In collection development we have attempted to build on existing strengths. We have purchased several rare or unique maps of New York, including a copy of Bleau's 1635 map of New Netherland, and a copy of David Burr's 1829 atlas of New York State. Recently we purchased on microfilm a complete set of Sanborn Fire Insurance maps for New York State.

I have found that there is a surprising amount that a library in our position can do to contribute to map librarianship on a statewide and to some extent a national level. Much of what we have accomplished has been done through cooperation with other libraries. Several years ago we played an important role in cooperative preservation projects for old New York State maps and atlases, and we are hoping to do something similar with our soil surveys and 15 minute maps.

We have also been engaged in the digitization of historical maps of New York State. This has been a pet project of mine, since I am interested in the history of cartography, and few of the maps in our collection date from before 1830. Our own digital images have been eclipsed by higher resolution work done elsewhere, and I am trying to take advantage of the work done by others by adding links and explanatory information to their images. As we improve our own capabilities for high-resolution digitization, we may return to the fray with more and better images of historical maps, and possibly of such materials as 15 minute maps and soil maps.

Only a portion of our map collection is cataloged. A by-product of many of my projects is a series of databases in EndNote format, most of which are only available in-house. These include a list of the New York State maps in our Special Collections Department, a list of our soil-surveys published prior to 1950, and a bibliography of New York State maps published prior to 1830. I hope to make at least some of these available on the Web using the Institute for Scientific Information's new product, Reference Web Poster.

book reviews

GIS and Health

Edited by Anthony Gatrell and Markku Löytönen. GISDATA 6. London: Taylor and Francis, 1998. xvii, 212 pp., maps, figures, tables, index. $75.00, hardcover (ISBN 0-7484-07790).

Reviewed by Russell S. Kirby, PhD, MS, FACE
University of Wisconsin-Madison

This book is a collection of essays that were the result of a symposium sponsored by the GISDATA scientific program of the Standing Committee of Social Sciences of the European Science Foundation, held near Helsinki, Finland, in 1996. The sixteen symposium participants were an international group, mostly European with some American participants. The editors have worked with the authors of each chapter to provide a series of essays that are both internally coherent and consistent with a monographic approach.

The primary goal of the book is to explore the opportunities for applying GIS technology and methodology to the domain of health (p. ix). To that end, the editors have structured the essays in two sections, the first dealing with methodological issues and the second describing a series of health applications for GIS. The editors contributed introductory and concluding chapters.

Methodological issues range from the philosophical and theoretical to the specific application of methods to problems in medical geography and spatial epidemiology. Jacquez, for example, chastises users of GIS for health research who adopt the "gee whiz" approach through the use of GIS to transform spatial data into thematic maps which are then utilized to develop hypotheses, preferring instead that the scientific method remain the basis for the development and testing of research hypotheses derived from GIS-based analyses of health concerns. Haining provides a brief discussion of the types of spatial statistical methods; this chapter is far too abbreviated to serve to do more than whet the appetite of the interested reader but the author does provide a useful set of references. Of all the chapters in this book, that by Kulldorff on statistical tests for randomness in spatial epidemiology is most able to stand on its own. Kulldorff reviews the voluminous literature on clustering of health events in space and time, classifies these into four general approaches, evaluates the strengths and weaknesses of each approach, identifies the most useful techniques, and discusses the methodological concerns that remain unresolved. In this reviewer's opinion, Kulldorff's chapter should replace the earlier reviews by Besag and Newell (1991) and Marshall (1991) as a resource for students and researchers seeking a comprehensive introduction to this subject.

Rushton's contribution focuses on methods for improving the spatial aspects of public health surveillance using GIS. Rushton's work will be familiar to many in public health through his summer courses and presentations at national public health meetings, but for others this chapter provides a useful overview of the application and relevance of his methodology. There is a major gap between

knowledge and practice in the application of methods for spatial analysis and statistical mapping within the public health community, across the spectrum from local public health agencies to state and national administrative units. Rushton and Haining both note that existing GIS applications are insufficient for health research because they fail to bundle the necessary spatial statistical routines with the automated mapping capabilities. While there is evidence that major vendors are moving to remedy this deficiency, full integration will be hampered by the rapid evolution of biostatistical and spatial statistical methods.

