System. Reasonably accurate latitude determination was mastered by the ancient Greeks from solar angle measurements, but the determination of longitude took much longer. Longitude, which has no convenient reference points or lines, required the development of accurate clocks known as chronometers in the eighteenth century. John Harrison's technical and political tribulations in developing the chronometer are described in Longitude by Dava Sobel (1995) and are portrayed in the History Channel movie by that title which first aired in 1998.

Latitude is the story of William Gilbert (ca.1540-1603) who systematically studied the Earth’s magnetism in what is considered the first modern scientific inquiry. Gilbert presented his findings in De Magnet: A New Natural Philosophy of the Lodestone, Magnetic Bodies, and the Great Lodestone the Earth Demonstrated With Many Reasons and Experiments (1600). Even though he was trained as a physician, Gilbert was captivated by magnets, their forces, and their motions. Gilbert noted the angular error of compass needles away from true north, declination, and the angle of the needles to the surface of the Earth, inclination. With detailed maps of hundreds of measurements of magnetic
declination and inclination, Gilbert hoped to develop an alternative method for calculating latitude, while at the same time determining longitude. This method was based on the assumption that a unique combination of magnetic declination and inclination would define a unique Earth location. His method failed to develop an accurate and reliable location scheme, but his measurements of the Earth’s magnetic variations, and experiments with lodestones, led him to the important conclusion that the Earth acted like a giant magnet.

Stephen Pumfrey chose the title *Latitude* for his book on Gilbert not only as a complement to Dava Sobel’s *Longitude* but also to demonstrate the fundamental role that geographic location played in this seminal scientific study. Gilbert’s studies of magnetism, following the model developed by Sir Francis Bacon, marked a critical turning point from Aristotelian speculation, which characterized the Renaissance, toward experimentation and measurement, the core of modern science. Gilbert’s study provided evidence of the observation-based Copernican heliocentric universe rather than the more “logical” and “perfect” Earth centered cosmos proposed in antiquity and embraced by Renaissance philosophers as well as religious leaders.

Gilbert’s explanations of magnetism and its applications may seem strange to modern readers, but they demonstrate the nature of scientific knowledge in Elizabethan England at the turn of the seventeenth century. Even though Gilbert recognized the association of magnetism with electrical sparks, demonstrating a relationship with electricity, he ascribed magnetic force to a mysterious attraction, called coition, that he attributed to the “soul” of the Earth.

Some of the great minds of that time such as Sir Francis Bacon, Rene Descartes, Johann Kepler, and Galileo embraced this force to explain the motions of the planets around the Sun in a new magnetic cosmology. However, within fifty years of publication of *Latitude*, the inability of this solar system model to demonstrate true magnetic behavior, especially the equally strong repelling force, prompted later investigators to more precisely measure the movements of the planets. Such studies facilitated the discovery of gravitation by Isaac Newton three generations later, and led to a more modern view of the forces in nature as being less anthropocentric and more physically based.

Stephen Pumfrey weaves the complex story of these technical concepts into an engaging text that is richly illustrated and well-written with few technical or grammatical errors. The book’s only significant flaw is the absence of an index. The book provides the geographer a fascinating history of ideas about the Earth at the dawn of the scientific era. Pumfrey links the preconceptions of antiquity with new discoveries of both new lands and new ideas brought forth out of exacting experiment and observation. The book provides a captivating story about the development of modern science in the context of answering some of the most fundamental geographic questions.

**REFERENCES**


Editorial Policy and Instructions to Authors

All manuscripts must be in acceptable form and ready for peer review. Contributions to The Geographical Bulletin of Gamma Theta Upsilon should follow the general specifications noted below:

1. All manuscripts should be double-spaced on 8 ½” x 11” paper with 1 ½” margins. Print on one side only. Submit three copies of the manuscript. Use 10 or 12 point fonts only. Upon submission of the final version of an accepted paper, the author should provide digital copies.

2. References, tables, charts and other graphics such as maps and photographs should be cited parenthetically in the text as follows: (Wilhelm 1998), (Table 3), or (Fig. 2). If a published statement is quoted, use page numbers e.g. (Wilhelm 1999, 3–4). Double space references on a separate page immediately following the text. Appendices and postscripts are to be avoided. Endnotes should be used sparingly. All references cited in the text should be listed and double-spaced alphabetically by author as noted below:


3. All tables and figures must be printed on separate pages, double spaced and referenced by Arabic numerals. Include a list of double-spaced table and figure captions.

4. All line drawings and graphics must be suitable for reduction to 7.5 by 5 inches. Maps must have scales, a fine neat line serving as a boundary and patterns which will tolerate reduction. All graphics and photographs will be black and white and of professional quality. Digital copies of all figures, drawings, photos and other graphics are required for final publication, in TIFF or JPG format, at least 300 dpi. For purposes of review, draft maps and copies of photographs are acceptable.

5. Include an abstract of up to 150 words double spaced followed by up to five key words. The abstract should state the objective, methods and conclusions of the paper, and should appear on a separate page.

6. It is the author’s responsibility to obtain copyright release in writing to use copyrighted material.

7. Use the same type style and font size throughout the paper. Please italicize book and periodical titles.

8. Authors should write their papers in the active voice.

9. Two copies of the article should be blind; that is, they should contain no information that would identify the author to a potential reviewer.

10. The editor recommends that student manuscripts be reviewed by a faculty member for editorial comments prior to submission.

Send three copies of all manuscripts to:

Dr. Steven M. Schnell
Editor, The Geographical Bulletin
Department of Geography
Kutztown University of Pennsylvania
Kutztown, PA 19530

Telephone: (610) 683-1595
Fax: (610) 683-4941
E-mail: schnell@kutztown.edu

The Editor and Editorial Board of The Geographical Bulletin and its Board of Directors and officers are not responsible for the facts, opinions, or statements of the authors contained in this volume.