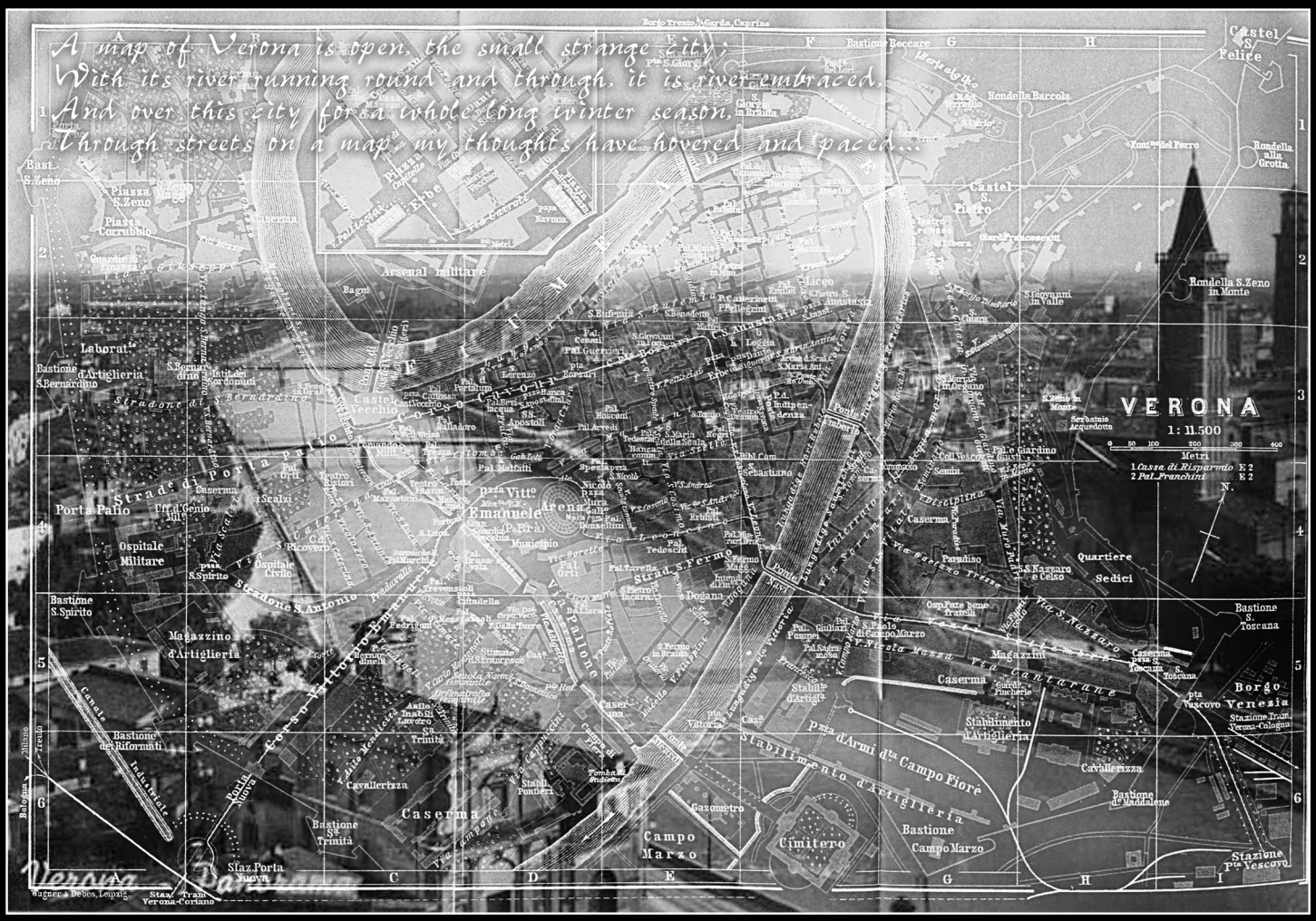
cartographic perspectives



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cartographic perspectives

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in this issue

Letter from the Editor

Rediscovering Cartography
By James E. Meacham, NACIS President, 2001-2002

I am pleased to report that our organization is growing and I sense a general feeling of optimism, opportunity and strong commitment in our ranks. We have seen a substantial growth in NACIS membership and meeting attendance over the last five years (see *figure 1*). At the 1997 Lexington meeting the attendance was 107 with a membership of 381. At last year's meeting in Portland the membership had grown to 485 and the meeting attendance had more than doubled to 231. The pre-conference event last year in Portland, "Practical Cartography Day," was also enormously successful, with 105 participants, including 65 more than was originally planned for. This is good news indeed. In a time when some have questioned the vitality of cartography, we are

(*continued on page 3*)

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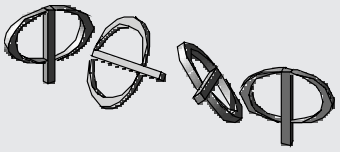
about the cover



"The cover design was created by Lou Cross. Lou is a cartographer and graphic artist with the Florida Resources and Environmental Analysis Center at The Florida State University.

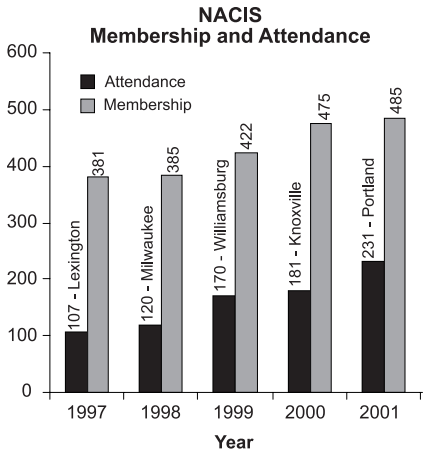
Verona collage, a tribute to Adele Haft's article in this issue discussing *Henry Reed's Poetic Map of Verona*. The map overlay taken from the Baedeker Fold-out map of Verona, 1928; The view of the *River Adige* from a postcard circa 1945; Poetry excerpt from Henry Reed's "A Map of Verona" 1942/1946.

seeing a substantial growth in our field.

I believe cartography is experiencing something of a rediscovery. From my point of view as a university cartography lab director and an active member of NACIS, I see substantial growth and renewed interest in cartography on several fronts in government, private industry, academia and the general public. In addition, the GIS community is turning out to a valuable partner rather than a threat to our profession. We need to move past the Cartography versus GIS debate (Tyner, 2001). I believe cartography is experiencing part of the increased awareness and growth that its parent discipline of geography and sister discipline of GIS are experiencing (National Research Council, 1997 and Goodchild, 2000).

The vitality of our field can especially be seen in the work of our membership. NACIS members are embracing opportunities on all mapping fronts, applying their cartographic craft and tools in very innovative and effective ways. They are making a difference in all disciplines that rely on spatial data from resource planning and environmental science to demographic studies and parks management. These efforts do not go unnoticed. Decision-makers and the public are rediscovering the importance of cartography through these efforts. These activities are defining us.

Through my work in the UO InfoGraphics Lab, I see first hand that government administrators and the rapidly expanding GIS community is rediscovering our profession and seeking us out for our knowledge and skills. We are the ones that can turn their rich databases and analyses - that are at the heart of their work - into well-designed data-rich print products and digital delivery systems. These products greatly assist them to fulfill their missions. My lab is seeing a rapid increase in these types of projects. We have put our cartographic knowledge to work on projects ranging from communicating Oregon's salmon recovery effort though maps and graphs, to building a comprehensive planning database of rural lands in our state. Students gain invaluable experience through these projects.



In our department we have noted increased demand for graduating students with cartographic design skills, in addition to the traditional GIS concepts, from both the public and private sectors. This is another significant indicator of the health of our field and our future.

As cartographers, we are in a vital period, a period of rediscovery. We must continue to embrace opportunities to apply our knowledge and skill in exciting and innovative ways. NACIS is both at the heart and the forefront of cartography. The NACIS community is strong and has the energy and the obligation to set the tone and the path for the future of our profession.

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Acknowledgments

I would to acknowledge the helpful comments from Erik Steiner and Kenneth Kato on this essay.

August 30, 2002

The Future Is Now: a Map Librarian's Response to "The Map Library's Future."

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C. Peter Keller makes many assertions and predictions on the future of map libraries in his recent essay published in *Cartographic Perspectives.*[1] However, instead of being based on any form of objective data or experience, these assertions and predictions appear to be based primarily on his personal perceptions of trends in map libraries and an assumption that users like himself are the primary or most important type of map library users. In this article I will respond to Keller's assertions and predictions and present my own version of the map library's future. Michael Gorman's statement "all important questions expand until they fill the world" is applicable to our question of the map library's future. In other words, we cannot answer the question "what is the future of map libraries?" until we know the answer to the broader question of "what is the future of libraries?" Further, we cannot answer that question until we know "how will people learn, and advance knowledge in the future?" This question, in turn, depends on the answer to "what is the future of society and of our civilization?" [2] The map library's future will no doubt be influenced by how map librarians are able to respond to the current circumstances and challenges within cartography, libraries, and various other parts of society in general. But ultimately, causal factors from business, government or the physical environment, often beyond control, may have the greatest impact on the map library's future.

"The map library's future will no doubt be influenced by how map librarians are able to respond to the current circumstances and challenges within cartography, libraries, and various other parts of society in general."

Changing Times: Horses and Motorcars or Apples and Oranges?

Keller begins with an analogy of the map being equivalent to the horse and digital geodata being the motorcar. The analogy is then used to bolster his claim that today's user is "no longer thinking of the traditional map library as a primary resource. They think of the map library as the traditional "stable" for paper maps, looking somewhere else to find the "garage" housing the digital mapping environment."[3] A more appropriate analogy would be maps as apples and digital geodata as oranges. Although users may prefer one format (or fruit) most have used (or consumed) both. Likewise many users will again in the future have needs for both formats. Just as apples and oranges together make a good fruit salad, paper maps and digital geodata compliment one another within the map library.

"Just as apples and oranges together make a good fruit salad, paper maps and digital geodata compliment one another within the map library."

Keller's argument that current map libraries should completely retool and focus primarily on digital geodata is primarily based on two assumptions: the "Golden Days" of paper maps are over (the paper map is becoming obsolete) and the expert GIS user is the map library's primary user. To bolster his argument that the paper map is in decline, Keller presents two pieces of anecdotal evidence.

As the first thread of evidence, Keller suggests that "today, those wishing to be associated with status and power no longer insist on having their picture taken next to a map or globe. Instead they opt to pose with images of computing hardware displaying information."[4] Keller presents no data, nor does he cite any studies, if any exist, that would confirm this assertion. Indeed, the opposite may still be true. A survey of portraits accessioned between 1990 and 2000, accessible via the Internet from the United

Kingdom's National Portrait Gallery within the "Politics, Government and Political Movements" category reveals that none out of a population of forty-six portraits have computer hardware in the background.[5] The point here is not to argue about the use of maps and globes as signs of status or significance. If, however, we are to make sound decisions about the map library's future, then we need tangible data and information and not analogies upon which we can base those decisions.

