

cartographic perspectives

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cartographic perspectives

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Editors' notes

You may have noticed that CP's numbering scheme has changed. "Volume 1 number 1 March 1989" has been superseded by "Number 2, Summer 1989." Ed Dahl, early cartography specialist with the National Archives of Canada, swayed us with ample (and amusing) evidence of the shortcomings of the volume/number scheme. As long as we were adjusting things, we thought that dating by season rather than by month would be better too (under the former scheme, this issue would have been dated "June," which would not have been quite true).

We do promise, however, that "Number 3, Fall 1989" will reach most of our readers in advance of the Annual Meeting (October 11-14, Ann Arbor, Michigan). We invite all who may wish to contribute a software review, events report, "fugitive cartographic literature" review, maps-in-the-news clipping, or cart lab bulletin board notice to contact us soon; to fulfill our promise, the deadline for submissions must be August 20!

We do hope you find the current issue useful, and as always, we welcome your comments.

David DiBiase & Karl Proehl

cartographic perspectives on the news

ICE ALERT!

Just after midnight on June 20 the Soviet cruise liner Maxim Gorky struck an iceberg in the Norwegian Sea about 180 miles west of the Spitsbergen Islands. The liner's hull suffered two large gashes—30 inches by 8 feet and 2 inches by 19 feet—forcing 575 West German passengers to take to the sea in lifeboats. At least 90 passengers alighted on sea ice when one lifeboat was damaged. Fortunately, the foggy, twilight arctic night was calm and the temperature just above freezing. The Norwegian Coast Guard vessel Senja arrived on the scene about four hours later. A helicopter was dispatched and all passengers were rescued without casualties. The 120 crew members who remained onboard somehow managed to keep the vessel afloat.

Icebergs continue to be perilous obstacles to high-latitude ocean navigation even now, 77 years after the Maxim Gorky's most famous predecessor.

On April 14, 1912, the maiden voyage of the British steamer Titanic was tragically cut short when it struck an iceberg off the Newfoundland coast,

claiming 1,503 lives. The state of the art of iceberg avoidance in that day was to periodically lower a thermometer overboard, with the expectation that the ship would be warned of impending danger by a sudden drop of ocean temperature. A more reliable solution has been sought ever since.

An impressive variety of schemes has been proposed or attempted, ranging from nuclear explosives, depth charges and torpedoes (the Brute Force approach), to laser beams (the Star Wars approach), acid sprays (the Chemical Warfare approach), even giant lassos and gargantuan suction cups (the Gary Larson approach). Yet the only really effective way to deal with icebergs, says specialist Chris Woodworth-Linas of Memorial University, St. Johns, Newfoundland, "is just to leave them do what they want to do."

In 1914, the Coast Guard International Ice Patrol was charged with the responsibility of tracking and reporting icebergs that threaten shipping lanes in a 700 square mile area of the North Atlantic. "This used to be done with ships out there doing patrols every spring," explains ice patrol senior observer Mike Alfulitis.

"They would sail around and look for the southernmost iceberg and then basically park next to it and warn ships to stay away. Not exactly high tech, but it worked."

Indeed it did. So well, in fact, that Commander Steve Osmer, chief of the ice patrol, was able recently to state that "There has never

remote sensing technique known by the acronym SLAR (Side-Looking Airborne Radar), which is able to penetrate the persistent fog that shrouds the area, has made airborne surveillance possible.

SLAR involves the pulsed transmission of long-wavelength "microwave" energy from an antenna mounted to the underside of an aircraft. Owing to differences in the reflectance characteristics of materials on the ground or the ocean surface, the energy is returned to the aircraft at different intensities. These signals are subsequently converted to images in which varying reflectance appears as tonal variation from light to dark.

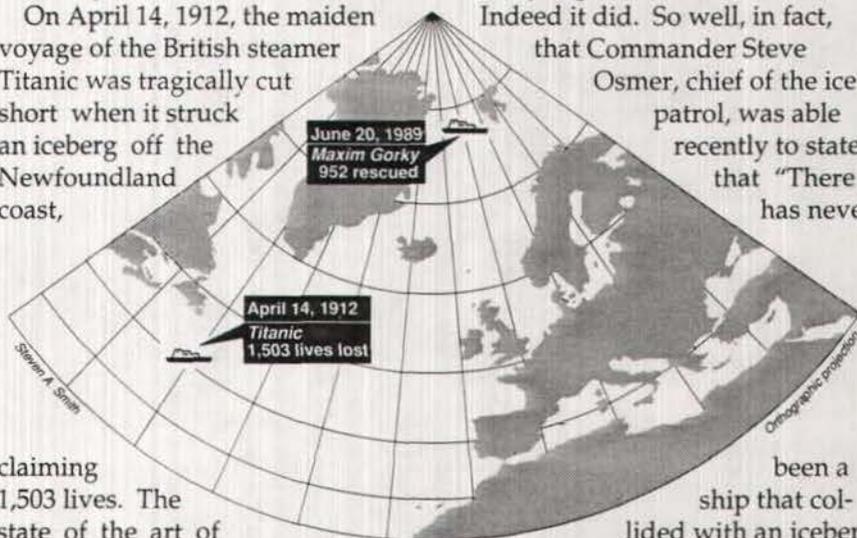
As is the case with most remotely sensed information, interpretation is a problem. "It is sometimes quite difficult to spot icebergs when they are in the middle of sea ice," explained ice patrol scientist Donald Murphy. "Reading these films is still something of an art." The interpreted SLAR imagery is used to produce daily maps depicting the locations and drift patterns of known and suspected icebergs. Iceberg alerts are also broadcast to ships navigating the area.

(adapted from the *Philadelphia Inquirer*, 6/11/89 and 6/21/89)

"GIS" IN THE MASS MEDIA

The May 28 edition of Peter H. Lewis' *New York Times* column "The Executive Computer" is entitled "When Maps are Tied to Data Bases." Lewis discusses several commercial and governmental applications of mapping software, from Pizza Hut franchise location decisions to urban utilities management to analysing the effects of development strategies at the World Bank to vehicle navigation systems in GM cars.

The article begins with a general description of GIS, which Lewis notes is "one of the fastest-growing applications of personal comput-



been a ship that collided with an iceberg inside our limits since we started in 1914" (what went wrong in the Norwegian Sea has yet to be told as this goes to press).

Since 1984, however, the Ice Patrol has been able to meet its responsibilities far more efficiently through airborne surveillance. A

ers." "Geographic information systems merge conventional data bases, which consist of rows and columns of numbers and words, with spatial data bases of maps and diagrams." The article subsequently drifts from GIS to AM/FM to desktop mapping applications, ignoring the admittedly fuzzy boundaries between different classes of computer-assisted geographic information analysis.

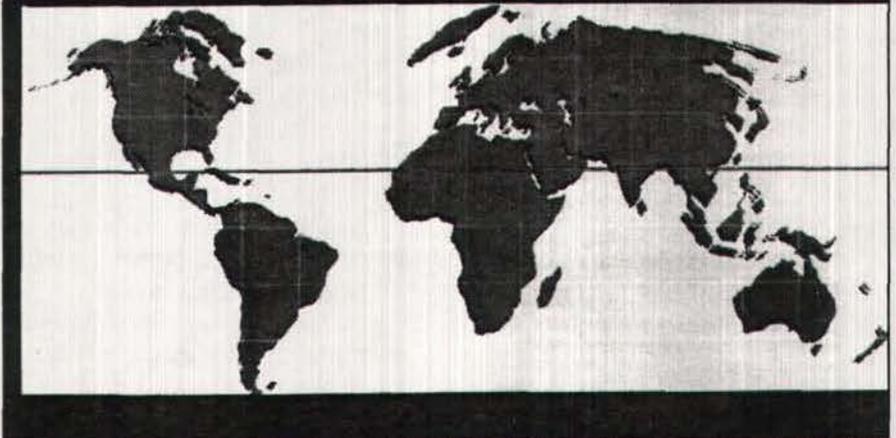
Lewis interviewed several GIS/mapping software vendors and users for the piece. Stephen Poizner of Strategic Locations Planning (purveyor of the desktop mapping stalwart Atlas*Graphics) explains that "If you have information that includes geographic data, it makes sense to analyse it in map form; otherwise you lose the spatial sense." Lewis credits Steward Nazzaro of the Dallas consultants Peat Marwick Main & Co. with the statement that "fewer than 10 percent of the country's governmental bodies now use geographic information systems. But it is inevitable that virtually all of them will be using computerized maps by the year 2000." Les Barker of the World Bank stresses that "There's a night-and-day difference between what we were doing before, using pen and ink and mechanical production, and what we're doing now with computers. . . . In the past 18 to 22 months we've saved half a million dollars in printing and pre-press costs."

Lewis concludes by anticipating the effect on computer-assisted geographic information analysis of the 1990 Census. "When the United States Census figures begin rolling in after April 1, 1990, companies and government agencies with geographic information systems will have unprecedented access to information about their customers and citizens." While this statement is certainly cause for excitement among professionals who deal with maps

and mapping, for citizens and consumers it may be cause for ambivalence. So long as only maps (not minds) are tied to data bases, the proliferation of computerized geographical analysis seems likely to be a welcome trend.

The *Time* piece includes an amusing account of an abandoned attempt to rename the Philippines: "Filipinos have long bristled at the colonialistic implications of calling their country the Philippines, in honor of Philip II of Spain. During the regime of Ferdinand Marcos, there was a campaign to rename

Introduce yourself to a new world...



Prospective new members of a prominent professional association concerned with surveying and mapping are currently receiving promotional literature which includes the map-like artifact shown above. Notice that this "new world"—apparently constructed from an interrupted projection of the old—includes twin Greenlands, Icelands, and Aleutian Island archipelagoes. How ironic that this illustration (which will likely be presented to generations of cartography students as a dubious example) represents an organization that continues to do such good work to promote better understanding of map projections.

THE NAMES THEY ARE A-CHANGING

Time (June 19, 1989) recently ran a feature on the ephemeral nature of geographic names. *Time* notes that Burma has renamed itself Myanmar, and that Cambodia (née Kampuchea) has changed its name five times in the past 20 years. "No international laws govern the christening of countries: the label that sticks is determined by the tastes or even the sanity of its rulers."

the country Maharlika, a native word meaning noble and aristocratic. Plans for rechristening proceeded until an academic pointed out that the word probably derived from Sanskrit. Fine, the proponents said, Sanskrit is a non-imperialist language. Yes, replied the scholar, but Maharlika was most likely derived from the words *maha lingam*, meaning 'great phallus.' That was the end of the campaign."

NATIONAL INVENTORIES OF DIGITAL SPATIAL DATA AND CARTOGRAPHIC APPLICATIONS SOFTWARE

It may seem odd that this information is presented under the heading "news" — after all, these inventories have been available since October, 1986. It seems to CP, however, that many of our readers may not be familiar with the background of this major effort, which we suspect will be interesting. No doubt there are some for whom the existence of these valuable resources is indeed news. Since the inventories are continuously updated and expanded as new information is received, this news is by no means out of date (no matter how slow bulk rate mail may be).

As a result of the National Inventories project, two documents, *Sources for Digital Spatial Data* and *Sources for Software for Computer Mapping and Related Disciplines* have been made available. *Sources for Digital Spatial Data* (489 pages as of June, 1989) includes brief descriptions of 687 spatial data sets that are available from various Federal, State, and local government agencies, and from the private sector. The data sets are indexed by area of coverage (world, U.S. or region, and project areas by State), and cross-referenced by 16 data types (administrative, base mapping, biological, cadastral, etc.). The *Sources for Software* catalog (582 pages) provides 885 mapping software descriptions indexed by ten categories (coordinate conversion, data modeling/analysis, geodetic/cadastral, geographic information systems, image processing and analysis, map and chart plotting and construction, microcomputer software, photogrammetry, physical sciences related to mapping, and data format conversion). The documents are laser printed directly from a database as orders are received on 8.5" by 11" paper and are velo-bound. They can be

purchased for \$22 each from the Earth Science Information Center, 507 National Center, Reston, VA 22092. Orders must be prepaid by check, money order, Mastercard, Visa, or government order. Custom searches are also available; call (703) 860-6045 for information.

The National Inventory project was implemented as the result of a 1983 "monitored bureau objective" of the Office of Information and Data Services, National Mapping Division, United States Geological Survey. The objective called for "a clearinghouse function for collection and dissemination of information on federal and state holdings of spatial data," and was later expanded to include cartographic applications software and holdings of private industry.

The monitored bureau objective followed from a Survey of Digital Activities conducted by the Federal Interagency Coordinating Committee on Digital Cartography. Keith Elliott was hired to implement the objective. He began by analyzing some 2500 pages of responses to the initial survey, compiling a list of about 130 government contacts. The initial contacts were approached through direct telephone and mail campaigns.

