



cartographic perspectives

bulletin of the
North American Cartographic Information Society

Number 22, Fall 1995
includes index for numbers 1-22

cartographic perspectives

Number 22, Fall 1995

in this issue

MESSAGES	1
FEATURED ARTICLES	
Cartography resources on the World Wide Web <i>Jeremy Crampton</i>	3
CARTOGRAPHY BULLETIN BOARD	12
<i>The Cartography Laboratory at Arizona State University Cartographic Laboratories at the University of Georgia Syracuse University Cartographic Laboratory</i>	
REVIEWS	
Drawing the line, tales of maps and cartocontroversy <i>reviewed by Judith Tyner</i>	15
Mapping the Renaissance world: the geographical imagination in the age of discovery <i>reviewed by David Woodward</i>	16
Mapping hidden dimensions of the urban scene <i>reviewed by Julio Rivera</i>	18
NACIS XV PRELIMINARY PROGRAM	20
NACIS NEWS	23
ANNOUNCEMENTS	24
CARTOGRAPHIC EVENTS	24
ABSTRACTS AND INDEX FOR ISSUES 1-22	25

messages

MESSAGE FROM THE EXECUTIVE DIRECTOR

From the point of view of the Executive Director, this last year has not been exceedingly taxing. The business of the executive office is becoming more routine, and we were spared the responsibility of handling registration for the Ottawa meeting. We did, however, collaborate with the editor of *Cartographic Perspectives*, Sona Andrews, to compile a membership directory, the first to appear in many years. We also produced a program to sort our CP mailing into "bundles" in accord with the requirements of the Postal Service.

For any successes achieved in the last year it is necessary that I credit my colleagues Susan Peschel, the Assistant Executive Director, and Sona Andrews. Susan has worked hard to maintain our membership records in top form and contributes in a major way to all of the other Executive Office functions. Her attention to detail and sense of responsibility have served the organization, and me, very well. Sona's service to NACIS is far above and beyond the already

(continued on page 2)



journal of the
North American Cartographic
Information Society

Editor:

Dr. Sona Karentz Andrews
Department of Geography
474 Bolton Hall
3210 N. Maryland Avenue
Univ. of Wisconsin-Milwaukee
Milwaukee, WI 53211
(414) 229-4872
fax: (414) 229-3981
e-mail: sona@csd.uwm.edu

Assistant Editor
David W. Tilton

Department of Geography
Univ. of Wisconsin-Milwaukee
Milwaukee, WI 53211
e-mail: carta@execpc.com

Copy Editor
Gretchen Papazian

ISSN 1048-9085
Cartographic Perspectives
is published triannually

(Executive Director's message cont.)
considerable call of duty expected from an editor of *Cartographic Perspectives*. She eagerly volunteers the responsibility of producing all of the mailings issued by this office (calls for papers, preliminary programs, ballots, etc.), and is always willing to find time in her busy schedule for other NACIS related matters.

It is, of course, with a sense of sadness for me that I receive the news that Sona has decided to give up the editorship of *CP*. In her three years thus far as editor, *CP* has continued to become better and better and has taken its place among the world's major cartographic journals. I should say, however, that I have no fear that *CP* will continue to prosper, as the human resources within NACIS, are, I believe, of the highest caliber.

At the time she announced her decision to step down from the editorship, Sona was to be the incoming chairperson of the Geography Department at UWM. This has, however, now changed. She will not be the Department Chairperson, but rather, an Assistant Vice Chancellor. Congratulations and best wishes Sona.

Christopher Baruth
NACIS Executive Director

ANNOUNCEMENT FOR NEW EDITOR

Dr. Sona Andrews, has indicated her intention of stepping down as Editor of *Cartographic Perspectives* with the publication of Issue #24 in the Spring of 1996. In the four years that Dr. Andrews will have served as Editor, the journal has nearly doubled in size and has gained in stature world wide. There now is an annual color issue, a feature unique to *CP* among cartographic journals. Much of this has been due to the energy and thoughtful imagination that Dr. Andrews has brought to this position.

The NACIS Board of Directors is anxious to continue to publish *Cartographic Perspectives* at this present level of excellence and without unnecessary interruptions. Anyone who is interested in the Editorship, or in some role contributing to it, is asked to contact any of the names below (addresses available on page 23) and be prepared to submit a vitae and a letter of application stating your reasons for and goals in becoming Editor of *Cartographic Perspectives*.

Dr. Henry W. Castner
President, NACIS

Dr. Keith Rice
Vice-President, NACIS

Dr. Michael Peterson
Chairman, CP Editorial Board

EDITOR'S NOTE AND ACKNOWLEDGMENT

There has been great interest shown in the articles from the *Map Libraries in Transition Conference* that were published in issue 21 of *Cartographic Perspectives*. At the time the issue was published I neglected to mention that Ed Dahl, with the National Archives of Canada, had done a considerable amount of work in assembling and editing the papers prior to the time they were received by *Cartographic Perspectives*. Ed's work made my job far easier. I feel neglectful that I did not acknowledge his contribution and I would like to take this opportunity to publicly thank Ed for all the work he did on these papers and for understanding my omission of that acknowledgment.

Sona Karentz Andrews
Editor, *CP*



The cover was produced and designed by Joe Polder, a graduate of the University of Wisconsin-Milwaukee with a major in Geography. The map was generated using Tera Data's Geocart projection software on a Macintosh computer. The tilted perspective is centered at 67 degrees N latitude and 130 degrees W longitude at an altitude of 15,000 km. The map was saved as an Adobe Illustrator 1.1 file and imported into CorelDRAW!. The atmosphere and water areas were fountain filled with Pantone 350 from 5% to 100% in 200 steps and angled at 74 and 152 degrees respectively.

feature article

Cartography Resources on the World Wide Web

This paper provides an overview of recent developments on the World Wide Web from a cartographer's perspective. The first section briefly describes how the Web came to be and discusses the conceptual models that control the Web's functionality. The second section of the paper is an overview of a variety of cartographic Web resources (ranging from federal to commercial to educational) that are available on the Web. These sites offer tremendous resources for use in the classroom, research, and even leisure activities. The paper concludes with examples of two Internet projects that make extensive use of cartographic materials: the *Geography Virtual Department* (out of the University of Texas–Austin) and the *Bosnian Virtual Fieldtrip* (out of George Mason University).

Jeremy Crampton
 Department of Geography
 George Mason University
 Fairfax, VA 22030
 jcrampto@gmu.edu

It's probable that you have heard of the Internet, the World Wide Web (the "Web"), and perhaps even the "Information Superhighway." But it's also probable that a year or 18 months ago you had not. This rapid rise from the exclusive domain of a few scientists to the covers of weekly news magazines is unprecedented in the history of the Internet. The Web is one of the fastest growing parts of the Internet. Since its inception in 1989, it has swept through most of the industrialized world at a staggering pace. By spring 1995, according to estimates published in *Business Week*, the number of sites was doubling every 53 days, reaching 27,000 by February 1995. Other figures indicate a similar rise to prominence; Web traffic ranked second (in kilobytes) of all traffic going across the National Science Foundation's network by March 1995, rising from a rank of 80th in January 1993, and it may already be the busiest part of the Internet by the time you read these words. The Internet as a whole is said to have grown at 10 percent a month for the last three years, and there are no signs of slowing. No one knows for sure how many available Web documents there are, but a reasonable guess as of mid-1995 would be at least ten million.

This paper is not a "how-to" paper on the specifics of setting up and using the Web. Fortunately one of the truisms about the Web is that everything you need to know about using the Web, is on the Web. Plus, the Web changes too quickly for this type of discussion to appear in print. Given the dynamic nature of the Web, this paper focuses on demonstrating the realization and potential of the Web from several cartographic perspectives.

The World Wide Web dates from 1989, when the European nuclear research agency (CERN) started thinking about how it might communicate research findings among its widely dispersed (and multinational) staff. The method that eventually evolved was based on something called "hypertext." This allowed the European scientists to collaborate with each other and their colleagues in America over the Internet. The term "hypertext" was originally coined in the 1960s by Theodore (Ted) Nelson, a professor at Brown University, but the term probably dates back much

INTRODUCTION

THE WEB CONCEPT

The basic definition of "hypertext" is simply: non-sequential writing.

earlier.¹ The basic definition of "hypertext" is simply: non-sequential writing. However, this definition does not manage to convey the radicalness of the idea. Consider for a moment how you are reading this text. Each word follows one from another in an orderly progression from start to finish. As you hold the journal in your hands, you can tell at a glance how far you have read and how much more there is left. Now imagine that you could read this paper backwards, if not word by word, then perhaps paragraph by paragraph (hypertextualists call these "chunks" of text a "lexia"). Does it make any sense? Now imagine that you can read this paper by beginning anywhere—middle, near the end, the third paragraph—and then can go to any other paragraph or lexia. And if the work was long enough (with each lexia linked into others stored around the world), you could keep following the path for as long as you wanted (or until you got bored). This would be a completely "open," non-hierarchical hypertext.

The real World Wide Web is much less chaotic than this, partly because the true possibilities of hypertext have not yet been explored, but also partly because humans crave order of some kind (thus creating an interesting contradiction at the heart of the Web; it is based on a destabilizing system which has to be "stabilized" in order to be comprehensible). But it is still possible to take long meandering routes through those ten million documents on the Web, following links from place to place. By comparing this navigation of "dataspace" to navigation of physical space, it is easy to appreciate that there might be some of the same problems of getting lost and wayfinding.

Some hypermedia developers have explicitly considered the utility of a "spatial metaphor" (such as a map or city environment) to guide users around a large, complex, and non-linear database.² The use of a spatial metaphor for hypermedia access has also been considered by cartographers. In a recent paper, Tilton and Andrews (1993) argued that the spatial metaphor is a mixed blessing and may actually impede database searches: "[w]e are concerned that the spatial metaphor is not descriptive of the structure and access of information; it is prescriptive" (Tilton and Andrews 1993, 62). Their reasoning is that the spatial metaphor has been over-literalized in interfaces by using a concept of a topological or "true" (Euclidian) space and that navigation through complex multimedia databases has no such inherent Euclidian structure. This point is a valid one and it shows how a metaphor can break down when it is literalized (Rorty 1989). However, their argument downplays two things. First, there is a long tradition of work on non-Euclidian spaces by geographers and cartographers (e.g., time-spaces, multi-dimensional scaling, cognitive maps, and cartograms). Although it is a useful reminder that "space" in hypermedia is unlikely to be a Euclidian space, it is a (non-Euclidian)

Some hypermedia developers have explicitly considered the utility of a "spatial metaphor" . . . [while others have] argued that the spatial metaphor is a mixed blessing . . .

1. Most writers on hypertext date the explicit idea to Vannevar Bush and his 1945 classic article, "As we may think" (now available as a hypertext document on the Web), but it is intriguing to push the date even further backwards. Could we usefully think of the Koran—with its commentaries and commentaries upon commentaries—as early hypertext? Other people have suggested seventeenth-century "reading wheels," which were designed to reduce the effort of reading many books at once, as another precursor of the Web. A more familiar source is the academic article, with its footnotes, references to other texts (bibliographies), and citation indexes.

2. A simple illustration was discussed by the organizer of a workshop held as part of the European Conference on Hypermedia Technology (ECHT) in 1994. It can be viewed on the Web and its URL is http://www.gatech.edu/lcc/ldt/Faculty/andreas_dieberger/Workshop.ECHT94.html.

space nonetheless.³ I would suggest that multi-dimensional scaling (MDS) may be a better metaphor for hypermedia because of its nonlinear and multi-dimensional maps and because, of course, it is spatial (e.g., one can analyze regions [or "nodes"] of the MDS space, as well as closeness and distance matters).

Second, Tilton and Andrews separate semantic networks (the organizing principle behind most hypermedia databases according to them) from spatial networks. This has the effect of disallowing navigation as a strategy for using hypermedia. In fact, I would argue that semantic networks have spatial elements (our mental processes are a bit like MDS in that there are regions of interlinked associations where "closer" associations are activated before more "distant" ones [see Lakoff 1987]). If we expand the notion of navigation to include temporal travel ("I want to go to that document from five minutes ago") as well as negotiation through non-Euclidian spaces, this would allow for the non-literal interpretation of navigation and space that Tilton and Andrews believe is lacking.

This focus in hypermedia research on giving users a sense of where they are probably comes from the human aversion to being lost (an aversion so strong it became a fundamental metaphor in non-spatial realms). Tilton and Andrews are right to criticize the over-literal use of this metaphor in hypermedia and its resulting focus on informing users about where they are.⁴ But we do not need to discard this or all metaphors; instead, we need to de-literalize the spatial one and think of new ones (such as MDS or user-specific dynamic maps).

Whatever the case, for now many "spatial" metaphors are present in navigating the Web. Web use is a matter of moving backwards or forwards from "page" to "page." The main indexing pages are called "homepages." Homepages are usually the central reference point for a site's Web resources and it is a good idea to begin there, for a well-designed homepage should provide access to the main supplemental pages at that site. The George Mason University Geography homepage is shown in Figure 1. The page is displayed in a "browser" called Netscape. Text and graphics are combined, and both can be used to provide reference points or links to other pages that are accessed by simply clicking on the highlighted link (e.g., "faculty" in Figure 1). In addition to text and graphics, sounds, animations, and binaries can often be provided through the use of so-called "helper" programs that are called-up by the browser to process the downloaded information.

Since the Web is highly distributed by design, some method of locating resources is necessary. This is provided by the Universal Resource Locator (URL). Each "resource" on the Web, whether it is a homepage,

If we expand the notion of navigation to include temporal travel . . . this would allow for the non-literal interpretation of navigation and space . . .

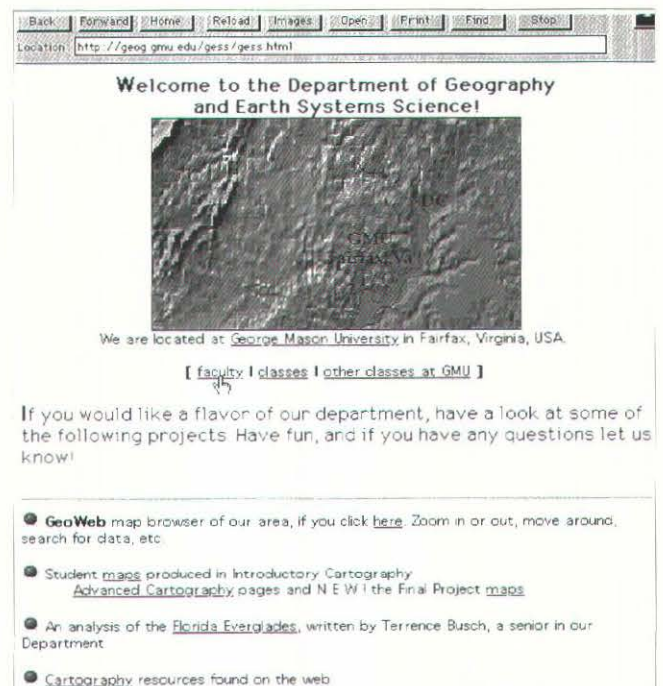


Figure 1. George Mason University's homepage on the Web.

3. By non-Euclidian space I am thinking of spaces where the concepts of "near" and "far" pertain, but that are also non-commutative (for example in cognitive maps [which have also suffered from over-literalization of the map concept] where A may be perceived as further than B, which is further than C, but C is not perceived as further than A [see Wood 1978]).

4. It might be better to let hypermedia users have a very rough rather than an exact sense of where they are (i.e., within a certain area, not at a certain point. Research with expert wayfinders suggests that this can decrease the processing load and increase solution times [Crampton 1992]).

map, sound, or binary program, requires a URL to be given to the browser before it can find the resource. You can type in the URL or simply follow a link from another page (the most usual method). Ritter (1994) provides information on configuring and using browsers as well as URLs. The reader should be aware that there have been several significant developments since Ritter's article appeared, including the ability to animate icons through a new strategy called "push-pull" from the Netscape Communications Corporation (NCC). NCC has also announced a deal with Macromedia to incorporate its animation software directly into the browser (*Macweek*, June 7, 1995). This means that animations will be played "live" as they are received rather than waiting for long downloads. This should speed up getting large multimedia resources from the Web. Although these developments are interesting, they have yet to be fully realized.

CARTOGRAPHY RESOURCES

The Web is changing rapidly due to its tremendous growth. For this reason, a Web-based online supplement (the Cartography Resource Page) has been developed to accompany this article in order to ensure the most up-to-date information. The Cartography Resources Page (Figure 2) contains the Web's most complete listing of cartographic resources available. It is part of a larger international effort to document available resources in what is called the "Virtual Library" (VL). The VL was organized by the MIT-based W3 Consortium (a group of Web experts and some of the original CERN researchers who developed the Web). The VL

takes advantage of the Web's inherent, distributed nature; each Library entry (cartography, geography, physics, anthropology, etc.) is maintained by a different author, thereby reducing the individual's load. All materials discussed in this paper (and much more) are available in this cartography supplement, and readers should check there often for updates.⁵ The VL provides an index to cartography resources on the Web rather than a repository of data itself. The index is organized thematically to cover the main providers of cartography resources on the Web: commercial, federal and educational sites, geography, and desktop publishing. There are also some related sites for GIS and remote sensing interests.