Keller's second thread of evidence for the suggestion that the paper map is obsolete follows: "knowledge gained during the ongoing technology and information revolution."[6] This "knowledge" is essentially Goodchild's lists of the fundamental weaknesses of paper maps and the potential of the database as map paradigm.[7] Keller focuses solely on the weaknesses of the map and the strengths of the database. To be objective paper maps, databases and even Goodchild's thesis all have strengths and weaknesses--as Pickles and Rhind have pointed out.[8] For example, one could argue that being static and fixed may be not be a weakness but a strength (less likely to be misused or intentionally altered or taken out of context). Another example is the poor cartography and the associated repercussions that are associated with the general displacement of cartographic teaching and standards within the academia and GIS community that have been suggested in this periodical and others.[9]

"If, however, we are to make sound decisions about the map library's future, then we need tangible data and information and not analogies upon which we can base those decisions."

POINTS OF CONTENTION AND ALTERNATIVE VIEWS

1) Are GIS Users Our Primary Users?

Implicit throughout his essay is the perception that the geographic information user of the future will be like Keller himself is (i.e. a digitally networked and technologically sophisticated high level user within the GIS community). Although important, the GIS community will remain a minority of the map library's users for the foreseeable future. First, the "Technology Society" or "Information Society" has yet to reach the majority of the World's population.[10] Second, even for that small segment of the World's population with the technology required for GIS, there is a diversity of users, skills and information needs. While their interests and needs may overlap, each library has a distinct and diverse clientele. And, each map library's collection is unique and varied, from large antiquarian collections to libraries providing topographic quadrangles for hiking expeditions. A good map librarian knows the community and serves the clientele with appropriate maps as well as appropriate technologies.

"A good map librarian knows the community and serves the clientele with appropriate maps as well as appropriate technologies."

2) Are We GIS Experts?

Although many map librarians are currently users of GIS, I disagree that most map librarians are now, or will ever really be expert users of GIS. Most map librarians have broad responsibilities including the care and maintenance of the collection, reference and research. To become highly proficient with GIS would require much more time than most librarians are able to devote. More likely, librarians will master mapping tools such as *ArcGIS* to quickly display data on a map to help answer a reference query. Likewise, librarians will be able to consult and provide advice on a range of GIS data related issues, in particular metadata. My point is to recognize that the real GIS experts are those using it every day as a part of a their daily work or research and it would be rare that a librarian could or would need to reach this level of expertise.

3) GIS Service Models in Map Libraries

I agree with Keller that "the foci of the mandate of the future will be on 'access' and 'use' of geographic and associated attribute information."[11] However, this is because these are essentially the foci of most map librar-

ies now. What I disagree with is Keller's assertion that these foci imply primarily, if not completely, digital information. Ironically, within his "vision for a future" Keller depicts an interesting scenario within a map library wherein "advances in printing technology will allow tomorrow's users to be able to print and take away a hard copy of a digital facsimile in full size and exceptional quality, if desirable."[12] I agree that this technology will improve access and that digital data will be increasingly important to map libraries. However, the process of digitizing maps on "just in case" scenario seems to contradict his argument that map libraries will need to adopt a business model approach. It is more economical for users to borrow or at least view the existing hard copy and map libraries to digitize, if needed, on a "just in time" scenario. Again, many map libraries, at least in the U.S., have already been engaged in digital scanning projects. However, it is not economically feasible for most individual libraries to attempt to scan large portions of their collections.

"Because of the diversity among librarians and users within and between map libraries, we have seen a diversity of GIS Service models emerge."

Because of the diversity among librarians and users within and between map libraries, we have seen a diversity of GIS Service models emerge. Keller points to many of these models and examples of map libraries that have gone "global" or those that have found champions in aiding their transition to a map library of the future. Although examining the GIS services of any of these libraries would be beneficial to one attempting to provide and promote a new service, no critical assessment of the various models has been done on GIS in libraries. I would warn Keller to be wary of any premature pronouncement of success this area. We really do not yet know which models are actually sustainable for libraries in the long run. We have, however, begun to realize what models are not viable for most. For example: in my opinion, the least viable and sustainable model is that which attempts to provide hardware and software akin to a GIS computer lab. Adler and Larsgaard still suggested that this is a viable model as recently as 1999 in describing the Automated Cartographic Information Center of the Borchert Map Library at the University of Minnesota.[13] It would be difficult for any map library to justify maintaining the most recent hardware and software for a large number of workstations that would simply be redundant of the services being provided within other campus computing facilities or the Geography Department.

"Virtual libraries also depend on a physical infrastructure which itself is not immune to disaster or neglect."

There are, of course, many effective models of GIS and digital geodata services in libraries. The point here is to affirm that these services are normally based on local needs and not global aspirations. Thus no two are exactly alike.

David Rhind identifies many of the causal factors of change in cartography.[14] Many of these same factors that may cause change within cartography will impact the map library of the future and may be beyond the immediate control of librarians, cartographers or even our collective voice. These may include more restrictive intellectual property rights, less access to government produced data, and a decreasing competition among GIS software producers. To Rhind's list of causal factors I would add the uncertainties of the physical environment and human error. Any map library could fall victim to environmental disaster (i.e. electrical shortages, fire, flood, acts of war, etc…). Virtual libraries also depend on a physical infrastructure which itself is not immune to disaster or neglect. Both physical and virtual libraries are impacted by human error or sabotage (i.e. misfiling, theft, failure to backup data, viruses). There are many historical examples of causal factors impacting map libraries. Map libraries in the U.S. benefited greatly from the mapping and geographical information gathering activities of the Second World War. After the war, this material flooded into many map libraries. There is no indication that this pattern

will repeat for digital data. The opposite may be true; high-resolution data will be more restricted in the future.[15] Another important indirect result of the Second World War (the baby-boom generation), that may have a great influence on the future of map libraries and libraries in general, is the demographic makeup of our population. Librarians are struggling with the uncertainty that libraries will not be able to replace staff equal to the rates of impending retirements of the next twenty years. The map library of the future may not have a trained and experienced map librarian staffing it because one may not be available.

"The map library of the future may not have a trained and experienced map librarian staffing it because one may not be available."

Also within his section on "Visions for the Future," Keller suggests that map libraries may have to adopt the business model approach to their services within this virtual, digital, and global environment. I would argue that most map libraries already facilitate, as a part of their reference services, many of the informational usage activities Keller suggests that we perform and charge fees for. The responsibilities of many map librarians include: offering assistance with map interpretation, creating a quick custom map for reference, helping with map design, helping users understand where they can find data, teaching classes, and providing location searching. However, like Eratosthenes, the ancient Greek mathematician and library director in Alexandria who was known as "Beta" since he was often second in prominence within a given discipline, map librarians, though well versed in many of these topics and activities, are rarely the expert in any. If map libraries, or any library or academic department for that matter, had to realize a net profit in the virtual environment, most would soon fail. Just as many of the "dot com" information provision companies that were to replace print and make libraries obsolete failed. Furthermore, charging fees that go beyond the recovery of incidental material costs is in direct conflict with the mission of many institutions. This type of rationing contributes to the disparity in resources available among the "haves and have-nots."

"If map libraries, or any library or academic department for that matter, had to realize a net profit in the virtual environment, most would soon fail."

4) What Map Librarians Do Best

The five core functions (identify, collect, organize, preserve, and make available) of the traditional map librarian are still relevant for digital geodata. Although each function still needs to be performed, librarians need not, and should not, always be solely responsible for each nor will the emphases on any particular function be the same as it is for paper maps.

No where in Keller's essay do we find mention of what it is that librarians are really the best at: creating metadata or cataloging for the information in their collections. In my view librarians have the skills to be able to provide a high level organization to the virtual collections of data via metadata. For many GIS users the creation of metadata is onerous and the more complex the dataset, the more time consuming and complex the metadata. With the cataloging skills of librarians and the GIS skills of geographers and cartographers, the disciplines can work together on collaborative projects to insure that GIS data is adequately documented and retrievable in the future.

". . . librarians have the skills to be able to provide a high level organization to the virtual collections of data via metadata."

For the functions of storing, preserving and making accessible digital data, several university libraries, such as those mentioned by Keller, have sponsored or have been directly responsible for creating and maintaining National Spatial Data Infrastructure (NSDI) clearinghouses. However, many more have collected and in effect become the informal clearinghouses of unique or local data sets for their users. Opportunities for user driven collecting will continue. Also, many map libraries have begun archiving legacy data sets to preserve and make accessible historical information.

SUMMARY Map Libraries will continue to grow and be relevant in the future because of the diversity of our users, collections and services. For most map libraries, to ignore the paper collection would be to ignore the needs of a set of users that may not be as digitally connected (or wish to be) as the expert GIS user. As individual map libraries try to evolve and balance their resources, they will need real facts to make informed decisions. However, even in making sound decisions we face risks of indirect and direct causal factors from government (i.e. laws, security, war, politics), business, technology and the physical environment (floods, fires, electrical blackouts) that are often beyond our control.

NOTES

[1] C. Peter Keller, "The Map Library's Future." *Cartographic Perspectives* 38 (Winter): 73-77.

[2] Michael Gorman, "What is the future of cataloguing and cataloguers?" in Programme and Proceedings of the 63rd General Conference of the International Federation of Library Associations and Institutions, Copenhagen, Denmark, August 31—September 5, 1997, 1. < http://ifla.inist.fr/IV/ifla63/63gorm.htm>

[3] Keller, 73.

[4] Ibid., 73.

[5] http://www.npg.org.uk/live/index.asp

[6] Keller: 73.

[7] Michael F. Goodchild, "Cartographic Futures on a Digital Earth." *Cartographic Perspectives* 36 (Spring): 3-11.

[8] John Pickles, "Cartography, Digital Transitions, and Questions of History." *Cartographic Perspectives* 37 (Fall): 4-18; David Rhind, "Business, Governments and Technology: Inter-linked Causal Factors of Change in Cartography." *Cartographic Perspectives* 37 (Fall): 19-25.

[9] Judith A. Tyner, "Whither Cartography? *Cartographic Perspectives* 38 (Winter): 3-6.

[10] Rhind: 20.

[11] Keller: 74.

[12] Ibid.

[13] P.S. Adler and M.L. Larsgaard, "Applying GIS in Libraries," in *Geographical Information Systems: Principles, Techniques, Applications and Management*, 2nd. ed. P.A. Longley, M.F. Goodchild, David J. Maguire ed. (New York: John Wiley & Sons), 907.

