SUMMARY

In summary, we must begin to think of the attributes of the virtual map library in cyberspace. It must be constructed to serve the information needs of the digital spatial information user based on the function of the information rather than the form. These needs are similar in type to the needs of the map user; the library continues to collect information, describe it, and provide access to it. The University of Connecticut's Map and Geographic Information Center, MAGIC, is using these three functional solutions to meet the challenges outlined by Buckland in his book, *Redesigning Library Services: A Manifesto.*

REFERENCE

Buckland, Michael. 1992. *Redesigning Library Services: A Manifesto.* Chicago: American Library Association.

AUTHOR'S POSTSCRIPT

Some further observations in light of developments since the *Map Library in Transition* conference: It has been eighteen months since *Mosaic* transformed the Internet and the World Wide Web by opening up a Pandora's Box of information resources. Last year NASA, NSF, and ARPA began the Digital Library Initiative. The cost of computers has reached a point where a basic machine has the computational power which a workstation had when this paper was presented. It is difficult today to buy a computer that is not capable of computer mapping or even analysis. Operating systems are on the verge of true muli-tasking. Desktop mapping and analysis software now come bundled with spreadsheets (for example, Lotus 1-2-3 bundled with AtlasGIS, Notes and Microsoft bundling MapInfo with Office). ❑

Transition in the World of Map Libarianship

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I t is a pleasure to address you this morning. Over the past 15 years, I have gained a deep respect for the map librarian profession and for the cartographic materials and spatial data information that you provide. The topic of transition is near and dear to my heart, and as a historian, I was interested to see what happened on this day, in years gone by, that we could relate to today.

In 1873, in New York City, delegates from Columbia, Princeton, Rutgers, and Yale met to formulate the rules for American football. We, of course, meet today to discuss transition rules for spatial data collection management.

In 1907, the first plans for an International Court of Justice were announced. The Court was to be set up in The Hague, Netherlands. Today, The Hague is the home of the International Federation of Library Associations (IFLA), and I currently represent us as Chairman of the Geography and Map Section. My first IFLA meeting was in Montreal, Canada, and I am pleased to see several of our Canadian colleagues here today.

In 1922, Marconi and General Electric, the world's leading "wireless" manufacturers, formed a company to be responsible for broadcasting radio programs throughout Great Britain. Today, we have cellular phones and electronic maps zipping across fiber optics cables as part of the information highway.

In 1931, Thomas Alva Edison died at the age of 84. He had invented the phonograph, microphone, and kinetoscope. He also had designed a complete electrical distribution system for lighting and power. I suggest that we can draw a direct parallel to the current plans and designs for electronic cartographic products and information systems.

In 1970, Prime Minister Trudeau of Canada clamped down on separatists who wished to break away from the Canadian Government. I guess we should check on our Canadian friends to see if they crossed the border properly. Actually, it is only fitting that we address today's topic together. A couple of years ago, I had the pleasure of addressing the 25th anniversary meeting of the Association of Canadian Map Libraries and Archives and know that our concerns, problems, and interests are the same.

And finally, lest we forget how quickly things can change, on this day in 1989 the 7.1 Loma Priata "World Series" earthquake hit San Francisco. We, of course, all know that it brought down a section of Interstate 880, but it also raised havoc with cartographic materials collections. For them, it was a quick transition for sure.

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As a historian and cartographer, I must begin a discussion of transition by looking back at where we have been and how we have already changed.

As I mentioned earlier, one of my most rewarding and interesting associations with this profession has been through the IFLA. In 1982, at my first conference, I read a paper prepared by Larry Carver on remote sensing and handling remotely sensed materials. Larry was unable to attend the conference, and I was the newly elected United States representative to the section. Think about how many space images or aerial photographs you now have in your collections. It has only been 11 years. With Landsat in orbit at that time, the paper also mentioned digital data, but most listeners still assumed that maps would always be on paper and not on those big 9-track tapes.