Elliott's survey methodology involved modifying an existing NTIS software information form and designing an original database description form. Concerned that response rates were likely to drop off rapidly if complex responses were required, he decided to request brief and fairly general descriptions. Contributors to *Sources for Digital Spatial Data* were queried about database subject, area of coverage, method of spatial referencing, currency, source, scale of digitized sources, accuracy, database size, structure and medium, as well as availability and price. *Sources for Software* is compiled from responses to queries on application area,

capabilities, hardware and operating system requirements, licensing terms, and price. Elliott notes that "the quality of responses varied from very detailed specifications to generic sales pitches." Though the responses have been edited, they remain somewhat uneven in format and content.

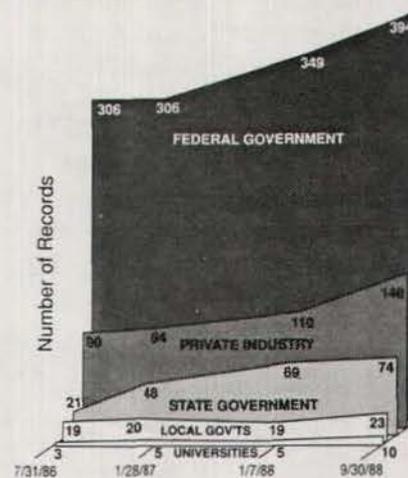


Figure 1: Trends in data references

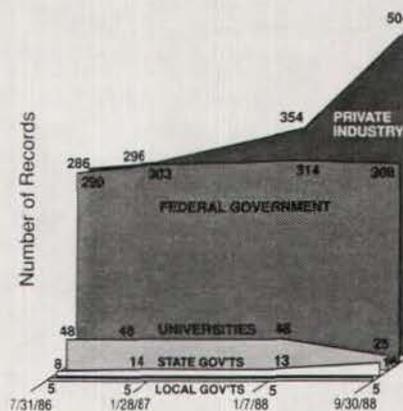


Figure 2: Trends in software references

The accompanying diagrams illustrate trends in the contributions of data and software references by producer sector in the two year period since the documents became available. Figure 1 demonstrates that the source of the majority (61 percent) of data references continues to be the Federal government. The number of records overall has increased by

48 percent. Elliott is convinced that a great many more data sets could be listed, but "some people don't have a mechanism for responding to people who may be interested."

The largest proportion of software references come from the private sector (59 percent). While the number of records associated with the Federal government has been static since 1986, the number associated with private industry has increased by 76 percent (Figure 2). Overall, the number of software references has increased 35 percent.

The entire Inventory currently consists of 1572 records that are imbedded in the Cartographic Catalog, a bibliographic database of some 82,000 records maintained in the GIPSY data management system.

According to Elliott, when the Inventories were first made available to NCIC State offices in 1986, the agency "never expected it to take off like it has." Although he has since been detailed as Acting Chief of ESIC and no longer is able to devote as much time to updating the Inventories, Elliott stresses that maintaining this service continues to be an important ESIC objective.

GIS INSTRUMENTAL IN OIL SPILL CLEANUP

The May issue of *GIS World* reports on the use of GIS technology in response to the discharge of some 240,000 barrels of crude oil in Prince William Sound from the Exxon tanker Valdez. According to *GIS World*, the Alaska Department of Environmental Conservation (ADEC) was able to integrate its standard environmental database with the GEOREF GIS and a recently completed database of the Prince William Sound shoreline created by E-Tech of Narragansett, Rhode Island. Drawing on ocean current, depth, and sensitive

wildlife habitat data as well as aerial and ground surveys, ADEC has been able to produce daily maps of the spill's extent for public and private spill authorities, as well as for Exxon itself. The GIS was implemented on "two Compaq 386/20s, a portable and a desktop, with a 300Mb hard drive and VGA graphics. E-size plots are coming off a Calcomp 1043GT pen plotter" in a makeshift office in a Valdez courthouse.

The National Oceanic and Atmospheric Administration (NOAA) has also been active in using GIS to monitor the spill. Commenting that "NOAA, as an agency, however, apparently has some technical catching up to do," *GIS World* describes how hardcopy "sensitivity maps" of the Prince William Sound area "were being faxed in to Washington and then digitized for use in SPANS."

The military has been using special purpose desktop mapping software to track the disaster. From a command post at Elmendorf Air Force Base near Anchorage, the Air Force's Oil Spill Computer Aided Response software was engaged on a network of "120 Macintosh IIs" to compile and relay graphic information to the Pentagon.

Timely, effective responses to regional environmental crises like oil spills involve analyses of large, complex spatial data sets. The potential of GIS may be greatest in the context of such problems. The Alaskan oil spill may be the largest in U.S. history (estimated at 38,000 tons), but it is not even among the top ten internationally. The largest oil spills on record involved the Ixtoc I well in the southern Gulf of Mexico (1979) and the Nowruz well in the Persian Gulf (1983). Each spill amounted to approximately 600,000 tons. Since the supertanker Valdez ran aground on March 24, two more spills—in the Delaware River south of Philadelphia and south of New-

port, Rhode Island in Narragansett Bay—have fouled U.S. waters. As expensive environmental insults continue to recur, the value of GIS analysis and desktop mapping is sure to grow.

LANDSAT PROGRAM STATUS

In its first issue, *CP* reported on the funding crisis that threatened to shut down the Landsat program. The following status report is culled from *Landsat World Update* (Volume 2, Number 5, May 16, and Number 6, June 12), a newsletter published by the Earth Observation Satellite Company (EOSAT), the company that operates Landsat archives and data processing equipment.

May 16

"Landsats 4 and 5 continue to operate nominally. Landsat 6 development continues towards a June, 1991 launch.

"The National Space Council, led by Vice President Dan Quayle, has reaffirmed a long-term commitment to the Landsat program by a unanimous decision. Early announcements indicate that Landsat 4 and 5 will be continued for the next two years, and support for the Landsat 6 mission will also be continued.

"The recommendations of the Council have been submitted to President Bush for his approval. Upon approval, Landsat 4/5 operations funding of \$5 million will be made available for the completion of fiscal 1989, and \$20 million for fiscal 1990.

"Landsat funding was also the subject of a Congressional markup held May 11 by the Natural Resources, Agricultural Research and Environmental Subcommittee (NRARE) of the House Committee on Science, Space and Technology. In NOAA budget authorization activity for fiscal 1990/91, the Subcommittee provided Landsat 4/5 operations funding, and Landsat 6 development and launch

funding.

"U.S. prospects and policy options for future U.S. civil remote sensing programs was addressed at a joint hearing convened May 9 by the International Scientific Cooperation (ISC) and the NRARE Subcommittees. The hearing is the first of two on the issue. According to NRARE Subcommittee chairman Rep. James Scheuer (D-NY), 'the near-termination of Landsats 4 and 5 last March vividly illustrated our lack of a coherent, stable, long-term policy for U.S. remote sensing satellites.' According to Scheuer, the hearings will explore options 'for putting Landsat back on track.' Rep. Ron Packard (R-CA), Ranking Minority Member of the ISC Subcommittee, said 'we need to look at the technological and scientific importance of Landsat in understanding the planet on which we live. We are spending billions of dollars on expeditions to our sister planets in the solar system, but we continue to neglect our own back yard of planet Earth.'

"Witnesses representing French, Soviet and Japanese remote sensing programs discussed their current status, as well as the commercial potential and possible future international cooperation for remote sensing systems. The pros and cons of international satellite consortia were addressed by a second panel, including Dr. John McElroy, Dean of Engineering, University of Texas at Arlington, and Jerry Caseman of the Harris Corporation. Both witnesses stated that prior to participating in any international consortium, the U.S. would "have to put its own house in order," to establish a strong position in the international remote sensing arena. The commercial potential for civil remote sensing was addressed by a third panel, whose studies about future land remote sensing efforts were recently released by the U.S. Department of Commerce."

June 12

"EOSAT is continuing with the transition of satellite command and control, and data processing facilities from NASA Goddard Space Flight Center to EOSAT Headquarters in Lanham, Maryland. The move is expected to be completed by October, when NASA will replace Landsat facilities with support systems for the Space Station project.

"On June 1 President George Bush announced from London that he had approved funding for the continued operations of Landsats 4 and 5, and for completion and launch of Landsat 6. According to a statement by press secretary Marvin Fitzwater, the President has also instructed the National Space Council and the Office of Management and Budget to review options for the continuation of Landsat-type data collections after Landsat 6. Funding for Landsat 6 is currently included in the Department of Commerce budget."

For further information on the Landsat program, contact EOSAT Public Affairs Office, 4300 Forbes Boulevard, Lanham, MD 20706, (301) 552-0547 or (800) 344-9933 ext 547.

NEW COOPERATIVE MASTER'S PROGRAM AT OHIO STATE

The cooperative master's programs are offered jointly by the departments of Computer and Information Science, Geography, and Geodetic Science and Surveying. They are designed for students who want to develop a broad base of understanding of mapping science, technology, and applications but also want to receive a disciplinary degree. Other departments are planning to join the cooperative master's programs, increasing the options available to

students. All students in these programs are required to complete a common core of five courses and a seminar.

Beyond the mapping and disciplinary cores, one may pursue course work and research in such areas as automated cartography, facilities management, geographic information systems, operations research, and telecommunications. There is sufficient flexibility in the disciplinary programs to enable the student to select valuable electives in math, computer and information science, electrical engineering, geology, geophysics, mineralogy, statistics, and surveying.

For further information, contact the Graduate Studies Committee, Center for Mapping, The Ohio State University, 412 Cockins Hall, 1958 Neil Avenue, Columbus, OH 43210-1247; (614) 292-6642.

NEW GIS SOFTWARE SURVEY DUE

GIS World has completed its Second Annual GIS Software Survey. Expanded to more than twice the size of the original survey, it compares 62 GIS and similar systems in over 100 categories. The 16-page survey report was mailed to *GIS World* subscribers with the July issue, and will be shipped free as a premium to new subscribers until the supply is exhausted.

The survey results will also be available in the new *GIS World Sourcebook*, to be published in August. With over 50 pages of reference information on GIS technology, data sources, and definitions, the *Sourcebook* will be priced at \$29.95 for subscribers, \$76.95 for others. Prepublication orders are being accepted now, and descriptive information is available from the publisher. Contact *GIS World*, P.O. Box 8090, Fort Collins, CO 80526.

featured article

The 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 will need to embrace the technology. By obtaining seed money from a Federal Library Services and 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.

Libraries have always been ready to embrace technological innovations. Incandescent lighting and xerographic copying were seen by librarians as provocative enhancements to the access of information. Computers made early entree into libraries as tools for storing and manipulating bibliographic records. As early as 1957, York Lucci and Stein Rokkan proposed a library center of machine-readable survey research data in a project sponsored by the School of Library Service at Columbia University. But machine-readable data files (MRDF), as a format, have not succeeded in library collections. To date relatively few libraries have developed an awareness of machine-readable data files beyond a collection of codebooks and referral directories, often times working within an informal relationship with campus computing facilities and the campus' Inter-University Consortium for Political Science Research (ICPSR) node.

It is a common misconception among computer specialists that a library is a book storehouse rather than a dynamic access point to information. Unfortunately, this misconception is often reinforced by the library's reluctance to collect the "book" tools of the computer trade, i.e. manuals, codebooks and documentation.

In a recent article, William Arm (1984) points out that "for many years librarians have been asking computing specialists for assistance. Unfortunately, assistance has not been forthcoming." At the same time the computing systems of our universities have become enormous collections of poorly indexed tools and resources. In the days when computing was restricted to a few specialists this was not important. When computer users were concentrated into terminal clusters, with many users sitting side by side, word of mouth was still an effective way of disseminating information. Now that computing has become widely distributed across campus, some better way is needed for scholars to learn of the riches at their fingertips.

The computing community is in need of the skills and experience the library profession can offer. The duplication of materials and effort in the computing community is a recognized problem. Computing specialists have failed to take the long term "research view" of the growing core of machine-readable information. Librarians have either failed to consider machine-readable information significant enough to acquire and control, or we have underestimated our ability and responsibility to handle it.