[14] Rhind, 19-25.

[15] Mark K. Anderson, "Military Wary of Map's Release," *Wire News* (December 12, 2000).

The Map Library's Future Revisited: A Response

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A senior colleague once explained to me that what matters is not the number of articles one publishes, but the impact they have with the readership. Using his yardstick, my article (Keller, 2001) expressing thoughts on the map library's future performed reasonably well. But it did so in part for the wrong reasons. I confess I deliberately wrote the article provocative to solicit response and dialogue. But I have offended some by the style of writing, and by my choice of analogies. I did not wish to cross the boundary to offense. For that I sincerely apologize. Those whom I have offended, please try and look for what I said instead of how I said it.

I followed the comments about the article posted on the various list servers with interest. Thanks also to those of you who e-mailed or wrote in private! I appear to have struck a raw nerve. Some of you didn't like the future I predict. Some of you took objection to the fact that I wrote from a map library user's point of view, and that I have a perceived GIS bias. On the other hand, many of you agreed that the points raised need to be debated, and that some of the points need to be acted on. Finally, there were a number of you from the map library user community who wrote to say that you were in full agreement with what was written.

Scott McEathron's (2001) reply raises some of the issues brought out in the list server discussions. His primary objections, however, appear to be that what I say are assertions and predictions based on personal experience and perception as a map library user without data collection and empirical analysis to back my opinions, and that it is inappropriate for me to speak out without the training and experience as a map librarian.

"Is it appropriate for a map library user to express opinion about the future of map libraries?"

Is it appropriate for a map library user to express opinion about the future of map libraries? My advocacy for user surveys and market research to understand society's needs and wants for maps, map products and map services is on record (Hocking and Keller, 1993; Keller, 1995a/b, Keller et al., 1995; Keller and O'Connell 1997). I am a firm believer in the users' rights to comment on products and services. My position is that professions, especially those in a service business, should not argue that they know what is best unless they have consulted extensively with their past, present and potential future clients? I agree with Scott, therefore, that we need facts and hard evidence to guide the map library's future. One way to get this is to conduct user surveys and market research. I hope my article and the subsequent discussions are of help when negotiating the necessary funding to support such research.

"In my mind there is no doubt that the distinction between a map library and other libraries will diminish in the future, that libraries increasingly will become information commons, and that the digital world will dominate."

I decided to put my personal thoughts about the future of map libraries to paper because of a genuine care and concern for map libraries. I care for their future. In my mind there is no doubt that the distinction between a map library and other libraries will diminish in the future, that libraries increasingly will become information commons, and that the digital world will dominate. The key visions I offered were that:

1. there will be a steady switch in emphasis from the paper map to the digital map, and map libraries therefore will have to embrace the virtual medium to survive;
2. successful map libraries of the future will broaden their mandate to become both, digital geographic and associated information resource centers;

3. in today's political and economic climate map libraries need to seek win-win strategies and collaboration in order to advance; and
4. the future map librarians will have as their primary purpose the dual roles of:
   i: information filter / information gatekeeper
   ii: offering assistant with geographic information access and use

Expressing these visions does not imply that I like or endorse them all. Quite the opposite! I love paper maps. I am an avid sailor who has a hard time letting go of paper charts. I watch with great skepticism as fellow sailors progressively switch to digital charting software fully integrated with GPS, radar and all sorts of other electronic gadgets. I am holding on to my beloved paper charts for now. But I know deep down that soon I will be in the minority and that eventually, the laws of marine navigation will change in response to public pressure, making it legal to navigate without paper charts. Scott McEathron may well point out that the above is another assertion I make based on personal experience without having hard data to prove it. But predictions sometimes must be made based on personal experience and gut feeling. Only the future can tell whose predictions ended up right or wrong.

"But predictions sometimes must be made based on personal experience and gut feeling. Only the future can tell whose predictions ended up right or wrong."

I wish briefly to comment on another couple of points Scott raises. Scott speculates that: "Although important, the GIS community will remain a minority of the map library's users for the foreseeable future" (McEathron, 2001, 4-8**.** I assume that "the GIS community" he refers to includes all those wishing to gain access to digital data. Let me share another personal observation. Some months ago I had lunch with a very respected retired member of our cartographic community. Chatting about her children's vacation plans, she informed me that she had looked up and studied their holiday destination on the Internet to become more familiar with the region's geography. Knowing that she has an extensive collection of excellent atlases in her home, I asked why she consulted the Internet instead of her atlases. I was amazed to learn that she thought the information easier to access on the Internet, and that she judged the Internet more informative. I learned a lesson that day that makes me ponder Scott's above statement. I believe that his prediction will be proven correct for those map libraries that don't make the transition to the virtual world. These map libraries will run the risk, however, of seeing their traditional clientele diminish as many of the old paper map clients will become part of the digitally literate GIS community. These libraries therefore will likely not be the map libraries of the future.

"The ability to duplicate and transfer digital maps at minimal cost makes the need for each map library to digitize their collection redundant."

Further on in his article, Scott acknowledges that the need does now exist for map libraries to offer digital map services, but that "it is not economically feasible for most individual libraries to attempt to scan large portions of their collections". He therefore argues that "it is more economical for users to borrow or at least view the existing hard copy and for map libraries to digitize, if needed, on a "just in time" scenario." My speculations differ. The ability to duplicate and transfer digital maps at minimal cost makes the need for each map library to digitize their collection redundant. A collaborative and coordinated effort by map librarians should allow any one paper map to be digitized once and once only (to mutually agreed to quality standards), thereafter distributing the digital version as required. Such a coordinated effort will be able to take full advantage of what Scott describes as strengths of map librarians, namely the abilities to create metadata and to catalog. Making duplicate digital copies distributed widely also resolves many of Scott's fears of causal factors impacting today's map libraries, such as sabotage, environmental disaster or human error.

Scott also raises interesting points when noting that "if map libraries, or any library or academic department for that matter, had to realize a net profit in the virtual environment, most would soon fail", and "furthermore, charging fees that go beyond the incidental material costs is in direct conflict with the missions of many institutions". Both these observations strike at the core of contemporary debates in society. Fundamentally opposing philosophical and political viewpoints exist in the developed world about the right to charge fees for information gathered and manipulated by the state and by private enterprise, and about the future of government subsidized services versus services delivery by private enterprise. It is exciting to see map librarians actively participate in these debates. This brings me to my last point.

"Fundamentally opposing philosophical and political viewpoints exist in the developed world about the right to charge fees for information gathered and manipulated by the state and by private enterprise, and about the future of government subsidized services versus services delivery by private enterprise."

I disagree with Scott that the future of map libraries must remain unanswered until we have solved the general question of the future of libraries, of society and of civilization. To wait is to be reactive instead of active or proactive. Anyhow, the majority of map librarians already are actively and proactively looking for ways to address and manage changing societal values and the technology revolution. It appears that this includes Scott's map library at the University of Illinois at Urbana-Champaign, a library that already proclaims a digital drainage network as its banner image, and one that does offer a number of digital data access services (see http://www.library.uiuc.edu/max/).

I have a lot of respect and admiration for the hard work and visionary efforts undertaken by map librarians. My apologies if this did not come through in the original article (Keller 2001). I took the easy route by writing about the future. You face the challenging task of managing the day-to-day transition. To quote: "Predicting the future is easy. It's trying to figure out what's going on now that's hard" (Fritz R. S. Dressler, http://www.quotablequotes.net/). Please keep up the good work.

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Mapping Ethnicity: Color Use in Depicting Ethnic Distribution

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Color effects are in the eye of the beholder.
Yet the deepest and truest secrets of color effects are, I know,
invisible even to the eye, and are beheld by the heart alone.
(Itten 1970)

Maps are made for a specific purpose, or set of purposes. No individual cartographer or cartography-producing organization produces a map just for the sake of producing a map. People and organizations have agendas; maps tell stories. Map stories are told through symbols and colors. Colors have meaning. Perhaps color choice is intended to indicate an organization's attitudes toward the phenomena being mapped. Color on maps of ethnic groups can be evaluated inter-textually by placing the maps into the context of their producers and the time of their production. The colors, and their meanings, that are used to represent particular groups will reflect the map producer's attitudes toward the ethnic groups. If these attitudes are unknown, they could be hypothesized by evaluating color usage. Color choices may act as indicators of opinions otherwise unexpressed.

ROLE OF THE ORGANIZATION

Much of the thinking about the role that organizations play in producing supposedly scientific maps was done by Harley (1988) during the latter half of his career. He began this work by examining antiquarian maps in a context far greater than the normal "map as beautiful object". Instead he examined them with the idea that the maps were artifacts produced by agents of organizations with particular goals and objectives. Harley wrote that the knowledge contained in maps was used to maintain the *status quo* and that this practice continues into the present. Maps must be "interpreted as socially constructed perspectives on the world, rather than the 'neutral' or 'value free' representations" that they previously had seemed (Harley 1988, 58).

"Maps are products of more than just simple rules of form and composition, of scientific fact gathering and logical display."

These ideas, which Harley applied to maps created in the fifteenth through seventeenth centuries, were applied generally in "Deconstructing the Map." Maps are products of more than just simple rules of form and composition, of scientific fact gathering and logical display. Even the most scientific of maps are the products of the "norms and values of the order of social tradition." (Harley 1989, 2) These norms and values vary between cultures and societies, thus the rules of cartography will also vary. But two unspoken rules seem to be common across all cultures: ethnocentrism and hierarchicalization of space. Harley does not feel that these rules are conscious acts but instead are manifestations that are taken for granted; one's own place or culture is always at the center of the universe, and in a naïve way, the places of those who are higher in society are more important than of those who are low.