The Web has been notable for its broad reach beyond the confines of universities and research labs, and it has been widely embraced by the commercial sector. For cartography, this means opportunities for map companies to provide information about themselves and, of course, to advertise their products and services. In many cases this amounts to no more than a simple announcement—a kind of "look, we're here." In other cases, however, map companies offer a true

value—namely, added service through their pages. In the increasingly competitive world of the Web, the winners are likely to be those sites that offer an actual service that entices someone to return and thus generate sales. This implies committing resources to the Web site, keeping it up-to-date, and responding to inquiries in a timely manner.⁶

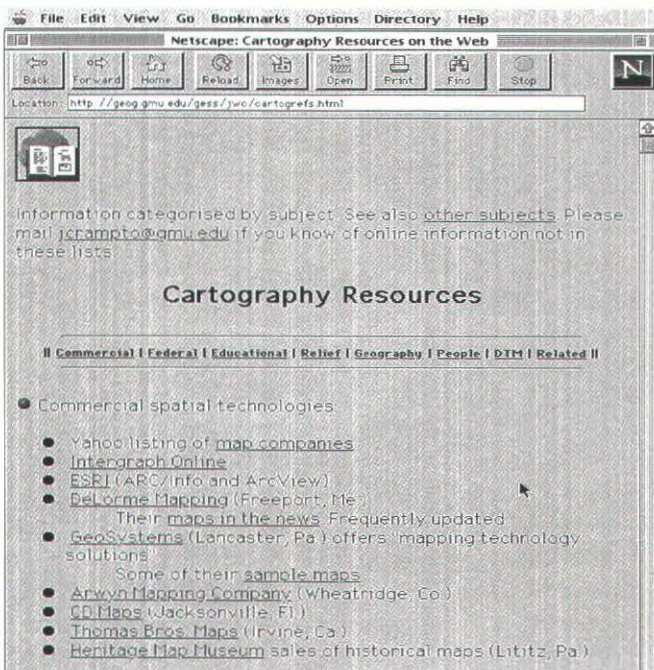


Figure 2. The Cartography Resource homepage on the Web.

5. The URL is <http://geog.gmu.edu/gess/jwc/cartogrefs.html>.

6. The most visited site in the United Kingdom, for example, is the Electronic Telegraph, which offers a free full news service every weekday (foreign, domestic, and front page news, along with full sports reporting, the weather etc.). Like many free newspapers they earn their money from advertising. The URL is <http://www.telegraph.co.uk/>.

One map company that has taken this approach is DeLorme Mapping of Freeport, Maine. DeLorme, already an established provider of maps, CD-ROMs, and atlases, is also now using the Web to provide information about the company and demonstration versions of some of its software (e.g., Map'n'Go, a travel planning program), as well as featuring, "maps in the news" advertising job openings, and so on (see Figure 3). DeLorme has been on the Web since 1994, and visitors to its site can download demonstration copies of its software or view recent news items illustrated with DeLorme's own mapping software (examples include the site where Scott O'Grady was shot down in Bosnia and Hurricane Allison in Florida). This service connects DeLorme's products with actual events and demonstrates uses for its software in a way that is designed to encourage people to purchase it.

Another map company with a substantial World Wide Web site is GeoSystems, of Lancaster, Pennsylvania. GeoSystems provides mapping services, locational database development, and GIS to many commercial sectors. One of their recent ventures was the animated cartography for Grolier's Encyclopedia (David DiBiase, a consultant on the project, has provided a description of these maps and the process used to create them [DiBiase 1994]).

DeLorme and GeoSystems are well-stocked sites, but as yet, they do not take advantage of the Web's innovations (i.e., things which are only possible on the Web). They are perhaps at "stage 2" of the three stages of computer cartography described by Clarke (1995, 4-5). Stage 1 is a period of resistance to the technology; stage 2 is a "replication stage," where computers are used to emulate previous practices done manually (e.g., getting the computer to draw lines or label maps); only in stage 3 (a "full implementation" stage) is the computer used in new and innovative ways.

An example of stage 3 Web cartography is the TIGER Mapping Service (TMS), a joint effort between the Bureau of the Census and Brandon Plewe, a researcher at the University of Buffalo. The TMS was initiated in October 1994 to provide realtime (so-called "on the fly") maps of roads and boundaries in the USA generated from the TIGER database. The advantage of map generation is that it responds to the particular needs of the user. Although preset maps are useful (e.g., those from Cartesia, a New Jersey-based map clip art company), they might not include the details, centering, projection, and features required by the user. TMS maps can be obtained at the Website⁷, or more innovatively, they can be fed and displayed into other pages as "inline" images. The TMS will generate these maps (such as the one shown in Figure 4 [page 8] of the Mall in Washington, DC) in response to a set of variables which can be sent to it.⁸

The second goal of the TMS is to meet the requirements of the Freedom of Information Act by making the Census Bureau's spatial database

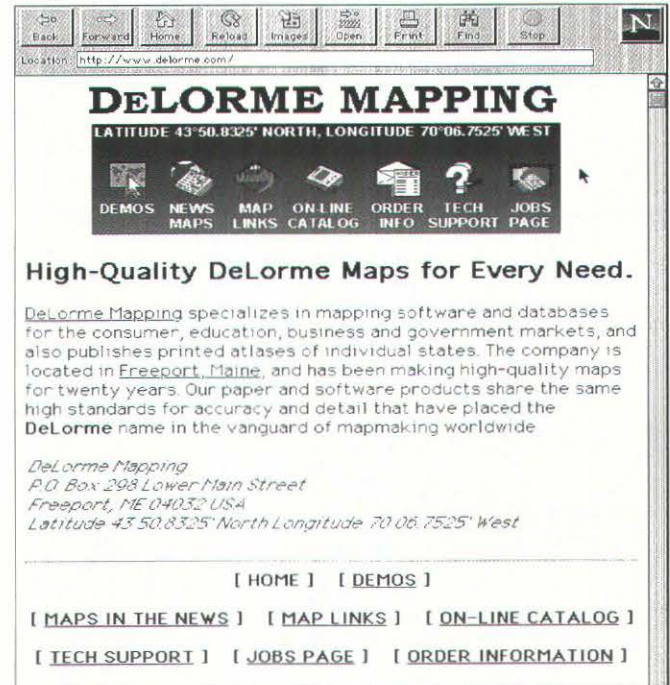


Figure 3. DeLorme Mapping's homepage on the Web.

An example of stage 3 Web cartography is the TIGER Mapping Service . . . [providing] realtime (so-called "on the fly") maps of roads and boundaries in the USA generated from the TIGER database.

7. <http://tiger.census.gov/>.

8. An earlier implementation of an on-the-fly map server by the Xerox Parc company apparently provided some of the inspiration for the TMS project.

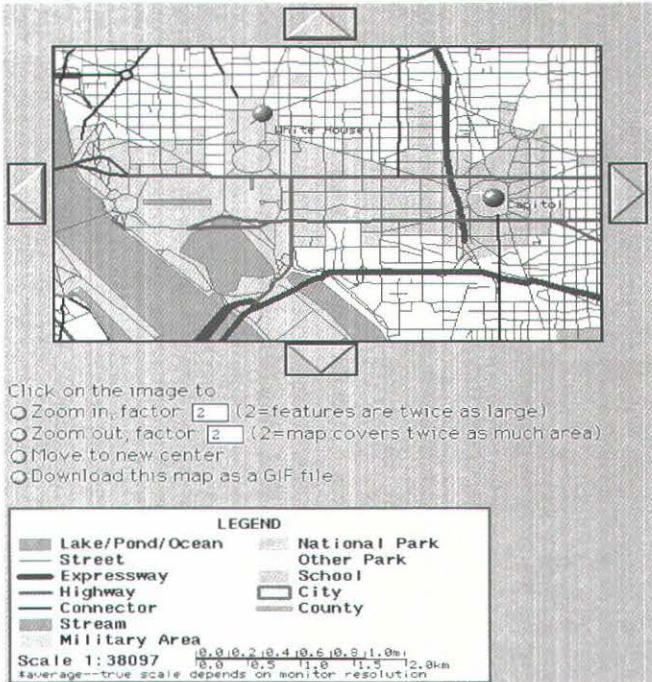


Figure 4. A map of the Mall in Washington D.C. generated by TMS from its Web site.

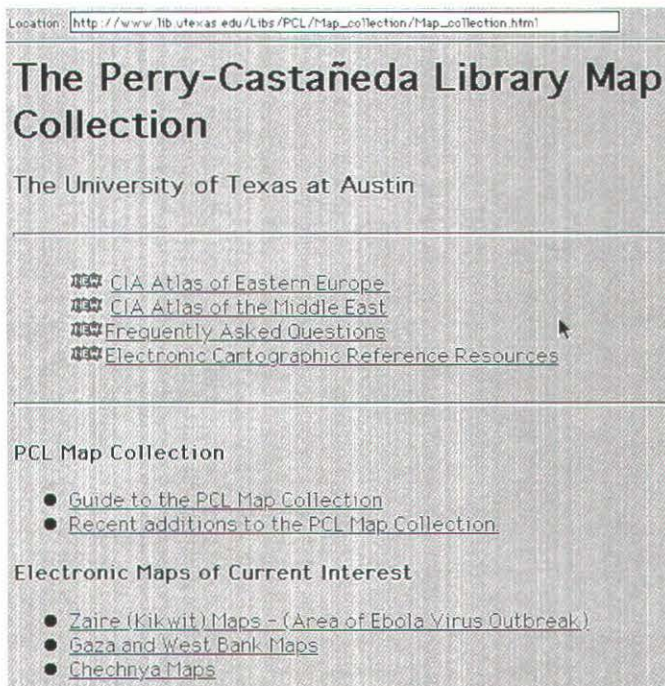


Figure 5. The Perry-Castañeda Map Collection's homepage on the Web.

public. As a federal agency, the Census Bureau provides its data to the public at cost recovery, which, to date, has meant delivery on CD-ROMs (over twenty of which are needed for the TIGER database alone). Future plans for the TMS are to create a thematic layer from the Census's statistical database (e.g., to create a user-defined map on-the-fly of Northern Virginia showing the percentage of the population earning more than \$50,000 household income).

In contrast to the user-generated maps offered by the TMS, other sites offer the delivery of pre-existing maps of regions, countries, or historical maps. For example, The Perry Castañeda Library Map Collection (PCL) at University of Texas-Austin holds over 230,000 maps, many of which have been made available via the Web.⁹ The PCL is very much of a barebones map site in that, despite the size of its collection, it follows the model of a traditional library-maps can be "checked out" (downloaded) or looked up in the table of contents (see Figure 5). Other than that, the site is a relatively unsophisticated stage 2 site, though still of course very useful. One problem with the Web delivery of maps is the potential copyright infringement, and therefore, a significant proportion of the PCL is copyright-free, federal maps, particularly CIA maps. The Web does have a copyright site that examines several general issues of copyright that apply to maps, such as the "fair use" provision of American law-when it is applicable, what it covers, etc.¹⁰

Other sites that are becoming major cartographic resources include federal agencies (such as the USGS) and weather sites that can deliver up-to-the-hour satellite images and movies (a well-known and particularly well-stocked one is at Michigan State¹¹). One can also access relief maps and animations made from USGS digital elevation models (DEMs), and even personal information about some cartographers. Obviously, given the wealth of material available, it is not possible to do more than mention many interesting sites in passing (all these can be accessed from the Virtual Library cartography page referenced above). The Geography Virtual Department Project, which is headed at the University of Texas at Austin, ties many of these resources together in a handy and useful manner.

9. The URL is http://www.lib.utexas.edu/Libs/PCL/Map_collection/Map_collection.html.

10. The URL is <http://www.benedict.com>.

11. The URL is <http://wxweb.msu.edu/weather>.

The goal of the Virtual Department Project is to build up a set of geography resources for curriculum delivery that potentially can become an entire undergraduate course in geography. It consists of the amalgamation of existing resources and newly written materials, both of which can take advantage of the distributed nature of the Internet and the hypermedia format of the World Wide Web.

The principal leader of this initiative is Kenneth Foote, a Professor of Geography at the University of Texas–Austin. He has already developed a two-semester graduate course, "The Geographer's Craft," which is "concerned with active-learning, problem-solving methods of instruction and hypermedia, using Internet-based course materials" (Foote 1994). These materials include lecture notes, syllabi, exercises, glossaries, and bibliographies.

According to the description at the Web site,¹² the scope of the Virtual Department is as follows:

*The project will concentrate first on linking and developing materials that will be useful to the widest range of geography departments, those aimed at: 1) undergraduate courses and laboratories in physical geography; 2) undergraduate courses in human geography; 3) courses addressing geographical techniques including cartography, GIS, and spatial analysis; 4) upper-division seminars on the history and philosophy of geography; and 5) materials designed for K-12 and pre-collegiate curricula.*¹³

This Project represents a very exciting opportunity for cartographers and geographers. It is a major undertaking (a three-year plan is in place)¹⁴ and has been endorsed by several geography associations, including the Association of American Geographers and the National Council for Geographic Education (see Figure 6). Already, some cartographic materials, such as notes on projections and cartographic communication, are available. It is easy to imagine how useful these are to, say, an adjunct professor or someone giving a cartography presentation. The resources are free, highly accessible, and self-contained. They take advantage of the Web's ability to link text, graphics, and animations (e.g., imagine a spinning globe unwrapping as the viewer zooms in through different projections, finally seeing an animated fly-through based on digital elevation models).¹⁵

12. The URL is <http://www.utexas.edu/depts/grg/virtdept/about.html>.

13. It is still unclear how to reference quotations from the Web, but this passage can be found on the Web page located in footnote 12. The intellectual value of Web materials is one issue to be addressed in the discipline's first online, fully refereed journal, *EarthWorks*. The URL is <http://www.utexas.edu/depts/grg/eworks/eworks.html>.

14. The plan calls for thirty new credit hours per year to be in place starting in 1996, with a goal of ninety credit hours—enough for an undergraduate major in geography.

15. A courselist of materials from the participating universities can be obtained at the URL <http://www.utexas.edu/depts/grg/virtdept/courses/courselist.html>.

the Virtual Department Project . . . take[s] advantage of the distributed nature of the Internet and the hypermedia format of the World Wide Web.

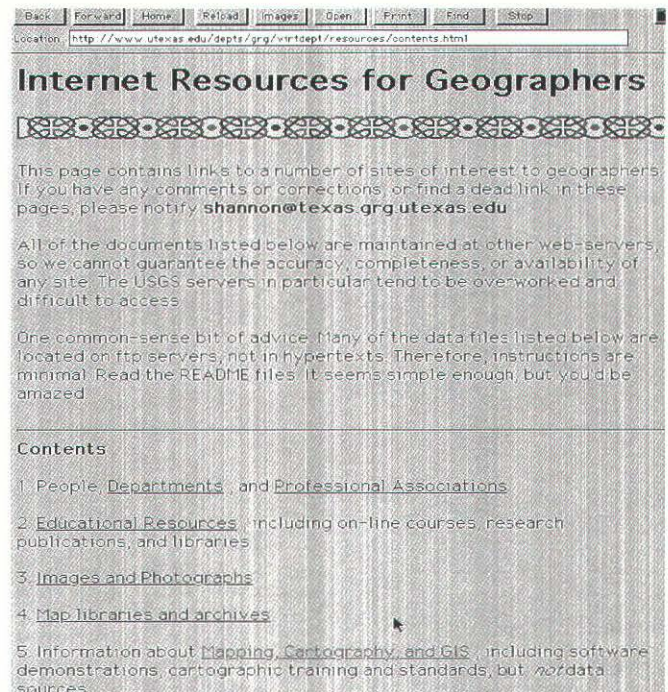


Figure 6. The Virtual Department's homepage on the Web.

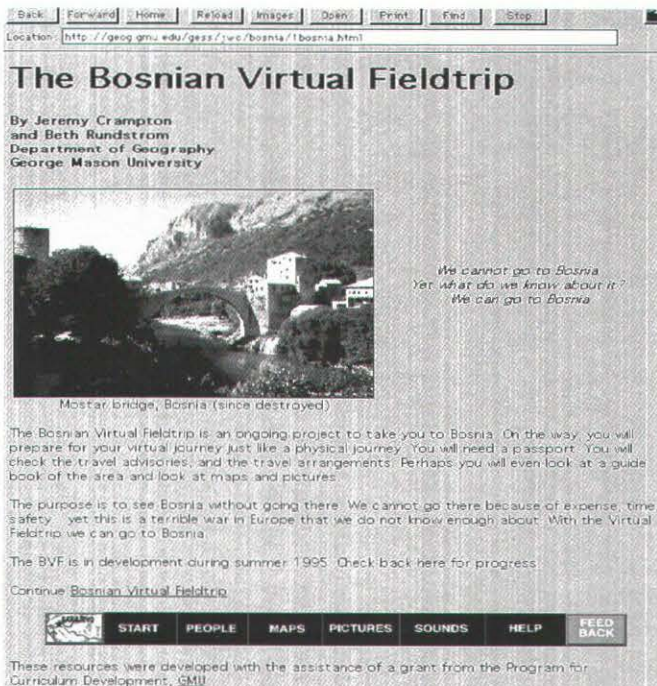


Figure 7. The Bosnian Virtual Fieldtrip's homepage on the Web.

Cartographers can use and contribute to the Geography Virtual Department in a variety of ways: by taking advantage of the workshops at professional conferences where preparation and use of the materials will be taught (e.g., setting up a homepage), and by contributing materials in their own fields.

Another project underway that is designed to be part of the Virtual Department is George Mason University's "Bosnian Virtual Fieldtrip" (BVF) (Figure 7).¹⁶ The BVF proceeds from the very strong tradition in geography of taking fieldtrips to encounter unknown landscapes first hand. Unfortunately, with rising enrollment and costs, it has become less feasible to run fieldtrips for undergraduates. In the case of Bosnia, there are the additional problems of safety, access, and time. Yet, Bosnia is now perhaps one of the most important regions on the planet. Over the last three years, war has come to Europe for the first time in two generations with little sign of resolution. From a geographic and indeed cartographic perspective, this conflict involves some of the most fundamental issues we are likely to teach in an undergraduate program, including but not limited to ethnicity, the territorial imperative,

irredentism, refugees, political geography, physical terrain, and cartographic partition. The BVF offers a "virtual" (Web-based) encounter in lieu of a physical one. It is aimed at beginning undergraduates enrolled in an introductory human geography course, and since it is on the Web, it is also accessible to the interested layperson.