Our dilemma, the Librarian's Dilemma, is the almost total transference of information from paper to electronic format. Joseph Raben (1979) has observed that "After five hundred years as the sole basis of printing technology, metal type is joining the spinning wheel, the water wheel, the cotton gin, the steam engine and now the propeller-driven airplane as

The Librarian's Dilemma: A Map Librarian's Access to Machine-Readable Information

Patrick McGlamery

*Patrick McGlamery
is Map Librarian of the
Homer Babbidge Library,
University of Connecticut,
Storrs, CN 06268*

THE ORIGINS OF PTOLEMY

exemplars of mechanisms that were vast improvements over those they replaced but that still had to yield to even superior ones." Paper, as a medium for storing and disseminating information, falls short of machine-readable information. Ironically, in 1989 much information exists in machine-readable form from author, through the editor, publisher and printer, until it is finally printed and distributed on paper.

At a backyard barbecue in Alexandria, Virginia in 1983, I got my first whiff that things in the Map Library profession were about to change radically. A friend, working at the Bureau of the Census, was discussing the 1980 decennial census and all the problems the Bureau was having getting its information out. He mentioned TIGER (Topologically Integrated Geographic Encoding and Referencing), the Bureau's redesigned Geographic Support System that consolidated the address coding, mapping and geographic inventory functions into a single database. When I got back to the University of Connecticut I began to gather bits and pieces of information about TIGER. There wasn't much. What there was indicated a thrust by two major mapping agencies to automate their mapping programs. It was disturbing to a paper Map Librarian.

A year later, attending my first National Cartographic Information Center (NCIC) State Affiliate meeting at the U.S. Geological Survey in Reston, Virginia, my counterpart from the Connecticut Department of Environmental Protection (DEP) was scurrying around the Survey like crazy acquiring Digital Elevation Models and Digital Line Graphs of the state. The DEP was working cooperatively with the Survey to develop a State Geographical Information System (GIS). When we went home at the end of the week the digital maps went with us.

I began to hear rumors of a planned coordination between UConn's Natural Renewable Resources Department and DEP. Then, in a time of little growth at the University, the Department of Geography managed to get the go-ahead for a graduate program in GIS. A half-million dollar High Tech Grant was awarded for a GIS Lab and an Image Analysis Lab. Electronic mapping was getting close to home. I quietly endured an anxiety attack . . .

When a Medical Anthropologist walked in and started talking about mapping epidemiological research in Hartford's Hispanic population the whole thing sort of came to roost right there in the Map Library. Those guys that ask questions five years ahead of anyone else . . . you've got to admire—and listen—to them.

Certainly, my greatest fear as a Map Librarian came when I realized how readily convertible to math maps are. How inherently Cartesian they are. How nicely geographers have developed the ideas of XYZ, arcs, nodes, polygons, *et al*, and then raster scanners. Can they make it any easier? I was terrified that my paper Map Library would become an anachronism in a decade. I resolved to develop a plan.

DEVELOPING A PLAN OF ACTION FOR THE INFORMATION AGE

Contrary to popular belief, Map Libraries are not resource havens in most university research libraries. Reference desks, systems operations, cataloging departments, preservation/conservation laboratories, even Art Libraries always seem to be able to make a better case for resources. Always in need of equipment, *money*, space, *money*, personnel, *money*; map libraries are a lot of fun if you thrive on challenge. I think a successful Map Librarian has to be a cross between a scrounger, raconteur, hail-fellow-well-met, a good scout, a Radar O'Reilly kind of guy. Kind of a sneaky, manipulative, evil genius behind the beard who is working hard to slice out an empire before anyone notices.

In 1984 the Map Library got an Online Computer Library Center (OCLC) M300, a rebuilt IBM PC. OCLC is an international library network and shared database of some 13 million bibliographic records. In 1984, OCLC began to replace its dedicated dumb terminals with IBM PC's to which it added a board and replaced the standard IBM keyboard with an OCLC keyboard. I used the M300 to catalog maps. It had no graphics capabilities, but it was a computer and it made me begin to think.

With the M300 I got OCLC terminal software, which, when I logged onto OCLC gave me as stupid a terminal as you can get. In order to play on the PC I had to use DOS. It's amazing what you can do using EDLIN and batch commands. It wasn't long before I got a version of PC-Write, File Express and other shareware. I made an acquisitions list. I remember thinking I'd never have any need of DBase because as a librarian what would I need a sophisticated database manager for?

But then a germ of an idea began to form in my mind: *what if I didn't use the computer just as a bibliographic tool? What if I used the computer to do what it was meant for . . . computing!*

What did I need to make the TIGER roar in the Map Library, to tap into a Connecticut GIS and let Geography grad students convert paper maps to digital code? *Money!* One thing about computers, you can do almost anything you want if you have enough money.

I figured, correctly as it turns out, that the library administrators were not about to give me the \$20,000 I might need to build and configure a cartographic workstation in the Map Library. I needed to find money from non-standard sources. I needed to write a *grant*.

To get a grant funded, of course, you are competing with others who think their ideas are better than yours. I needed to find that special something, a gimmick that made my grant better than theirs. This is about when that Medical Anthropology student sauntered into the map library and asked for some maps of Hartford to digitize. He described his idea to me and I put him in touch with the right people and thereby discovered my gimmick.

What's special about my Map Library is that it is at the University of Connecticut and also at the University is the Roper Center, *the* archive of public opinion data. The Roper Center is affiliated with the Institute of Social Inquiry. And the Institute is a Census Data Users State Affiliate. The Institute has the Census' summary tape files for Connecticut and the expertise to tailor the information.

I wrote all this up in a memo to my boss: RE: NCIC, ISI, Roper Center, IBM, digitizing data, TIGER. I gave it to him and let him simmer with the alphabet stew. I waited about a week and then, like Radar O'Reilly, I came in with a plan of action. He signed it. What he signed wasn't worth a cent, but it gave him the idea I was going to pursue a plan of action. And it sanctioned the pursuit of that action.

I began to make the case for getting at "primary information on tape." I began to talk to people about cataloging data files. Now that's radical. Make a bibliographic record for a data file. I pulled out all the old librarian arguments: freedom of information, rights of the citizen, information rich getting richer, information poor getting poorer, censorship through equipment costs. I began to develop into a librarian who sees the focus on cartographic information, regardless of its format; map, tape, image, whatever.

One day, one of the library muckety-mucks was mucking through the halls of the administrative suite asking if anyone knew of a grant idea because she had this notice of *free Library Service and Construction Act (ISCA) money*. My boss, Colonel Potter, having signed the plan of action,

I began to talk to people about cataloging data files. Now that's radical.

THE GRANT PROPOSAL

suggested me. It probably went something like this: "McGlamery's got an idea he trots out every now and then. Give it to him and see if it shuts him up." She did.

I wrote a grant, "Maps for the Future: Computer-assisted Cartography for the Community." I agonized over that title. It has every soft, fuzzy, hugable, cartographic word I could think of! I submitted it on April Fools Day, of course.

I wrote the LSCA grant as a research and implementation grant. My proposal was to create a facility to serve as a library cartographic workstation. A *library* tool designed to access information in a cartographic format. It is not a geography department workstation nor a cartographic laboratory. The map librarian's job is *not* map making. It's providing access to machine readable information in a cartographic format.

The primary part of the grant involves generating maps of demographic data from distributed sites. I am interested in providing accessibility to as broad a user group as possible. I decided to design a system to be put on the university's mainframe computer using the mapping capabilities of SAS/Graph rather than a PC-based system in the Map Library. A couple of good reasons for a distributed network come to mind:

1. As a map librarian I have been an information node for social scientists trying to map their data. Typically they use SAS/Graph to make something that looks like a map, but usually doesn't act like a map.
2. There are users who have data, know nothing about SAS/Graph, or maps, or computers, but who want to map their information.
3. For many of these users, purchasing a mapping package and graphic hardware for the few maps they need to make is not feasible.
4. There is an extended group of SAS users in the state who meet on an irregular basis and who keep in touch with a newsletter and via electronic mail.

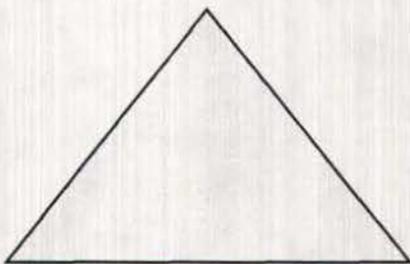


Figure 1: Model of a research library



Figure 2: Model of a computer program

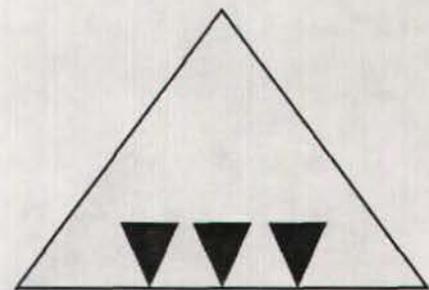


Figure 3: Model of computer applications in a research library

IMPLEMENTATION

About June 20th I pulled out the manuscript and brushed it off. For sure it hadn't stood a chance against ramps for the handicapped or record conversion for a special collection of 18th century German economic treatises. Two days later I got a call that it had been accepted with full funding (\$17,600). Great idea. Good luck. Anxiety attack . . .

Computers are tricky. They seem really complex, but are really very simple. Libraries are also tricky. They seem very simple but are really

very complex.

Computer programs are designed with a single function in mind. As that function is attained, another is added, and so on, and so on. An effective program is a model of logical progression. I saw it as an inverted pyramid, functional point at the bottom and building toward complexity (Figure 1).

Libraries, on the other hand, are big, broad-based pyramids (Figure 2). Ponderous storehouses of information, described and accessed through card catalogs. The idea of a research collection is, ideally, that anyone can come in, at any time, and ask any question, at any level, and expect to get an answer. Maybe they will . . .

Now, how was I to apply that pivotal computer pyramid to the ponderous library pyramid? The answer lay in the opposite of what maps do. Maps tend to be format specific, not subject specific. Topographic quadrangles, for example, answer all kinds of questions, from hiking to civil engineering to historical geography. Computer programs, on the other hand, are subject specific. I guessed, then, that this library computer-assisted cartographic workstation was going to be a multifaceted, subject specific station. I imagined it as a lot of little inverted pyramids lined up in the ponderous, squat pyramid, each facet pointing to a different type of map need: demographic, base map, geologic, topographic, image analysis and so on (Figure 3).

With the grant I hired a Research Assistant from the Geography Department. I purchased computer equipment: a high-resolution graphics monitor, an EGA graphics card, a CD-ROM reader, 20Mb Bernoulli disk drive, digitizing tablet and a color inkjet printer. I acquired software: Tektronix emulation software, and Windows and SAS Manuals. I also procured data files: a tailored version of the GBF DIME Files of the tracts of Connecticut from Geographic Data Technology, Chadwick-Healey's SUPERMAP, and the National Atlas on CD-ROM from GEOVision. With these I have put together a SAS/Graph-SAS/AF program we call PTOLEMY.

PTOLEMY is a menued mapping facility. The user enters cued information at the appropriate points in the session and PTOLEMY builds a SAS/Graph program that utilizes DIME boundary files, either user supplied or "canned" data sets, and appropriate output devices. I've tried to make it as much like a PC program as possible.

What PTOLEMY does is sequentially build a SAS/Graph program. The

```

=====
=                                     =
=           WELCOME TO PTOLEMY         =
=           -----                   =
=                                     =
=   An Interactive Mapping Package Developed   =
=                                     =
=           At The Map Library Of         =
=                                     =
=           The Homer Babbidge Library      =
=                                     =
=           The University Of Connecticut   =
=                                     =
=====

Please enter a 1 on the Command line to continue

```

Figure 4: PTOLEMY title screen

```

=====
= During your PTOLEMY session you will be creating =
= a SAS/Graph program which can be viewed and =
= printed. You will be asked to supply information =
= in a prescribed sequence. In order to "back-up" =
= through the program hit the PF3 key. The se- =
= quence is: =
= 1. Name your terminal type. You may only =
= view from a graphics terminal or a PC with a =
= graphics card running Y-Term. =
= 2. Name your data set. PTOLEMY supplies a =
= 1980 Census data set. Your data set must be in =
= SAS format. See the HELP selection on the menu =
= if you have any questions. =
= 3. Choose your pattern. Y-Term only views =
= Black-on-White, but you can name a color printer. =
= =
= ANY QUESTIONS CALL: P. McGlamery; 486-4589 =
=====

Please enter a 1 on the Command line to begin

```

Figure 5: PTOLEMY explanation screen

first steps are introductory: a title screen (Figure 4) and explanation of what will be asked of the user (Figure 5). The program begins by instructing the user to select an output device, then asks whether the data set is user-supplied or PTOLEMY-supplied (The PTOLEMY data set menu is shown in Figure 6). After the data has been determined the base map is selected. The grant provided funding for the purchase of tailored DIME boundary files. We groomed them a bit by replacing the state code with a town code that was derived from the alphabetical listing of the towns and mounted them on the mainframe. The user can select a variety of configurations of town and tract level maps of Connecticut. Two lines of title are

supplied. Finally the user is asked to selected hatched or solid fill and color choice. The output (Figure 7) appears on the screen or is picked up in the Computer Centers Output Room, depending on the user's choice.