> Cartography deploys its vocabulary accordingly so that it embodies a systematic social inequality. The distinctions of class and power are engineered, reified and legitimated in the map by means of cartographic signs. The rule seems to be 'the more powerful, the more prominent.' To those who have strength in the world shall be added strength in the

> map. Using all of the tricks of the cartographic trade — size of symbol, thickness of line, height of letter, hatching and shading, the additions — . . . maps, like art, become a mechanism "for defining social relationships, sustaining social rules, and strengthening social values."(Harley 1989, 7)

Harley never uses the word propaganda; he dances around it looking for something deeper than some of the grotesque and unsubtle uses for which maps have been created. Harley is searching for links between cartography and power. "Power is exerted *on* cartography. Behind most cartographers there is a patron; . . . Power is also exercised *with* cartography. Monarchs, ministers, state institutions, the church, have all initiated programs of mapping for their own ends." (Harley 1989, 12)

One of the earliest articles discussing propaganda maps is Speier's (1940) "Magic Geography" that was funded by the Research Project on Totalitarian Communication. Speier indicates that while line weights, part shapes, color use, and symmetry are all "extraneous to the scientific purpose of a map" propaganda producers exploit these elements to communicate a specific idea, regardless of its truthfulness (Speier 1940, 313). Speier (1940) describes a number of different cartographic propaganda products, including ethnic mapping. He explains that the German government was evidently interested in showing its people that the Second World War would not be a repeat of the first. In depicting the situation, German areas were shown in red, enemy countries in yellow, and neutral countries in gray. In *Under the Map of Germany* (1997), Herb describes a number of examples of using red in exactly this way in *Andrees Handlatlas*, *Westermanns Weltatlas*, and school atlases; red was used to depict German populations and a difficult-to-distinguish-from-red brown was employed to indicate "Kaschubes and Masures," which visually increased the amount of German-controlled territory (Herb 1997, 96-97). Occasionally, the selected red hue, perhaps in concert with value and saturation, is not quite as prominent. Herb also includes an example of a 1918 map published in Vienna that included German and Polish population distributions. This map "appeared to favor the Germans because it displayed them in red, a very dominant color … inspection revealed that Spett chose a red that was almost violet. This made the Germans look less prominent than the Poles, who were designated by a bright green" (Herb 1997, 38).

"Power is exerted on *cartography. Behind most cartographers there is a patron; . . ."*

Wright (1942, 530) describes how reds with differing values could be used on a map of "Pomeria" by the hypothetical *Bulletin of the Sudian Geographical Society* to show the population distribution of "Nordians" and "Sudians." Sudian population percentages are shown using a sequential scheme, white to red, ranging from white showing areas where Sudians comprised less than ten percent of the population to dark red showing areas of more than ninety percent Sudian. Although in Wright's (1942) example, the population size of these groups is nearly equal because the Nordians are concentrated in urban centers while Sudians are predominantly rural. The distribution of Sudians is shown in shades of red, and Pomeria appears to be predominantly Sudian. While Wright (1942) could have used any hue in his example, he chose for a Sudian journal to use red for depicting the distribution of Sudians.

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Centers of Jewish populations "were prominently depicted in yellow—an indication of what was on the mind of the Nazis" on a classified ethnographic map of Poland used by Hitler (Herb 1997, 144). In an example drawn from late twentieth century state road maps, Wood (1992), as part of a discussion of cartographic symbols that are used on a map but do not

appear in the legend, states that North Carolina is white while a "yellow tint [is] used for 'other states.'" (p. 99) Yellow is an interesting hue choice for indicating "other" because it is highly visible as well as being one of the better remembered hues (Saunders 1961, 7).

The production of ethnic maps could be included in Harley's idea of connecting maps to the power of an organization. Maps showing ethnic groups often follow color practices, similar to these uses of red and yellow, while attempting to not be overt propaganda pieces. Usually maps of ethnic group locations fall within the bounds of good cartographic "taste" and do not exaggerate cartographic elements.

COLOR CARTOGRAPHY

Beyond studies of color production and physiological/physical/visual perception of color, little research has been done in geography/cartography on connotations attached to colors by map users. It appears that some work was done on the use of color on late nineteenth and early twentieth-century maps. An awareness of potential problems in color use was expressed quite early. At a German Geographical Meeting held at Nuremberg in May 1907, Eckert stated, "If cartography were devoid of art it would sink to the level of a mere handicraft, as is evidenced even to-day in many map products of inferior quality. On the other hand, an artistic appearance, particularly a pleasing colouring, can deceive in regard to the scientific accuracy of a map" (Eckert 1908, 347). Although Eckert's comments were intended to be applied to landform maps and other maps depicting physiography, land cover, and climate, his comments could be extended to ethnographic mapping. Robinson (1952) set Eckert's statement into the context of propaganda maps by writing, "The increased color reproduction facilities as well as the growth of propaganda maps during the last decade or so, has brought a realization of the danger of using color haphazardly." (p. 76)

"Maps showing ethnic groups often follow color practices, similar to these uses of red and yellow, while attempting to not be overt propaganda pieces."

Keates (1962) in *The Perception of Colour in Cartography* discusses problems of color perception from both physiological and psychological view-points. He emphasizes that, not withstanding differences in physiological perception, there will differences in psychological color perception because of differing previous experiences and training. Keates (1962) places psy-chological color perception within the context of civilization and society.

> "One salient fact, common it seems to all civilisations, is that colour has subjective associations, partly social and traditional, and partly personal. We cannot ignore these subjective associations in the graphic arts—in fact in cartography we frequently rely on them—but it is important to realise that not all people develop the same types of associative idea. The symbolic connotation of hue is as old as civilisation." (p. 21)

". . . little research has been done in geography/cartography on connotations attached to colors by map users."

Keates (1962) also touches on how color is used to indicate elevation, a topic covered much more thoroughly by Imhof. Imhof's (1982) comments on color center on using color to depict elements of the landscape, primarily elevation, but also land-cover and geomorphologic forms with the choice of hue often being driven by the visual appearance of the landscape. Imhof (1982) writes that on topographic maps

> "the *color symbolism of maps* is firmly established. … As far as the choice of color permits, one should retain the colored appearance of the landscape, . . . Examples are lowland green, ocean blue, white or light gray ice, the yellow or brown color of fields or desert, the green of grassland and the darker blue green of forest." (p. 74)

Imhof (1982) continues by briefly listing other conventional color uses for other kinds of thematic maps: cooler isotherms blue, warmer isotherms red; climate zones and associated vegetation zones ordered as blue (arctic/subarctic), blue green (subarctic/subalpine), yellow green or olive (temperate), brown or orange (subtropical), and red (tropical); precipitation amounts in shades of blue; population levels in red or yellow ("skin color of man"); high air pressure is red while low pressure is blue. Maps representing surface conditions often mix naturalism, using colors closely associated with the surface features being depicted, with symbolism, standardized color use conventions such as the aforementioned list of climate zones and associated colors (Imhof 1982).

Wood questions whether the colors selected to "code" specific kinds of land cover can be anything but arbitrary. He quotes an introductory comment from the National Geographic Society's *Atlas of America: Space Age Portrait of a Continent* that states that colors were chosen to create "a realistic view of the physical world" and continues with "*A realistic view?* What can this mean but that since the film [color infrared] cannot be relied on, *humans will apply the appropriate colors?*" There is seemingly no way for a human-produced object to be truly realistic because of the interpretation and abstraction that goes on during the creation process (Wood 1992, 55-65). Later in the same work as well as in an earlier work (Wood 1986), Wood writes that using blue to indicate the presence of water is neither "self-evident" nor historically consistent. Water is many different colors, both naturally and through human intervention. Blue water on maps is merely a convention, and according to Wood this is "fortuitous, for the color used to represent water on the map *image* does double-duty as background for the sheet *as a whole*" (Wood 1986, 57 and 1992, 99). Blue is the "metaphor" for water as green is for trees regardless of season, pollution, and short or long term environmental changes (Wood 1986, 77). Thus the use of color to show "realistic" landscape is nothing more than coding for the landscape type; color on a map will never be the item, only a symbol requiring interpretation.

"Thus the use of color to show 'realistic' landscape is nothing more than coding for the landscape type; color on a map will never be the item, only a symbol requiring interpretation."

Robinson (1967) provides three reasons that cartographers must be knowledgeable about color use: color assists in simplifying and clarifying a map's contents; color "use seems to have remarkable effects on the subjective reactions of the map reader;" (p. 50) and color assists in increasing general perceptibility. The second of these is of great importance when considering the use of color on maps of ethnic groups. Less than fifteen years later, Robinson and Petchenick (1976) indicated that color research has not been applied to cartography:

> "There now exists a sizable body of published psychological research into the effect coding dimensions (the graphic form given to a symbol--color, shape, size, etc.) on various tasks involving the use of graphic displays. Very little of this research, however, has been conducted in the context of cartography, probably because of the enormous complexity of even a simple map." (p. 82)

"Work on color has advanced but still does not include a robust or global study of color meanings as applied in cartographic contexts."

Work on color has advanced but still does not include a robust or global study of color meanings as applied in cartographic contexts. The work that has been done most recently largely centers on using color to enhance data interpretation and to accentuate patterns or connections.

COLOR PREFERENCES

The reactions to and preferences for color have been studied largely in psychology and advertising. Unfortunately, most of these studies focus on hue (nearly always referred to as "color") without holding value and satu-

ration constant or taking into account their possible affects on reactions to color. Whitfield and Wiltshire's (1990) review article is the most recent to summarize the large and diverse literature about color preferences. In particular are studies performed with color chips that highlight the difficulties in comparing results of different studies because past researchers did not take into account the three-dimensional aspect of color, nor did they typically consider the color environment surrounding the test chips.

Studies have been conducted using three different kinds of tests: naming the first color that came to mind, identifying a favorite color, and comparing or ranking colors from most to least preferred. Overwhelmingly, red and blue emerge as preferred colors. Yellow appeared to be the least preferred color. In the middle, green generally ranked higher than orange or purple but there was no clear color preference order, nor was there a clear position for brown except for it being ranked below red, blue, and green. There were some differences that seem to be dependent upon cultural orientation and educational program.

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In a study done at the American University of Beirut, Choungourian (1968), found that American students preferred red (with blue second) while students from Lebanon, Iran, and Kuwait preferred different shades of green (with a variety of other hues second). Previous to this study, it was thought that red (and then blue) were "universal" favorites. Unfortunately, the conclusion of this study does not evaluate why there were such varying results. Perhaps, it could be suggested that the use of green as a religious color biased the responses from the subjects from predominantly Islamic nations, or that green is a preferred color in more arid nations because of the connotation of vegetation associated with water sources. Similarly, red and blue might have been preferred by American students because of the implied connotations of national identity.

A different set of studies (Wiegersma and De Klerck 1984; Wiegersma and Van Der Elst 1988) found that American subjects tended to select blue regardless if asked to name the first color they thought of, to name a favorite color. Blue also led in studies done in Australia and some parts of Africa. But elsewhere, when asked to name the first color that came to mind, red and black emerged as the leaders. Explanations for this were not clearly articulated but the authors seem to indicate that these preferences were "culture-dependent," and not a response to any kind of language bias.

"There were some differences that seem to be dependent upon cultural orientation and educational program."

In a different kind of study (Gotz and Gotz 1974) two groups of university students comprised of art majors and non-art majors were asked to evaluate a set of colors as to whether they were "pleasant," "unpleasant," or "neutral". There were some distinct differences between the two groups. For both of the groups, red and blue were considered pleasant, and gray and pink were unpleasant. The non-art majors had two additional unpleasant colors, black and violet, and an additional pleasant color, orange. Both groups regarded white as neutral; the art majors also included black in this category while the non-majors included beige. No trends could be found for green or yellow but these two colors were not considered neutral by the survey subjects.