The BVF uses a mixture of resources (text, maps, photographs, sounds, and timelines) to gradually introduce the virtual fieldtripper to the region. In Part I, for example, the fieldtripper studies the effect of scale on the amount of detail shown in Bosnia, the physical terrain, and the historical background of the region. Although there is a designed sequence to the BVF, fieldtrippers can access, via hypertext links, the main resources from any page they happen to be on. These resources include a picture gallery, sound archives, help files, and a map library. In Part II, the fieldtrippers get a closer look at some of the ethnic groups and their leaders, and they can pick from a list of places (e.g., Sarajevo, Mostar, Bihac) to study in more detail. Many of these pages are local, but some also take students out to other sites, whether it be the Bosnian Embassy or the homepage for Croatia.

COMMENTS

In summary, the rapid popularization of the World Wide Web over the past few years brings incredible opportunities for cartographers. Not only are innumerable cartographic materials available from a variety of federal, commercial, and educational sources (such as the USGS, the Census Bureau, map companies and libraries), but cartographers are moving to the forefront of material provision. The next few years will no doubt be a very productive time cartographically. If you have not already ventured out onto the Web, it is now time.

16. The URL is <http://geog.gmu.edu/gess/jwc/bosnia/bosnia.html>.

Bush, V. 1945. As we may think. *Atlantic Monthly* 176(July):101-108.

REFERENCES

Clarke, K. 1995. *Analytical and computer cartography*. 2nd Ed. Englewood Cliffs, NJ: Prentice-Hall.

Crampton, J. 1992. A cognitive analysis of wayfinding expertise. *Cartographica* 29(3/4): 46-65.

DiBiase, D. 1994. Designing animated maps for a multimedia encyclopedia. *Cartographic Perspectives* 19: 3-7, 19.

Foote, K. 1994. The Geographer's Craft: a new approach to teaching geographical methods in the liberal arts Curriculum. *The Pennsylvania Geographer* 32: 3-25.

Lakoff, G. 1987. *Women, fire and dangerous things*. Chicago: The University of Chicago Press.

Ritter, M.E. 1994. Mosaic and the World Wide Web. *Cartographic Perspectives* 19: 44-47.

Rorty, R. 1989. *Irony, contingency, and solidarity*. New York: Cambridge University Press.

Tilton, D.W. & S. Andrews. 1993. Space, place and interface. *Cartographica* 30(4): 61-72

Wood, D. 1978. Introducing the cartography of reality. In D. Ley and M.S. Samuels (Eds.). *Humanistic Geography*. Chicago: Maaroufa Press. □

You are invited to attend the

**XV Annual Meeting of the
NORTH AMERICAN CARTOGRAPHIC
INFORMATION SOCIETY**

Wilmington, North Carolina
October 25 - 29, 1995

see preliminary program on pages 20-22

cartography bulletin board

THE CARTOGRAPHY LABORATORY AT ARIZONA STATE UNIVERSITY

by Barbara Trapido-Lurie
Department of Geography
Arizona State University

Arizona State University's Cartography Laboratory will enter its 11th year of operation this Fall. Housed in a Geography Department with a large, active faculty, the primary focus of the Cartography Laboratory is to provide departmental support. Funding for salaries, equipment, and materials comes from the Geography Department and services are provided to Department faculty at no charge.

In a typical year, the lab produces 120-130 maps and other graphics for publication. Most of these are published in scholarly journals. In addition, the Lab supports departmental faculty by producing presentation materials (slides, overheads, and posters) and black-and-white enlargements from 35-mm film. Occasionally, special projects are carried out for the Arizona Geographic Alliance and for clients outside the ASU Geography Department.

The Lab employs one full-time cartographer who also instructs a course in cartographic design and assists with the introductory cartography course. Occasionally, student interns take on special projects for the lab, for which they earn academic credit.

ASU's lab is like many University cartography labs in that in the last few years it has seen a transition from photomechanical to computer-based production techniques. Almost all new projects are computer based. The

Lab still maintains its photographic equipment and it remains a valuable resource for map compilation and occasional special needs. The photographic equipment consists of a horizontal copy camera, contact frame, arclight platemaker, and tray and PMT processing capability.

The Lab's computer hardware consists of a 486/66Mhz PC and an Apple Laserwriter IIf printer. An upgrade to an HP 600 x 600 dpi printer is planned for the coming year. A nearby University computer facility provides access to several other key pieces of equipment: a scanner, color printers (Xerox 4700 and Xerox 5775 Cyclone), and Matrix slide film shooter. Computer production centers on the use of Aldus (Macromedia) FreeHand as the Lab's basic production software. Maps and graphics may be brought into FreeHand via the scanner, or via analytical software (MapInfo or ArcView 2 for maps, DeltaGraph Professional or Excel for graphs). MicroCAM and Geocart provide sources for geodata on a regional and smaller scale. Finally, Hijaak helps convert images from one graphic file format to another.

Three projects undertaken within the last year exemplify the type of work done by the Lab and the Lab's production approach:

1. Eleven choropleth maps that illustrate the geographic aspects of the abortion debate in America. These maps were produced as color slides for presentation and in black-and-white for printed publication. The data were provided in Lotus files that were brought into ArcView 2. ArcView was used to plot the choropleth maps. The final design was carried out with Aldus FreeHand. The files were sent to the Matrix slide film shooter to create the color slides. The

final black-and-white versions will be sent to an imagesetter.

2. A 33" x 24" two-color map of Lemon Creek Glacier, Alaska. This highly detailed topographic map of the glacier had been created several years ago by a now-inaccessible computer program. The map had been mechanically scribed onto standard scribecoat. The researcher wanted the map redesigned for publication and wished to use color in order to distinguish the glacier from streams, lakes, and the surrounding rock and snow. The new map was constructed by adding separations (scribecoats, peelcoats, and a type negative) to the existing scribecoat.

3. An outline map series for the Arizona Geographic Alliance of twenty four black-and-white maps designed as reproducible masters for classroom use. This project was initiated at the request of teachers involved in the Alliance. It included world, continent, and regional maps. Geocart was used to generate the basemaps in appropriate projections. These files were then brought into FreeHand for the addition of screens and text. The final black-and-white versions will be sent to an imagesetter.

In addition to changes in how production is carried out, a significant change in Lab operation has been in the expertise and expectations of its clients—the department faculty. Faculty are now much more likely to bring in a digital file of their data instead of a sketched map or graph. They more frequently request "working" graphics that they can then refine and bring back to the Lab for final production. Many of them use their own graphing

packages to visualize their data and then come to the lab for "publishable" versions of the graphs. A few faculty are beginning to do the same for maps by using GIS products for visualization. At the same time, their desires for presentation materials are becoming more sophisticated and there is an increase in requests for multicolor slides and overheads. Given these changes in the Lab's "customers," it will be increasingly important for the Lab to be able to work with data and graphics files from many different sources. It is anticipated that the Lab will increasingly serve as a resource center for faculty who would like to use computer software as a visualization tool and who also appreciate receiving advice on how to go about using it. Finally, the Lab should continue to have a steady, and even growing, number of requests for high quality final graphics; though the specific forms of these graphics will change as the technology develops. □

CARTOGRAPHIC LABORATORIES AT THE UNIVERSITY OF GEORGIA

by Jan Coyne
Institute of Community and Area
Development
University of Georgia

The Cartographic Services Laboratory and the Institute of Community and Area Development (ICAD) are the major cartographic production facilities at the University of Georgia. Cartographic Services is the campus cartography lab. It is located in the Geography-Geology building but it is not administratively part of either of those departments.

The Cartographic Services Laboratory is one of several research services facilities providing support services for faculty and students. Another major campus graphics lab, the Instructional Resources Center provides services primarily related to classroom instruction, however, it is seldom called upon to produce maps. The Cartographic Service Laboratory is partially self-supporting, with its revenue coming mainly from clients on campus. The Lab also does work for state agencies and, on rare occasions, for non-governmental clients who can make a case that there is no other place to obtain the services they want. The Lab employs seven full-time staff and does not provide instruction nor does it employ student workers.

Mapping is only one of the services provided by the Lab. The production of charts, graphs, slides, and photographs make up the majority of the work done by the Lab. Clients mainly come from the science departments (due, in part, to the Lab's physical location) and prints of autoradiograms and protein gels are a common product. Color and high-contrast slides are created from hardcopy originals or from digital images. Like other labs, Cartographic Services has made the transition from manual to digital production of graphics. The graphs, charts, and maps are produced using Macintosh software that includes FreeHand, Photoshop, and Delta Graph.

Map production is generally limited to small-format black and white laser printer output for publication in books and journals. A service bureau in Atlanta is used to provide film negatives when necessary. The Lab had previously engaged in manually drafting large-format, two and four color map projects. Now color maps are output only as slides. Clients wishing to obtain color maps other

than slides are given assistance in finding a service bureau but they must deal with the service bureau directly.

The Institute of Community and Area Development is a service unit of the University of Georgia. ICAD is not actually a cartography lab at all, however it does publish *The Atlas of Georgia* and *The Interactive Atlas of Georgia*. As a service unit, it extends the University's expertise to the rest of the state and it is organized differently from academic departments on campus. ICAD employs approximately 30 faculty members, many of whom have joint appointments in other departments such as Environmental Design, Political Science, Psychology, Education, and Geography. ICAD's clients include communities in the state and organizations within Georgia and in the Southeast region. Clients receive services in the areas of community and economic development, natural resources management, growth management, land use planning, recreation planning, and regional planning.

Cartography at ICAD developed from ICAD/Geography professor Howard Schretter's idea that the state of Georgia needed an atlas. At the same time, the University began planning for its 1985 bicentennial and the Geography Department hired a cartography professor interested in atlas production. Space was provided by the Geography Department and ICAD organized funding to create *The Atlas of Georgia*.

The Atlas of Georgia was produced entirely in-house using manual photomechanical processes. The production staff included a combination of part-time student workers and full-time employees that were hired for the project. The marketing and sales were handled by ICAD staff.

The Atlas of Georgia was published in 1986 and its success

encouraged ICAD to support work on a new edition. Instead of producing a second edition of the printed book, however, the editors decided to create a digital atlas that would allow users to access the data directly from the maps. They envisioned the Atlas to be reasonably priced and to run on standard PCs found in homes and schools.

Commercial software was not available that could be adapted to meet their requirements so ICAD enlisted a Geography Department graduate student with programming skills to develop the software. The result was *The Interactive Atlas of Georgia* that was released in 1994. It updates many of the subjects illustrated in *The Atlas of Georgia* and most of its 256 maps can be queried to find county-level data by pointing at counties on the screen. County names and city locations can be viewed from any map screen. Atlas users can define regions by selecting multiple counties and can view data by region. Composite maps of counties meeting criteria specified by the user can also be viewed.

Due to the success of its projects, ICAD decided to make atlas production part of its mission. There is now a permanent staff for the development, production, marketing, and sales of *The Interactive Atlas of Georgia*. An updated version, that will expand the content and add new data and maps, is currently underway. Postcards have recently been mailed to registered users of the Atlas in order to solicit their ideas for inclusion in the new versions. Lesson plans have also been developed to help teachers use the Atlas for classroom instruction. □

SYRACUSE UNIVERSITY CARTOGRAPHIC LABORATORY

by Mike Kirchoff
*Department of Geography
Maxwell School of Citizenship
and Public Affairs
Syracuse University*

The Syracuse University Cartographic Laboratory is a focus for cartographic activities at Syracuse University. The primary responsibility of the Laboratory is to meet the Geography Department's need for maps and graphics in scholarly publications. The Lab also provides the University community with advice and assistance for the professional, educational, and technical aspects of cartography and mapping. Cartographic services are available, at cost, to the University community and to nonprofit organizations such as the Syracuse Chamber of Commerce and area tourist and visitor bureaus. Most of the Lab's income for new equipment and software comes from these outside contracts.

At present, the Lab has two full time professional cartographers. Student assistants were once employed for drafting but as with most cartography labs, computer methods have replaced manual methods. Our Leroy pens have dried up, the darkroom is closed, and the stat camera is up for sale.

The Lab has two accelerated Power Macintosh computers primarily running Macromedia FreeHand and Adobe Photoshop. Aldus PageMaker, DeltaGraph Pro, Geocart, Microsoft Word, Microsoft Powerpoint, and Microsoft Excel are used occasionally, however, the bulk of the cartographic work is done with FreeHand. Recently, the Lab began using prepared map bases on CD-ROM from Cartesia for

routine work such as creating simple outline maps for the classroom.

Most of the original maps, however, are made by scanning a base map on the HP ScanJet and then using the scan as a template in FreeHand. The HP ScanJet has replaced the stat camera for copying existing maps and Photoshop is used to correct imperfections in the original. Other laboratory equipment includes an HP LaserJet 4M and access to an HP Designjet 650C 36" wide color plotter. The HP LaserJet 600dpi resolution is suitable for some publications and proofing but most maps are sent to a service bureau for imagesetting.

Products produced by the Lab have not changed much since the introduction of computer technology. We still focus on thematic maps for publication but we now have greater design and editing flexibility. For instance, relief shading is easier to add and special type effects such as skewing and rotating are now possible. Perhaps the most significant benefit of the technology is in editing. Authors can review draft copies of the maps and easily make changes without sending the cartographer back to the darkroom for a tedious remake of positives and negatives.

The future of the Syracuse University Cartographic Laboratory seems secure and interesting. There is increasing demand for our services and we are looking forward to the possible production of the first *New York State Atlas* both in print and on CD ROM. We plan to continue a tradition of exploring new technology and utilizing it to support our clients needs. □

reviews

BOOK REVIEW

Drawing the Line, Tales of Maps and Cartocontroversy.

Mark S. Monmonier, New York: Henry Holt, 1995, 368 pp., maps, index, notes. \$27.50 Hardbound. (ISBN 0-8050-2581-2)

reviewed by Judith Tyner
Department of Geography
California State Univ., Long Beach

Political intrigue, deception, court battles, suspense. The newest best-selling thriller? No, it is Mark Monmonier's *Drawing the Line, Tales of Maps and Cartocontroversy*. Monmonier is certainly one of the most prolific writers in cartography and one of the best. In *Drawing the Line*, Monmonier continues his agenda of informing the public about maps, their strengths, and their dangers; and this book promises to reach the widest audience of all. Beginning with *Map Appreciation* (with George Schnell), and continuing through *How to Lie with Maps* and *Mapping It Out*, Monmonier has reached out to the nonspecialist, to the person who likes maps, uses maps, or needs maps. However, while the previous books were aimed primarily at social scientists, *Drawing the Line* is directed toward the general reader who frequents large chain bookstores.

In his preface, Monmonier notes that the map's combination of power (often because readers accept maps unquestioningly) and subjectivity (a necessary aspect of the cartographic process) has repeatedly put maps at the center of controversy. His stated goal here is "to lay out the territory of map controversy by exploring the ways maps are used to convince people and by examining how a

map can play various roles as a contest, prize, or stratagem" (2).

Monmonier tells his tales, old and new, in eight chapters, linking what sometimes seems like strange partners. For example, what, we might ask, do continental drift and geopolitics (the subjects of chapter five) have in common? On the surface, they have very little in common, yet Monmonier successfully links these two to show how maps are used in developing ideas and to establish the legitimacy of new scientific and political theories.

The book begins with the Peters projection and the battles that raged over it. Although this is a familiar story to most cartographers who followed the fight in journals and newspapers, with the perspective of time, Monmonier has been able to step back and look at the impact of the dispute.

The power of names on the map to assert ownership or express contempt is examined in "Place Names, Ethnic Slurs, and Ideological Renaming." The discussion ranges from prospectors' vulgar or obscene place names immortalized on maps to insults of almost every minority and the arrogant replacement of native names with European names. Thus, Monmonier ties geopolitics to the ideology that drives renaming. Similarly, "The Vineland Map, Columbus, and Italian-American Pride" is a tale of deception, forgery, and the ethnic pride of Italian-Americans and Scandinavian-Americans. While this conflict, like that of the Peters projection, may be familiar to many cartographic readers, they may not have followed the entire story and its consequences.

Court battles over boundaries and the role of cartographers as expert witnesses on both sides using maps as evidence are the subjects of chapter four, "Boundary Litigation and the Map as Evidence." Recent and historical battles for territory are used as

examples. Shifting the terms of these debates, "Maps, Votes, and Power" examines political redistricting and is a plea for better guidelines. It is a story of classic and modern gerrymandering.

"Siting, Cartographic Power, and Public Access" looks at the recent use of GIS in finding a site for a low-level radioactive waste dump in upstate New York. This could have been a dull tale, but through Monmonier's forceful writing a tale of intrigue, government chicanery, and public outrage unfolds. In "Risk Maps and Environmental Hazards," rather than relating a specific story about these increasingly important maps, Monmonier examines what he sees as their four aspects. First, he explores the design of environmental maps and the role of maps in risk communication. Then, he examines emergency-response maps and looks at the conflict between environmentalists and landowners over the representation of fragile wildlife habitats. Finally, he shows how maps aid in protecting the public's health and the environment as they reveal relationships between contamination and disease.

The Epilog should be required reading for anyone who believes that making a truly objective map is possible and that GIS will solve all mapping problems. Monmonier points out that it is not only maps done by obvious propagandists that are dangerous; unintentional bias can be just as misleading and treacherous. He also discusses problems that may arise in the future as cartography becomes more interactive and the distinction between mapmaker and map user is increasingly blurred. He cautions that databases containing meaningless and misleading information can be used to create meaningless or misleading maps. Inappropriate displays are but a keystroke or mouse click away when such databases exist. If one reads nothing else of the book, this

brief discussion is crucial.

