

these salient points: “[T]he maps we discern in a movie often heighten our awareness about perception and subjectivity” (207), and “a map in a movie can unsettle or displace the inferred contracts tendered at the beginning of every film about the conditions of viewing that follow” (208). But “When a cartographic shape—be it a projection, a globe, an icon of the world, an atlas, a diagram, a bird’s-eye view of the landscape, a city-view—is taken as a point of departure, it becomes a model, a patron, or even a road map from which transverse readings can be plotted” (208) and “[C]artography and cinema share in the design of what one critic long ago (Jameson 1982) called ‘strategies of containment’” (212).

This book was written more for film historians than cartographers; indeed, it reads like it belongs in a film history classroom. Unfortunately, only forty figures appear in the text for the sixteen films discussed (plus the numerous other films referenced). Given the graphic nature of both cartography and cinema, Conley should have provided more figures to help the reader better visualize his points. While a DVD insert with film clips would provide much appreciated context, I doubt that copyright restrictions would allow such a feature. Regardless of these criticisms, this reviewer will likely never watch movies in quite the same way again.

Placing History: How Maps, Spatial Data, and GIS Are Changing Historical Scholarship

Edited by Anne Kelly Knowles, with a digital supplement edited by Amy Hillier, and a foreword by Richard White.

Redlands, California: ESRI Press, 2008.

313 pp., 85 figures, endnotes, bibliography, index, author biographies, CD insert.

\$49.95. Softbound

ISBN 978-1-58948-013-1

*Reviewed by: Daniel G. Cole
Smithsonian Institution, Washington, DC*

This book springs from both a conference at the Newberry Library in 2004, “History and Geography: Assessing the Role of Geographic Information in Historical Scholarship,” and as a sequel of sorts to Knowles’ earlier edited work, *Past Time, Past Place: GIS for History* (2002), to which it serves as a compendium of projects now completed. More than half of this book’s chapters range in topic across time and space, while the others provide theoretical and methodological discussions usable for future research. In total, thirteen authors from history, geography and planning departments across academia present a foreword, ten chap-

ters, and a conclusion to address how maps, spatial data, and GIS are changing historical scholarship.

Knowles begins the introductory chapter by identifying the differences between geographers and historians and notes some reasons why historians have generally been reluctant to use GIS. She posits that historical GIS (HGIS) scholarship combines historical geography and spatial and digital history with databases that record both locations and time, thus enabling maps (including animations) to illustrate changes over time. She uses examples to show that HGIS has been focused on the themes of the history of land use and spatial economy, reconstructing past landscapes and built environments, and infrastructure projects to facilitate the use of HGIS research. Lastly, Knowles helpfully addresses the conceptual and technical challenges facing historians and geographers who plan to use GIS in their research. Particularly, she discusses the paucity of colleagues doing similar work, the ability to recognize geographic information embedded in historical sources, the variable of accuracy in mapping over time, and the lack of standards in documentation.

In Chapter 2, Peter Bol describes the use of GIS for investigating the history of China in a study based at Harvard and Fudan universities. The China Historical GIS (CHGIS) is an ambitious project covering more than 2100 years and ultimately consisting of three elements: “a continuous time series of the administrative hierarchy from the capital down to the county”; “major nonadministrative settlements, particularly market towns that proliferated during the last millennium”; and “historical coastlines, rivers, lakes, and canals” (28). The administrative structure has been modeled as points, for example, capital–county seat–village, with shifting lines and areas of control against the landscape. Indeed, as Bol notes, “For much of the last millennium, demarcating boundaries was the exception rather than the rule” (42). Nonetheless, the CHGIS maximizes the point coverage of settlements as much as possible so that Thiessen polygons can be used to approximate the county boundaries over time. Supplementing that data are compilations of local gazetteers, market networks, lineal villages, and religious networks. In all, CHGIS aims to “take into account such historical shifts in sources and spatial conceptions” (54).

The third chapter, “Teaching with GIS,” is split into two parts: “The Value of GIS for Liberal Arts Education” by Robert Churchill and “A Guide to Teaching Historical GIS” by Amy Hillier. In Part I, using several pertinent examples, Churchill discusses how GIS adds value to education. “First, GIS can teach valuable analytical and problem-solving strategies that transcend disciplinary boundaries. Second, GIS emphasizes visualization and underscores the indispensable value of the visual by using maps to communicate results.