A "paired comparison experiment" (McManus, Jones and Cottrell 1981) with Munsell colors, controlled for hue, value and saturation, was performed to discover if color preferences remained consistent throughout the experimental period; if there are gender differences in color preferences; if differences in color preferences are a function of differences in hue, value, or saturation; and if an individual's preferences are consistent through time. Generally, "archetypal" red and blue/blue-purple hues

were preferred with green-yellow and black being disliked. As the hues became less saturated, blue remained liked while red and yellow were disliked; this was also the pattern as the hues' values were decreased. The researchers also found that females had a strong dislike for green-yellow while males disliked black. It appears that hue preference was most clear when value and saturation were held constant. Overall, blue was preferred and yellow was disliked by a majority of the study's subjects. There was no clear-cut ranking of the other hues presented.

A more recent study (Taft 1997) investigated semantic responses to color chips/samples and the same colors applied to a variety of every day items. Thirteen colors, eight from the "outer edge of the NCS hue circle" thus somewhat controlling for value and saturation, plus three colors of less specific hue and value (pink, brown, and beige) as well as black and gray, were tested. There were five bipolar scales, beautiful-ugly, elegant-vulgar, loud-discreet, masculine-feminine, and warm-cold. Participants were asked to respond to color samples and colored items on these scales. While the results for the individual items with the same color may have varied (in part connected to the appropriateness of the color for the item), for the most part the trends of progressing from positive to negative (on the beautiful-ugly and elegant-vulgar scales) were similar to other studies. Red and blue were given first and second preference. Black moved up considerably, to third or fourth place, but pink, yellow, and orange remained near the end of the rankings.

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Dent (1999) summarizes color preferences without attribution. "Generally, [adults] tend to favor colors at the shorter wavelengths. Color preferences among North American adults are blue, red, green, violet, orange, and yellow, in that order . . . Women show a slight preference for red over blue and yellow over orange, whereas men slightly prefer blue over red and orange over yellow. Both sexes choose saturated colors over unsaturated ones" (p. 294). Dent (1999) also reminds his readers that colors with longer wavelengths, the red (warm) end of the spectrum, seem to advance in the field of view, thus appearing closer, while colors at the blue, shorter wavelength (cool) end of the spectrum appear to recede. Hues with higher values that are more saturated also advance, while those with lower values or are less saturated recede. (p. 296)

COLOR MEANING AND USAGE

Beyond color preference and physiological reactions to colors, cultural symbolism of colors should be examined. "A significant although less important aspect of color methodology concerns the conventions, preferences, *and the traditional significance of colors*. The cartographer must be familiar with all these considerations before he can effectively evaluate the color technique." (Robinson 1952, 81) Robinson does not elaborate on the impact of the meaning of colors when he writes about cartographic color use. But color meanings, and the subtle shading that meanings can impart to map contents, are potentially significant in examining ethnic mapping.

"Color meanings, and the subtle shading that meanings can impart to map contents, are potentially significant in examining ethnic mapping."

Dent also suggests that color connotations must be taken into account in combination with intended use when designing a map. He does not address potential cultural differences in meaning. (Dent 1999, 296) As with color preferences, there are cultural differences in color meanings but there are also commonalties. Unfortunately, colors can have multiple meanings, some seemingly in direct conflict with each other, which leads to difficulty in "assigning" a meaning to a color without fully knowing the color's use context historically and culturally. Colors may also change meaning with different contexts or when accompanied by other colors.

Additionally, responses to colors and their associated meanings can vary in intensity from county to country and ethnic group to group and

without regard to the medium on which the color is applied. At the 1995 Dayton Peace Accords, Richard Dilley "was advised to not wear a brand new green blazer because 'That Muslim color would insult the Serbs.'" (Ward et al. 2001, 14)

Berlin and Kay found that "a total universal inventory of exactly eleven basic color categories exists:" white, black, red, green, yellow, blue, brown, purple, pink, orange, and gray. (Berlin and Kay 1969, 2) These basic colors, not including pink and disregarding differences in value and saturation, were the subject of a Dutch study intended to recommend improvements for color use on Dutch-produced maps. (van der Weiden and Ormeling 1972) The researchers were aware that colors often have subjective meanings attached that could affect how map symbols are interpreted. Participants in the study were asked to associate colors with ninety "catchwords," of which fifty were terms that might appear on a map legend. The participants were not asked which colors they personally preferred but rather which colors had the "best fit" or "best relationship" to the catchwords. Some of the study's associations, along with associations from other sources, appear in Table 1. The authors caution their readers that "the results found can only be of value to cartographic products directed towards Dutch consumption, because one has to accept that the preference [association of color with concept] for certain colors differ from country to country." (van der Weiden and Ormeling 1972, 287)

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ADDING ETHNICITY

"That colors possess value dimensions has implications for those working in ethnic relations. It is possible to stigmatize a person or group graphically by depicting them in colors designed to reflect negative attitudes." (Sommer and Estabrook 1974, 37) Ethnic groups are people tied together through commonalties such as language, race, religion, and cultural origin. Quite often, ethnic groups have life styles, customs, dress, and value and belief systems that differ from other ethnic groups. Ethnicity is more than mere self-determination or definition. How those outside a particular ethnic group, especially an organization with an active publication program, view and symbolize that group can effect how the group is seen by third parties.

The effort to map ethnic groups or ethnic territory, relying on language, race, history and religion, is not new although it appears to have gained momentum with the European Romantic movements, with an increasing interest in vernacular languages as well as folk literature, costume and other cultural markers, and the subsequent growth of nationalism. Ethnographic maps began to be used "to substantiate the claims of rival nations to specific territories." (Wilkinson 1952, 548) Early maps used hand-tinting to apply color to areas (choropleth) occupied by specific groups with a later refinement of using specific symbols to show minority populations. Dots and proportional symbols came into use between the first and second world wars. (Wilkinson 1952, 551)

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Cartographic methods of depicting ethnic group distribution have been surveyed with specific emphasis on comparing areal symbols, dot symbols, and diagrams and particular concern for depicting absolute numbers of ethnic group members, numerical proportions, ethnic land claims, small or widely dispersed ethnic populations, actual spatial distributions, and complex distributions along with the problems of scale, resolution and generalization. Color differentiation was specifically mentioned as being problematic when the size of the symbol, dots or proportions on diagrams,

Hue	Positive Meanings	Negative Meanings	Cartographic or Cultural Use
Red	blood (life); fire (warmth); passion; sentiment; valor; patriotism; revolution; Christ; liberty; strength; excitement; love; busy; action; extroversion; stimulation; loyalty	Blood (spilled); fire (burning); death throes and sublimation; wounds; surging/tearing emotions; passions; war; anarchy; revolution; martyrdom; danger; the devil; noise; defiant; contrary; hostile strong red: warning	high elevations; important items; communication networks; line symbols (road networks); volcanoes; warm climate; power (i.e., electricity) native American pink: British empire
Orange	fire/flames; marriage; hospitality; benevolence; celestial fruit; pride and ambition; earthly wisdom; warmth; happiness; busy; harvest; fall; middle life; action	malevolence; Satan strong orange: warning	
Yellow	the sun; light; illumination; dissemination and comprehensive generalization; magnanimity; intuition; intellect; supreme wisdom; highest values; divinity; ripening grain; vivacity; kindness; happiness; busy; fertility; joyful; jovial; cheerful; youth; optimism; spring	treachery; cowardice; weakness; noise; dishonesty; hate strong yellow: warning saffron: debauchery; malevolence; impure love	boundary lines; high elevations; sand; desert; dry climate; power (i.e., electricity) Chinese, oriental
Green	vegetation; nature; fertility of the fields; sympathy; adaptability; prosperity; hope; life; immortality; youth; freshness; auspiciousness; recognition of the soul; wisdom; restfulness; country life; rest; peace	death (connecting link between black mineral life and red mineral life); lividness; envy; jealously; disgrace; sinister; opposition; moral degradation; madness; greed; cheapness; ignorance	vegetation (various types); agricultural land (various types); wet lands; tropical climate; young population; recreation areas Islam, Irish
Blue	the sky. light blue: day; calm sea; thinking; religious feeling; devotion; innocence; truth; constancy; justice; charity; cold; restfulness; authority; serenity	doubt; discouragement; depression; melancholy dark blue: night; stormy sea; silence; loneliness	harbors; cold climate; water; air transportation; steel; mountains blue-green: French empire

Table 1. Color Meaning and Usage

Violet	power; spirituality; royalty; love of truth; empire; patience; humility; nostalgia; memories; dignity; richness; elegance	sublimation; martyrdom; mourning; regret; penitence; resignation; humility; sorrow; despair; pain	heath land; Roman Catholic
Brown	the earth; utility; warmth; country life; cozy; friendly; reassuring	barrenness; poverty; lonely; dull; depressing	contours; rock formations; landforms; oil; mud; mountains; wet lands; dry climate; wood products native American
White	day; innocence; purity; perfection; rectitude; wisdom; truth; quiet; authority; cleanliness; faith	spectral; ghostly; cold; blank; void; mourning; sickness	salt; cold climate; glaciers and icebergs Caucasian
Gray	maturity; discretion; humility; penitence; renunciation; retrospection; quiet; reserved	neutralization; egoism; depression; inertia; indifference; barrenness; winter; grief; old age; penitence; cold; weakness; lazy; lonely	clay; iron; natural gas; industrial land use areas; urbanized areas; rocks; mud or sand flats; rainy or moist climate; luke warm climate; roadways; older population; steel
Black	mighty; dignified; stark; sophistication; regality (without being pompous) fertilized land; grim determination; night; solemnity; humility; authority; strength	morbidity; nothingness; despair; night; evil; sin; death; sickness; negation; lonely; mourning; heaviness	oil; factories; railroads; roadways; Protestant African; African-American

(Table compiled from Adams and Osgood 1973; Dent 1999; Dreyfuss 1972; Green and Horbach 1998; Grieve 1991; Kaplan 1975; van der Weiden and Ormeling 1972; Williams, Morland and Underwood 1970)

Table 1 (continued)

became too small for the viewer to be able to distinguish between colors. The "Use of colours" merited two short and general but telling paragraphs:

"The use of colours in ethnic (as well linguistic) maps opens a wide field for manipulation."

> The use of colours in ethnic (as well linguistic) maps opens a wide field for manipulation. But there are only a few methods, which may be called definite offenses against cartographic objectiveness. One is the habit of attributing the brighter colour to one's own ethnic group, providing it is not a small minority (then it should be symbolized by a bright colour). A second is to "incorporate" other ethnic groups, which declare themselves differently, by using the same colour, perhaps using just a screen or the name of the people for distinction.