Although since the 1940s sporadic research has been done on the role of maps as propaganda and on maps as tools of persuasion, in recent years the power of maps has become a popular topic with Brian Harley's and Denis Wood's work especially. Monmonier, who has been involved in many cartographic ventures, has taught cartography and map use, and is aware of the working cartographer's problems, has a different approach than Harley to the subject of map bias. Monmonier is more interested in educating the public than in blaming the cartographer. Although in the epilogue he discusses the cartographer's role, it is again more educational than censoring.

Rarely do books written by cartographers reach the shelves of mainstream bookstores. Historians or journalists usually write the few cartography books that can be found there (John Noble Wilford's *The Mapmakers*, for example). Monmonier, however, has managed to pull off the conjurer's trick of writing a book that is both scholarly (ample citations and bibliography) and readable. The writing is lively, personal, and clear; he is knowledgeable, insightful, and entertaining. This is a formidable combination.

But what about readers of *Cartographic Perspectives* and cartography students? Will we find this book too simplistic, telling us things we already know? While some tales may be familiar, doubtless not all are, even those which are familiar have some thought-provoking twists and information detail. There is excellent material here for lively seminar discussions, and some chapters open the door to further research.

Monmonier has told a series of intriguing tales and told them well; I recommend the book to cartographer and layperson alike. □

BOOK REVIEW

Mapping the Renaissance World: The Geographical Imagination in the Age of Discovery.

Frank Lestringant. Translated by David Fauset from *L'atelier du cosmographe*. Berkeley and Los Angeles: University of California Press, 1994. xvii + 197 pp., illus., index. \$38.00 Hardbound. (ISBN 0-520-08871-9)

*Reviewed by David Woodward
Department of Geography
University of Wisconsin-Madison*

The scope of this book is at the same time narrower and broader than its title might suggest. It is broader in that it is an examination of the general role of New World myths on European Renaissance literature. In other words, the "mapping" in the title is used both metaphorically and literally, and therefore it means something much broader than "cartography." Yet, the book's scope is limited by the fact that the theme is seen mainly through the eyes of one French cosmographer, André Thevet of Angoulême (1516-92). Fortunately, Thevet left most of his unfinished cosmographical manuscripts intact, "with the creative untidiness of its tools and materials, both unusual and ridiculous: maps of islands by the hundred, draft copies of his last unfinished books, representing up to four distinct stages of his work, and meticulously annotated mariner's charts. This *Wunderkammer* lacks only the monsters and prodigies that Thevet collected in what he called his 'most precious cabinet.'" One of the best known parts of his collection of Americana includes the Codex Mendoza and fragments on the religion of the Tupinamba Indians and Aztecs, which nourished his *Cosmographie universelle* (1575).

Readers of *Cartographic Perspectives* are likely to find two chapters of particular interest: chapter 1 "The Cosmographical Model," and chapter 5, "Cartographics: An Experience of the World and an Experiment on the World." If they venture into the other sections of the book, especially those dealing with the issues of the symbolism of the New World's influence on sixteenth-century literature, they will find themselves in the unfamiliar and sometimes bewildering land of literary criticism. As this review will reveal, the emphasis in this book does not lie in the traditional history of cartography, but it provides a very valuable context for the meaning of "cosmography" in the sixteenth century and its association with European mapmaking. In order to achieve this, Lestringant has provided an appendix with extracts from a previously unpublished manuscript of Guillaume Le Testu's *Cosmographie universelle* and a bibliography of works by André Thevet. The work also seems to have been well served by its translator, David Fauset.

The original French title was *L'atelier du cosmographe*—"The workshop of the cosmographer." The cosmographer, as we have seen, is Thevet, cosmographer to Henri III, the last of the French kings in the House of Valois. He entered the Franciscan order at the age of ten, and this monastic status later allowed him to travel, study, and write. His first voyage was to the Levant from 1549 to 1552 and resulted in the *Cosmographie de Levant*. But it was a second voyage to "Antarctic France"—founded on an islet in the Bay of Rio de Janeiro—that made his name. Based on ten weeks "among the most savage men of the universe," Thevet fashioned his book, the *Singularitez de la France Antarctique*. His exploration narratives came under severe attack by his contemporaries, Catholic and Protestant

alike. He was known as a plagiarist and liar of the first order, particularly by Jean de Léry, his rival commentator on the New World and a Protestant pastor.

In an introduction exploring the issue of the relative importance of the discovery of America to Renaissance European literature, Lestringant compares two interpretive models. The one model is teleological and asserts that the exotic myths of the New World developed from chaos into the Noble Savage. The other model argues that the reception of the discovery of America was relatively minor compared to the European preoccupation of the Orient, specifically the Turkish threat on the doorstep of Europe. Lestringant points out that both models fall short, largely due to their failures to account for different scales of activity: the "local" or Mediterranean arena, and the global arena.

These scale differences are also echoed in the comparison of the cosmographer's and chorographer's task—topics that Lestringant explores in the next chapter. The relationship among chorography, geography, and cosmography were common themes for discussion in sixteenth-century descriptions of the world. They derived from Ptolemy's *Geography*, and no geographic encyclopedia in the Renaissance was complete without drawing the distinctions. Chorography was the representation (drawn or written) of local regions and tended to be qualitative in its treatment (i.e. the work of an artist). Geography, on the other hand, was the study of the Greek *ges*, or whole earth, and relied on the authority of the classical authors and travelers. It required knowledge of the size and shape of the earth and tended to be quantitative in approach. Cosmography was meta-geography, in which the mathematical issues of geography were cast not

only in an celestial framework of parallels and meridians but which also attempted to explain the creation of the world in metaphysical terms. Cosmography was thus not only a literary *Wunderkammer* of the earth's curiosities; its task was also to show how these strange facts fit into the broader scheme of things as created by God. Thevet's *Cosmographie universelle* (1584), issued in four volumes, with 228 woodcuts and four maps of the continents, reveals one schema.

Given the massive, global scale of the *Cosmographie universelle*, one might ask why the book that is the subject of the next chapter, the *Cosmographie de Levant* (1554), whose content was "local," merited the name of a "cosmography." The *Cosmographie de Levant*, published on Thevet's return from the near East, is structured on an itinerary that moves from Venice to Marseille by way of Constantinople, Egypt, and the Holy Land. *Cosmographie de Levant* was derived from several sources, particularly the *Lectiones antiquae* of Coelius Rhodiginus, first published in 1516. The book is not a travel account, but a geographical encyclopedia of the region gained as it were by a game of travel, or as Lestringant puts it, a "geographical goose chase." Its importance was far more as an emblem book of social and moral issues drawn from classical and medieval sources than a geographical description of the near East. As an example of Christian symbolism that fits into his cosmographical aims, he describes Antioch as a celebrated city of red lilies symbolizing Christian "martyrs and confessors."

In the next two chapters, Lestringant addresses the role of South American mythologies as he discusses "The Invention of Brazil" and "Amazons and Monarchs." These themes were the subject of Thevet's *Singularitez de la France*

Antarctique (1557-58), which was translated into English as the *New founde worlde* in 1568. Although Thevet spent only ten weeks at Guanabara ("Gouffre [gulf] of the river of Guanabara or Janaire" or Bay of Rio de Janeiro), the book is largely devoted to this area that was part of "Antarctic France," an imperial dream that was officially abandoned in 1560. Brazil became the universal standard of symmetry between north and south, east and west. For example, Thevet compares the similarity of the Amazon and Ganges rivers. He also builds two complicated myths: the warrior kings and the Amazons. The "king" myth is based on his description of Quoniambec, the naked warrior-chief of the Tupinamba Indians with eminent qualities: "eight feet tall and able to carry a barrel of wine," as well as being able to simultaneously discharge an artillery piece from each shoulder. This physical prowess notwithstanding, Quoniambec was also capable of contrite prayer. Quoniambec was thus intended as a model of the Noble Savage, susceptible to the Christian faith and thereby becoming a dependable cog in the wheel of the European colonial enterprise. Instead, he became a target of Jean de Léry in his *Histoire d'un voyage*, who rightly scoffs at the "impostures" and "stork stories" by the "cosmographer by royal letters." De Léry, who had also spent time in Brazil, asserted that the Tupinamba culture functioned according to egalitarian principles, in which there were "neither kings or princes" but instead all of the warriors were "each almost as much a lord as the others."

Thevet also develops the myth of the Amazon in considerable detail. To the three sorts of Amazons described by the ancients (African, Southeast European, and Asian there could now be added a fourth (the American).

This race of warrior women devoted themselves to all activities normally reserved for men, beginning with hunting and war, in which they conducted themselves with exceptional ferocity. Conversely, they despised housework and horticulture. They represented a "world upside down," a common theme in the popular literature and art of the sixteenth century. Here too, Thevet contributed to the tangled web of mythology by which the New World was depicted.

In chapter 5, "Cartographics: An Experience of the World and an Experiment on the World," Lestringant discusses the various cartographic projects of Thevet, noting that "Thevet, like Münster or Postel before him, considered himself as much a cartographer as a geographer." Maps are the part of his work that have been most consistently cited, particularly his famous, but unfortunately no longer extant, map of France. The "use value" of the maps decayed much more slowly than that of his text, which quickly became passé and outmoded. His largest cartographic project, the *Grand Insulaire et Pilotage*, a great pilot book and atlas of the world's islands, was unfinished and unpublished. All that remains of this huge project, modeled on the *isolarios* of Cristoforo Buondelmonti, Bartolommeo dalli Sonetti, Benedetto Bordone, and Tommaso Porcacchi, are two manuscript volumes with eighty-four individual copperplate maps inserted at the corresponding chapter headings. These manuscripts have been preserved in the Bibliothèque Nationale, Paris. Another manuscript, the *Description des plusiers Isles* (1588), also in the Bibliothèque Nationale, is a partial ordering of the *Grand Insulaire* dealing with islands in the North Sea, English Channel, and Atlantic.

The maps are a curious blend of the navigator's art and the cosmographer's science. Ostensibly geometrically projected, and graduated carefully in longitude and latitude, they nevertheless bear rhumb lines conventionally superimposed without regard for cardinal direction as though to confirm—at least symbolically—the dual value of the maps for both navigator and cosmographer. In one example, illustrated as plate 9 in the book, the island of Newfoundland is depicted back to front, with the Newfoundland mainland to the north and Anticosti Island (proudly named "Isle de Thevet") and Nova Scotia ("partie de la Nouvelle France") to the east.

Thevet's brand of cosmography soon came to an end. The overarching encyclopedic goal was seen to be arrogant and—to the extent that the cosmographer took a "God's-eye view" of the world—even blasphemous. It gave way to a splintering of the sciences—"the partial knowledges of the topographer, the historian, the botanist, the military engineer, and soon also the statistician." What was lost was a suitable general framework into which the *bricolage* of anthropological data—some outright mythological, some empirical—could be placed. Consequently, as Lestringant eloquently states, "it was only in the twentieth century that the cosmogony of the Tupinamba Indians or that of the ancient Mexicans, carefully tucked away in Thevet's *Cosmographie universelle*, would at last find adequate readers, in the persons of Alfred Métraux or Claude Lévi-Strauss . . ." It is here that Thevet can be seen to have been ahead of his time and where his work provides a fertile field for students of early modern history, anthropology, and Renaissance literature. □

BOOK REVIEW

Mapping Hidden Dimensions of the Urban Scene.

J. Szegö. Swedish Council for Building Research. Stockholm, Sweden: Ljunghlöfs. 1994. 266 pages. Paper. (ISBN 91-540-5651-9)

reviewed by Julio Rivera
Department of Geography
University of Wisconsin-Milwaukee

Mapping opens by lifting the reader on a balloon ride at night over an unidentified city. The balloon uses a remote sensing device which monitors the movements of the residents of the city below. The device is sensitive enough to monitor minute levels human activity on the street and in buildings (it is even able to detect the birth of a baby in an ambulance). Fortunately, the device and the balloon ride are fictional; however, the questions Szegö poses are not. Szegö is interested in the daily movements of the city, particularly the daily flows of the city as its residents move from home to work and back home again. His primary questions are: What is the model of the city as it flows from day to evening and back again? How has this model of the city changed over time? How does this model help us plan our communities better? In exploring these questions Szegö's study focuses on the Swedish cities of Malmö and Lund and the surrounding communities.

Szegö models these cities using the concept of structural density (SD). He defines SD as a type of map algebra that adds together the density of residents (dweller density [DD]) and workers (worker density [WD]) in the city to create a three-dimensional model of a city. The usefulness of the model, Szegö suggests, is that

SD expresses the requirements for land, describes the 3-dimensional structure of the city, and indicates the intensity of activity in a city.

Szegö suggests that representing a city in terms of SD provides a clearer picture of urban use during a 24 hour period. He argues that combining WD and DD provides a more complete picture of urban use than either aspect alone would. And, he demonstrates that, by superimposing WD and DD on top of each other, a new previously hidden pattern of the city (SD) is revealed.

Szegö calculates the structural density in his study area over the past few decades in order to examine and illustrate the development of the towns. He presents WD, DD, and SD cross-sections of the cities and plots their growth on three-dimensional graphs. The graphs are effective at showing the patterns of growth in the cities studied.

To demonstrate the usefulness of SD, Szegö relates this concept to three specific applications: influence calculations, city planning, and estimating the built-up volume of Sweden. An influence calculation is the measurement of an internal or external force that acts upon the density (population, worker, or structural) of a city. Szegö's primary example is air pollution, which can be measured and its density mapped. Szegö provides examples that vary pollution concentrations over space and time. When the influence maps are combined with maps of structural density, the map reader sees a new pattern that shows the pollution and the influence it has on the structural density of a city. Szegö creates a number of effective surface models that illustrate these concepts. In his diagrams, a problem like pollution is examined as the spread of pollution concentrations over an area and over the various concentrations of persons. The

mapped effect allows the reader to see the levels of pollution and their effects on the human population. Szegö suggests that planners will want to use this information to increase the population's exposure to positive influences and reduce exposure to negative influences.

Pollution is an areal problem, but Szegö reminds the reader that other influences may be in the form of a point, line, or area which may be mobile or stationary. Szegö explores the possibilities of using map algebra in a number of contexts to visualize a variety of problems such as pollution, geologic phenomena, transportation networks, and nuclear disaster.

Szegö discusses how the planning of the expansion Lund and the surrounding communities were completed by estimating and planning the area required for each person. He also describes a method for the estimating the built-up volume of Sweden to determine heating requirements for the country.

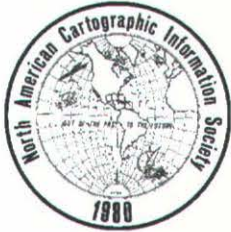
Mapping is as much a visual book as it is a written one. At least one-third of the book is composed of maps and graphs. Most of these are well done, but many are difficult to read because they represent the abstractions he presents in the text. Some of the maps need better geographical reference points. For example, sometimes the reader needs to return to one of the reference maps to understand what a particular map means. In addition, some of the color plates are misregistered (the author encloses an apology for these). The color density maps are difficult to read because the colors chosen do not follow a progression which would imply increasing density. The map reader is forced to return to the legend each time to determine the density of a region.

The work is a little antiseptic and avoids controversy. The balloon ride hints that the author may begin to analyze data which

may be sensitive or semi-private. He mentions that the method would apply to nuclear disaster, but does not discuss this possibility extensively. The book avoids the analysis of population data other than density and the physical built volume, but the author suggests that examining "the web of life" is a valuable pursuit. Those who use population data (census, etc.) should be able to use and expand on Szegö's work.