The chapter by Collins focuses on methods for modeling spatial variation in air quality. This chapter is useful in that it describes several competing methodologies (dispersion modeling, kriging, hybrid methods, and spatial regression), identifies their strengths and weaknesses, and compares the statistical results of each using the same dataset. As noted earlier by Kulldorff, similar studies are needed to provide the information necessary to assess the statistical power and robustness of competing statistical methodologies for a number of issues in the fields of spatial epidemiology and medical geography. The final chapter in this section focuses on the opportunities for the analysis of time geography and health using GIS. Löytönen makes a convincing case for resurrecting a set of methods that had their heyday in the 1970s and early 1980s but have rarely been the focus of attention in the field of medical geography and are virtually unknown to epidemiologists and public health researchers. Inevitably, however, the brief chapter provided here serves only to scratch the surface and serious students will need to review the references and other sources.

The remainder of the book focuses on GIS health applications. While readers may find information of interest in the contributions by Trinca and by Braga et al., these chapters focus on describing applications rather than placing the contributions they describe in methodological perspective. López-Abente examines several approaches to the spatial analysis of cancer mortality, while van den Berg shows how population-based health data have been used for small area analysis and point-pattern analysis in western Pomerania. Teppo discusses opportunities for enhancing the analysis of cancer data with GIS, with examples from the Finnish experience. This chapter focuses primarily on data quality and epidemiological issues, rather than on methodological questions in spatial analysis or disease mapping.

Wilkinson et al. provide an overview of applications of GIS in public health. This chapter is limited in scope, and focuses more on environmental epidemiology than on the broader range of public health applications. Fortunately for American readers, the proceedings of the Third National Conference on GIS in Public Health (ATSDR 2000) and two issues of the Journal of Public Health Management and Practice devoted to GIS applications in public health (Richards et al. 1999) more than make up for this deficiency.

Methods for improving small area estimates of health needs through the use of registries or other population-based databases are discussed by Lovett et al. in the final substantive chapter. While American readers may be put off by the chapter's focus on data resources in the United Kingdom, the discussion is actually quite relevant irrespective of national context. Particularly useful are the sections outlining methods for calculating population estimates from patient databases and for applying census estimates to clinical contexts.

Clearly this book is not a comprehensive, all-in-one resource for the student of medical geography or the GIS trainee interested in health applications. However, the book does generally cover the broad range of approaches and methods for applying GIS to questions of health and disease and might serve as a supplemental text for a course in medical geography or as a resource for an advanced GIS seminar. Some critical comments are in order. First, in most chapters the references selected are somewhat limited in their connection to clinical research and population health. As a case in point, although Rushton's chapter is an excellent introduction to geographic approaches to mapping of public health indicators, a reader new to this subject is not directed to the literature on public health surveillance (e.g. Teutsch and Churchill 2000; Wilcox and Marks 1995). While the authors of many chapters are experienced in disease mapping or in environmental epidemiology, practical examples of public health applications are lacking. In the authors' defense, this may be because the real work of public health occurs on a day-to-day basis and rarely appears in peer-reviewed journal form. However, it would be interesting to integrate the concepts and methods discussed here into a public health practice text such as Dever (1997). Finally, this volume contains little material concerning the cartographic aspects of GIS and, therefore, should not be read by those seeking an introduction to geographic information systems in general.

So where does this book sit within the academic literature on geography, GIS, and spatial analysis in health? In my opinion, this book is an interim step, containing several insightful chapters and others that will rarely be accessed five years from now. Those who have access to a large research library would be best advised to

read the chapters of interest there, and the rest of us should await a more exhaustive and comprehensive compendium on this subject in the years to come.

References

Agency for Toxic Substances and Disease Registry. *Proceedings of the Third National Conference on GIS in Public Health*. (Atlanta, GA: Agency for Toxic Substances and Disease Registry, 2000); URL:http://www.atsdr.cdc.gov/GIS/conference98/proceedings.

Besag J., Newell J. The detection of clusters in rare diseases. *Journal of the Royal Statistical Society Series A* 1991;154:143-155.