The program attempts to effect clear cartographic communication by following fundamental cartographic principles. By limiting choices and sequencing decisions, the user is not overwhelmed with choices. The cartographer will systematically work through notions of map purpose and map type. The user, however, will often approach computer cartography like a kid in a candy store and end up with something that looks like a map, but doesn't act like a map because it is illegible or misleading. PTOLEMY provides the user with a simplified decision tree: it will be a choropleth map, the hatching will be thus and so, the color will be your choice of red, blue, green, and so on.

The choice of which data classification techniques should be provided for users was a major difficulty. Since many statisticians seem to prefer quartiles, I decided to make quartile classification the default for PTOLEMY. I will, however, work with users to produce the classification that represents their data most appropriately. What PTOLEMY attempts to do is provide a straightforward tool for illustrating statistical information cartographically.

What PTOLEMY attempts to do is provide a straightforward tool for illustrating statistical information cartographically

PTOLEMY, the hardware purchased to support it, and most importantly the lessons learned while developing it, have brought the Map Library significantly closer to dealing with the problems of providing the user with machine-readable information. As we enter the next decade with TIGER, Mark II, enhanced demographic information, high-volume storage media, educated users and increased demands, the librarian will inevitably have to deal with the 'new' information formats. I'm looking forward to the rest of the story.

```

=====
*
* Please Enter The Ptolemy Name Which Corresponds To
* The Desired Data Set
*
* Data Set Description          PTOLEMY
*                               Name
*-----
* 1) Total Population          - POP
* 2) Percent Of Population In Professional
*   Occupations                - PROCC
* 3) Percent Of Population With High School
*   Degree                      - HIGH
* 4) Mean Family Income        - INCOME
* 5) Mean Home Value - Owner Occupied
*                               - HOME
* 6) Mean Contract Rent        - RENT
* 7) Percent Population Below Age 18
*                               - CHILD
* 8) Persons Per Household     - POPHOU
* 9) Fertility Rate            - FERT
* 10) Percent Single Family Housing
*                               - SHOUS
* 11) Percent Of Population Non-White
*                               - NWHITE
* 12) Percent Single-Parent Households
*                               - SPRNT
*
* PTOLEMY NAME: &varnm
*
=====
Press the PF3 key to continue

```

Figure 6: PTOLEMY data set menu

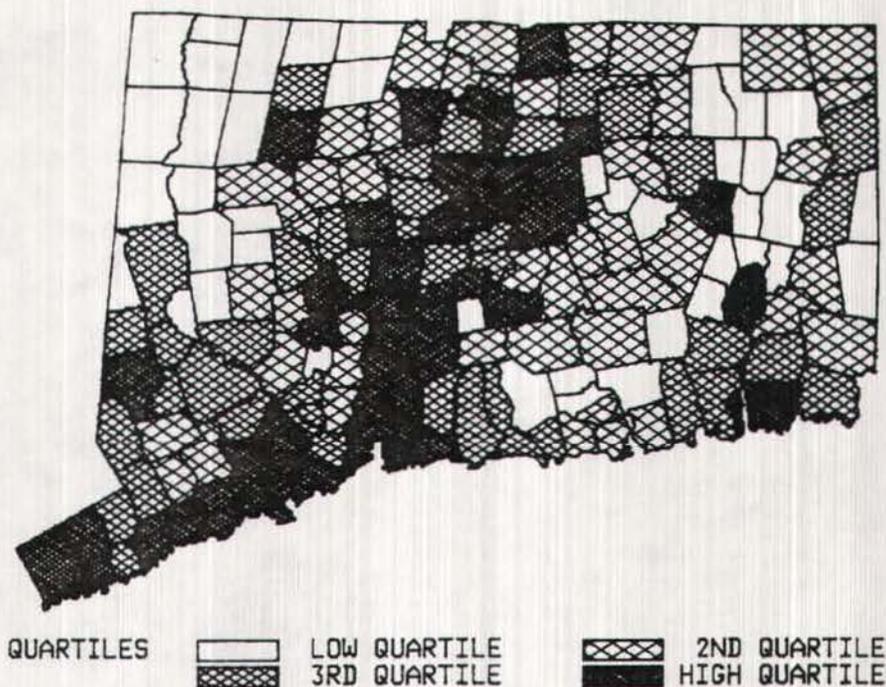
Arms, William Y. (1984) "Scholarly information," *College and Research Libraries*, May, pp. 165-169.

Raben, Joseph (1979) "The electronic revolution and the world just around the corner," *Scholarly Publishing*, April, pp. 195-209.

REFERENCES

Editor's note: Information about the TIGER data format and proposed products was distributed by representatives of the Bureau of the Census at the Denver NACIS meeting. The following persons were responsible for a report entitled "The TIGER File: Proposed Products": Robert A. LaMacchia, Geography Division, (301) 763-4708; Silla G. Tomasi, Geography Division, (301) 763-4700; and Sheldon K. Piepenburg, Data User Services Division, (301) 763-1808. The best description of TIGER's data structure issued thus far is probably a paper distributed by Frederick R. Broom, Geography Division, entitled: "TIGER Preliminary Design and Structure Overview: The Core of the Geographic Support System for 1990." Information on obtaining a sample prototype TIGER file for Boone County, Missouri is included in the Cartographic Techniques section of this issue. SAS is a statistical package produced and marketed by the SAS Institute, Inc., Box 8000, Cary, NY 27511-8000.

POPULATION, 1980 CENSUS DATA CONNECTICUT



In Cooperation With The Map Library, University of Connecticut

Figure 7: Sample PTOLEMY output

Este artículo trata sobre cómo un bibliotecario de mapas consiguió entrar al versátil mundo de la cartografía por computador. Aunque la evolución de información computarizada en bibliotecas ha sido intermitente, a medida que mas información es almacenada en cinta o disco las bibliotecas tendrán que asimilar la tecnología e incorporarla en sus operaciones. A través de una subvención del Acta Federal de Servicios y Construcción de Bibliotecas, la biblioteca de mapas de la Universidad de Connecticut obtuvo equipos de computador, paquetes y programas, y archivos de frontera. Con la ayuda de un asistente de investigación, el bibliotecario escribió un programa en SAS, llamado PTOLEMY, que permite a usuarios trazar mapas con sus datos. PTOLEMY funciona a base de menús en el "mainframe," y los usuarios pueden entrar al programa desde puntos remotos.

El dilema del bibliotecario de mapas: su acceso a la información computarizado

Extracto

cartographic techniques

THE DESKTOP MAPPING MARKET (continued)

The April 17, 1989 issue of *PC Week* features a pair of articles by Jon Pepper entitled "Desktop Mapping Gains Corporate Recognition" and "Users Praise Mapping Software's Potential." Also featured is a "vendor profile" of 16 purveyors of mapping software for IBM-PC and compatible microcomputers, as well as a chart that outlines hardware requirements, capabilities, color and text features, output options, and prices of the profiled vendor's products. According to *PC Week*, "The products listed serve a wide range of purposes, including general map making, driving directions and calculations, and weather tracking and forecasting. All information was supplied by the vendors."

Pepper points out that "A number of factors are converging to produce demand for PC mapping software. First, the hardware platforms have advanced so that '286 and '386 computers are fairly commonplace in corporate settings . . . Second, the corporate market is only now beginning to appreciate what mapping software can do, which is attracting more vendors to the marketplace." According to Ken Shain of Geovision Software Corporation, the appeal of mapping systems to the corporate market lies in their use as "a management-information tool," rather than as tools to produce finished goods for sale. Therefore, the market was "stifled until the cost dropped down dramatically to the PC level."

Four principal concerns emerge from Pepper's discussions with desktop mapping system users: ease of use, price, flexibility, and compatibility.

"We wanted the average user to be able to produce something immediately," said George

Zalaquett of NSI Technology Services Corp., Research Triangle Park, NC. NSI uses the Geovision system to map the locations of environmental monitoring sites.

Doug Taylor of Yellow Freight System Inc. of Overland Park, KN uses Atlas*Graphics to locate service terminals. Taylor explained to *PC Week* that "We wanted to be able to draw maps as well as generate overlays that could be zoomed to fit an existing map . . . Price was important, but we wanted the flexibility even more than the price . . ." Pepper reports that "Yellow Freight spent about \$20,000 for its hardware/software setup, plus about \$3000 for additional data files."

Concern for PC-to-mainframe file compatibility is voiced by Tom Link, an environmental protection specialist with the EPA. Link downloads EPA air pollution data in ASCII form, edits it with a word processor, and maps spatial variations in air quality on a PC (his choice of mapping software is not mentioned in the *PC Week* article—perhaps EPA is reluctant to make endorsements).

SOFTWARE REVIEW

Software reviews will normally be solicited by the editors, but unsolicited reviews are invited for consideration. If you are using a piece of software useful in working with map information, and are interested in contributing a review, please communicate this interest to the editors.

PC-Globe+ and Electromap
reviewed by Sona Karentz Andrews
and Chris Baruth, University of
Wisconsin—Milwaukee

PC-GLOBE+
Comwell Systems, Inc., 2100 S.
Rural Road, Suite 2, Tempe,
Arizona 85282. PC-GLOBE+ is an
electronic software package
containing maps and information
on 177 countries. The list price is
\$69.95. Registered owners are

qualified to purchase annual upgrades at minimal cost. The program supports EGA, CGA, Hercules Monochrome, or VGA displays for the IBM PC/XT/AT, PS/2 or compatible with a memory of 384Kb RAM, MS.DOS 2.0 or later (Macintosh and Apple II versions will be available later this year). The output support is through an IBM Proprinter, the HP Laserjet Series II, the IBM Color Printer and compatibles. PC-GLOBE+ has four 5.25" disks (it is also available in 3.5" format) and a 28 page user manual. The software is operated with pull-down menus controlled by a mouse or arrow keys. There are seven main menu options: Help, World, Region, Country, Database, Utilities, and Quit. World, regional, and country boundary maps can be accessed through all menus, whereas country elevation and physical features maps are only accessible through the country sub-menus.

The sub-menus for the Database option include statistics on Population; Age; Language, Ethnic Groups, and Religion; Health Statistics; City Information (populations, phone codes, time zones, latitude and longitude coordinates, and country's Western Union telex access codes and ham radio prefixes); GNP for 1987, 1988 and 1989; Resources, Agriculture and Industry; Imports and Exports; Government; and Culture and Tourism. This information can be displayed in bar charts and tables for an individual country or up to ten countries of the user's choosing to compare statistics. Since all the data in the data base files is aggregated by country, it is not possible to map the information at the country scale. Regional and global scale maps of the data are, however; easily displayed.

The utilities options include changing map parameters (shifting world center, change color, delete country boundaries), calculation of

distances and bearings between two cities in the program or two latitude and longitude points of the user's choosing, currency conversions, time zone information, print screen and view text files, and a save map display.

PC-GLOBE+ is easy to install onto a hard disk and uses 1.5 Mb of disk space. The menus are self-explanatory and there is little need to follow the directions in the user manual in order to understand how to operate the program. Virtually all the map displays use Miller's Cylindrical projection. This does not present a major problem at the global scale, but at the higher latitudes distortions of scale and shape are significant.

The maps in PC-GLOBE+ look very simple and are highly generalized. This is especially the case with the country maps, since they show a limited number of features using iconic symbols to represent the general locations of mountains, rivers, deserts, and forests; or the country maps of cities which always include eight cities—regardless of the size of the country or city populations.

One of the nicest features of the program is the large database. You can choose to map the information for select countries or for all countries. The data base format is flexible and allows the user to add data. The graphics and text from the program can be exported to other programs such as WordPerfect, PageMaker, PC-Paintbrush, Lotus 123, Ventura, and others (we did not try any of these options and are unable comment on how well the program performs in this regard). The shift world center option and calculation of distances and bearings utilities options add some flexibility to the program.

ELECTROMAP

ELECTROMAP, Inc., P.O. Box 1153, Fayetteville, Arkansas 72702-1153. ELECTROMAP is another

electronic atlas software package containing 238 country, regional, topographic, and statistical maps. The list price is \$129 (\$159 after September 1). The program supports EGA or VGA displays for the IBM PC or PS/2 or compatibles with a memory of 640Kb RAM, MS.DOS 3.1 or later. The output can be printed with screen dump or screen capture software. ELECTROMAP uses five 5.25" disks (it is also available in CD-ROM version) and a 20 page user manual. The software is operated with a top menu bar and clicking areas on index maps with a mouse or arrow keys. The World index map is used to access one of fourteen regional index maps, which in turn allow you to access country maps. Map access is also possible using an alphabetical drop-down index of all countries, cities, and physical features listed in the program.