In short, despite the book's flaws, Szegö's concept of structural density gives us another way of looking population density. Another value of this work is that it gives students and researchers a sense of what map algebra can accomplish in practical applications. Szegö's examples provide a starting point from which others can locate their own data and begin to imagine it in creative ways by combining it with other data about the human and physical environment. This work reminds us that our new computer tools allow us to map many things easily, including moving away from traditional 2-D maps and into the world of 3-D maps. □

XV Annual Meeting of the NORTH AMERICAN CARTOGRAPHIC INFORMATION SOCIETY



Wilmington, North Carolina
October 25 - 29, 1995

WEDNESDAY, OCTOBER 25

- 10:00 am - 7:00 pm **Registration**
- Noon- 6:00 pm **WORKSHOP: *Distributing Maps Through the Internet***
Organizer: Michael P. Peterson, University of Nebraska at Omaha
- 3:00 - 5:00 pm **WORKSHOP: *Introduction to ATLAS*GIS for Windows***
Organizer: Jan Mersey, University of Guelph
- 1:00 - 3:00 pm **NACIS Board Meeting**
- 7:30 pm **Opening Session**
Keynote Speakers: James Leutze & Frank Ainsley, Univ. of North Carolina - Wilmington
- 9:00 - 11:00 **Poster Session & Reception**
Organizer: Donna G. Schenstrom, Univ. of Wisconsin-Milwaukee

THURSDAY, OCTOBER 26

- 8:00 am - 7:00 pm **Registration**
- 9:00 am - 5:00 pm **Exhibits Open**
- 8:30 - 10:00 am **Concurrent Sessions**
 - SESSION A: *CARTOGRAPHIC METHOD AND THEORY***
 - Spectral Schemes: Controversial Color Use on Maps*
Cynthia A. Brewer, Alan M. MacEachren, & Linda W. Pickle, Penn State University
 - Cartographic Testing: Postmortem of an Experimental Project*
Charles P. Rader, Univ. of Wisc-River Falls
 - The Meaning of Map Interaction*
Michael P. Peterson, Univ. of Nebraska at Omaha
 - SESSION B: *UNIVERSITY CARTOGRAPHY LABS - CURRENT TRENDS AND FUTURE DIRECTIONS***
(Organizer: James R. Anderson, Florida State University)
 - From Printed Maps to the CD-ROM to the Internet: The Atlas of Florida Experience*
James R. Anderson & Christopher D. Wilkes, Florida State University
 - Prepress Production Issues of Importance to Cartographers*
Joseph Stoll, Univ. of Akron & Donna Schenstrom, Univ. of Wisconsin-Milwaukee
 - CVNRA Map: Trailblazing, Politics, and Cartography*
Claudia James & Thomas Nash, Univ. of Akron

•10:30 - Noon
Concurrent Sessions

SESSION C: CARTOGRAPHIC ANIMATION

*A Cartographic Animation of Portland, Oregon's Annexation History:
Discrete Areal Change at Disjunct Times*
Alison E. Philpotts, Michigan State University

Searching Maps Using Color and Motion
Robert Lloyd, University of South Carolina

SESSION D: MAP COPYRIGHT ISSUES

Copyright and Cartography Labs, Questions of Map Ownership
Will Fontanez, University of Tennessee

U.S. Copyright and Multimedia
Trudy Suchan, Penn State University

Copyright and Maps
Dennis McClendon, Chicago CartoGraphics

•Noon - 2:00 pm

Luncheon & Annual Business Meeting

•2:00 - 5:00 pm

Tours

Wilmington Adventure Walking Tour, American Geographic Data, U.S. Army Corps of Engineers

FRIDAY, OCTOBER 27

•8:00 - Noon

Registration

•8:00 - 2:00 pm

Exhibits Open

•8:30 - 10:00 am
Concurrent Sessions

SESSION E: CARTOGRAPHIC EDUCATION

Anatomy of the Introductory, Cartography Course Revisited
James R. Fryman & Bonnie R. Sines, Univ. of Northern Iowa

Cartographic Education in Germany: State and Recent Developments
Ulrich Freitag, Freie Universitat Berlin

Teaching ARC/INFO as a Cartographic Tool
Zehdreh Allen-Lafayette, New Jersey Geological Survey

SESSION F: MICROCOMPUTER MAPPING ROUND TABLE DISCUSSION

Organizer: Dennis McClendon - Chicago CartoGraphics

•10:30 - Noon
Concurrent Sessions

SESSION G: PANEL DISCUSSION ON CARTOGRAPHIC EDUCATION

Organizer: Keith Rice, Univ. of Wisconsin-Stevens Point

SESSION H: GPS AND GIS

Augmented GPS to Benefit All Phases of Aircraft and Vessel Navigation
Ronald M. Bolton, NOAA - Aeronautical Charting Division

Save Our Rivers Revisited: Planning and Products of the 1996 GIS Model
Margit L. Crowell, Southwest Florida Water Management District

Generation of Digital Base Maps for Preparation of Thematic Maps
Cidney J. Freitag, USGS

•Noon - 1:00 pm

LUNCH on your own

•Noon - 1:15 pm

CP Editorial Board Meeting

• 1:30 - 3:00 pm
Concurrent Sessions

SESSION I: MAPPING IN A CHILD'S WORLD (Organizer: Henry W. Castner - Pittsboro, NC)
An Educational Taxonomy for Maps in a Child's World
Henry W. Castner - Pittsboro, NC

Designing Maps for the Elementary Grades
Karen M. Trifonoff, Bloomsburg University

Children's Cognitive Processing and Understanding of Thematic Map Symbolization
James E. Young, Appalachian State University

Terrain Models: A Tool for Experiential Learning in Geography and Mapping
Sam Brian, Bank Street College of Education, Geography and Mapping Institute

SESSION J: AUTOMATING MAP RESOURCES AND THE INTERNET

World Wide Web Resources for Cartographers
Jeremy Crampton, George Mason University

Putting Cartography on the Internet: The Alexandria Digital Library Project
Barbara P. Battenfield, Christopher Weber, Ming-Hsiang Tsou, Patricia Trawinski & Victor Ricci, NCGIA

Bending the Rules: Creatively Adapting Library Systems to Automate the Map Collection
Paige Andrew & Melissa Lamont, Penn State University

• 3:30 - 5:00 pm
Concurrent Sessions

SESSION K: MAPPING IN A CHILD'S WORLD II
Organizer: Henry W. Castner - Pittsboro, NC

Map Skills in Quebec's Elementary School Curriculum
Jacqueline Anderson, Concordia University

Round Table Discussion on Mapping in a Child's World: Implications for Cartographic and Geographic Education

SESSION L: PANEL DISCUSSION - IMPACT OF FEDERAL BUDGET CUTS ON MAPPING WITHIN GOVERNMENT, ACADEMIC INSTITUTIONS, AND THE PRIVATE SECTOR

Organizer: Ronald M. Bolton, NOAA - Aeronautical Charting Division

• 6:30 - 10:00 pm

ANNUAL BANQUET: Speaker: Denis Wood, North Carolina State University, "Living With Maps."

SATURDAY, OCTOBER 28

• 8:30 - 10:30 am

NACIS Board Meeting

• 11:00 - 6:00 pm

Field Trip Excursions

NACIS sponsored trips:

1:45 - 4:15 pm: *Henrietta II - Cape Fear River Sightseeing Cruise*

11:00 am - 6:00 pm: *Bald Head Island Junket*

An excursion exploring an island steeped in coastal cultural history & geography.

Shuttle Transportation will also be provided to the following sites:

Wrightsville Beach, Museum of Lower Cape Fear, and The Downeast Rover (sailboat)

For More Information Contact:

Keith W. Rice

Department of Geography & Geology, University of Wisconsin-Stevens Point
Stevens Point, WI 54481

PHONE: (715) 346-2629, FAX: (715) 346-3372, e-mail: krice@uwspmail.uwsp.edu

NACIS news

NACIS OFFICERS

President: **Henry Castner**

164 Fearington Post
Pittsboro, NC 27312
(919) 542-1602
fax: (919) 542-5072
(term expires Oct. 95)

Vice President: **Keith W. Rice**

Department of Geography
University of Wisc. -Stevens Point
Stevens Point, WI 54481
(715) 346-4454
fax: (715) 346-3624
e-mail: Krice@uwspmail.uwsp.edu
(term expires Oct. 95)

Secretary: **Craig Remington**

University of Alabama
Box 870322
Tuscaloosa, AL 35487
(205) 348-1536
(term expires Oct. 95)

Treasurer: **Ed Hall**

410 McGilvrey Hall
Kent State University
Kent, OH 44242-0001
(216) 672-2017
fax: (216) 672-4364
e-mail: ehall@kentvm.bitnet
(term expires Oct. 96)

Past President:

Charles E. Harrington

10904 Kingstead Rd.
Damascus, MD 20872
(301) 443-8360
fax: (301) 443-8701
(term expires Oct. 95)

NACIS EXECUTIVE OFFICER

Christopher Baruth

AGS Collection
PO Box 399
Milwaukee, WI 53201
(800) 558-8993 or (414) 229-6282
fax (414)229-4380
e-mail: cmb@csd.uwm.edu

NACIS BOARD OF DIRECTORS

Patricia Chalk

Department of Geography
University of Western Ontario
London, ON N6A 5C2
Canada
(519) 661-3425
fax: (519) 661-3750
(term expires Oct. 95)

Barbara Fine

1636 Eye Street N.W.
Washington, D.C. 20006
(202) 628-2608
fax: (202) 628-2610
(term expires Oct. 95)

Patricia Gilmartin

Department of Geography
University of South Carolina
Columbia, SC 29208
(803) 777-2989
fax: (803) 777-4972
e-mail: gilmartin-pat@scarolina.edu
(term expires Oct. 96)

Donna Schenström

Department of Geography
3210 N. Maryland Ave.
Univ. of Wisconsin-Milwaukee
Milwaukee, WI 53211
(414) 229-4865
fax: (414) 229-3981
e-mail: dgs@csd.uwm.edu
(term expires Oct. 95)

John Sutherland

Map Collection, Science Library
University of Georgia Libraries
Athens, GA 30602-7412
(706) 542-0690
fax: (706) 542-6523
e-mail: jsutherl@uga.cc.uga.edu
(term expires Oct. 95)

David W. Tilton

Department of Geography
3210 N. Maryland Ave. Univ. of
Wisconsin-Milwaukee
Milwaukee WI 53211
(414) 961-9666
fax: (414) 961-9266
e-mail: carta@execpc.com
(term expires Oct. 95)

Carolyn C. Weiss

Statistics Canada
Geography Division
Jean Talon Building
Ottawa, ON K1A0T6
Canada
(613) 951-3921
fax: (613) 951-0569
(term expires: Oct. 96)

CARTOGRAPHIC PERSPECTIVES

Editor: **Sona Andrews**

Assistant Editor: **David W. Tilton**

Department of Geography
474 Bolton Hall
3210 N. Maryland Ave.
Univ. of Wisconsin-Milwaukee
Milwaukee, WI 53211
(414) 229-4872
fax: (414) 229-3981
e-mail: sona@csd.uwm.edu
also carta@execpc.com

EDITORIAL BOARD

Chair: **Michael Peterson**

Department of Geography /
Geology
University of Nebraska-Omaha
Omaha, NE 68182
(402) 554-2662
fax: (402) 554-3518
e-mail: geolib@cwis.unomaha.edu

cartographic perspectives Back Issues

The first issue of Cartographic Perspectives was published in March 1989. Back issues (for all issues) are now available at a cost of \$20 per issue (\$10 for members). Please specify the issue numbers (1-22) when ordering. Makes checks or purchase orders payable to NACIS. Send your back issue requests to:

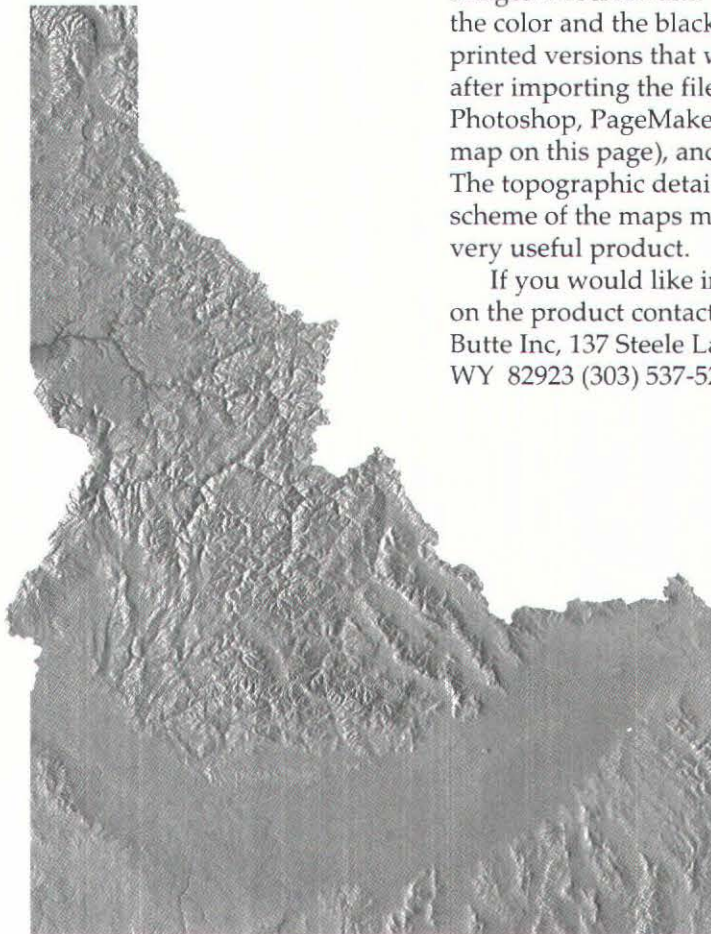
Edward Hall, Treasurer
410 McGilvrey Hall
Kent State University
Kent Ohio 44242-0001

announcements

U.S. TOPOGRAPHY ON CD-ROM

Chalk Butte Inc. has produced a CD-ROM atlas of U.S. Topography computed from the USGS 3 arc second elevation data base. The Atlas includes a screen size image of every state in the United States (except Alaska). Each state can also be displayed in a one by one degree, 1:530,000 tile. Individual tiles are displayed in latitude and longitude coordinates and they are identified by state and the latitude and longitude of their southeast corners. All of the maps are in 24-bit color but they can also be viewed in 8-bit color.

The relief depicted on the maps is shown in extraordinary detail



and the files are easily imported into any Macintosh or DOS/Windows application that accepts PICT (Mac) or TIFF (DOS/Windows) files. You can also use utilities such as Photoshop to assemble two or more tiles into a larger map. All of the maps are at a uniform scale that permits convenient screen comparisons of geologic features (although the color palette for the eastern states differs from the western states). The Atlas is available in both Mac (2 CD-ROMs) and DOS/Windows (1 CD-ROM). The list price for the product is \$299 (academic price is \$120). The minimum system requirements are 3MB RAM and PICT reader for Mac and a TIFF reader and LZW compression for DOS/Windows.

Cartographic Perspectives received a copy of the Macintosh version of the Atlas. We were very impressed with the quality of the images on screen and with both the color and the black and white printed versions that were made after importing the files into Photoshop, PageMaker (see Idaho map on this page), and Illustrator. The topographic detail and color scheme of the maps make this a very useful product.

If you would like information on the product contact: Chalk Butte Inc, 137 Steele Lane, Boulder, WY 82923 (303) 537-5261. □

cartographic events

October 15-18

Western Association of Map Libraries Meeting

Las Vegas, Nevada

Contact: Katherine Rankin,
(702) 895-3062. krankin@nevada.edu.

October 25 -29

NACIS XV

Wilmington, NC. See preliminary program on pages 20-22. For more information contact: Keith Rice, Dept. of Geography, Univ. of Wisconsin-Stevens Point, Stevens Point, Wisconsin 54481. (715) 346-2629

November 13-17

LIS/GIS '95

Nashville, TN

Contact: LIS/GIS '95, 5410 Grosvenor Lane, Suite 100, Bethesda, MD 20814-2122 (301) 493-0200 fax (301) 493-8245.

December 1-2

3rd ACM International Workshop on Advances in Geographic Information Systems

Baltimore, Maryland

Sponsored by ACM in cooperation with CACS-USL, UT1-CERISS.

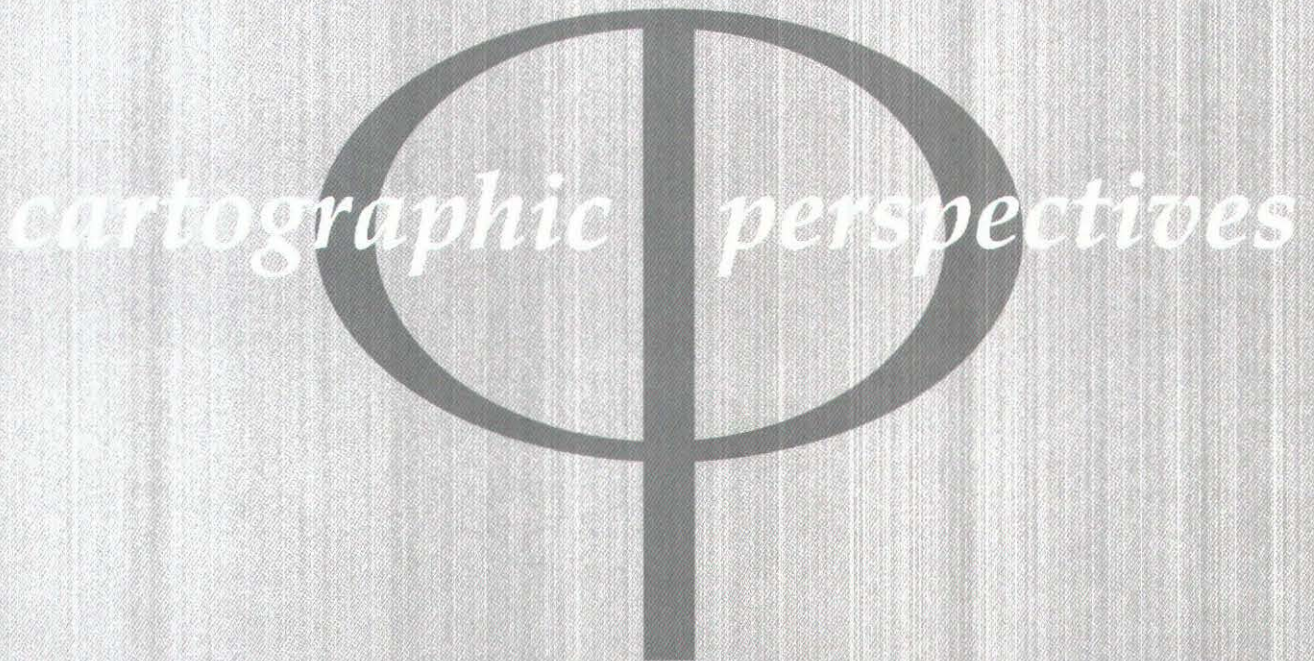
Contact: Patrick Bergougnoux, c/o Michele Cuesta, The University of Toulouse 1, CERISS Laboratory, Place Anatole France, 31042 Toulouse Cedex, FRANCE, (33) 61-57-4789, Fax (33) 61-57-9444, bergougn@irit.fr.