Third, GIS engages a variety of important and timely social, economic, and political issues. Finally, GIS can provide a pedagogy that at once serves and cuts across traditional disciplines" (63). In Part II, Hillier uses historical data from Philadelphia to show how GIS was used in a course on urban history. Her students' examples range from W.E.B. Du Bois's map of social class in 1896 to maps of ethnicity, population, commerce, crime, transportation planning, and mortgage practices for the city. Historically mapped data of these types reflect the values and biases of the institutions and people mapping and being mapped.

Chapter 4, by Geoff Cunfer, analyzes the history of the Dust Bowl from the late nineteenth to the mid-twentieth century. His research challenges two assumptions: that dust storms happened where most of the land was plowed and that storms only happened after the massive plow-up of the 1920s. He notes that in the past, case studies were made of individual farms, locations and counties, and he specifically describes one study from the 1970s that evaluates only two counties in Oklahoma and Kansas during the 1920s-30s. More recently, GIS technology has allowed the study of the entire central and southern Plains region of the U.S.; in Cunfer's case, 208 counties across portions of five states and from the latter half of the 1800s forward. The author provides five animated maps illustrating average annual rainfall and percentage of total county area devoted to cropland plotted against numbers of dust storms. His results show that while plowing up the Plains did contribute to dust storms, this action by farmers could not be the only factor since many dust storms occurred upwind of plowing. A greater coincidence can be seen on his maps of drought zones overlain by dust storm regions. Cunfer also extends his analysis back into the 1800s by extracting data from local newspapers in the region, thus demonstrating a non-standard method of data gathering for GIS databases.

Ian Gregory, also a co-author with Paul Ell of a recent HGIS text (*Historical GIS: Technologies Methodologies and Scholarship*, Cambridge University Press, 2007), gives the reader a provocative title for Chapter 5: "A Map is Just a Bad Graph: Why Spatial Statistics are Important in Historical GIS." He starts off by bemoaning the typical choropleth map produced by many GIS users. Instead, he advocates going beyond the alleged limitations of thematic maps and making use of spatial statistics in HGIS. I use the word "alleged" since, after all, any good cartographer or GIS specialist should already be aware of using quantitative methods in their analyses. In balance, it must be said, he also discusses the limitations of spatial statistics alone, particularly noting the use of local versus global (or whole-map) statistics to avoid results with spurious spatial correlations. Regardless, he points

out how most GIS programs only provide a subset of possible spatial statistical techniques. Gregory then provides examples of three spatial analytical methods used in the study of the Irish potato famine and its demographic consequences from 1841 to 1881 and of infant mortality in Victorian and Edwardian England and Wales. Here, he successfully aims "to show how spatial statistics statistical provide new insights that otherwise have been concealed by the complexity of the data" (129). He finishes by warning that while spatial statistics "is an important and underused tool for historical GIS . . . the greatest challenge to the historian is not performing these techniques but interpreting the patterns that emerge from the data" (146).

The sixth chapter, by Brian Donahue, gives an overview of GIS for environmental mapping of agricultural husbandry in colonial Concord, Massachusetts. He studied various land records ranging from the original land grant in 1635 to the end of the colonial period. His initial analysis makes use of surficial geology, hydrology, and a derived layer of circa-1600 native landscapes. Donahue follows with a map of the parcels of Concord's "First Division," where fifty families made use of the land through divided holdings for houses, farming, and pasture, as well as parcels held in common. He then focuses on the divided, and often widely dispersed, holdings of individual landholders and their descendants. Parcels were typically irregular and described by metes and bounds; the author mapped these by land ownership two-dimensionally and added the third dimension of time. Obviously, his research involved a considerable amount of work interpreting the colonial records and translating them into a GIS database. He concludes by noting that "the bulk of land protection and stewardship in New England is being done by local conservation groups" and that "GIS mapping can serve as a useful tool to guide and inspire grassroots conservation efforts" (175).

Michael Goodchild delivers the seventh chapter on the future potential of temporal GIS. In his text, he provides a historical background to GIS and spatial databases followed by theoretical and methodological discussions on the conceptual design and workings of an HGIS. Tracking data to illustrate lifelines, migrations, explorations, and general tracks and flows can be stored and handled in an object-oriented database for historical analysis, while changing boundaries over time are handled in a longitudinal database in a GIS. Goodchild gives an excellent overall introduction to HGIS databases, and in my opinion his manuscript should have been placed toward the front of the book.