In Munich, in 1983, I presented a paper at IFLA titled, "Earth Science Products for Tomorrow's Libraries." I discussed microfiche, microfilm, and videodisc cartographic products. I was also able to illustrate how our 1:100,000-scale digital data were being transferred to something called CD-ROM and that the price for national coverage would go from an estimated $20,000,000 to $448,000 to provide complete sets to the map depository libraries. I am convinced that the introduction of CD-ROMs was a major turning point in our current transition from paper maps to digital spatial data.

In 1988, we gathered in Sydney, Australia, for the annual IFLA meetings. My topic was "Will Your Library Be the Spatial Data Information Center of the Future?" I spoke about geographic information systems (GIS) and how they could answer complex, multilevel questions from your patrons. The most asked question of me was: "How do I get started?" On the way to Australia, I had stopped in Santa Barbara for a meeting with people from the Research Library Group who were beginning a Library GIS project to link the world's map libraries into a worldwide cartographic information system. Does it sound so farfetched now? How many of you are now running GIS software in your institution and communicating with people around the world?

HISTORY

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FUTURE

What does the future have in store for us? What new things will we have to deal with as we make the transition into the future? Obviously, we will be dealing with digital data in one form or another. For new United States earth resource satellite images, we will have to wait because Landsat 6 recently became "Hydrosat" and is imaging the bottom of the ocean. But with SPOT and future Landsats or commercial satellite systems, we will have high-resolution digital images in our collections and running in our GIS.

We will soon have raster-scanned images of our maps on CD-ROMs. A company in Aurora, Colorado, can already provide you a scanned image of any one of our 1:24,000-scale topographic maps for $99.

The largest new program that we are involved with is the digital orthophoto quadrangle (DOQ) program being run out of our Western Mapping Center in Menlo Park, California. We intend to produce 1:12,000-scale DOQs on a county-by-county basis for the whole country. The project is being accomplished in conjunction with the Department of Agriculture and several States. Minnesota and the upper Mississippi flood areas will probably be the first areas covered. One very important aspect of this program is that the data will only be available in digital form. We do not intend to print hard-copy versions of these black-and-white electronic products. Not only is this a challenge for you, but the Government Printing Office (GPO) must figure out how to fund the production of thousands of discs if they are to be depository items.

Within the U.S. Geological Survey, we are establishing a series of cooperative research projects with private industry. New legislation allows us to enter into these agreements to pool our respective talents and solve problems. We currently are negotiating one of these agreements with the Environmental Systems Research Institute, Inc. (ESRI). We hope to draw on ESRI's talent in GIS software development to assist us in land use and land cover programs and in developing applications programs that use digital line graph data from the USGS. There are hopes that this mechanism can be used to work with other private companies so that neither of us needs to digitize the same information and so that we can exchange it.

As the National Mapping Division goes through its transition, we have come to realize that we aren't the only people that can make maps. With today's hardware and software, any of you can probably make a map that is cheaper, more up-to-date, and just as accurate as ours. Recently, I was asked to judge a student map contest for the American Congress on Surveying and Mapping. In one Canadian geography program, each member of the class was asked to make a map of the same Caribbean island. Five of the resulting maps had been entered in the contest. What was fascinating about the results was the differences between the maps. Even though they covered the same area, the colors were different and some emphasized the highways while others highlighted the parks and natural areas. North arrows were in different places, and legends and keys were treated in very different ways. My guess is that we will see more and more of this, and while it will make it more difficult to catalog these products, the key to finding them again will be that same cataloging information.

Perhaps the area where transitions are occurring faster than in any other is in cartographic communications. Today, the Internet road on the super highway of information is being built from one campus or town to

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the other. Many of you are on the Maps-L list server, and questions and answers are being passed worldwide. At the USGS, we have started to use the World Wide Web Mosaic system as a means to provide information. In addition to providing information, we are also providing data free of charge. While the National Mapping Division is selling digital elevation models of the country, our own Water Resources Division decided to put them on the Internet where anyone can sign on and download them. Not very many years ago we were under pressure to recover not only all our reproduction and distribution costs for these products, but the production costs as well. Things have changed quickly. Because Government data can not be copyrighted or patented, anyone can put the data from any agency on the Internet.