Fourteen maps are available on a pseudo-cylindrical equal-area projection at the World scale. These include; Topography, January Temperature, July Temperature, Precipitation, Agricultural Labor, Electricity, Income Per Capita, Income Growth, Infant Mortality, Inflation Rate, Life Expectancy, Literacy Rate, Population Density, and Population Growth. A text option allows you to display lists of statistics alphabetically by country or by numerical rank in page format.

The regional maps are limited to displaying country boundaries with topographic information. The country maps display either cities and rivers or topography. A text option allows you to display a drop-down menu for text information on the Geography, People, Government, Economy, and Communications of the selected country. The information is overlaid in page form. A flip option allows you to change from the printed text back to the map.

The program is easy to install

but takes considerable time to do so and requires 6Mb of space on the hard disk. The menus are self-explanatory and the user manual only needs to be consulted to determine the limitations of the software. The maps displayed in ELECTROMAP are lovely. They contain substantial detail (therefore the large amount of disk space) and use subtle colors and hypsometric shading for elevation. One cannot help but to be very impressed when the first map appears on the screen. The program is, however, very limited in the number of maps it contains and the data base it supports. The user will surely be disappointed by these limits.

There are a number of differences between PC-GLOBE+ and ELECTROMAP. PC-GLOBE+ contains many more statistical data that can be graphed and/or mapped. PC-GLOBE+ allows you to generate a large number of world maps whereas ELECTROMAP has only fourteen world map options. The maps of less than the entire world as displayed on PC-GLOBE+ are mostly enlarged portions of the world map on the Miller's Cylindrical projection, whereas regional and country displays on ELECTROMAP consist of a series of independently projected maps, providing for a more satisfactory effect. One should keep in mind that although PC-GLOBE+ offers the user more flexibility, both programs are electronic atlases and neither one is intended to be mapping software.

The ELECTROMAP maps are by far more detailed and more attractive than those of PC-GLOBE+, however, at this scale the map displays can, in no way, be compared favorably to even a mediocre printed atlas—the resolution of the medium will not supply nor permit it. Both programs contain, at best, a level and

amount of information comparable to the most elementary type of school atlases, leading us to the assessment that their best use is probably at the secondary school level.

How different are these electronic atlases than their printed counterparts? Given their current costs and limited number of maps and specific hardware requirements, they are not competitive with printed atlases. And turning pages is not much different than clicking through menus. Electronic atlas creators have not yet taken full advantage of the medium they are working in, but rather have attempted to make the electronic atlas a software clone of the printed atlas. In this respect, PC-GLOBE+, with its broad data base and choices of what to display where has the potential to move in that direction, however, both programs have a long way to go.

A CALL FOR MAPPING SOFTWARE REVIEW EDITORS

CP is planning an annual compilation of mapping software review references for publication in the Winter issue. We are seeking individuals willing to compile references from a wide range of sources and to submit a list in digital form by December 1, 1989.

Several individuals might share the responsibility. One could concentrate on software reviews for IBM-PCs and compatibles, another on software for the Apple Macintosh, another on software for workstations, minicomputers, or mainframes. For more information please contact David DiBiase at (814) 863-4562; Bitnet: DWD1 at PSUVM.

PROTOTYPE TIGER FILES AVAILABLE

U.S. CENSUS BUREAU
The TIGER/LINE file for Boone County, Missouri is available from

the U.S. Census Bureau on a single reel of tape (at either low or high density) for \$175. The prototype product offers more than 4.6 Mb of information on roads, railroads, rivers, and other features, along with names and classification codes; State, county, census tract, block, and other area codes; feature shapes; address ranges and ZIP codes. Contact: Customer Services, Bureau of the Census, Washington, DC 20233; (301) 763-4100.

AAG MICROCOMPUTER SPECIALTY GROUP

The AAG/MSG is offering a demonstration program by James Taylor that displays the Boone County prototype TIGER file. The program is distributed on two high density diskettes at a cost of \$5, including "the Boone County data which the Census sells for \$60." Requires EGA graphics. Request diskette G16 from Robert Sechrist, Department of Geography, Indiana University of Pennsylvania, Indiana, PA 15705. Make checks payable to the AAG Microcomputer Specialty Group.

cart lab bulletin board

This forum is offered to encourage communication among practitioners at a time of rapid technological transition. Questions, comments, and announcements are invited.

THE BEST OF BOTH WORLDS: Linking the WORLD projections package with Macintosh drawing programs

*Iden Rosenthal
Maximum Use Software*

Desktop publishing (DTP) technologies have profoundly altered the balance of power between the technical pen and the microcomputer in the graphic arts, as well as

in thematic mapmaking. The DTP market appeared in response to the introduction—in 1985—of Apple Computer's Laserwriter, Adobe System's PostScript page description language, and Aldus Corporation's PageMaker, the first personal page layout program. The second generation of PostScript output devices (such as the Linotronic Imagesetter) coupled with advanced drawing programs like Adobe's Illustrator and Aldus' FreeHand make it possible to generate real typography, fine dot screens, and color separations direct to film. The prospect of creating high-quality thematic maps without sticking-up lettering, etching and peeling, and compositing negatives is enticing to many thematic map producers.

PostScript's unprecedented power to describe pages that has made it a *de facto* industry standard. PostScript became accessible to a large, previously untapped market through the intuitive graphic interface of Apple's Macintosh microcomputer. Market forces have led IBM and the clone-makers to find a way for their machines to work more like the Mac, at least for graphics purposes. Although the Mac was designed with graphics central to its method of user interaction, and thus has an inherent advantage, there are twice as many MS-DOS systems being used for DTP. For what it's worth, my opinion on the issue of Macintosh vs. MS-DOS is this: if you've got them, it's best to mix both machines in the same workplace, passing files back and forth via cable or networking. With the Macintosh you run into fewer frustrating configuration and compatibility hang-ups and (at least to date) the drawing programs are faster, easier to learn and use, more powerful, and better tailored to production concerns. On the other hand, many people are already set up to table digitize base maps on a PC running

AutoCAD or some other CAD program. Furthermore, many programs that are important for cartographers have yet to be ported from MS-DOS to the Apple operating system. Perhaps the best example is the WORLD map projections package.

WORLD is widely regarded as the best at what it does, and there is no equivalent in the Macintosh environment. Fortunately, the option of saving output to disk as a PostScript file has recently been added. Unfortunately, the PostScript files generated by WORLD are incompatible with Illustrator and FreeHand. PostScript may be something of a standard, but it is a very broad one. The litany of PostScript subformats (Illustrator PostScript vs. FreeHand PostScript vs. Encapsulated PostScript) goes on at length. What follows is an outline of a procedure that converts the PostScript that WORLD generates into a form that Illustrator and FreeHand can manipulate (FreeHand can import Illustrator files, though Illustrator does not return the favor).

What you need to understand for this operation is that an Illustrator file is comprised of three sections: a prolog, a body, and a trailer. The prolog and trailer sections are virtually identical for every file so you can just copy them from a dummy file and combine them with whatever x,y coordinates you like in the body section. For simple line strings the format is:

```
x1 y1 m
x2 y2 l
x3 y3 l
...
xn yn l
S
```

A polygon has the same form except that $x1 y1 = xn yn$.

PostScript is written in standard ASCII text so any word processor

can be used to edit it. In fact, I use a WordPerfect macro to accomplish the conversion. If one wanted to make routine use of this procedure, however, I'd recommend writing a Turbo Pascal utility for the speed of it. The conversion consists of the following search and replace sequences:

1) Replace everything (in the WLDOUT file WORLD creates) up to and including the first line ending with "moveto" with the prolog from any other functional Illustrator file. The prolog starts at the beginning of the file and ends with the line "%EndSetup:".

2) Change all occurrences of "moveto" in the file to "m". **IMPORTANT:** Make sure after this that no two consecutive lines end with an "m." If they do, get rid of all but one of them. This happens when WORLD is asked to generalize or to break a polygon off on the edge of the page. If your text editor can't handle this double-'m' search procedure you may have to resort to some minimal programming.

3) Change all occurrences of "lineto" in the file to "l"

4) Change all occurrences of "stroke" to "S"

5) Replace the last two lines in the WLDOUT file with the trailer from a functional Illustrator 1.1 file. The trailer starts with the line "%Trailer:" and runs to the end of the file.

Congratulations, you are done! You can now open the file you have created using either Illustrator 88 or FreeHand and start adding data and design.

One thing to be aware of is that WORLD sometimes creates PostScript with lines like "47.324-235.763 lineto", i.e., no space between the x and y values. This

will choke Illustrator. There has to be a space between the 47.324 and the -235.763. Another problem may arise if the x,y coordinates in your converted WLDOUT file aren't close to the x,y coordinates from the Illustrator file you harvested your prolog from (as found in the line of the prolog that begins "%BoundingBox:"). If the coordinate systems don't happen to nearly match, you won't see anything on the page when you open up the file after conversion. The map is still there, you just can't see it. Try this sequence of commands: Fit to View, Select All, Cut, Paste. The map should then be centered on your page.



Adobe Illustrator 88 desktop showing a converted WORLD Postscript file with paths selected

I continue to be intrigued by the creative problem-solving process that is required to push the limits of desktop mapping. The same practical issues are being tackled simultaneously in many different kinds of mapmaking environments. By offering this information to the cartographic community, I hope to turn a few more heads in the direction of desktop mapping and encourage others to share their thoughts and problem-solving efforts in this area. My company, Maximum Use Software, consults on desktop mapping and publishes a utility that creates graphs directly in Adobe Illustrator file format. I am always happy to talk Macintosh cartography and can be reached at (215) 878-9364.

fugitive cartographic literature

Interesting articles about cartographic information often appear in unexpected outlets. The goal of this section is to bring those publications to the attention of our readership. We invite synopses of papers appearing in journals other than those devoted to cartography, geography, and map librarianship.

Blaut, J.M. (1987). Notes toward a theory of mapping behavior.

Children's Environmental Quarterly, 4:4 (Winter), pp. 27-34.
reviewed by Jeffrey C. Patton, University of North Carolina at Greensboro

Blaut begins by stating that the process of mapping is "a normal activity in human beings of all ages and all cultures, akin to language behavior and perhaps equally primitive and basic". Blaut and others have long held that mapping behavior is analogous to linguistic behavior in both development and practice. This paper explores the evidence for and the implications of this position.

As a starting point for theorizing about mapping behavior Blaut differentiates between macroenvironmental behavior (place behavior) and microenvironmental behavior (behavior directed at individuals or objects). He makes the argument that the human sensory and motor modalities function differently in each case. Exteroceptors are more critical in place behavior while proprioceptors are more important in microenvironmental situations. For example in understanding and remembering objects the hands and manipulation are used while comprehension of a larger environment may require the use of feet and walking. In speaking of mapping behavior Blaut deals specifically with macroenvironmental behavior. He points out that the comprehension and organization of macroenvironments relies on the development of

cognitive maps and that *learning of "place"* by either adults or children requires a communication system be utilized. As ordinary language is insufficient to meet the needs of communicating macroenvironmental information, mapping evolved in all cultures.

For the reasons given above Blaut hypothesizes the following:

1. Mapping is a limited and specialized linguistic form.
2. Mapping emerged from the same root process as natural language.
3. Mapping and maps are older than written language.
4. Mapping abilities emerges naturally in young children independent of training.
5. Mapping is a cultural universal.

To support these hypotheses Blaut presents evidence that mapping behavior is homologous to ordinary written language, having both syntax (a set of ordering rules) and is semiotic. While he freely admits that maps may be limited as a language form in terms of what they can easily communicate, mapping is clearly a language.

Evidence of early mapping behavior in children is well documented with several examples presented detailing how toy play may mimic the macroenvironmental world and "accustom" children to a map-like (rotated and reduced) perspective of the world. The successful interpretation and use of black and white vertical aerial photographs by five year old children is given as evidence of the development of sophisticated cognitive maps.

Archeological and anthropological finds are reported which indicate that mapping is indeed very old in human culture. The

oldest known map from Catal Huyuk is over 8000 years old while the oldest written language appears to be only 6000 years old (those languages utilizing an alphabet are significantly younger). Blaut suggests that this is the case because mapping behavior "buds off" from basic linguistic behavior at a much lower level than writing and that written language may be a derivative of mapping.