Dever G. E. A. *Improving Outcomes in Public Health Practice: Strategies and Methods.* (Gaithersburg, MD: Aspen Publishers, 1997).

Marshall R. J. A review of methods for the statistical analysis of spatial patterns of disease. *Journal of the Royal Statistical Society Series A* 1991;154:421-441.

Richards TB, Croner CM, Novick LF. Geographic information systems (GIS) for state and local public health practitioners, Part 1 and 2. *J Public Health Manag Pract* 1999 Mar;5(2):73-6; 1999 Jul;5(4):1-6 Teutsch S.M., Churchill R.M., Editors. *Principles and Practice of Public Health Surveillance*, Second Edition. (New York, Oxford University Press, 2000).

Wilcox L.S., Marks J. S., Editors. *From Data to Action: CDC's Public Health Surveillance for Women, Infants, and Children*. (Atlanta, GA: Centers for Disease Control and Prevention, 1995).

The Island of Lost Maps: A True Story of Cartographic Crime

By Miles Harvey. Random House, New York, 2000. 406 pp., illus., notes, index. ISBN 0-375-50551-7 Cloth $24.95

Reviewed by Judith A. Tyner, Ph.D. Professor of Geography, California State University, Long Beach, Long Beach, CA 90840. 562-985-5332; e-mail: jztyner@csulb.edu.

> ". . . in my journalistic travels, as in my personal wanderings, I'm a sucker for detours, back roads, tourist traps, scenic views, and historic landmarks." (p. 136)

The Island of Lost Maps details, on one level, a true story of cartographic crime, the theft of 250 rare maps, worth over one-half million dollars by Gilbert Bland, one of the biggest such thefts known. A reader who is interested solely in this theft and wants an unadorned story of crime, capture, and punishment, may be somewhat frustrated, because Miles Harvey does not follow what he calls "interstate Bland." The reader who enjoys wanderings into history of cartography and exploration, the workings of libraries, and the worlds of map collectors and dealers will enjoy the trip. In this saga of map theft, Harvey cleverly introduces readers to a wide range of topics by intertwining them with the crime story.

In keeping with Harvey's road analogy, the story is actually a quest and is structured much like a quest novel. Harvey is in pursuit of the mind of the aptly named Mr. Bland. Why and how did a teenage car thief, small time unsuccessful crook, Army deserter, with apparently no previous knowledge of or interest in rare maps, become a map thief so convincing that he was able to walk into the rare book rooms of treasure house libraries in the US and Canada, steal maps (using a "shopping list"), and sell them to major map dealers?

Each chapter begins with a narrative that sets the theme. For example, Chapter 2 "Imaginary Creatures," begins with a discussion of the mythical monsters on *mappae mundi*, and the human monstrosities on the 1493 world map in Harman Schedel's *Nuremberg Chronicle*. These, then, are tied to the many imaginary (false) identities that Bland used. The chapter wanders through fictional maps in the Hardy Boys mysteries, the map that Robert Lewis Stevenson used as a base for *Treasure Island*, and the plot of *The Treasure of Sierra Madre*. This literary trick seems forced at times and mildly annoying, such as the unhappy ghost of Lloyd Brown, author of *The Story of Maps*, muttering curses as he hovers above the reading room of the Peabody Library where the crimes were discovered.

Because Harvey is a journalist and not an academic, he gains much of his material through discussions and interviews with experts in a variety of fields. These are effective; readers feel they are in the room with him. Thus, we learn about the world of map dealers through a day trip to a Sotheby auction with "the map mogul" Graham Arader; we watch as the bidding for a copy of Ptolemy's *Geographica* escalates from $100,000 to over $1.2 million. Several hours are spent at the home of "Mr. Atlas," a anonymous, knowledgeable, avid map collector, and at the office of Dr. Werner Muensterberger, psychologist and author of *Collecting: An Unruly Passion*, to understand the obsession for collecting, which after all, fuels the market for antique maps.

The stage is set for Bland's map thefts through a discussion of the problems libraries have maintaining and protecting their collections—the costs of physical repairs to aging buildings, modern