Less obvious offenses are the "downgrading" of minorities by attributing to them less intensive colours than to the majority group; the attribution of "dark" and "dirty" colours to rivaling groups. (Jordan 1997, 893)

Jordan's comment about "dark" and "dirty" colors is a reference to the potential role of saturation and value on the interpretation of color and color preferences. Because the research on color preference, for the most part, did not take into account variations in saturation and value, there may be no objective way of evaluating different shades of the same hue.

A number of maps were selected from the collection at the University of Illinois at Urbana-Champaign to evaluate for possible ethnocentric or anti-ethnic color usage. The maps had to include multiple ethnic groups each depicted with a hue that facilitated qualitative differentiation between the groups. Maps employing single-hue progressions could not be included because of the more typical interpretation of magnitude or percentage change *a la* Wright's example (Wright 1942, 530). Maps that employed diverging (bi-polar or complementary hue) or sequential (partial spectral hue or blended hue) color schemes were not included because these schemes also are often used to indicate the magnitude of an attribute or an attribute's transition from one measurement extreme to another. (See Brewer 1994, 130-131 or Brewer *et al*. 1997, 418 for color examples of spectral, diverging, and sequential schemes.) If ethnic groups were shown on individual maps within a set of maps, as in the case of some atlases, each individual group had to have a unique color assigned. Unfortunately, some of the more recent publications showing ethnic distribution, including *We the People*, *Atlas of Ethnic Diversity in Wisconsin*, and *Mapping Census 2000: The Geography of U.S. Diversity*, are designed in such a way that the same hue is used repeatedly to show distributions of various groups throughout the publication making evaluation of ethnic preferences unattainable.

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The sample selected was biased toward materials depicting Europe because of their greater ease of availability and the author's general understanding of European events. Europe has also been a hotbed of ethnic strife because concentrations of people who strongly identify with many different groups are within close proximity to each other. Ethnographic mapping experienced a surge during the late Romantic period in part because of increased travel, pastoralism, and an accompanying interest in folk culture. A large number of ethnic maps were produced between the first and second world wars as national borders were established and reestablished. Interest in ethnographic mapping appears to have increased again during the 1990s.

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Berlin and Kay's work on color terms (Berlin and Kay 1969, 2) was used to generalize the number of hues to be ordered into a more easily defined number of color groups. The colors on the maps were evaluated using the a first-to-last preference group order of: red, blue, green, purple, orange, pink, brown, yellow, gray, black. Red was selected as the first preference because of the apparent, but perhaps not fully proven, tendency for representing "self" with red; because red "advances" visually, it is a logical first choice for self-boosterism. After blue and green and until reaching the last three hues, the order of the mid-ranked colors was not strongly fixed because of contextual reactions to specific combinations of hue, value, and saturation. Color meaning and cultural use also were considered as possible reasons for color selections.

Maps related to ethnic group dispersion appear in a number of nineteenth century atlases, some colored by hand and others with printed color. These maps did not strictly indicate ethnic group distribution, and the color use can not be evaluated for potential ethnic preferences because

concept of "ethnicity," as it has been used for the past sixty or seventy years, was not yet in place. The maps show geographic distribution of languages, language groups, or "races."

The *Ethnographic Map of Europe* by Gustaf Kombst and published in different editions of *Johnston's Physical Atlas* during the first half of the nineteenth century is based on physiological and temperamental characteristics of different "races." The primary races are Celtic, Teutonic, and "Sclavonian." Primary colors were selected to represent these groups, and their subgroups, in such a way that colors could be added together to create appropriate other colors for "mixtures."

"The Ethnographic Map of Europe *by Gustaf Kombst . . . is based on physiological and temperamental characteristics of different 'races.' Primary colors were selected to represent these groups, and their subgroups, in such a way that colors could be added together to create appropriate other colors for 'mixtures.'"*

> The three great varieties of the Caucasian species have been pointed out, the *Celtic* by *blue*, the *Teutonic* by *yellow*, and the *Sclavonian* by *red*. The subvarieties of these varieties have different shades of these fundamental colours. Wherever there has been a crossing of these varieties, or subvarieties, it is indicated by a mixed colour, in such a manner that the colour predominant in the mixture points out the predominant national element. Thus green, in its different shades, points out a mixture of Celtic and Teutonic blue; flesh colours, and other tints mixed of red and yellow, &c., point out a mixture of Teutonic and Sclavion blood. (Kombst 1848, 30)

Color is employed on this map to suggest connections between groups rather than preference for specific groups.

Völkerkarte von Europa (Figure 1, p. 61) found in *Richard Andree's Allgemeiner Handatlas* indicates, with printed color, language families: Germanic languages in unsaturated reds, Romance languages in blues, and Slavic languages in greens. A variety of hues and shades are used for other smaller language families or individual languages that do not fit into a family. The other "peoples map" in *Andree*, *Völkerkarte der Erde* (Figure 2, p. 61), focuses on race. Mongolen, Southeast Asians, Koreans, Japanese, North Asians, along with "Beringsvölker" and Eskimos, are shades of solid or patterned green. "Mittelländer (Kaukasier)" are pink; native Americans, "Amerikaner," are primarily shades of solid or patterned blue. Dravidians on the Indian subcontinent are a noticeable orange that somewhat contrasts with the "Mittelländer" pink of Indo-Europeans.

The oldest sheet map examined, *Map of the Races of Europe and Adjoining Portions of Africa and Asia* (Figures 3,4,5, p. 62), was published in December 1918, although copyrighted in 1919, by the National Geographic Society and accompanied a monograph-length article by Edwin A. Grosvenor (Grosvenor 1918). The map may have been heavily influenced by Leon Domanin's maps from 1915 and 1917 (Wilkinson 1951, 211). As with *Völkerkarte von Europa* from Andree's *Handatlas*, predominant language groups, not individual languages or ethnicities, are mapped. The colors assigned, using the labels from the map's legend, are: bright blue, Pre-Aryan; browns, Greco-Latins; yellow, Celts; reds, Teutons; greens, Slavs; purples, Ural-Altaians.

*"*Races of Europe *is the first of many maps . . . from the first part of the twentieth century that show Germans in red and Russians in green. Grosvenor places the deliberate color design choices for the map into the context of Armistice negotiations."*

The "Pre-Aryans" include only one group, the Basques. Depicting this isolated group surrounded by the French and the Spanish in similar shades of brown makes it appear both very isolated and besieged.

Races of Europe is the first of many maps, although most of them are German, from the first part of the twentieth century that show Germans in red and Russians in green. Grosvenor places the deliberate color design choices for the map into the context of Armistice negotiations.

Close students of events in Europe during the last few weeks will recall that shortly after the signing of the armistice these Germans [north of

Fiume], entirely surrounded by Jugo-Slavs, announced that they would petition the Powers to permit them to set up a separate autonomous State, fashioned after the miniature republics of San Marino and Andorra.

The colors of this map show at once how extraordinary is such an appeal; for whereas the San Marinesi are the racial brothers of the Italians who surround them, and the Andorrans are similarly of the same blood and language as the Spaniards who encircle them, the red of this Teuton colony is seen to be in clashing disharmony with the dominant green of the encompassing South Slavs. In other words, the colors tell their own story of the kinship of the races which they symbolize. (Grosvenor 1918, 535)

Grosvenor's explanation of color use on the map should not be construed to mean that he was sympathetic to the German viewpoint; the portion of the monograph that discusses the German people (Grosvenor 1918, 502-508) is far from favorable. Germans are red only because of their linguistic connection to English, and for speakers of English Grosvenor has nothing but praise.

"Considering the views of the governments in power, the choice of black to represent Jewish communities is hardly surprising. It appears that the Hungarians, Turks, and Romanians were also somewhat 'beyond the pale.'"

Prior to the Second World War, German influence steadily increased in central and Eastern Europe. A number of ethnographic maps were prepared in 1940 by the German General Staff and German Foreign Office (Wilkinson 1951, 287-295). *Volkstumskart von Rumanien* and *Volkstumskart von Jugoslawien* (Figures 6,7, p. 63) are multiple-sheet sets, mapping data from 1930 and published by Wilfred Krallert in Vienna in 1941 after German occupation of Romania and Yugoslavia. Graduated circles are used to show ethnic group populations. The same color scheme is used on both sets: red, German; yellow, Hungarian; dark green, Russian; light greens, other Slavic groups; purple, Romanian; blue, Bulgarian; brownish yellow, Turkish; black, Jewish. The often very small German groups are easily visible on the 1:200,000 map sheets. Considering the views of the governments in power, the choice of black to represent Jewish communities is hardly surprising. It appears that the Hungarians, Turks, and Romanians were also somewhat "beyond the pale."

Nationalities in Majority over 50 Per Cent (Figure 8, p. 63), which appears in *Atlas of Central Europe*, was prepared slightly later in the 1930s than the German sets for Romanian and Yugoslavia but was not published until 1945. Although the colors in the choropleth maps appear to have been augmented for the digital edition published in 1991, they may reflect the place and time of original publication.

"Retrospectively examining maps produced during the first part of the twentieth century is more straightforward than examining privately published maps from the last quarter of the century . . ."

Hungarians are red; Italians, bright blue; Slovenes, brown; Germans, yellow; and Czechs, tan. The same color scheme was used for three other maps in the atlas. The scheme partially inverts the potential ethnic preference expressed in the German maps, a different point of view on nearly the same situation. Hungary had been greatly reduced by the 1920 Treaty of Trianon, losing large amounts of territory and ethnic Hungarian population to Yugoslavia, Romania, and Czechoslovakia. The selection of blue to represent Italians could be a nod toward the Italian-Hungarian Treaty of Friendship that had been signed on April 5, 1927, vowing "constant peace and perpetual friendship." (League of Nations 1928, 401) The Hungarians and Italians had a mutual animosity toward Yugoslavia, and this treaty established early relations that led to Hungary's eventual inclusion in the Axis camp.

Retrospectively examining maps produced during the first part of the twentieth century is more straightforward than examining privately published maps from the last quarter of the century because the context of the earlier maps can be more clearly established by reading historical accounts. There is not a tactful way of asking an organization its views on

specific ethnic groups; attitudes will be highlighted only through time or overt and documented actions. Also, because of an increased understanding of visual color differentiation and graphic design, many maps appear to have been designed with readability, not subliminal messages, in mind. The practice of assigning hues because of cultural connections appears to occur with a high frequency.

Dominant Ethnic Groups, 1980 in the *Historical Atlas of Massachusetts* (Figure 9, p. 64) is the composite, choropleth lead-off map for a group of small-scale maps, each showing the distribution of a different ethnic group.

"The practice of assigning hues because of cultural connections appears to occur with a high frequency."