In concluding Blaut makes several suggestions for map learning and reading:

1. Map skills can be taught at school entering age or before.
2. Natural mapping in young children employs a downward eye-in-the-sky perspective. This can be developed by placing large maps on the floor or even incorporating maps into the flooring.
3. Contrary to some structuralist views young children can gain the most from and enjoy complicated maps the most. He explains that this may be due to the fact that children are more sophisticated map readers than previously thought or simply that more complicated maps are more exciting even if they are not fully understood.
4. As mapping has common roots with written language this link should be utilized to promote not only better mapping skills but also reading and writing skills.

Blaut's rather informal paper makes a compelling case that mapping behavior is a fundamental activity of all human beings and of all cultures. It has important ramifications for anyone interested in natural language, map design for children, or geographic education.

Ottosson, Torgny (1988). What does it take to read a map? *Scientific Journal of Orienteering*, 4, 97-106.
reviewed by Jeremy Crampton, Penn State University

Can children understand maps "early and easily," or do they find maps difficult, not at all "transparent"? This is the main question addressed by Ottosson in his review of a brief selection of literature on the topic. And it is certainly an important question in this time of geographic ignorance. If children readily understand maps, geographic education need not devote much effort to them, and could possibly even ignore them. On the other hand, if map understanding is an effortful process, explicit formal training may be necessary.

Ottosson largely accepts the former position. Since "most spatial relationships on many maps are the same as the relationships between the corresponding real-world features" (p. 101), it is possible for children to have a basic understanding of maps. A large number of his references are from the Sheffield Research Program (UK), one conclusion of which is that young children can easily use maps.

However, this kind of position has been repeatedly criticized. Piagetian as well as cartographic theory would argue that map understanding does *not* come "early and easily." There are also empirical problems with such arguments. Ottosson appears to be aware of these criticisms, but rather too easily dismisses them (in a single sentence) before going on to make the assertion quoted above. The trouble with this position is that it merely pushes the problem backwards; instead of striving to understand how children comprehend maps, the task instead is to understand spatial comprehension of the

environment (skills which are then somehow applied to map comprehension). Environmental comprehension is a worthy goal, but the overall impression gained from this type of argument is that maps are just reflections of reality that do not involve human creativity or categorization.

Other parts of the article are concerned with showing that map projection (i.e., perspective), symbolization, and scale are not problematic for young children. Ottosson presents some results from an experiment he did involving five year old children who were asked to describe "a rather complex road map." Although there were errors (which seem to reflect the child's reification of symbols, consistent with Piagetian theory), Ottosson nevertheless claims that symbolization is not a crucial problem.

Although there is no doubt that children can learn spatial relations (such as proximity) early on, it is misleading to claim that this means map understanding follows naturally because "in essence . . . map understanding is spatial understanding" (p. 102). It ignores the fact that maps are creative realizations, not degraded pictures of reality. Ottosson's teaching examples depend on showing literal similarities between the environment (a road bend) and the map. This is not necessarily "incorrect," but as he admits himself, it takes attention away from the map's role, its form and also the active participation of the child.

Miller, David; and Modell, John (1988). Teaching United States history with the Great American History Machine. *Historical Methods*, summer 1988; pp. 121-134.
reviewed by Karl Proehl

The Great American History

Machine (GAHM) is a computer-based tool used at Carnegie-Mellon University for interactively accessing and exploring county-level census and election data through a map interface. GAHM was designed as a teaching application to be used for generating and exploring hypotheses rather than for formally testing them.

On the basis of field testing GAHM, the authors believe that this software opens up new possibilities for enabling students to approach historical problems empirically and analytically. A sensible way to use computers in introductory history courses is to facilitate the search for patterns in large bodies of data. GAHM is designed to make data accessible through a medium that invites the search for patterns—the choropleth map.

Six exercises were mentioned along with a series of maps. The authors found that students in this course were much more engaged with the material than is normally the case in introductory history courses.

An excerpt from **Mary Kingsley, *Travels in West Africa***, London: 1897.

Submitted by Pat Gilmartin, University of South Carolina.

Mary Kingsley was an English explorer who explored the Ogowé and Rembé rivers of West Africa in the late 1900's. During her forays there, she collected specimens of fish for the British Museum and continued her father's studies of the religions and laws of primitive societies. She travelled alone, mostly by canoe, hiring native guides along the way. One afternoon, she and her party stopped at a village of the Fan cannibal tribe to ask about villages further upstream. The following is Kingsley's description of the map which the Fans created for them.

"... when we reached a large village on the north bank, we seemed to have a lot of daylight still at hand, and thought it better to stay at [a village] higher up, so as to make a shorter day's work for to-morrow, when we wanted to reach Kondo Kondo; so we went up against the bank just to ask about the situation and character of the up-river villages . . . One chief . . . took a piece of plantain leaf and tore it up into five different-sized bits. These he laid along the edge of our canoe at different intervals of space, while he told M'bo things, mainly scandalous, about the characters of the villages these bits of leaf represented . . . The interval between the bits was proportional to the interval between the villages, and the size of the bits was proportional to the size of the village . . .

"Now there is no doubt that that chief's plantain-leaf chart was an ingenious idea and a credit to him. There is also no doubt that the Fan mile is a bit Irish, a matter of nine or so of those of ordinary mortals, but I am bound to say I don't think, even allowing for this, that he put those pieces far enough apart . . ."

Schiff, Barry (1989). Aeronautical charts; portraits of the earth.

AOPAPilot, March, pp. 78-80, 82.
reviewed by Claudette Dellon,
Aeronautical Charting Division,
NOS/NOAA

Schiff, a pilot, has written a humorous and touching article on his long-standing love affair with aeronautical charts. He views them as pieces of art, portraits of the earth, with which a pilot can "window-shop the world."

A chart is a map modified for use in aerial or maritime navigation and is meant to work on rather than to look at (though some, like Schiff, like to look as well as to work). To maximize the

value of a chart, pilots must learn as much as they can about chart symbology. Schiff feels this can best be accomplished by reviewing the National Oceanic and Atmospheric Administration (NOAA) 112-page booklet, *Aeronautical Chart Users Guide*. To help remember the differences among large- and small-scale charts, he points out that one inch on a VFR terminal area chart (scale 1:250,000), a sectional chart (scale 1:500,000), and a world aeronautical chart, or WAC (scale 1:1,000,000) equals 4, 8, and 16 statute miles respectively.

Covered also is a history of "navigational maps," dating back to 1807 when President Thomas Jefferson established the Survey of the Coast to map our nation's coasts. The Air Commerce Act of 1926 assigned the task of creating charts for air navigation. The first aeronautical chart was published in 1927, the year of Lindbergh's historic flight. By 1930, sectional aeronautical charts were developed to provide coverage for the entire country. Sectionals, at 1:500,000 scale, provide detail needed for visual navigation of slow- to medium-speed aircraft. Those who fly faster and higher don't need as much detail, and this led to the development of regional aeronautical charts (RACs), followed by WACs, and finally, in the 1960's, operational navigation charts (ONCs) published by the Defense Mapping Agency (DMA). RACs, WACs and ONCs are produced at 1:1,000,000 scale.

In 1970 the name of the Survey was changed to NOAA, of which the National Ocean Service (NOS) is charged with publishing and distributing aeronautical charts. Chart products are described in NOS's free catalog, *Aeronautical Charts and Related Products*, available from NOAA Distribution Branch, N/CG33, NOS, Riverdale, MD 20737.

In addition to producing ONCs,

DMA produces visual jet navigation charts (JNCs) at 1:2,000,000 scale. Only 122 JNCs are required to cover the entire world, with three covering the continental U.S. The kings of visual charts are the global navigation charts (scale 1:5,000,000') developed for very long range aircraft navigating at very high altitudes. For a free catalog of these and other charts, contact the DMA Combat Support Center, ATTN: PMA, Washington, DC 20315-0020.

Schiff is also fascinated by charts produced by foreign governments. He considers some to be real works of art. The excitement this collector and art lover feels for aeronautical charts is contagious.

cartographic artifacts

ALBUM OF MAP PROJECTIONS

USGS Professional Paper 1453 entitled "An Album of Map Projections" by John Snyder and Philip Voxland has been prepared to acquaint those in the cartographic profession with the wide range of map projections that have been developed during the past few centuries. Ninety basic projections are presented with consistent and concise textural descriptions and are accompanied by standardized, visual portrayals.

USGS MAP DISTRIBUTION

The USGS/GPO cooperative map project has been operating for over four years since its inauguration in October 1984. USGS consolidated its eastern and western map distribution facilities into Building 810 in the Denver Center in 1986 in order to realize an annual cost savings of over \$1 million. During the consolidation, 3700 tons of maps and books were delivered to Denver in 185 truckloads.

Building 810 offers some seven-

teen acres of floor space. About 10,500 linear feet of shelving — with 2500 linear feet reaching 16 feet high—holds approximately 100 million sheets representing 70,000 different map titles.

USGS maps are currently produced at the Reston printing facility. Both flat and folded maps are printed in a variety of quantities. Printed materials are stacked three feet high, then strapped to pallets. The pallets wait in a loading area until 40,000 pounds are accumulated—one truck load. At least twice a month, a truck departs Reston for Denver.

Adapted from Administrative Notes, April 1989.

MAGERT OPEN FILE REPORTS

Titles in this series are generally of an ephemeral nature or are too specialized to warrant general distribution as formal publications. They are available as on-demand photocopies, as a service to the map library community. All orders must be prepaid with a check or money order made payable to Jim Coombs, MAGERT Open File Reports Production Manager. There is a minimum charge of \$3.00 per order. Prices include postage and handling. Orders should be sent to: Map Library, duane G. Meyer Library, Southwest Missouri State University, Box 175, Springfield, MO 65804-0095.

86-1 Vick, Nancy J. **Guide to U.S. map resources: a personal name index.** 1986. 16 leaves. \$1.60.

86-2 Sunnen, Linda, and Daniel O. Holmes. **Map room acquisition procedures: University of California, Berkeley: a systems analysis.** 1984. 36 leaves. (an introductory examination of then current problems with some suggested solutions) \$3.60.

86-3 COUNTY COORDINATES (4 corner latitude/longitude; degrees and minutes):

-CA Robertson, R. Bruce. **California County coordinates.** 1984. 4 leaves. \$0.40.

-HI Baldwin, James A. **Hawaii County coordinates: including major islands and National Parks.** 1987. 4 leaves. \$0.40.

-IL Wenner, Alex, and Marian Hunter. **Illinois County coordinates.** [1985] 5 leaves. \$0.50.

-MO Wilson, Allen P. **Missouri County coordinates.** 1988. 6 leaves. \$0.60.

-UT Robertson, R. Bruce. **Utah County coordinates.** 1984. 3 leaves. \$0.30.

-WY Walsh, Jim. **Wyoming County coordinates: including National Parks and Monuments, and Wind River Indian Reservation.** 1986. 3 leaves. \$0.30.

86-4 Vick, Nancy J. **Latin America Cutter list: first and second order administrative divisions.** August 1988. 30 leaves. (An expansion of the Library of Congress "G" classification schedule; excludes Mexico) \$3.00.

86-5 Cobb, David A. **United States State coordinates.** 1986. 4 leaves. (4-corner latitude/longitude for each state; degrees and minutes) \$0.40.

86-6 U.S. National Parks and Forests Cutter list. 1986. 11 leaves. (Library of Congress expansion of "G" classification schedule) \$1.10.

86-7 Sample map workforms for M.A.R.C. input. 1986. 8 sheets (some printed on both sides) (Locally devised OCLC, RLIN, and UTLAS input workforms) \$1.50.

88-1 Kandoian, Nancy. **An English translation of words abbreviated in Ritter's Lexikon.** 1988. 4 leaves. \$0.40.

88-2 Vick, Nancy. **MAGERT alphabetical membership list.** February 1988. 20 leaves. \$2.00 (This ORF will be updated biannually).

88-3 Lorrain, Janice, and Jim Coombs (with a "tip o' the hat" to Charles A. Seavey). **A map to the LC "G" schedule.** 1988. 18 leaves. \$1.80. (a new, expanded, and improved set of base maps showing place names and "G" schedule 4-digit area numbers).

MAP LIBRARIANSHIP

"Take a map and travel with it"—that was Clara Egli LeGear's response to Librarian of Congress James H. Billington when he asked her what advice she would give young people interested in maps and geography.

Billington, John Wolter (chief, Geography and Map Division) and other staff members paid tribute to Mrs. LeGear for her 74 years of service to the Library at the division's Christmas party in December.

Mrs. LeGear, now 92, has spent a lifetime involved in almost all aspects of map librarianship—cataloging, reference, acquisitions, bibliography, and administration—in the Library's Geography and Map Division. Soon to be published by the Library of Congress is Mrs. LeGear's "Comprehensive Author List," Volume 9 in the *List of Geographical Atlases* in the Library of Congress.