March 18-21, 1996

Tenth Annual Conference on Geographic Information Systems

Vancouver, BC, CANADA

Contact: Sylvia Marshall, GIS World, 155 E. Broadwalk Drive, Fort Collins, CO 80525, (970) 223-4848, event-info@gisword.com. □



*Abstracts
& Index
to Articles and Reviews
Issues 1-22*

Cartographic Perspectives
Spring 1989, 1

Automated Radar Video Map Production at NOS (1:5-10)

Ronald M. Bolton and Russell A. Hoover

The Aeronautical Charting Division (ACD), National Ocean Service (NOS), National Oceanic and Atmospheric Administration (NOAA) produces the Radar Video Maps (RVM's) used by air traffic controllers to monitor and control the Nation's airspace. These complex maps depict the local Federal Aviation Administration (FAA) airspace definition and show airways, intersections, holding patterns, selected navigational aids, special-use airspace boundaries, and other radar display elements critical to the traffic controller's radar scope displays. Previously produced by tedious manual methods, the ACD's Aeronautical Chart Automated Production (ACAP) system now provides the tools for automated production of this integral part of the FAA air traffic control system.

Cartographic Perspectives
Summer 1989, 2

The Librarian's Dilemma: A Map Librarian's Access to Machine-Readable Information (2:7-13)

Patrick McGlamery

This paper addresses how a map librarian gains entree to the fast track world of computer cartography. The history of machine-readable information in libraries has been rocky. As information resides more frequently on tape or disk, libraries need to embrace the technology. By obtaining seed money from a Federal Library Services Construction Act grant, the Map Library at the University of Connecticut procured hardware, software and boundary files. With the aid of a research assistant, the librarian wrote a SAS program, PTOLEMY, which allows users to map their data. PTOLEMY is a menued environment running on the mainframe. Users may access the mapping system from remote sites.

Cartographic Perspectives
Fall 1989, 3

Desktop Mapping at Temple University (3:3-13)

Mark Mattson

In 1986 Temple University began applying desktop mapping and publishing software developed for the Apple Macintosh microcomputer as alternative tools for cartographic production. Our experience indicates that these tools can significantly reduce the costs associated with photo-mechanical production of thematic atlases while actually resulting in superior products. This article presents an overview of Temple's desktop mapping activities with the intent of stimulating wider discussion of this important alternative approach to map design and production.

Cartographic Perspectives
Winter 1989-90, 4

Color Chart Use in Map Design (4:3-10)

Cynthia A. Brewer

Ten process-printed color charts based on the perceptually ordered Munsell system were previously developed. Sixteen cartographers with experience in color map design were mailed copies of the chart and were subsequently interviewed by telephone. The objectives of the interviews were to gather background information on the cartographers' general use of color charts and to examine the perceived usefulness of the Munsell-based charts as aids for map color selection. Approximately half of the interviewees were not satisfied with the color charts they were currently using. Over half of the cartographers had difficulties with differences between printed map and chart colors. As a summary of the interviews, eleven recommendations are made for the design of yellow-magenta-cyan charts of the conventional lithographers' format. Twelve of the cartographers judged the Munsell-based charts as potentially useful aids for map color selection, especially for the design of thematic color progressions. Likewise, the cartographers' solutions to difficulties with the layouts of their conventional charts indicated that a different chart organization, possibly perceptual, would be useful to cartographic designers. Overall, the interviews revealed a surprising diversity of opinions about and requirements of color charts that are used in map design.

Choosing Tools: Nine Metaphors of Four-Dimensional Cartography (5:3-17)*Philip J. Gersmehl*

Animated maps are now technically and economically feasible. Like other forms of cartography, map animation has some unique design considerations, which involve a variety of tradeoffs. Making these tradeoff decisions is easier if we acknowledge that different animation software packages seem to embody a number of different perspectives—a 'flipbook' style of animation, for example, is suited to different tasks than a 'stage-and-actor' or a 'model-and-camera' program. This paper contrasts nine different animation metaphors, with special attention to the degree to which a given tool allows a cartographer to make particular kinds of revisions.

*Cartographic Perspectives
Spring 1990, 5****Maps in Children's Literature*** (6:3-12)*Jeffrey C. Patton and Nancy B. Ryckman*

This paper reports the findings of a survey conducted to determine the frequency and use of maps in two categories of children's fiction books: those aimed at children just beginning to read and those intended for readers at the third grade level. The number of maps, type, purpose and general scale were noted. Results from the two samples were compared to similar information gathered for the Newbery and Caldecott award and honor winning books. While books for older children had twice as many maps as those for beginning readers the Newbery and Caldecott books had the highest percentage. Large scale maps were used more frequently than small scale maps and the number of fantasy maps and real maps was about equal. Maps tended to be used to explain the spatial events of the story but also many were employed as props or as general locational illustrations with little reference to the story.

*Cartographic Perspectives
Summer 1990, 6****Ethical Problems in Cartography*** (7:3-13)*Patrick McHaffie, Sona Karentz Andrews, Michael Dobson and two anonymous employees of a federal mapping agency*

The problem of defining and actualizing standards of ethical conduct troubles many professions, including cartography. In an attempt to formalize the ethical discourse in cartography the editors of *Cartographic Perspectives* invited five contributors to discuss what they perceive as important ethical problems in the discipline. The contributors were selected from the three major sectors of the cartographic enterprise: commercial mapping organizations, government mapping agencies, and university geography departments offering cartography programs. The contributors identify personal and institutional vigilance in product quality assurance, map plagiarism through violation of copyright law, and conflicts of interest as important ethical issues. The commentary concludes by questioning the nature and validity of cartography's claim to truth ("accuracy"), and asserts that cartographic ethics cannot be extricated from the values of the larger society which commissions the production of cartographic information.

*Cartographic Perspectives
Fall 1990, 7****Mapping the Nation's Physiography by Computer*** (8:15-24)*Richard J. Pike and Gail P. Thelin*

Recent advances in computer technology present opportunities for the machine visualization of topography. A new shaded-relief map of the conterminous United States is the first one-sheet graphic of U.S. landforms larger than Erwin Raisz's classic 1939 hand-drawn panorama. The 1:3,500,000-scale digital image (about 4.5' long), reproduced here at 1:10,000,000 has greater fidelity and detail than portrayals of this large area by artistic (manual) techniques. The new map also shows synoptic topography more clearly than contoured elevations, satellite images, or radar mosaics. We created the map by processing 12,000,000 elevations (digitized from 1:250,000-scale topographic sheets at a grid resolution of 0.8 km) on a VAX-11/780 computer, using proprietary software, a modified Lambert photometric function, 255 gray tones, and the method of Pinhas Yoeli as implemented by Raymond Batson and others.

*Cartographic Perspectives
Winter 1990-91, 8*

Cartographic Perspectives
Spring 1991, 9

Computer-aided Mapping for Facilities Management and Environmental Compliance (9:3-14)

Diane C. Drigot, Margaret E. Elliot and Karen L. Glyn

As staff and budgets shrink and environmental requirements grow, facilities managers face a critical need for more timely access to geographic-based information to achieve regulatory compliance. An integrated Geographic Information System (GIS) can successfully satisfy this need for a large municipality. But for managers at smaller facilities, a full-function GIS often exceeds what is needed and affordable. Such managers can derive similar benefits with minimal staff, budget, and equipment investments by developing a microcomputer-based system, using CAD/CAM software as a mapping package linked with third-party database management software. This paper describes how a military installation in Hawaii successfully built such a system using *AutoCAD* and *dBase III+*.

Cartographic Perspectives
Summer 1991, 10

Ethics and Map Design. Six Strategies for Confronting the Traditional One-Map Solution (10:3-8)

Mark Monmonier

Traditional, positivist approaches to map design usually yield a single map. These one-map solutions foster a highly selective, authored view reflecting many factors, such as map scale, geographic scope, feature content, map title, classification of data, and the crispness or fuzziness of symbols representing uncertain features. As a result, the rightfully skeptical map viewer ought to question whether (a) an ulterior motive led to a biased view of reality favoring the author's philosophical or political biases or economic goals, or (b) a lazy map author failed to explore designs offering a more coherent or complete picture of reality. Technology has aggravated the problem of one-map solutions by placing powerful mapping software at the disposal of amateur cartographers who can generate convincing-looking graphics with little or no understanding of their data or the principles of mapping. And the technology also allows devious map makers to perfect designs that support their points. But technology can also foster greater openness and more complete understanding of maps and their meaning, and thereby provide a more ethical approach to cartographic analysis and communication. After discussing the problem of single cartographic views, I present six strategies for a more open and overtly critical cartography in which one-map solutions are both rare and suspect.

Cartographic Perspectives
Fall 1991, 11

A Content Analysis and Comparison of Three Cartographic Journals: 1964-1989 (11:3-22)

Pat Gilmartin (with commentaries by Bernard Gutsell, David Fairbairn and Robert B. McMaster)

The contents of three major English-language cartographic journals from Great Britain, Canada, and the United States were analyzed and compared to determine if there are significant differences among them. Results show considerable similarities in the publication of user-oriented research and articles related to automated cartography. The three journals varied considerably in their publication record for historical cartography and several other relatively minor categories. The question of editors' influence on journal content was considered and input sought from representatives of the three journals in the study.

Cartographic Perspectives
Spring 1992, 12

Mapping Land Degradation Factors in Mexico (12:15-21)

María C. García and Graciela Pérez

Traditional and automated cartographic methods were used to compile a comprehensive map of environmental problems in Mexico. The map is part of the recently published *Atlas Nacional de Mexico*. This paper outlines the procedures followed during the collection and analysis of data through to its cartographic expression. The recent increase in the publication of environmental maps at regional, national, and global scales may increase awareness of the threatening effects of man-induced environmental disturbances.

Cartographic Animation: Potential and Research Issues (13:3-9)

Doris Karl

The potential of computer animation has been realized in many different disciplines. Animation is also a powerful visualization tool for cartography; however, it has been neglected until recently. This paper portrays the need for animation in cartography in the light of the new approaches and methods in the sciences as well as in society. It discusses two main reasons for the lack of animation in cartography: the fixation on the printed map and the absence of a comprehensive approach to cartographic animation. Finally, a variety of issues for further research are proposed.

Visualizing Uncertain Information (13:10-19)

Alan M. MacEachren

When a GIS is used to drive map-based visualization, exploration of potential relationships takes precedence over presentation of facts. In these early stages of scientific analysis or policy formation, providing a way for analysts to assess uncertainty in the data they are exploring is critical to the perspectives they form and the approaches they decide to pursue. As a basis from which to develop methods for visualizing uncertain information, this paper addresses the difference between data quality and uncertainty, the application of Bertin's graphic variables to the representation of uncertainty, conceptual methods of spatial uncertainty as they relate to kinds of cartographic symbolization, and categories of user interfaces suited to presenting data and uncertainty about that data. Also touched on is the issue of how we might evaluate our attempts to depict uncertain information on maps.

The Impact of the Implementation of the North American Datum of 1983 (NAD 83) on Aeronautical Navigation in the United States (14:3-8)

Ronald M. Bolton

On October 15, 1992, the horizontal geodetic reference system used for all aeronautical charts and chart-related products published by National Oceanic and Atmospheric Administration (NOAA)/National Ocean Service (NOS) changed from the North American Datum of 1927 (NAD 27) to the North American Datum of 1983 (NAD 83). The Global Positioning System (GPS) now allows satellites to define much more accurately geographic locations in terms of latitude and longitude, utilizing an earth centered reference system; the NAD 83 is based on this new technology. As a result, the latitude and longitude of almost all points in the National Airspace System (NAS) were revised. The greatest coordinate shifts were in Hawaii and Alaska where latitude moved by as much as 1200 feet and longitude by up to 950 feet. In the conterminous U.S., the largest changes were approximately 165 feet in latitude and 345 feet in longitude. The impact to aeronautical navigation in the U.S. of the datum shift from NAD 27 to NAD 83 was not limited to aeronautical charts and related publications. All Flight Management Systems (FMSs) and Air Traffic Control Systems (ATCs) had to be modified to accept and utilize the NAD 83 coordinates. The impact of the implementation of NAD 83 on aeronautical navigation in the United States was significant.

Maritime Boundaries on National Ocean Service Nautical Charts (14:9-15)

Charles E. Harrington

The National Ocean Service (NOS) is responsible for charting the Nation's coastal waters and, therefore, is the lead Agency for the portrayal of maritime limits of the United States of America. The 1958 Geneva Convention on the Territorial Sea and the Contiguous Zone states "... the normal baseline for measuring the breadth of the territorial sea is the low waterline along the coast as marked on large-scale charts officially recognized by the coastal state." In 1976, NOS was requested to show various maritime limits on its regular issue of nautical charts. The paper presents the history of maritime boundaries on National Ocean Service (NOS) charts, methods used in constructing the various maritime limits, the push for lateral seaward boundaries, and the technical aspects of maritime limits.

*Cartographic Perspectives
Fall 1992, 13**Cartographic Perspectives
Winter 1993, 14*

Cartographic Perspectives
Spring 1993, 15

A Cartographic Quincentenary (15:3-12)

Arthur H. Robinson

On October 15, 1992 NACIS members were honored to have Emeritus Professor Arthur Robinson deliver the banquet address at the Twelfth Annual NACIS meeting in St. Paul, Minnesota. Professor Robinson enlightened and entertained us with the following presentation on Martin Behaim, the making of the Behaim Globe (in 1492), and an interpretation of the geographic relationships depicted on that globe.

Desktop Map Design: Some Odysseys of Form and Flow (15:13-20)

Kevin Byrne

Making maps on today's desktop platforms can be something of an odyssey that often obligates the designer to traverse minefields of non-integrated software. This article details the workflows for nine maps produced with desktop computer software. Each workflow falls across a row; each row references a captioned map that was a tangible outcome of the author's implementation of desktop cartography using image processing and other software tools. A need for early articulation of appropriate verbal goals to guide the power and charm of map design software is discussed.

Cartographic Perspectives
Fall 1993, 16

Relating Cognitive Development to Cartographic Education With a Model of Orientation Space (16:3-8)

Henry W. Castner

An "orientation space" is briefly described as a means of synthesizing a vast literature and of providing psychologists and cartographers with some common ground for discussing the issues of cognitive development in children as they might apply to elementary cartographic education. The vast literature refers to the work in many fields on the questions of how children navigate and orient themselves, how they visualize and organize space and spatial relationships, and how they express these ideas graphically.

The Development of Children's Spatial Knowledge: Implications for Geographic Education (16:9-18)

Jodie M. Plumert

One of the many challenges facing the education system today is providing children with a better understanding of geography. Increasingly, cartographers and educators have turned to developmental psychologists for information about how children's spatial cognitive development influences their ability to understand and learn about the spatial relations on maps. Central to the process of learning and remembering spatial relations is the ability to organize locations within some kind of spatial structure. Recently, the role that hierarchical organization plays in remembering and reasoning about locations has received increasing attention within the field of cognitive psychology. Studies have shown that both children and adults alike tend to organize locations into regions with nested levels of detail. For example, the location of a toothbrush might be remembered as on the second shelf in the medicine cabinet in the bathroom upstairs, or the location of Iowa City might be known as in the state of Iowa in the Midwest region of the United States. There are, however, limitations in children's ability to make use of hierarchical spatial structures; this has important implications for cartographic education. As a result, younger children may require more visual aids and explicit organizational frameworks when learning and communicating information about locations. The ideas and suggestions presented here about the relations between children's spatial cognitive development and their understanding of geography are aimed at fostering further collaboration between cartographers and developmental psychologists.

How Practical Are Minimum-Error Map Projections? (17:3-9)

John P. Snyder

Ever since the Mercator projection gained wide acceptance for general geographic world maps, there have been attempts to replace it because of its serious area distortion. Most minimum-error projections, however, are difficult or nearly impossible to construct without a modern computer. Does this negate their use? The answer is probably yes if most users need to digitize maps or do their own programming of formulas, but no if the goal is to make the map easier for measurement of distance, area, and shape. We too often still choose projections to suit pre-computer criteria involving ease of construction, rather than to meet the needs of the map user. This paper reviews the practicality of minimum-error map projections and illustrates a wide range of minimum-error projections.

Cartographic Perspectives
Winter 1994, 17

Reexamining the Role of Maps in Geographic Education: Images, Analysis, and Evaluation (17:11-20)

James E. Young

The ability to make, understand, and use maps is essential for anyone trying to think about the world around them. Children's failure to make and use maps in a meaningful way contributes to the lack of geographic awareness across the country. The "linguistic map" (a graphic representation of the mental connections between words, sensory images, abstract concepts, and value judgments) is proposed as a model for evaluating maps used in educational materials. An evaluation of social studies textbooks found that the maps failed to promote learning at all three levels proposed by the linguistic model: concrete images, abstract analysis, and value evaluation. Problems with the textbook maps are examined and suggestions developed for using maps in educational materials.

Thematic Mapping With Illustration Software: Unraveling the Mystery of Graphic File Formats (18:3-16)

Brian Morber and Janet E. Mersey

This paper focuses on using a popular microcomputer graphic design package (CorelDRAW 4.0) in conjunction with a variety of GIS/mapping software to test their capacity to transfer map images. Emphasis is placed on the advantages and disadvantages of transferring different bitmap and vector formats, rather than on the nature of the formats themselves. All of the cartographic packages tested had some capacity to export thematic maps to CorelDRAW, although some file formats provided greater flexibility than others. Generally, it appears that simpler thematic maps transfer easily, while more complex types require considerably more effort to transfer successfully. Both Windows Metafiles and Computer Graphics Metafiles proved to be efficient file formats for exporting most types of map images to CorelDRAW.