Other things that we see in the future are on-line indexes, the ability to produce status graphics, and many metadata systems. These are what engineers and scientists call cataloging systems. After all the years of systems engineers designing information systems, they have finally discovered that the libraries knew how to describe and catalog data all along.

We also project that you will see maps and other spatial data products produced under cooperative programs. The U.S. Forest Service and the USGS, for example, are starting to produce a joint edition topographic and forest service map. There are 10,000 quadrangles covering the National Forests, and it is silly for both agencies to produce a same-scale map of the area. We have compromised on symbology and content and will now produce a similar map. If the Forest Service makes one quad, we won't remake the same one but will work on the one beside it instead. This will save money, speed up the revision process, and provide people with what they want. We hope this same approach can be taken with State agencies and even private companies. Talks are underway with firms like Bell South and Minnesota Power and Light.

I have already mentioned free data on the Internet, and with last week's announcement of the possible merger of Bell Atlantic and a cable company, I believe it won't be long before all our homes are wired into the information highway and we will not only be able to communicate with each other, but also to move data around and create products for ourselves to meet specific needs.

All of this raises many questions about how we, in the spatial data business, will work in the future. The following are a few questions that I think may stimulate additional discussion at this conference.

- What do you do when we no longer produce a final product but simply maintain national digital data sets?–For those of you used to dealing with maps, you may find that all the data we have are on tape or some optical storage media. How will your patrons see the maps if you don't have plotters, computers, and GIS software to handle the data?

- What happens if the reinventing government activities make major changes in the GPO depository program?–Major shifts to electronic media are one thing, but what if the agencies don't consider electronic data to be publications.

- What do we have when there are so many one-of-a-kind products that it is senseless to catalog them?

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QUESTIONS

- What happens to any collection when you can access it from home?–Will your reading room be necessary, and do you charge for the outside access?

- Who sets national standards, and how do you know who produced what?–Will the developing metadata systems look like, and be able to interface with, map cataloging systems?

- Have you started acquiring computers, software, and GIS packages?–Why haven't you?

- As an archivist, have you realized that you can't have it all and have you begun to figure out how to network or connect with the major sources or producers of spatial data products?–What happens when you become a producer and create a product with your GIS in your library?–Will you catalog everything?

CONCLUSION

We are continually told that we live in a changing world, and that is true. If people who died just 50 years ago were to return, they would be amazed and bewildered. The changes in our electronic information world have just begun. As an example, I just heard this information-age version of a famous old nursery rhyme. It went like this:

Mary had a little lamb,
Its fleece, electrostatic.

And everywhere that Mary went
the lights became erratic.

It followed her to school one day,
electrons all a-jiggle.

It made the children's hair rise up
and finger tips a-tingle.

The teacher tried to turn it out
her body was not grounded,
the sparks were seen for miles away,
and she's not yet rebounded.

You must not abandon the treasures that you, as map librarians and archivists, care for. Even in digital form, the maps you handle today will be the old relics for those who follow.

In the midst of so much that is new and in transition, there is a persistence of the old, the very old, in the world we inhabit. These old things are still, perhaps, more important than the new. We ride today in jet planes, but I can still remember the feel of the cold air on my face as I rode in my grandfather's sleigh, behind a team of horses, on a clear winter night. That memory has lasted longer than any plane flight for me.

You must not abandon the treasures that you, as map librarians and archivists, care for. Even in digital form, the maps you handle today will be the old relics for those who follow. Step forward and don't let the engineers and scientists define your role and your systems. Cartographic information is our province, and we should decide what we need to do to enhance and modernize the profession. ❏