Clara LeGear joined the Library of Congress as a typist and clerical assistant in December 1914. Eleven months later she transferred to the Division of Maps.

During her first 35 years, Mrs. LeGear served in a variety of positions, including cataloger, reference librarian, assistant chief (1931-1945), and librarian in charge of cartographic acquisitions.

After the Second World War Mrs. LeGear relinquished her administrative duties in order to devote full time to writing and bibliographic activities. Her first major publication was a manual on the care and preservation of cartographic materials, *Maps: Their Care, Repair and Preservation in Libraries* (1949), which quickly became a standard reference work in the field of map librarianship.

With the official designation of bibliographer, she resumed work on a bibliography of atlases in the Library of Congress that had been started by her former chief, Philip Lee Phillips, completing Volume 5 of *A List of Geographical Atlases* in the Library of Congress in 1958. Earlier she produced a two-volume work, *United States Atlases, 1950-1953*. She also continued work on the division's card file of bibliographic citations to cartographic literature, which was eventually published by G.K. Hall as *The Bibliography of Cartography* (5 volumes, 1973).

Retirement from the Library after 47 years of service in 1961 did not put an end to her productivity. Appointed Library of Congress honorary consultant in historical cartography, she went on to complete volumes 6, 7, and 8 of *A List of Geographical Atlases* and continued compiling the *Bibliography of Cartography* until a full-time bibliographer was appointed in 1969. As a result of her extremely long and productive career, Mrs. LeGear has received extensive national and international recognition and numerous awards from professional and cartographic organizations. When she received the Honors Award of the Special Libraries Association's Geography and Map Division in 1957, the citation recognized her "as patron saint to anyone interested in historical cartography; as a source of advice and counsel to all; as author of many of the bibles of the profession...; and

especially...for the very gracious modesty with which all of these things have [been] accomplished."

Two years after her retirement from the Library of Congress, in 1963, Mrs. LeGear received the Library's highest honor, the Distinguished Service Award.

Mrs. LeGear was accompanied at the Geography and Map Division Christmas party by her husband of 50 years, Russell LeGear, who retired from the Library himself after 34 years as a descriptive cataloger.

LC Information Bulletin, April 1989

UNIVERSITY OF MARYLAND OFFERS DUAL MASTERS CURRICULUM

The Geography/Library Sciences (GELS) curriculum of the University of Maryland is a full offering in computer-based spatial analysis and information management—one of the few programs in the United States.

Students earn a Master of Library Science and Master of Arts in Geography on completion of a minimum of fifty-six graduate hours. Applicants must be accepted by both departments. Those who already hold a related graduate degree may be eligible for advanced standing in the program.

Contact Dr. Anne S. MacLeod, College of Library and Information Services, Hornbake Library Bldg.—Room 4111E, University of Maryland, College Park, MD 20742, (301) 454-3590; or Dr. Kenneth E. Corey, Department of Geography, 1113 Lefrak Hall, University of Maryland, College Park, MD 20742, (301) 454-2241.

cartographic events

EVENTS CALENDAR

July 31–August 4: SIGGRAPH '89

(Special Interest Group on Computer Graphics), Association for Computing Machinery Annual Conference, Boston, MA. Contact: SIGGRAPH Conference Office, 111 East Walker Drive, Chicago, IL 60601.

August 6–10: **URISA 27th Annual Conference**, Boston Marriot Copley Place, Boston, MA. Contact: Tom Palmerlee, Executive Director, URISA, 319 C Street SE, Washington, DC 20003; (202) 543-7141.

August 17–24: **ICA International Cartographic Conference 1989**, Budapest, Hungary. Contact: Ernő Csáti, Institute of Geodesy, Cartography, and Remote Sensing, H-1373, Budapest, POB 546, Hungary.

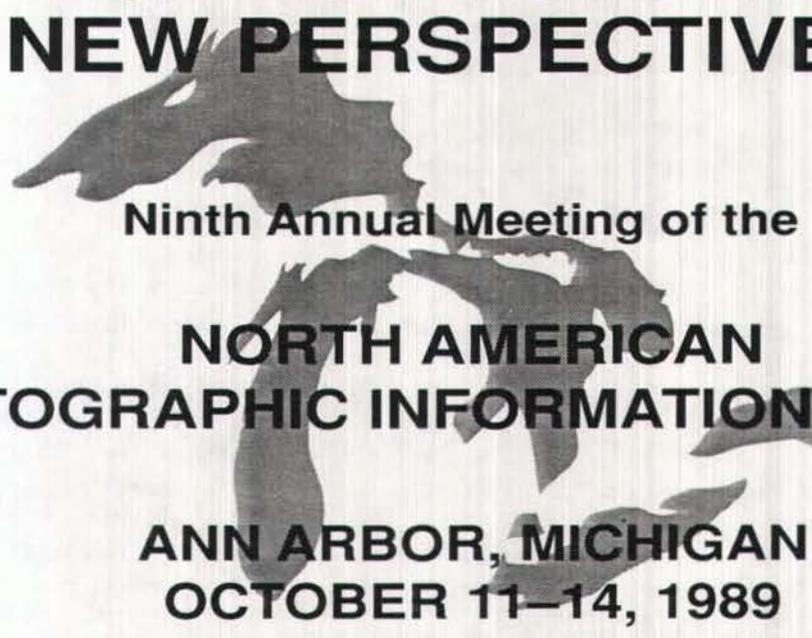
September 15–16: **GIS: Database and Mapping Applications**, sponsored by Lincoln Institute of Land Policy (LILP), San Francisco, CA. Contact: LILP, (800) LANS-DUSE.

September 17–22: **ACSM/ASPRS Fall Convention**, Cleveland, OH. Contact: John E. Daily, Suite 100, The Honeywell Building, 925 Keynote Circle, Cleveland, OH 44131.

September 18–19: **ERIM Fall Conference**, "Options for the Federal Agenda for Earth Observations in the Global Change Era," Washington, DC. Contact: Dr. Robert H. Rogers, ERIM, Box 8618, Ann Arbor, MI 48107-8618; (313) 994-1200 ext. 323; FAX (313) 994-1575; Telex 4940991 ERI-MARB.

September 20–23: **International Map Dealers Association Annual Conference and Trade Show**, Kansas City, MO. Contact: Nancy Edwards, Office Manager, International Map Dealers Association, P.O. Box 1789, Kankakee, IL 60901.

**NUEVAS PERSPECTIVAS
NOUVELLE PERSPECTIVES
NEW PERSPECTIVES**



**Ninth Annual Meeting of the
NORTH AMERICAN
CARTOGRAPHIC INFORMATION SOCIETY
ANN ARBOR, MICHIGAN
OCTOBER 11-14, 1989**

The Ninth Annual NACIS meeting will feature papers on various aspects of cartographic information and, in particular, those papers which relate to the theme of this year's meeting: *New Perspectives*. Topics include:

- * Atlases--Concepts to Production
- * Canadian Cartography
- * Cartographic Design
- * Cartographic Education
- * Cartographic Software
- * Cognitive Cartography
- * Computer Mapping
- * GIS
- * Geological Mapping
- * Government Mapping Programs
- * Historical Cartography
- * Latin American Cartography
- * Map Librarianship
- * Mapping Water Resources
- * Marketing Cartographic Information
- * Navigation
- * Remote Sensing
- * Statistical Mapping
- * Techniques in Map Production
- * The Cart Lab: Issues and Problems

The NACIS IX conference site will be the Ann Arbor Inn in the heart of the city's business district. It provides easy access to over 40 restaurants, shops and the University of Michigan. Various cultural activities such as museums, galleries, gardens and libraries are also close by. Known as the "City of Trees", Ann Arbor displays a wide array of colorful leaves in October. Temperatures are mild and range between 40 and 60 degrees. Registration and accommodations information will be made available soon.

Conference information:

Diana Rivera
University Libraries
Michigan State University
East Lansing, MI 48824-1048
(517) 353-4737

Poster Session information:

Craig Remington
Department of Geography
University of Alabama
University, AL 35486
(205) 348-1536

Exhibit information:

Charles E. Harrington
NOAA/NOS
6001 Executive Boulevard
Rockville, MD 20872
(301) 443-8360

October 11–14: **North American Cartographic Information Society** Ninth Annual Meeting, Ann Arbor, MI. Contact: Diana Rivera, University Libraries, Michigan State University, East Lansing, MI 48824–1048; (517) 353–4737 ext. 4593.

November 12–15: **NCGA Mapping & GIS '89**, Los Angeles, CA. Contact: NCGA; (703) 698–9600.

November 26–30: **GIS/LIS '89**, sponsored by AAG, ACSM, ASPRS, URISA; Orlando, FL. Contact: ACSM; (703) 241–2446.

March 13–16, 1990: **GIS '90**, Vancouver, B.C. Contact: Hugh Legg; (604) 664–5922.

Spring 1990: **Canadian Cartographic Association** Annual Meeting, Victoria, B.C. Contact: Dr. C. Peter Keller, Dept. of Geography, University of Victoria, Victoria B.C.

June 22, 1990: **ALA Preconference Workshop on Satellite Imagery and Aerial Photography**. The Map and Geography Round Table and RTSD/CCS Committee on Cataloging: Description and Access will cosponsor a workshop, "Remote Sensing Imagery: Identification, Control and Access," on Friday, June 22, 1990 in Chicago, prior to the ALA Annual Conference. The workshop will include discussions on identifying the special characteristics of remote sensing images (including satellite images and aerial photographs) as well as creating and coding catalog records for them. A practicum will follow. Instructors will be Dr. Helen Jane Armstrong (Univ. of Florida), Mary Larsgaard (U.C., Santa Barbara), Betsy Mangan (L.C.), and Nancy Vick (Univ. of Illinois). For more information, contact Ellen Caplan (OCLC) at (614) 764–6000 or Nancy Vick at (217) 333–0827. Complete registra-

tion information will be available this fall.

July 1990: **4th International Symposium on Spatial Data Handling**, Zurich, Switzerland. Contact: Dr. Duane Marble, Dept. of Geography, 103 Bricker Hall, The Ohio State University, Columbus, OH 43210.

CALL FOR PAPERS

The editors of *The American Cartographer* are soliciting papers for a special issue on analytical cartography to be published in January, 1991. Potential topics include:

- § The conceptual structure of analytical cartography
- § Theory of spatial operators in regular/irregular cellular systems
- § Spatial filtering in cartography
- § Spatial data structures
- § Relational data structures in a cartographic setting
- § Object oriented data structures
- § Mathematical definition of cartographic objects
- § Spatial database systems
- § Numerical terrain analysis/representation
- § Cartographic query languages
- § The use of artificial intelligence in cartography
- § Concepts of vehicle navigation systems
- § Use of fractals in cartography
- § Concepts of numerical map generalization
- § New work in map projections

Please contact the guest editor if you are interested in a topic that is not listed here. All manuscripts submitted will be peer reviewed with the normal process. For the

style requirements, please refer to the July, 1989 issue of *The American Cartographer*. Please send a one page prospectus to the guest editor if you are interested in writing an article.

GUEST EDITOR

Prof. Harold Moellering
Dept. of Geography 103 BK
Ohio State University
Columbus, OH 43210
Tel: (614) 292–2608
Bitnet: Ts0215@OHSTVMA

SCHEDULE

Prospectus due: October 1, 1989
Submission of manuscript: February 1, 1990
Notification of review: May 1, 1990
Revision of manuscript: September 1, 1990
Planned publication: January, 1991

CONTINUING EDUCATION

September 6–8, 1989: **Digital Geographic Information Systems** George Washington University, Washington, DC. Instructors: John E. Estes and Jeffrey L. Star, Department of Geography, University of California—Santa Barbara. The course concentrates on the requirements and techniques for managing data within geographic information systems. It introduces concepts of geographic analysis and emphasizes the need to assess simultaneously point, polygon, and raster (image) data. The processing of various data types and use of data from diverse sources is facilitated through the application of common methods of geographical referencing and data interchange formats. In a laboratory session, participants receive hands-on experience with a microcomputer-based geographical information system.

For further information, contact Darold Aldridge at (202) 994–8518.

NACIS news

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Editors: **David DiBiase** (Department
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8092

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ington, KY 40506-0056; (606) 257-
5863

Ellen White, Department of Geog-
raphy, Michigan State University,
East Lansing, MI 48824, (517) 366-
4658

Those positions marked by an asterisk are open for nomination for 1989-90.

Three Directors-at-Large, The Vice
President and Secretary must be
elected by our next annual meet-
ing. Please forward nominations

to: Ron Bolton, Room 100, 6010
Executive Blvd., Rockville, MD
20852. Nominations when for-
warded should include a letter of
acceptance and a short vita for use
on the annual ballot.