Cartographic Perspectives
Spring 1994, 18

Culture of the Wisconsin Official State Highway Map (18:17-27)

Mark H. Bockenhauer

Wood and Fels (1986) strikingly reveal that even a cartographic product as "taken for granted" as a road map is as much a tool of the maker as of the user. Indeed, a highway map comprises a sophisticated package of messages. In this paper, a series of State of Wisconsin official highway maps is examined to illustrate that each is a product of the culture in which it is produced. Map messages reflecting state institutional cultures are communicated through the principal state map image as well as through other map elements. Examples are selected from the 1920s to the present to highlight a changing transportation and mapmaking culture, appropriation of the official state highway map as a tool of tourism and gubernatorial promotion, and the presence of certain persistent and disturbing depictions of women and minorities. Wisconsin's official highway map is found to include both deliberate and unintentional reflections of the changing (and in some aspects, unchanging) state of the state.

Cartographic Perspectives
Fall 1994, 19

Designing Animated Maps For A Multimedia Encyclopedia (19:3-7)

David DiBiase

Between January and June 1993, GeoSystems—an R. R. Donnelley and Sons Company—compiled and produced thirty animated maps for the 1994 edition of the *New Grolier Multimedia Encyclopedia*. Animated subjects requested by Grolier included the American Revolutionary War, World War II, and Magellan's circumnavigation of the world. I collaborated with GeoSystems as a private consultant, providing design specifications for the series. In this paper, I discuss some of the cartographic challenges GeoSystems faced in condensing these complex events into brief (4-5 minute) animations.

Proactive Graphics for Exploratory Visualization of Biogeographical Data (19:8-19)

Barbara P. Buttenfield and Christopher R. Weber

Developments in software functionality afford new opportunities for cartographic visualization that improve capabilities for data exploration. By using proactive tools such as animation and hypermedia, users may browse database contents to view the organization of the data as well as the organization of the database. When visual tools are proactive, users initiate queries and steer data presentation in a manner consistent with the associative power of the human intellect. This paper argues for increased emphasis on proactivity in designing cartographic displays. A hypermedia implementation is presented for a biogeographical database. Software functions include animation and hypermedia for browsing data at multiple scales and times. Issues of graphical design and hypermedia navigation are emphasized.

The Armchair Traveler Plugs In: Multimedia Cartography as a Visual Supplement to Travel Writing (19:20-25)

Shannon Des Roches

Travel writings, such as Stuart Stevens's West African adventure, *Malaria Dreams*, provide readers with interesting and entertaining stories. However, because they seldom give adequate treatment to the geographic, historic, cultural, and political issues, they leave the reader with an incomplete impression of the landscape. The accounts of these journeys can benefit from an interactive "visual supplement" that contains animations, maps, photos, drawings, graphs, and sounds. A visual supplement can complement the text and augment a reader's overall experience. This paper presents some issues pertinent to creating effective visual supplements and includes examples from a prototype for *Malaria Dreams*.

Using High-Resolution Digital Scans in Multimedia Cartographic Applications (19:26-30)

David W. Tilton

Since June of 1993, the Geography Department at the University of Wisconsin-Milwaukee has been engaged in a research project to develop the *Archive of Native American Maps on CD-ROM*. A major component of this project involves the creation of high-resolution scans of the maps in the archive. This paper discusses several issues encountered in the acquisition, manipulation and display of these scanned images. The issues include scanning resolution, file compression, palette shifts, and image tiling.

Creating Interactive Media on CD-ROM (19:31-40)

Sona Karentz Andrews

The Department of Geography at the University of Wisconsin-Milwaukee is developing a research oriented, visual database of North American Indian maps on a CD-ROM. This project is funded by a grant from the National Endowment for the Humanities, Division of Research Programs. The CD-ROM will contain maps, extensive descriptions, and catalog information about the maps. The digital maps and text will be linked through a hypermedia interface. This archival database is intended to function as a research tool for scholars studying the cartography, landscape perception, cognition, art, and history of Native Americans. This paper presents an overview of the project, a brief discussion of the technology used, sample images and database information, and a description of how the interface functions.

Current Trends in Electronic Atlas Production (20:5-11)*Bengt Rystedt*

Electronic atlases have the potential to add a new dimension to the use of atlas information. An electronic version can contain data and software to produce maps not possible in book form. They can serve as a preliminary stage to Atlas Information Systems and can also form the core of a multimedia system. The ICA commission on national atlases was formed at the 13th International Cartographic Conference in Morelia, Mexico in 1987 to serve as a forum for electronic atlas conception and production. Electronic atlases have been a topic at every commission meeting ever since. The observations presented in this paper are findings from these meetings.

New Forms, Concepts, and Structures for European National Atlases (20:12-20)*Ferjan Ormeling*

After proposing definitions for "atlases," "national atlases," and "electronic atlases," this paper outlines the requirements for electronic national atlases produced in the 1990s. These requirements will then be compared with the actual national atlases produced in Europe between 1988 and 1994.

Visualizing Digital Atlas Information Products and the User Perspective (20:21-28)*C. Peter Keller*

The digital revolution and associated advances in multimedia and electronic information transfer have opened hitherto unthinkable opportunities for atlas design and distribution. As a result, the status quo of the conventional atlas is being challenged by a research community eager to move towards sophisticated digital atlas products. The assumption made by the digital atlas research agenda is that atlas users share the researchers' enthusiasm for digital atlas products. It is argued that contemporary advances in digital atlas design are driven by computing innovations; that is, researchers are embracing faddish technologies to advance imaginative new atlas products with little attention given to the atlas user community's wants and needs. It is proposed that the design of innovative digital atlas products be paralleled and influenced by atlas consumer research. Atlas user surveys are called for to evaluate the market's reaction to conventional atlas products and to test the atlas users' willingness to use and pay for innovative digital atlas products.

The Potential of Electronic Atlases for Geographic Education (20:29-34)*Ute J. Dymon*

Available computer technology requires a rethinking of the use of cartographic aids for geographic education. Electronic atlases have the potential to provide a new, exciting medium to promote geographic instruction. They can provide an active, integrative tool to teach geographic concepts and allow processes of higher learning to take place in an innovative, dynamic format. While students are exposed to geographic concepts through electronic atlas use, they also acquire computer skills which will be essential in the twenty-first century.

An Electronic Atlas Authoring System (20:35-39)*Richard M. Smith and Thomas Parker*

This paper describes an electronic atlas authoring system that is being developed at the University of Arkansas. The system is a set of computer programs that aids in the construction of electronic atlases. The paper begins by examining the types of organizations that might be interested in using this system. It then offers a general description of the authoring system, including a discussion of the specific components which make up the system. The final section of the paper outlines how the system might be distributed.

A Personalized National Atlas of the United States (20:40-44)*Joel L. Morrison*

The U.S. Geological Survey published the *National Atlas of the United States of America* in 1971. Since then times have changed, and the technological revolution in cartography today makes it mandatory to take a close look at the concept of a

Cartographic Perspectives
Winter 1995, 20

national atlas. This paper focuses on two concepts related to national atlases: the popular conception of a national atlas and the notion that a comprehensive national atlas would contain information on the United States that most commercial atlases would not include. Ideas are presented that describe what a future, comprehensive, digitally produced national atlas for the United States (CD-NAUS) might look like.

Cartographic Perspectives
Spring 1995, 21

The Benefits of Verbal and Spatial Tasks in Contour Map Learning (21:3-15)

Margaret Lanca and John R. Kirby

It has been proposed that the ability to read a map stems from both verbal-analytic and spatial-holistic processes. It has, in turn, been argued that these processes are affected by both spatial ability and gender. This essay presents the results of a study exploring these relationships. Subjects studied a contour map in one of four conditions: a verbal learning group, a spatial learning group, a combined spatial and verbal learning group, and a study-only control group. Contrary to previous reference map learning studies, this study found that the verbal task had no effect upon memory for two-dimensional map information. As predicted, the spatial task did increase memory for three-dimensional map information. In terms of spatial learning instructions, males performed significantly better than females for three-dimensional map information, and females' two-dimensional map memory was better in the non-spatial task groups than in the spatial task groups. There was no effect of spatial ability for map memory. These results suggest limits for the benefit of a verbal learning task in contour map learning.

Papers From *The Map Library in Transition*

The Future Of Digital Data In Map Collections:

One Perspective (21:18-21)

Colleen Beard

Disenfranchisement: Paranoia or Possibilities (21:21-23)

Debra D. Lords

Building The Virtual Map Library; Some Considerations (21:24-28)

Patrick McGlamery

Transition in the Wordl of Map Librairanship (21:28-29,46-48)

Gary W. North

*Planning For GIS In Libraries: Decisions, Choices
and Opportunities (21:49-53)*

Linda R. Zellmer

What You'll Need To Know To Use GIS in 2001 (21:53-56)

Ronald F. Abler

*Sources of Error in a Map Series, or Science as a Socially Negotiated
Enterprise (21:30-36)*

Peter Gould

Temporal, definitional, and spatial errors may be present in maps, as well as errors of underreporting and estimation. These are illustrated in a series showing the diffusion of AIDS in the United States, and constitute an example of science as a socially negotiated and hermeneutic enterprise.

Cartography Resources on the World Wide Web (22:3-11)

Jeremy Crampton

This paper provides an overview of recent developments on the World Wide Web from a cartographer's perspective. The first section briefly describes how the Web came to be and discusses the conceptual models that control the Web's functionality. The second section of the paper is an overview of a variety of cartographic Web resources (ranging from federal to commercial to educational) that are available on the Web. These sites offer tremendous resources for use in the classroom, research, and even leisure activities. The paper concludes with examples of two Internet projects that make extensive use of cartographic materials: the Geography Virtual Department (out of the University of Texas-Austin) and the Bosnian Virtual Fieldtrip (out of George Mason University).

*Cartographic Perspectives
Fall 1995, 22*AUTHOR(s), *Article Title*, Issue: PagesABLER, Ronald F., *What You'll Need To Know To Use GIS in 2001*, 21: 53-56ANDREWS, Sona Karentz, *Creating Interactive Media on CD-ROM*, 19: 31-40BARUTH, Christopher, *Papers From The Map Library in Transition Conference Opening Remarks*, 21: 16-17BEARD, Colleen, *The Future Of Digital Data In Map Collections: One Perspective*, 21: 18-21BOCKENHAUER, Mark H., *Culture of the Wisconsin Official State Highway Map*, 18: 17-27BOLTON, Ronald M. and Russell A. Hoover, *Automated Radar Video Map Production at NOS*, 1: 5-10BOLTON, Ronald M., *The Impact of the Implementation of the North American Datum of 1983 (NAD 83) on Aeronautical Navigation in the United States*, 14: 3-8BREWER, Cynthia A., *Color Chart Use in Map Design*, 4: 3-10BUTTENFIELD, Barbara P. and Christopher R. Weber, *Proactive Graphics for Exploratory Visualization of Biogeographical Data*, 19: 8-19BYRNE, Kevin, *Desktop Map Design: Some Odysseys of Form and Flow*, 15: 13-20CASTNER, Henry W., *Relating Cognitive Development to Cartographic Education With a Model of Orientation Space*, 16: 3-8CRAMPTON, Jeremy, *Cartography Resources on the World Wide Web*, 22: 3-11DES ROCHES, Shannon, *The Armchair Traveler Plugs In: Multimedia Cartography as a Visual Supplement to Travel Writing*, 19: 20-25*Index to Articles**Cartographic Perspectives
Issues 1-22*

Index to Articles
Cartographic Perspectives
 Issues 1-22

- DIBIASE**, David, *Designing Animated Maps For A Multimedia Encyclopedia*, 19: 3-7
- DRIGOT**, Diane C., Margaret E. Elliot, and Karen L. Glyn, *Computer-aided Mapping for Facilities Management and Environmental Compliance*, 9: 3-14
- DYMON**, Ute J., *The Potential of Electronic Atlases for Geographic Education*, 20: 29-34
- GARCÍA**, María C. and Graciela Pérez, *Mapping Land Degradation Factors in Mexico*, 12: 15-21
- GERSMEHL**, Philip J., *Choosing Tools: Nine Metaphors of Four-Dimensional Cartography*, 5: 3-17
- GILMARTIN**, Pat, (with commentaries by Bernard Gutsell, David Fairbairn and Robert B. McMaster), *A Content Analysis and Comparison of Three Cartographic Journals: 1964-1989*, 11: 3-22
- GOULD**, Peter, *Sources of Error in a Map Series, or Science as a Socially Negotiated Enterprise*, 21: 30-36
- HARRINGTON**, Charles E., *Maritime Boundaries on National Ocean Service Nautical Charts*, 14: 9-15
- KARL**, Doris, *Cartographic Animation: Potential and Research Issues*, 13: 3-9
- KELLER**, C. Peter, *Visualizing Digital Atlas Information Products and the User Perspective*, 20: 21-28
- LANCA**, Margaret and John R. Kirby, *The Benefits of Verbal and Spatial Tasks in Contour Map Learning*, 21: 3-15
- LORDS**, Debra D., *Disenfranchisement: Paranoia or Possibilities*, 21: 21-23
- MACEACHREN**, Alan M., *Visualizing Uncertain Information*, 13: 10-19
- MATTSON**, Mark, *Desktop Mapping at Temple University*, 3: 3-13
- MCGLAMERY**, Patrick, *The Librarian's Dilemma: A Map Librarian's Access to Machine-Readable Information*, 2: 7-13
- MCGLAMERY**, Patrick, *Building The Virtual Map Library; Some Considerations*, 21: 24-28
- MCHAFFIE**, Patrick, Sona Karentz Andrews, Michael Dobson, and two anonymous employees of a federal mapping agency, *Ethical Problems in Cartography*, 7: 3-13
- MONMONIER**, Mark, *Ethics and Map Design: Six Strategies for Confronting the Traditional One-Map Solution*, 10: 3-8
- MORBER**, Brian and Janet E. Mersey, *Thematic Mapping With Illustration Software: Unraveling the Mystery of Graphic File Formats*, 18: 3-16
- MORRISON**, Joel L., *A Personalized National Atlas of the United States*, 20: 40-44

- NORTH**, Gary W., *Transition in the World of Map Librarianship*, 21: 28-29, 46-48
- ORMELING**, Ferjan, *New Forms, Concepts, and Structures for European National Atlases*, 20: 12-20
- PATTON**, Jeffrey C. and Nancy B. Ryckman, *Maps in Children's Literature*, 6: 3-12
- PIKE**, Richard J. and Gail P. Thelin, *Mapping the Nation's Physiography by Computer*, 8: 15-24
- PLUMERT**, Jodie M., *The Development of Children's Spatial Knowledge: Implications for Geographic Education*, 16: 9-18
- ROBINSON**, Arthur H., *A Cartographic Quincentenary*, 15: 3-12
- RYSTEDT**, Bengt, *Current Trends in Electronic Atlas Production*, 20: 5-11
- SMITH**, Richard M. and Thomas Parker, *An Electronic Atlas Authoring System*, 20: 35-39
- SYNDER**, John P., *How Practical Are Minimum-Error Map Projections?*, 17: 3-9
- TILTON**, David W., *Using High-Resolution Digital Scans in Multimedia Cartographic Applications*, 19: 26-30
- TRAINOR**, Timothy, *A Forward to Electronic Atlases: National and Regional Applications*, 20: 3-4
- YOUNG**, James E., *Reexamining the Role of Maps in Geographic Education: Images, Analysis, and Evaluation*, 17: 11-20
- ZELLNER**, Linda R., *Planning For GIS In Libraries: Decisions, Choices and Opportunities*, 21: 49-53

Index to Articles
Cartographic Perspectives
Issues 1-22

ATLAS, BOOK, AND SOFTWARE REVIEWS
 (TITLE, Author, Reviewer, Issue: Pages)

- AMERICAN PLACES DICTIONARY: A GUIDE TO 45,000 POPULATED PLACES, NATURAL FEATURES, AND OTHER PLACES IN THE UNITED STATES.**, Frank R. Abate (editor), reviewed by Christopher Baruth, 21: 42-43
- AN ATLAS OF POPULATION PATTERNS IN METROPOLITAN LOS ANGELES AND ORANGE COUNTIES 1990**, Eugene Turner, and James P. Allen, reviewed by Michael Hyslop, 11: 24-25
- ATLAS JAPAN: IN ENGLISH AND JAPANESE**, Teikoku-Shoin, reviewed by Robert Werner, 17: 29-30

Index to Reviews
Cartographic Perspectives
Issues 1-22

Index to Reviews
Cartographic Perspectives
Issues 1-22

ATLAS OF FLORIDA, Edward A. Fernald, and Elizabeth D. Purdum (editors), James R. Anderson, Jr., and Peter A. Krafft (cartographers), reviewed by Ruth Anderson Rowles, 15: 21-22

ATLAS OF THE PACIFIC NORTHWEST, 8TH ED., Philip L. Jackson and A. Jon Kimerling (editors), reviewed by Joseph Poracsky, 19: 49-51

ATLAS*PRO AND ATLAS*GIS, Strategic Mapping, reviewed by Robert Werner, 14: 22-28

BASIC CARTOGRAPHY FOR STUDENTS AND TECHNICIANS, VOL I, 2ND ED., R.W. Anson and F.J. Ormeling, reviewed by Jeremy Crampton, 21: 43-44

BOUNDARIES OF HOME: MAPPING FOR LOCAL EMPOWERMENT, Doug Aberley (editor), reviewed by Margaret Pearce and Jean McKendry, 20: 48-50

CARTO-GRAPHIES, Sylvie Rimbart, reviewed by Peter Gould, 7: 20-22

CARTOGRAPHY: THEMATIC MAP DESIGN, THIRD EDITION, Borden D. Dent, reviewed by Cynthia A. Brewer, 17: 26-27

DISEASE AND MEDICAL CARE IN THE UNITED STATES: A MEDICAL ATLAS OF THE TWENTIETH CENTURY, Gary W. Shannon, and Gerald F. Pyle, reviewed by Connie Weil, 21: 44-45

DRAWING THE LINE, TALES OF MAPS AND CONTROVERSY, Mark S. Monmonier, reviewed by Judith Tyner, 22: 15-16.