Black population distribution is in red, a power color. This could be a subtle reference to a potential or sleeping political power. Many of the other color choices appear to be culturally based. Irish are green; French-Canadians are light-blue, a traditional house color used by this group. Germans are shown in a color that could be described as "Prussian blue" while Russians are a regal (czarist) purple. Italians are yellow perhaps because there is a perception that Italians are noisy or happy. Massachusetts also has a small Native American population that, according to the map, dominates only one town in the state at the southwest tip of Martha's Vineyard. Contrary to common sense which would suggest selecting a vivid color to represent a small group thus enabling its easy location, the color chosen for native Americans is gray. It is difficult to see and nearly impossible to locate the single town when scanning the map quickly. Native Americans have disappeared from the landscape.

Two choropleth maps from *The Ethnic Quilt*, *Leading Ethnic Population, 1990* and *Second Leading Ethnic Population, 1990* (Figure 10, p.65), are designed to use the same color scheme with completely different visual results. A non-saturated blue similar to but slightly darker than the blue used by the United States Geological Survey for water bodies is assigned to "Non-Hispanic White." On *Leading Ethnic Population* (Figure 11, p. 66), because non-Hispanic White is the leading population in much of the greater Los Angeles area, this causes the other groups to appear as islands.

The blue almost serves as a background as suggested by Wood (Wood 1986, 57 and 1992, 99) even though it does not represent water. The blue "background" assists in seeing the pattern of other, non-white ethnic groups, all of which, except for Mexicans, are represented by saturated hues. Mexicans are represented by a non-saturated, low value pink. This pink becomes the background color on *Second Leading Ethnic Population*. The bold difference between the blue and pink backgrounds emphasizes the distribution of the area's two leading ethnic groups. It is difficult to attribute any of the color selections to either ethnic preference or cultural connection. On this pair of maps, color has been selected or designed to emphasize differences and to enable viewers to locate and differentiate between smaller ethnic groups.

"Contrary to common sense which would suggest selecting a vivid color to represent a small group thus enabling its easy location, the color chosen for native Americans is gray."

A New Social Atlas of Britain includes *Minorities 1991* (Figure 12, p. 67) covering Britain (England, Scotland, Wales) at the county level with graduated dot map. Some of the color choices appear to be culturally based. English-born, a minority in northern and western Scotland, are represented by a pinky red hue perhaps in homage to the pink British Empire on nineteenth century world maps. Scottish-born are represented by "Saint Andrew" blue and the Irish-born by a saturated green.

A cultural connection for the greenish yellow hue representing the Welsh-born is more tenuous to draw and may have a connection to the practice of wearing daffodils on Saint David's Day honoring the patron saint of Wales. Color cultural connections for Non-British-born minority populations can not be made. Blacks from the Caribbean, Africa, and

elsewhere are indicated with three different shades of purple. Indians are represented with tan, and Pakistanis and Bangladeshis are represented with two different shades of orange. Chinese are an unsaturated blue, other Asians light green, and those born in other European Economic Community (EEC) nations are a murky olive green. Reflecting Jordan's comment (Jordan 1997, 893) about "'dark' and 'dirty' colours," the color indicating people born in other EEC nations could be considered somewhat suspect.

The Gypsy population in Eastern Europe has dropped out of sight on *Sprachenverteilung in Siebenbürgen (Language Distribution in Transylvania)* much in the same way that Native Americans disappear on the map from the *Historical Atlas of Massachusetts*. While the German and Slovakian groups are not predominant in the area they are the most visible because they are shown in blue and red, respectively, using graduated circles. The Gypsy distribution is indicated in gray and visually drops out making the group unimportant and difficult to track.

"The Gypsy population in Eastern Europe has dropped out of sight on Sprachenverteilung in Siebenbürgen (Language Distribution in Transylvania) *much in the same way that Native Americans disappear on the map from the* Historical Atlas of Massachusetts*."*

Ethnic Map of the Republic of Croatia and the Republic of Bosnia and Herzegovina was produced at approximately the same time as *Sprachenverteilung in Siebenbürgen* (Figure 13, p.68). Using graduate pie charts, it was published after the dissolution of Yugoslavia and appears to clearly reflect attitudes toward ethnic groups. The Croatians, the map publishers, are bright blue, one of the preferred colors. Muslims are green, perhaps a cultural choice reflecting a color associated with the religion. The Hungarian distribution is yellow, somewhat marginal. Serbians are brown and other Yugoslav groups are purple, colors quite low on the list of desirability. *A Concise Atlas of the Republic of Croatia & of the Republic of Bosnia and Hercegovina*, published by the same agency two years after the *Ethnic Map of the Republic of Croatia* (Figure 14, p. 69) and focusing primarily on Croatia, includes an ethnic map, *Population According to Nationality in 1991* (Figure 15, p. 70). The hue usage is similar to the previous *Ethnic Map* but does not completely duplicate it because of some additional groups.

Again, Croatians are bright blue, and Muslims are green. Hungarians are a bluish-green that can be differentiated in the legend, but in the graduated circle pie charts the Hungarian sliver is often so small that it can not be easily differentiated from the green used for Muslims. Serbians are represented by an orangish brown and Czechs by a reddish brown. Italians are indicated with a receding purple. The data used for this map was drawn from census results. The census questionnaire allowed respondents to declare nationality by region; this appears to have happened most commonly in Istria and those responding thusly are indicated with a shade of blue very close to, just slightly lighter than, the saturated Croatian blue. Similarly, there appear to have been a number or respondents who claimed Yugoslavian nationality; these are indicated with a brown very similar in hue, saturation, and value to the Serbian brown. It appears that through color use the atlas publisher is aligning Istrian "nationals" with Croatians and undifferentiated Yugoslavians with Serbians.

"The maps examined for this study fall into three distinct groups that are chronologically separated by two world wars and reflect different understanding of ethnology or graphic design."

CONCLUSION

The maps examined for this study fall into three distinct groups that are chronologically separated by two world wars and reflect different understanding of ethnology or graphic design.

Prior to the First World War, especially during the late nineteenth century, ethnographic map creators were influenced by the pastoral movement. Their maps focused on "race" and language families with special emphasis placed on finding and promoting connections between different yet related groups. These maps can not be evaluated for attitudes towards

groups of people as expressed through depiction of color choice. Unique colors were not used to make clear distinctions between interconnected groups.

The sense of ethnicity as an amalgamation of genetic stock and cultural heritage was not expressed until after the First World War. The sets of 1:200,000-scale maps produced by the Germans during the late 1930s and early 1940s seem to specifically target designated ethnic groups and on the surface appear "easier" to evaluate than any of the other maps, perhaps because of assumed knowledge about organizational and governmental goals and programs. The historical record of attitudes and events leading up to and during the Second World War can be consulted, and organizational color use then can be evaluated in the context of documented actions.

"The sense of ethnicity as an amalgamation of genetic stock and cultural heritage was not expressed until after the First World War."

After the Second World War attention in cartographic research turned toward enhancing readability through design, including color use, typography, and lay out. Ethnic maps produced later in the twentieth century may have been designed to optimize readability through "scientific" color use with little consideration of potential color messages. But colors continue to appear based on historic nationalistic use.

Doing this exercise raises more questions than it answers, in particular about the validity and replicability of this approach and about constancy within a single evaluation session and between multiple sessions. Of particular concern is the problem of finding firm footing in the color preference literature. Few of the studies appear to have held value or saturation constant or taken into account how variations of value and saturation can substantively change a hue from one color to another. Red, blue, and green appeared to be the most preferred colors and yellow and black the least preferred but the positions of the intermediary colors "floated" and could not be firmly fixed. In the actual viewing of the maps, the author found it difficult to not allow personal color preferences or aesthetic values to interfere with evaluating color content on maps. Occasionally, the author's personal opinion about places and people also might have interfered with evaluating color use.

"Ethnic maps produced later in the twentieth century may have been designed to optimize readability through 'scientific' color use with little consideration of potential color messages."

The next steps in examining color use on maps of ethnic population distribution require expanding the sample set and working with human subjects. Because of the potential for non-accurate color reproduction, individual subjects would need to view legends on the original maps; legends could not be recast in a consistent format. Some participants would be asked to evaluate their preferences for the colors found in legends without seeing the associated ethnic groups. After viewing the maps, to establish a preference baseline, these participants would be asked to rank Munsell colors controlled for hue, value, and saturation. Other participants would see both color and ethnic group in the legends and would be asked to create a preference ranking for the ethnic groups based on depiction color. The participants would not be explicitly told either the map producer or publication date. This set of participants would be asked to view and rank the Munsell colors before evaluating the legends. Having the participants evaluate the colors and connected ethnic groups somewhat blindly could help remove the influence of inferential knowledge about governments and historical events.

"The next steps in examining color use on maps of ethnic population distribution require expanding the sample set and working with human subjects."

Both map readers and map producers need to develop awareness of potential color meanings or subliminal messages. Some of the most recently published color maps of ethnic group distribution appear in the fourth volume, *Bevölkerung*, of *Nationalatlas Bundesrepublic Deutschland*. These maps, in particular *Berlin, Anzahl, Anteil und Herkunftsländer der Ausländer 1998* (Figure 16, p. 71) and *Ausländer aus ausgewählten westlichen*

Industrieländern 1997, should be viewed both as stand-alone items and as part of the atlas. Both use choropleth maps with a sequential progression from light yellow to olive green to show the percentage of the population that is non-German as the cartographic background. Floating on top are graduated pie charts that indicate the proportion of specific ethnic populations. The color palate used for the pie charts on these maps is not used elsewhere in the volume. The maps are pleasing to the eye; the pie charts advance into the foreground and are not obscured by the context-setting choropleth map. Design constraints most likely impacted the colors selected for the pie charts but while many of the hues at first glance appear complementary, when further examining the map they become less so. On *Berlin, Anzahl, Anteil und Herkunftsländer der Ausländer 1998,* the green for the Turkish population is not a clear color but is muddied into a grayish shade.

The red for the United States has a orangish cast while that for former Soviets is pink, Great Britains are shown in an eye-popping yellow, the Greeks and French are yellowish green and the Yugoslavs and Poles are tans bordering on orange. Only the Italians, Vietnamese, and Portuguese are indicated by colors that could be considered "positive." Even the choropleth backdrop of pale yellow progressing to olive drab even becomes suspect. Interpreting these maps becomes a balance between understanding color meaning and deliberate design with color for readability.

Map creators need to increase their awareness of color connotations and preferences when creating works that could be interpreted as assigning values or expressing likes and dislikes. Similarly, map readers should remember that maps can never be completely divorced from the political, social, or technological contexts in which they were created. For some maps it may be completely appropriate to "read" meaning into a color selection while for others the potential message conveyed by a color must be discarded.

"Map creators need to increase their awareness of color connotations and preferences when creating works that could be interpreted as assigning values or expressing likes and dislikes."