CONGRESS OF CARTO- GRAPHIC INFORMATION SPECIALISTS ORGANIZATIONS

*Final Text, as Adopted,
The Newberry Library, Chicago,
November 10, 1988*

Resolution #1

WHEREAS, WE, THE DELE-
GATES to the Congress of Carto-
graphic Information Specialists
Organizations, assembled in
Chicago on November 9th and
10th, 1988, discussed common
concerns and expressed our hopes
for cooperation among ourselves
and our respective organizations,
and

WHEREAS, WE found those
discussions and our social inter-
change to be of mutual benefit,
and

WHEREAS, WE learned that there
is great potential for improving
our ability to serve better our
members and our patrons, and

WHEREAS, WE find that a con-
tinuing interchange among us and
our organizations will promote
cooperation in many areas of
mutual interest, will provide
opportunities for personal growth
and continuing education, and will
strengthen our collective voice,

WE RESOLVE, THEREFORE, to
return these sentiments to our
respective organizations with a
request that they individually
appoint one member, by February
15, 1989, to a Planning & Coordi-
nating Committee to plan and
conduct the first International
Conference of Cartographic

Information Specialists to be held in 1990 or as soon as practicable;

BE IT RESOLVED, FURTHERMORE, that the Planning & Coordinating Committee should proceed with reference to the following guidelines, which have been discussed and are considered worthy of further consideration:

1. The Conference should include lectures, workshops, exhibits, and time for each sponsoring organization to have at least one meeting of its own members for the conduct of business.

2. That successive Conferences, if any, should be held at intervals of no greater than five years.

3. The focus of the Conference should be on map curatorship and librarianship, as compared to cartographic production.

4. The Conference should not be designed to take the place of the annual meeting or other meetings of the sponsoring organizations, but if a sponsoring organization finds it advantageous to forego one of its meetings in exchange for the Conference, or hold one of its meetings in conjunction with the Conference, it is encouraged to do so.

5. The Conference should not diminish the quality of regular programming by the parent organization, but rather the Conference should supplement the continuing education and strengthen the information exchange between organizations and their members.

6. The Planning & Coordinating Committee shall elect its own Chair from among those appointed to the Committee.

Resolution #2

WHEREAS, there is a need to

improve the quality of communications between the members of cartographic information specialist organizations, and

WHEREAS, there is a desire to eliminate unnecessary duplication of effort in accomplishing the above objective,

NOW, THEREFORE, WE, the delegates to the Congress of Cartographic Information Specialists Organizations, request that each member organization designate a member, by February 15, 1989, to act as the Information Coordinator for that organization.

The Information Coordinators, in cooperation with each other, should attempt to accomplish the following objectives:

Develop a mechanism for pooling and disseminating information on the following:

Calendar dates for meetings, exhibits and other events

Job announcements, retirements, vacancies, and any other employment related information

Awards, prizes, grants, and other opportunities for professional advancement

Lists of publications as sources of information and as disseminators of information

and,

Matters of common interest to all.

Resolution #3

The Congress regrets the expenditure of time, effort, and money represented by the production of three overlapping or competing directories of map libraries (by SLA GMD, ALA MAGERT, and ACMLA). While we can appreci-

ate the organizational and economic motivations that led to this duplication, it seems to us a less than ideal situation given the size of the map library community, the restricted budgets of libraries, and the palpable lack of harmony it presents to observers of the map library scene.

The Congress discussed several possible solutions, including

1. Unilateral suspension of one or more publications,

2. Further specialization of information to make the directories more distinctive (for instance, one specializing in descriptions of collections, including, perhaps, ARL profiles by class number; another in personal addresses and phone numbers),

3. A totally cooperative effort, involving several groups, using a uniform questionnaire, and published by a neutral publisher, such as Bowker,

4. A two-volume directory, one for the U.S., and the other for Canada, to be sold separately or as a set, and

5. Staggered publication dates to maximize the currency of information promoted while minimizing overlap (two directories, for instance, might each have five-year revision cycles, with a new directory appearing every two and one-half years).

NEW APPOINTMENTS

NACIS Preident Juan José Valdés announces the following appointments: **Diana Rivera** and **Karl Proehl** will represent NACIS in the planning of the first **International Conference of Cartographic Information Specialists** to be held in 1990 or as soon as practicable. Diana will serve on the Planning &

Coordinating Committee and Karl will represent NACIS as an Information Coordinator.

EXCHANGE PUBLICATIONS

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

Canadian Cartographic Association Newsletter. A quarterly publication offering news and announcements to members of the CCA. Contact: Canadian Cartographic Association, c/o Department of Geography, Memorial University of Newfoundland, St. John's, Newfoundland, A1B 3X9; (709) 737-8988; Bitnet: CHWood@MUN

Cartomania. This quarterly newsletter of the Association of Map Memorabilia Collectors offers a unique mix of feature articles, news, puzzles, and announcements of interest to cartophiles. Contact: Siegfried Feller, publisher/editor, 8 Amherst Road, Pelham, MA 01002; (413) 253-3115.

GIS World. Published six times annually, this newsmagazine of Geographic Information Systems technology offers news, features, and coverage of events pertinent to GIS. Contact: Debbie Parker, Subscription Manager, GIS World, Inc., P.O. Box 8090, Fort Collins, CO 80526; (303) 484-1973.

LETTER TO THE EDITORS

April 26, 1989

Dear David,

Many thanks for your very snappy looking first edition of *Cartographic Perspectives*. In return, I enclose our most recent CCA Newsletter, and look forward to your future issues. It looks like I will be incoming CCA manager as well as

the newsletter western correspondent.

Given the multiplying number of meetings in cartography and GIS, and the difficulties of attending all such meetings, we could at some point perhaps consider the possibility of a joint annual meeting at some border crossing of well placed city, e.g. Seattle, Buffalo, Toronto etc.. We have gained much from recent joint meetings with like minded organizations, which helps foster continued co-operation, although their set-up can be complex.

Anyway the exchange of newsletters is extremely useful.

Yours sincerely,
Roger D. Wheate
University of Calgary

instructions to contributors

FEATURED PAPERS

All featured papers will be *solicited* by the NACIS Publications Committee. The goals of the solicitation procedure will be to select high quality papers that provide a balanced representation of the diverse interests of the membership. The primary mechanism for soliciting featured papers will be a paper competition held in conjunction with the Annual Meeting. All papers prepared for the meeting and submitted in written and/or digital form will be considered. Three of these will be selected to appear in *Cartographic Perspectives* during the next year.

In addition to the competition winners, the Publications Committee (in consultation with the editors) will solicit one or more papers each year from other sources. The goal here is to ensure that all aspects of the membership are served and to attract some thought-provoking ideas from authors who may not be able to attend the Annual Meeting.

Authors of selected papers will be given an opportunity to respond to suggestions of the Publications Committee or meeting participants before submitting as final version. The writing quality must adhere to high professional standards. Due to the interdisciplinary nature of the organiza-

tion, it is particularly important that papers are carefully structured with ideas presented succinctly. The editors reserve the right to make editorial changes to ensure clarity and consistency of style.

Papers ranging from the theoretical/philosophical to methodological/applied topics will be considered providing that ideas are presented in a manner that will interest more than a narrow spectrum of members.

To be considered for the paper competition, papers should be prepared exclusively for NACIS, with no major portion previously published elsewhere.

TECHNICAL GUIDELINES

Cartographic Perspectives is designed and produced in a microcomputer environment. Therefore, contributions to *CP* should be submitted in digital form on 3.5" or 5.25" diskettes. Please send paper copy along with the disk, in case it is damaged in transit.

Text documents processed with Macintosh software such as WriteNow, WordPerfect, MindWrite, Word, and MacWrite are preferred, as well as documents generated on IBM PCs and compatibles using WordPerfect or Word. ASCII text files are also acceptable.

Graphics generated with Adobe Illustrator or Aldus FreeHand for the Macintosh are most preferred, but generic PICT or TIFF format graphics files are usually compatible as well. Certain graphics formats for the PC may also be submitted (for example, HPGL (.PLT), CGM, EPS, and TIF).

For those lacking access to microcomputers, typed submissions will be tolerated. Manually produced graphics should be no larger than 11 by 17 inches, designed for scanning at 300 dpi resolution (avoid fine-grained tint screens). Continuous-tone photographs will also be scanned.

Submissions may be sent to: David DiBiase, Department of Geography, 302 Walker Building, Pennsylvania State University, University Park, PA 16802; (814) 863-4562.

COLOPHON

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NACIS membership form**North American Cartographic Information Society
Sociedad de Informacion Cartografica Norte Americana**

Name/Nombre: _____

Address/Dirección: _____

Organization / Afiliación profesional: _____

Your position/Posición: _____

Cartographic interests/Intereses cartografico: _____

Professional memberships/Socio de organizacion: _____

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

Individual/Regular: \$15.00 U.S./E.U.

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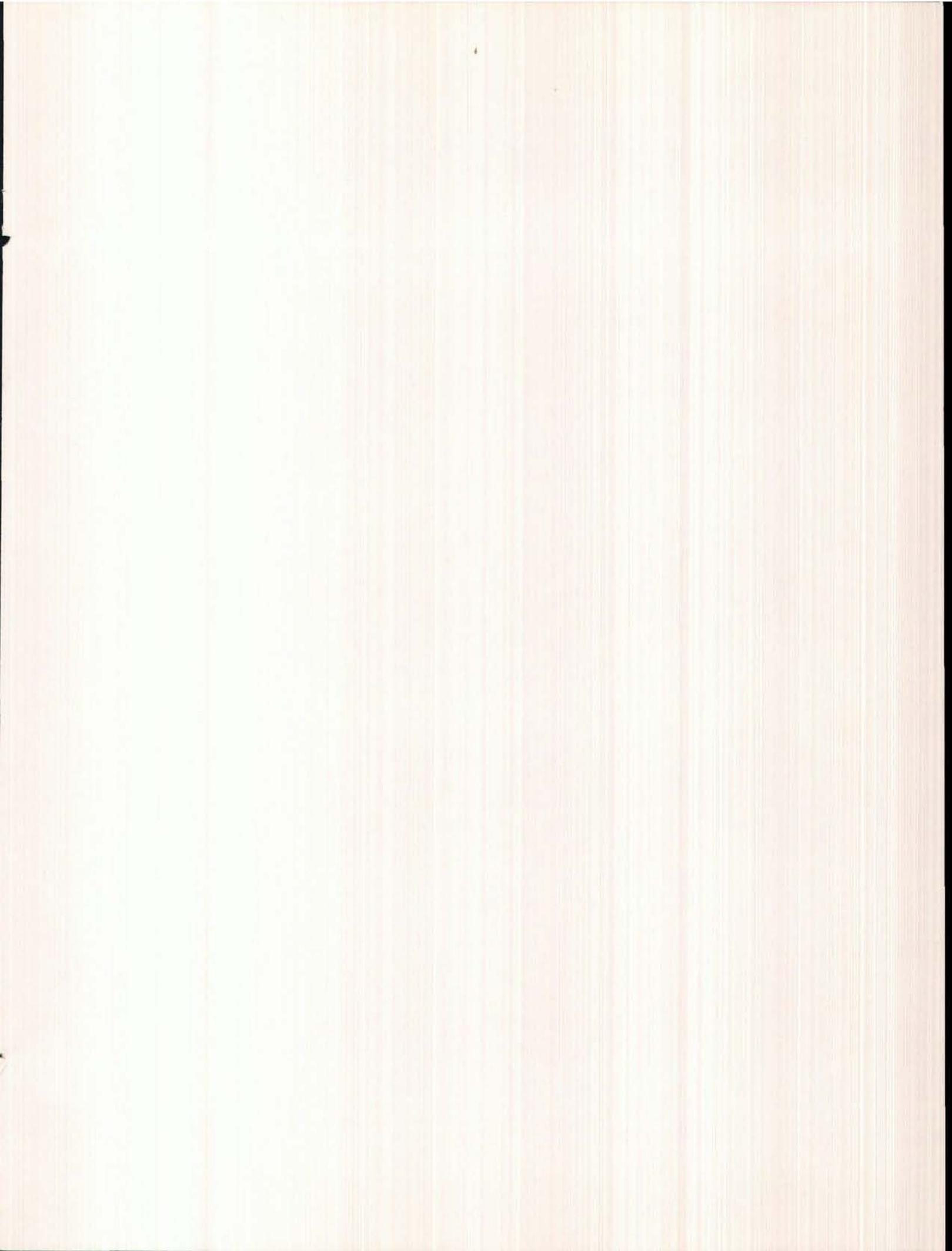
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NACIS

6010 Executive Boulevard, Suite 100

Rockville, MD 20852

U.S.A.



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

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