EASY IMAGE, Pentramics Inc., reviewed by Mark Schwartz, 20: 54-56

ENVISIONING INFORMATION, E. R. Tufte, reviewed by Mark C. Detweiler, 10: 22-24

FIRST ANNUAL SOFTWARE REVIEWS DIRECTORY, Robert P. Sechrist, and Anne Gibson, 5: 17-21

FLATTENING THE EARTH: TWO THOUSAND YEARS OF MAP PROJECTIONS, John P. Synder, reviewed by Mark P. Kumler, 18: 32-33

GEOCART, Terra Data Inc., reviewed by David W. Tilton, 17: 24-25

GEOGRAPHIC INFORMATION SYSTEMS: THE MICROCOMPUTER AND MODERN CARTOGRAPHY, D.R.F. Taylor (editor), reviewed by John B. Krygier, 9: 24-26

GEOGRAPHICAL INFORMATION SYSTEMS: PRINCIPLES AND APPLICATIONS, D.J. Maguire, M.F. Goodchild, and D.W. Rhind (editors), reviewed by E. Lynn Usery, 13: 21-22

GEOLOGICAL MAPS: AN INTRODUCTION, Alex Maltman, reviewed by Norman Meek, 13: 20

Index to Reviews
Cartographic Perspectives
Issues 1-22

HISTORICAL ATLAS OF CANADA, VOLUME III: ADDRESSING THE TWENTIETH CENTURY, 1891-1961., Donald Kerr and Deryck W. Holdsworth (editors); Geoffrey J. Matthews, (cartographer/designer), reviewed by William G. Loy, 7: 19-20

HISTORICAL ATLAS OF CANADA. VOLUME II. THE LAND TRANSFORMED, 1800-1891, R. Louis Gentilcore (editor), reviewed by John H. Long, 19: 48-49

INTERACTIVE ATLAS OF GEORGIA., Thomas W. Hodler, Neal Lawson, Howard A. Schretter, and Jeffrey Torguson, reviewed by Patrick McHaffie, 20: 53-54

INTERACTIVE COLOR: A GUIDE FOR COLOR IN COMPUTER GRAPHICS, San Diego Supercomputer Center, reviewed by Cynthia Brewer, 12: 7-9

LES VILLES "EUROPÉENNES" AND LA FRANCE DANS L'ESPACE EUROPÉEN, Roger Brunet, reviewed by Peter Gould, 4: 20-21

MAP USE AND ANALYSIS, John Campbell, reviewed by Joseph Stoll, 8: 25-26

MAP USE AND ANALYSIS (SECOND EDITION), John Campbell, reviewed by Ute Dymon, 16: 24-25

MAPMAKER, Select Micro Systems, Inc., reviewed by John B. Krygier, 1: 11-12

MAPMAKERS OF THE SIXTEENTH CENTURY AND THEIR MAPS. BIO- BIBLIOGRAPHIES OF THE CARTOGRAPHERS OF ABRAHAM ORTELIUS, 1570, Robert W. Jr. Karrow, reviewed by Clinton R. Edwards, 19: 53-54

MAPPING IT OUT: EXPOSITORY CARTOGRAPHY FOR THE HUMANITIES AND SOCIAL SCIENCES, Mark Monmonier, reviewed by Pat Gilmartin, 16: 22-24

MAPPING HIDDEN DIMENSIONS OF THE URBAN SCENE, J. Szegö, reviewed by Julio Rivera, 22: 18-19

MAPPING THE RENAISSANCE WORLD; THE GEOGRAPHICAL IMAGINATION IN THE AGE OF DISCOVERY, Frank Lestringant, translated by David Fausett from *L'atelier di cosmographie*, reviewed by David Woodward, 22: 16-18.

MAPS ARE TERRITORIES: SCIENCE IS AN ATLAS, David Turnball, with a contribution by Helen Watson with the Yolngu Community at Yirrkala, reviewed by Mark Warhus, 19: 51-53

MAPS: FROM QUILL TO COMPUTER, New Dimensions Media, reviewed by Cherie A. Semans, 4: 19-20

MICHELIN'S CENTRAL WASHINGTON DC STREET MAP, Michelin Tire Corporation, reviewed by Sally S. Summerall, 12: 10-11

Index to Reviews
Cartographic Perspectives
Issues 1-22

MONARCHS, MINISTERS, AND MAPS: THE EMERGENCE OF CARTOGRAPHY AS A TOOL OF GOVERNMENT IN EARLY MODERN EUROPE, David Buisseret (editor), reviewed by Matthew H. Edney, 15: 22-24

OUR SECRET LITTLE WAR, L.N. Abrams, reviewed by Michael Russell Rip, 12: 11-12

PC-GLOBE+ AND ELECTROMAP, PC-Globe+ Comwell Systems Inc., Electromap Inc., reviewed by Sona Karentz Andrews and Chris Baruth, 2: 14-16

PICTORIAL MAPS, Nigel Holmes, reviewed by Charles P. Rader, 14: 20-21

SOME TRUTH WITH MAPS: A PRIMER ON SYMBOLIZATION AND DESIGN, Alan M. MacEachren, reviewed by Jeffrey C. Patton, 20: 46-48

SYSTAT, SYSTAT Inc., reviewed by Mark Leitzell and Alan MacEachren, 4: 11-12

THE CADASTRAL MAP IN THE SERVICE OF THE STATE: A HISTORY OF PROPERTY MAPPING, Roger J.P. Kain and Elizabeth Baigent, reviewed by Margaret Pearce, 17: 27-29

THE NEW STATE OF THE WORLD ATLAS, 4TH EDITION, Michael Kidron, and Ronald Segal, reviewed by Ellen E. White, 14: 21-22

THEMATIC MAPPING FROM SATELLITE IMAGERY: A GUIDE-BOOK, Jean Denègre (editor), reviewed by Michael P. Peterson, 21: 41-42

THINGS MAPS DON'T TELL US: AN ADVENTURE INTO MAP INTERPRETATION, Armin K. Lobeck, reviewed by James E. Young, 18: 33-34

TWO MAPPING SOFTWARE PACKAGES FOR MACINTOSH COMPUTERS, MACCHORO II WITH MAP ANIMATION, Image Mapping Systems, Atlas*MapMaker 4.53, Strategic Mapping, reviewed by Gene Turner, 10: 17-20

VISUALIZATION IN GEOGRAPHIC INFORMATION SYSTEMS, Hilary M. Hearnshaw and David J. Unwin (editors), reviewed by J. Krygier, 20: 50-52

EXCHANGE PUBLICATIONS

Cartographic Perspectives gratefully acknowledges the publications listed below, with which we enjoy exchange agreements. We continue to seek agreements with other publications.

ACMLA Bulletin. Published triannually by the Association of Canadian Map Libraries and Archives. Offers article, reviews, and news on cartography and map library related issues. Contact: Colleen Beard, Brock University Map Library, St. Catharines, Ontario L2S 3A1 Canada.

ACSM Bulletin. Published six times a year by the American Congress on Surveying and Mapping. Offers feature articles, regular commentaries, letters, and news on legislation, people, products, and publications. Contact: Membership Director, 5410 Grosvenor Lane, Bethesda, MD 20814; (301) 493-0200.

Baseline. Published six times a year by the Map and Geography Round Table, American Library Association. Contact: Editor Nancy J. Butkovich, Physical Sciences Library, 230 Davey Laboratory, Penn State University, University Park, PA 16802; (814) 865-3716; e-mail: njb@psulias.psu.edu

Bulletin of the Society of Cartographers. Published twice a year, the *Bulletin* features articles on techniques and ideas applicable to the Cartographic Drawing Office. Contact: Pamela Spoerry, Department of Geography, University of Cambridge, Downing Place, Cambridge, CB2 3EN, England.

Cartouche. A quarterly publication offering news and announcements to members of the Canadian Cartographic Association. Contact: Canadian Cartographic Association, c/o Weldon Hiebert, Geography Department, University of Winnipeg, Manitoba, R3B 2E9, Canada; (204) 786-9483; fax (204) 786-1824; e-mail: weldon.hiebert@winnipeg.ca.

Cartographica. A quarterly journal endorsed by the Canadian Cartographic Association/ Association Canadienne de Cartographie that features articles, reviews, and monographs. Michael Coulson, Editor. ISSN 0317-7173. Contact: University of Toronto Press Journals Department, 5201 Dufferin Street, Downsview, Ontario, M3H 5T8 Canada; (416) 667-7781.

Cartographic Journal. Biannual Journal of the British Cartographic Society. Includes research articles, 'shorter' articles, official records of the Society, book reviews, and a list of recent cartographic literature. Contact: Hon. Secretary, Charles Beattie, 13 Sheldrake Gardens, Hordle, Lynton, Hants, SO4 10FJ, England.

Cartography. Biannual Journal of the Australian Institute of Cartographers. Each issue contains two parts: the Journal proper and the Bulletin. The Journal contains original research papers, papers describing applied cartographic projects, reviews of current cartographic literature, and abstracts from related publications. ISSN 0069-0805. Contact: John Payne, Circulation Manager, GPO Box 1292, Canberra, A.C.T. 2601, Australia.

Cartography Specialty Group Newsletter. Triannual publication of the Cartography Specialty Group of the Association of American Geographers. Features news, announcements, and comics. Contact: Ann Goulette, Editor, Intergraph Corporation, 2051 Mercator Drive, Reston, VA 22091-3414; (703) 264-7141; e-mail: ann@pluto.ne1300.ingr.com.

Cartomania. The quarterly newsletter of the Association of Map Memorabilia Collectors. Offers a unique mix of feature articles, news, puzzles, and announcements of interest to cartophiles. ISSN 0894-2595. Contact: Siegfried Feller, Publisher/Editor, 8 Amherst Road, Pelham, MA 01002; (413) 253-3115.

Geotimes. Monthly publication of the American Geological Institute. Offers news, feature articles, and regular departments including notices of new software, maps and books of interest to the geologic community. Articles frequently address mapping issues. ISSN 0016-8556. Contact: Geotimes, 4220 King Street, Alexandria, VA 22302-1507.

GIS World. Published monthly, this news magazine of Geographic Information Systems technology offers news, features, and coverage of events pertinent to GIS. Contact: John Huges, Managing Editor, GIS World, Inc., 155 East Boardwalk Drive, Suite 250, Fort Collins, CO 80525; (303) 223-4848; fax: (303) 223-5700.

Information Bulletin. Triannual publication of the Western Association of Map Libraries. Contains features, atlas and book reviews, WAML business, and news. Contact: Mary L. Larsgaard, Executive Editor, Map and Imagery Laboratory, UC-Santa Barbara, Santa Barbara, CA. 93106; (805) 893-4049; fax: (805) 893-8799, 4676, 8620; e-mail: mary@wash.uscdic.ucsb.edu.

Mapline. A quarterly newsletter published by the Hermon Dunlap Smith Center for the History of Cartography at the Newberry Library. This newsletter contains notes, announcements, recent publications, calendar, and short essays on topics of interest to the history of cartography. ISSN 0196-0881. Contact: James R. Akerman, Editor, *Mapline*, The Newberry Library, 60 West Walton Street, Chicago, IL 60610.

Perspective. This newsletter of the National Council for Geographic Education (NCGE) is published five times a year in October, December, February, April and June. News items related to NCGE activities and geographic education are featured. Contact: NCGE, Leonard 16A, Indiana University of Pennsylvania, Indiana, PA 15705; bitnet: clmccard@iup.

FEATURED PAPERS

Each issue of *Cartographic Perspectives* includes featured papers, which are refereed articles reporting original work of interest to NACIS's diverse membership. Papers ranging from theoretical to applied topics are welcome. Prospective authors are encouraged to submit manuscripts to the Editor or to the Chairperson of the NACIS Editorial Board. Papers may also be solicited by the Editor from presenters at the annual meeting and from other sources. Ideas for special issues on a single topic are also encouraged. Papers should be prepared exclusively for publication in *CP*, with no major portion previously published elsewhere. All contributions will be reviewed by the Editorial Board, whose members will advise the Editor as to whether a manuscript is appropriate for publication. Final publication decisions rest with the Editor, who reserves the right to make editorial changes to ensure clarity and consistency of style.

REVIEWS

Book reviews, map reviews, and mapping software reviews are welcome. The Editor will solicit reviews for artifacts received from publishers. Prospective reviewers are also invited to contact the Editor directly.

TECHNICAL GUIDELINES FOR SUBMISSION

Literature cited should conform to the Chicago Manual of Style, 14th ed., University of Chicago Press, Chapter 16, style "B." Examples of the correct citation form appear in the feature articles of this issue. Authors of Featured Papers should submit four printed copies of their manuscript for review directly to Dr. Michael Peterson, Chair of the *CP* Editorial Board, Department of Geography, University of

Nebraska - Omaha, Omaha, Nebraska 68182. Manuscripts are reviewed by a minimum of two referees. The recommendations of the reviewers and the Chair of the *CP* Editorial Board are sent to the Editor of *CP*. The Editor will contact all authors to notify them if their paper has been accepted for publication and if revisions are necessary prior to publication. The following technical guidelines should be followed for all accepted manuscripts (these guidelines also apply to book, map, and software reviews).

Material should be submitted in digital form on 3.5" diskettes. Please send a paper copy along with the disk. Text documents processed with Macintosh software such as *WriteNow*, *WordPerfect*, *MS Word*, and *MacWrite* are preferred, as well as documents generated on IBM PCs and compatibles using *WordPerfect* or *MS Word*. ASCII text files are also acceptable.

PostScript graphics generated with *Adobe Illustrator* or *Aldus FreeHand* for the Macintosh or *Corel Draw* for DOS computers are preferred, but generic PICT or TIFF format graphics files are usually compatible as well. Manually produced graphics should be no larger than 11 by 17 inches, designed for scanning at 600 dpi resolution (avoid fine-grained tint screens). Continuous-tone photographs will also be scanned.

Materials should be sent to: Dr. Sona Karentz Andrews, Editor- *Cartographic Perspectives*, Department of Geography, 3210 N. Maryland Avenue, University of Wisconsin-Milwaukee, Milwaukee, WI 53211; (414) 229-4872, fax: (414) 229-3981; e-mail: sona@csd.uwm.edu.

Cartographic Perspectives EDITORIAL BOARD

Chair

Dr. Michael P. Peterson
University of Nebraska - Omaha

Ms. Jan Coyne
University of Georgia

Mr. Jim Anderson
Florida State University

Dr. Cynthia Brewer
Pennsylvania State University

Dr. Patricia Gilmartin
University of South Carolina

Hull McLean
U.S. Department of State

Charles Rader
University of Wisconsin-
River Falls

Dr. Keith W. Rice
University of Wisconsin -
Stevens Point

Nancy Ryckman
University of North Carolina -
Greensboro

James Minton
University of Tennessee

Ms. Carolyn Weiss
Statistics Canada

COLOPHON

This document was desktop-published at the Department of Geography, University of Wisconsin-Milwaukee, using an Apple Macintosh IIcx and Centris 650 computers. Word processing was accomplished primarily with *Microsoft Word 6.0*; page layout with *PageMaker 5.0*. Graphics not rendered with *Aldus FreeHand*, *Adobe Illustrator*, *Corel Draw*, or *ATLAS*GIS* were scanned from paper originals using a desktop scanner. The *PageMaker* document was output at 2400 dpi. The bulletin was printed by offset lithography on Warren Patina 70# text stock. Text type is set in Palatino, a face designed by Herman Zapf.

NACIS membership form

North American Cartographic Information Society Sociedad de Información Cartográfica Norte Americana

Name/Nombre: _____

Address/Dirección: _____

Organization/Afiliación profesional: _____

Your position/Posición: _____

Telephone Number: _____

Fax Number: _____

E-mail Address: _____

Membership Fees for the Calendar Year*/ Valor de nómina de socios para el año:

- Individual/Regular: \$28.00 U.S./E.U.
- Full-time Students/Estudiantes: \$8.00 U.S./E.U.
- Institutional/Miembros institucionales: \$58.00 U.S./E.U.
- Library Subscriptions to Cartographic Perspectives: \$58.00 U.S./E.U.

**Make all checks payable to/
Manden sus cheques a:**

NACIS
AGS Collection
P.O. Box 399
Milwaukee, Wisconsin 53201

**Membership fees include subscription to Cartographic Perspectives.*

The North American Cartographic Information Society
(NACIS) was founded in 1980 in response to the need for a multidisciplinary organization to facilitate communication in the map information community. Principal objectives of NACIS are:

§ to promote communication, coordination, and cooperation among the producers, disseminators, curators, and users of cartographic information;

§ to support and coordinate activities with other professional organizations and institutions involved with cartographic information;

§ to improve the use of cartographic materials through education and to promote graphicacy;

§ to promote and coordinate the acquisition, preservation, and automated retrieval of all types of cartographic material;

§ to influence government policy on cartographic information.

NACIS is a professional society open to specialists from private, academic, and government organizations throughout North America. The society provides an opportunity for Map Makers, Map Keepers, Map Users, Map Educators, and Map Distributors to exchange ideas, coordinate activities, and improve map materials and map use. *Cartographic Perspectives*, the organization's Bulletin, provides a mechanism to facilitate timely dissemination of cartographic information to this diverse constituency. It includes solicited feature articles, synopses of articles appearing in obscure or non-cartographic publications, software reviews, news features, reports (conferences, map exhibits, new map series, government policy, new degree programs, etc.), and listings of published maps and atlases, new computer software, and software reviews.

Department of Geography
University of Wisconsin-Milwaukee
P.O. BOX 413
Milwaukee, WI 53201

BULK RATE
U.S. POSTAGE
P A I D
MILWAUKEE, WI
PERMIT NO. 864