Chapter 8, by Richard Talbot and Tom Elliott, presents a project from the Ancient World Mapping Center, specifically, the creation of a GIS database from the *Peutingen Map of the Roman World*. This map is believed to be a copy of Roman work from AD 300 and survives

in eleven sections, each about 33 cm high by 62 cm wide. A series of scans preserves the map in digital form from which route networks, point locations, and physical features were extracted and built into the GIS. Warping this map, however, was not found to be a reasonable task given that the "scale, aspect, ratio, and even the cardinality of the compass points shift from one part of the map to the next as the design struggles to accommodate the competing pressures imposed by its extreme shape" (206). Instead, distance and point data were transferred to the GIS while matching features to the digital version of the *Barrington Atlas of the Greek and Roman World* (Princeton University Press, 2000). The authors tested the assumption that the original cartographer set distances on the map to local usage (Roman miles, Gallic leagues, etc.), but the use of these distance measures by the mapmaker(s) was far from consistent. Nonetheless, the authors found that the fixing of known sites and routes helped fill in missing places and find locations for previously unknown sites. They consider this effort to be only the first stage in the larger work of mapping the Roman and Greek worlds.

The ninth chapter, by David Bodenhamer, outlines the implications of GIS for the discipline of history. The author begins by complaining that many historians rarely use, much less embrace, GIS technology, but he forecasts that "GIS may have the most potential for breaching the wall of tradition in history for two reasons: it maps information, thus employing a format and a metaphor with which historians are conversant; and it integrates and visualizes information, making it possible to see the complexity historians find in the past" (222). Whether creating maps for academic papers or publishing a historical atlas, GIS provides a platform for examining history. Given the viewing flexibility of many GIS layers, the software enables views from multiple perspectives and scales, an ability historians often desire. Regardless, "one of the most cited impediments is the technology's awkwardness or inability in managing ambiguous, incomplete, contradictory, and missing data" (126). Fortunately, developments in GIS are gradually allowing better depiction of the dimension of time, while historical maps are becoming more readily available (from sources such as David Rumsey and the Library of Congress), and digital historical gazetteers are often providing anchors to uncertain places of the past. Bodenhamer sums up by noting that "historical GIS offers an alternate view of history through the dynamic representation of time and place within culture" (231).

In Chapter 10, Knowles postulates what Lee and other Confederate and Union commanders could see of the battlefield at Gettysburg. She notes that Lee, Meade, and other West Point graduates were schooled and practiced in the science of topographical map-

ping, and thus had well-developed talents for viewing and reading terrain. Few maps existed of this or other eastern battlefields before the engagements, so scouts and reconnaissance patrols could only report, and commanders could only understand, the situation as it could be seen. Identifying lines of sight and fields of vision is, therefore, vital for understanding Lee's and others' actions and reactions.

Curtis Musselman, cartographer and GIS coordinator of Gettysburg National Military Park, shared the data layers of the area in and around the park, including the current 3D terrain model. A second digital terrain model was necessarily created from georeferenced historic maps produced by post-Civil War army topographers. Both the historic and modern map layers were combined to develop viewsheds from points of prominence, such as Lee's position atop the Lutheran seminary on the west side of the village or the Union signalmen's position on a small hill known as Little Round Top. Overall, "the GIS viewsheds help one imagine what might have gone through the minds of soldiers and commanders that fateful day" (260).

The concluding chapter, by Knowles, Hillier and Balstad, sets an agenda for HGIS. While it is no longer surprising to see historians using GIS in their research, its full potential has yet to be realized. HGIS requires both quantitative and qualitative scholarship. Since GIS, in general, works best in an interdisciplinary environment, sharing duties between historians, geographers, economists, and demographers helps mix the best attributes of these fields and so results in better analyses and the creation of new knowledge. A major challenge ahead is to create institutional infrastructure for collaboration in HGIS. The authors also campaign for the GIS software companies to "provide options for representing uncertainty," to develop "a tool that automatically creates data source notes for maps" and to "calculate and represent spatial change over time more easily" (272).

The supplementary CD comes with a copy of ArcExplorer, four PowerPoint presentations, PDFs, animations, and map documents. The PowerPoint slide shows, with accompanying PDFs of the presentation notes, relate to Knowles', Bol's, Hillier's, and Cunfer's chapters. Cunfer also provides five time-series animations of southern Plains rainfall, cropland, and dust storms. In addition, a link on the CD takes the reader to Knowles' Web site which provides her classroom handouts, as well as scanned and georectified versions of Warren's 1874 map of the Battle of Gettysburg. Lastly, Hillier, Cunfer, and Bol share three map documents and their associated map layers (TIFs and shapefiles) with readers to learn more about their studies.

In summation, this is an excellent book that should be shared and promoted with our colleagues in History. While I have quibbles over the organization of

its chapters, the text is to be highly recommended as encouraging further work in this realm. Because of this book, and other publications by Knowles, Hillier, Bol, Gregory, and others, I look forward to future publications in the use of GIS for History.

Terra Incognita: Mapping the Antipodes before 1600

By Alfred Hiatt

University of Chicago Press, 2008

298 pages, 8 color plates, 47 grayscale figures

Hardbound (ISBN 13: 978-0-226-33303-8)

Reviewed by: Jonathan F. Lewis
Benedictine University

Terra Incognita examines and explains the initial appearance and subsequent evolution of European perspectives on remote, unvisited portions of the globe. Covering the period from antiquity through the medieval epoch and into the period of global exploration, the book's eight chapters are arranged in chronological succession. While the chapters are of roughly equal length, the periods each covers necessarily are not.

Hiatt's initial chapter lays out his framework for presenting European representations of unknown lands, which he introduces by describing Abraham Ortelius' sixteenth century *Typus orbis terrarum*. This map's inscription on the massive continent thought at the time to dominate the southern hemisphere reads, "*Terra Australis Nondum Cognita*," or "Southern Land Not Yet Known," a clear indication of the expectation that remote lands did in fact exist, even if their exact form and contents were unknown. As Europeans acquired new knowledge about remote regions, *terra incognita* gradually became *terra inventa* (discovered land) and *terra nondum cognita* (land not yet known). That is to say, it evolved from unknowable into places both knowable and places soon to be known.

Throughout his book, Hiatt consistently returns to four organizational themes. The first theme involves the political implications "of spaces and people beyond the known world" (8). These implications include both imperial ambitions and tests of faith, the former because the antipodes represented frustrating limitations on ambitious rulers, and the latter stemming from Biblical assertions that Christianity must be spread to all lands. This theological implication led St. Augustine to conclude that no territory (and certainly no people) existed beyond the insurmountable barriers of vast oceans and intense desert heat.

Hiatt's second theme covers the manner in which remote areas were described and depicted, producing a particular geographic or cartographic tradition. As knowledge of the world was handed down through

generations, it was gradually supplemented by new knowledge, which led to the need to distinguish ancient from modern knowledge. For Hiatt, there is a clear and consistent, if not always smooth, line of thought extending from the ancient period through the early modern. It is characterized by ancient writings being retold and supplemented, not simply to preserve the originals, but to give them prolonged credibility by making them appear to foretell subsequent discoveries.

The third theme explores periodization, and Hiatt's conviction that conceptions of the world do not easily fit standard period delimiters. He observes that, while change did occur, "[W]hy that change occurred will not be enlightening if it falls back on banalities about inherently "antique," "medieval," or "modern" ways of viewing the world" (9). For Hiatt, the medieval period witnessed not the end of a view of the world informed by ancient writers, but rather a dialogue with older texts carried out by medieval translators challenged to explain (or explain away) positions taken by esteemed writers such as Virgil. Later, as European explorers encountered new regions, their attempts to map it were heavily informed by the very traditions that had deemed these areas forever inaccessible.

The book's final theme is one of representation. Many of the chapters examine the necessarily speculative graphic representations of unvisited and/or unreachable *terra incognita* lands that were devised by European cartographers and explorers over a period spanning hundreds of years.

The convergence of the four themes is exemplified by the medieval reinvention of Cicero's ideas via Macrobius and his subsequent translators and critics, thus allowing an ancient perspective to make its way into much later and, presumably, more knowledgeable periods.

The map of Macrobius illustrates Cicero's theories; it was produced for a text written in the fifth century; there is reason to think that it was wholly or partially reconstructed in the tenth. It underwent significant adaptations in the twelfth century, and a revival of interest in the fifteenth as a result of humanist interest in Cicero. Is the map classical, late antique, medieval, or Renaissance? Does it not rather belong to any period in which it was reproduced? (11)

Given Hiatt's objectives, the early chapter "The Antipodes in Antiquity" represents an important foundation for what follows. In it, he examines texts produced during the period and the political and social significance of distant, unreachable lands. He introduces the antipodes by reviewing texts of classical writers convinced not only of Earth's sphericity but also its likelihood of being widely inhabited. Plato, in particular, is cited as having set many terms for subsequent discussion, including a test of basic intel-