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Henry Reed's Poetic Map of Verona: (Di)versifying the Teaching of Geography, IV

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Henry Reed's "A Map of Verona" became the title piece of the only poetry collection published by this multi-talented Englishman (1946). By recalling his trip to Naples and prophesying his devotion to Verona, the poem foreshadows Reed's lifelong passion for Italy. In "A Map of Verona," Reed is unique among map-poets in presenting himself as the star-crossed lover of a place, whose mapped image he eroticizes into the beloved's body. Because Reed ultimately rejects his map as illusory, the poem invites us to consider the type of map he was gazing at while composing "A Map of Verona." This paper, the fourth in a series about the use of poetry in the teaching of geography, argues that Reed might have used the 1928 edition of *Italy from the Alps to Naples*, one of the popular Baedeker travel guides esteemed for their accurate maps and plans. Yet a gulf separates the Baedeker map of Verona from earlier, more romantic depictions of the city. Perhaps no image comes closer to sharing Reed's sensibility than the complementary views of Verona displayed in Braun and Hogenberg's magnificent *Civitates Orbis Terrarum* (1581).

Keywords: Poetry about Maps, Travel Guides, Baedeker, Blue Guides, Braun and Hogenberg, Map/Geography Education, Maps of Verona

Phillip and Juliana Muehrcke would call this a story of an "imaginative map reader" (Muehrcke 1974, 323). In it, the English poet Henry Reed contemplates an apparently ordinary map of Verona, a place he has never seen. Gazing at its austere lines and simple palette, he transforms the mapped city into an object of desire, and himself into seducer. For twelve stanzas he ponders his plight. Should he risk the same disappointment he felt with Naples, whose map once had seemed as "open"? Can he trust any map, having experienced both the charms and imperfections of one? Will he ever visit Verona or just savor its image on a map?

"Phillip and Juliana Muehrcke would call this a story of an 'imaginative map reader'."

How Reed answered these questions is the subject of this paper, the fourth in a series advocating the use of poetry in the teaching of geography (see Haft 1999, 2000, 2001b). It begins with his poem "A Map of Verona" and the complex relationships between the verses, Reed's life, and the elusive Italian city. It argues that his obsession with the poet/novelist Thomas Hardy inspired Reed not only to travel but to create his own poem about a map. It examines the contemporary travel guides Reed might have used, details how he attempted to improve upon their maps, then considers other types of cartographic images Reed would have enjoyed had he known about them. While focusing on a 1928 Baedeker guide, it looks back at Braun and Hogenberg's views of Verona and at a few of the idiosyncratic maps that appeared shortly before their groundbreaking *Civitates Orbis Terrarum.* Finally, after a glance at an erotic emblem-map of Verona and its obvious debt to Braun and Hogenberg, this paper offers some thoughts about what these poetic maps of Verona may contribute to students of geography and cartography.

HENRY REED'S "A MAP OF VERONA" (1942/1946)

Quelle belle heure, quels bons bras me
rendront ces régions d'où viennent mes
sommeils et mes moindres mouvements?

A map of Verona is open, the small strange city;
With its river running round and through, it is river-embraced,
And over this city for a whole long winter season,
Through streets on a map, my thoughts have hovered and paced.

Across the river there is a wandering suburb,
An unsolved smile on a now familiar mouth;
Some enchantments of earlier towns are about you:
Once I was drawn to Naples in the south.

Naples I know now, street and hovel and garden,
The look of the islands from the avenue,
Capri and Ischia, like approaching drum-beats—
My youthful Naples, how I remember you!

You were an early chapter, a practice in sorrow,
Your shadows fell, but were only a token of pain,
A sketch in tenderness, lust, and sudden parting,
And I shall not need to trouble with you again.

But I remember, once your map lay open,
As now Verona's, under the still lamp-light.
I thought, are these the streets to walk in in the mornings,
Are these the gardens to linger in at night?

And all was useless that I thought I learned:
Maps are of place, not time, nor can they say
The surprising height and colour of a building,
Nor where the groups of people bar the way.

It is strange to remember those thoughts and to try to catch
The underground whispers of music beneath the years,
The forgotten conjectures, the clouded, forgotten vision,
Which only in vanishing phrases reappears.

Again, it is strange to lead a conversation
Round to a name, to a cautious questioning
Of travellers, who talk of Juliet's tomb and fountains
And a shining smile of snowfall, late in Spring.

Their memories calm this winter of expectation,
Their talk restrains me, for I cannot flow
Like your impetuous river to embrace you;
Yet you are there, and one day I shall go.

The train will bring me perhaps in utter darkness
And drop me where you are blooming, unaware
That a stranger has entered your gates, and a new devotion
Is about to attend and haunt you everywhere.

The flutes are warm: in tomorrow's cave the music
Trembles and forms inside the musician's mind,
The lights begin, and the shifting crowds in the causeways
Are discerned through the dusk, and the rolling river behind.

And in what hour of beauty, in what good arms,
Shall I those regions and that city attain
From whence my dreams and slightest movements rise?
And what good Arms shall take them away again?

"A Map of Verona" is the title poem of the only volume of poetry Henry Reed produced during his lifetime (1914-1986). Although it had appeared in *The Listener* originally (Reed 1942, 343), Reed revised the poem to open his 1946 collection *A Map of Verona* (Reed 1946, 9-10). After his death, this later version retained its prominent place in the definitive *Henry Reed: Collected Poems*, from which our text derives (Reed 1991, 3-4. Courtesy of Oxford University Press.).

"It is hard to overstate the poem's significance for this man of many talents—poet, teacher, journalist, cryptographer, broadcaster, writer of radio plays, book reviewer, translator, and professor of English."

It is hard to overstate the poem's significance for this man of many talents—poet, teacher, journalist, cryptographer, broadcaster, writer of radio plays, book reviewer, translator, and professor of English. Of all the places he lived, two imprinted themselves indelibly on his memory. One was a house in Dorset, England called Gable Court, where he lived in 1949-1950 with Michael Ramsbotham, to whom he dedicated *A Map of Verona*. The other was Italy, a country he first visited in 1934 and to which he returned again and again. Written in 1942, the year he met Ramsbotham, "A Map of Verona" is an autobiographical poem that nostalgically recalls his initial trip to Naples and prophesies his return to Italy, this time to Verona. Yet it would be almost a decade before Reed, alone after his breakup with Ramsbotham, made his journey to Verona.

Reed had gone to Naples to write a biography of Thomas Hardy, the subject of his master's thesis at University of Birmingham. Although he never completed the work, he fell in love with the warmth of the city and its people: "My youthful Naples, how I remember you!" Then came Italy's involvement in the Spanish Civil War and World War II. In 1942, after a year in the Royal Army Ordnance Corps, Reed was transferred to the Italian Section of the Government Code and Cypher School at Bletchley Park, forty miles northwest of London. While at work, he helped decipher coded messages from his adopted country. In his spare time, he composed "A Map of Verona" and many of the other poems that eventually appeared in his collection. When Reed finally saw Verona in 1951, he described his joy in a letter to his parents (Reed 1991, xv)[1]:

"In 1942, after a year in the Royal Army Ordnance Corps, Reed was transferred to the Italian Section of the Government Code and Cypher School at Bletchley Park . . ."

> It is a most lovely city, small enough for me to walk right across it in less than an hour; I had a letter of introduction to a friend of a friend & was in consequence well looked after & made much fuss of. My arrival was even announced on the radio, I learned with much delight later on.

Reed's obsession with Thomas Hardy continued until he scrapped the biography in the mid-1950s. In the meantime, it brought him to the places later memorialized in his writings and helps account for the importance of the map in "A Map of Verona." Reed's beloved Gable Court, for example, was located in Dorset, the English county where Hardy lived most of his life. Hardy made Dorset the setting—as "South Wessex"—of several of his masterpieces. One of the most celebrated maps in fiction is the "Map of Wessex," illustrated by Emery Walker to accompany Hardy's *The Life and Death of the Mayor of Casterbridge* (Hardy 1912, 388-389). In that novel, made-up names of actual places (e.g. Casterbridge for Dorchester, Dead-

man's Bay for Lyme Bay) appear beside identifiable names (e.g. Stonehenge, Southampton), thus allowing the reader to recognize England's south coast immediately (Pinion 1968; Zanger 1982, 789-90). Hardy even prepared a map for his *The Return of the Native* (Hardy 1878, vol.1, frontispiece; cf. O'Sullivan 1975, 66-68) and another in 1895 for a collected edition of his works (Hardy 1991, xx). After abandoning novels, Hardy envisaged another map while composing his poem "The Place on the Map." Here a "hanging map [that] depicts the coast and place" recalls a critical moment in an affair. The final stanzas of Hardy's elaborately rhymed poem describe how the narrator reacts to his lover's secret (Hardy 1914, 37-38; 1976, 321-22):

"After abandoning novels, Hardy envisaged another map while composing his poem 'The Place on the Map.'"

v
For the wonder and the wormwood of the whole
Was that what in realms of reason would have joyed our double soul
Wore a torrid tragic light
Under order-keeping's rigorous control.

vi
So, the map revives her words, the spot, the time,
And the thing we found we had to face before the next year's prime;
The charted coast stares bright,
And its episode comes back in pantomime.

These verses, coupled with Hardy's interest in mapping his novels, may have inspired Reed's map-poem about the tragic consequences of a love-affair. "A Map of Verona," however, is not only finer poetry but its specificity and complexity set it apart from "A Place on the Map." Reed's work is autobiographical, while the relationship between Hardy's poem and his own life is open to debate. "A Poor Schoolmaster's Story" was Hardy's manuscript title as well as the poem's subtitle when first published in *The English Review* in September 1913 (Hardy 1913, 161-62). Such slim evidence has led scholars to suggest that "A Place on the Map" is fictional (Bailey 1970, 280-81) or that it was based on the story of a teacher friend, Horace Moule, who had fathered an illegitimate child (Pinion 1989, 213). But it may refer to Hardy's 1867 affair with Tryphena Sparks (Deacon and Coleman, in Bailey 1970, 281). Or, because "A Map of the Place" was one of many he penned after the death of his wife Emma Gifford in 1912, it may recall her father's objection to their courtship in 1873 (Weber, in Bailey 1970, 281; Johnson 1991, 102); or it may refer, in some way, to Emma's own death (Zietlow 1974, 194). Nor is the setting of Hardy's poem any less speculative: since the poem doesn't name the place on the map, the location of the "jutting height . . . with a margin of blue sea" must depend on the characters involved.

"Like Hardy, Reed contemplates a map that transports him back to a pivotal place and time where love and pain interlace."

Like Hardy, Reed contemplates a map that transports him back to a pivotal place and time where love and pain interlace. Reed's study of maps, however, is far more developed than Hardy's. In the five central stanzas of "A Map of Verona," Reed presents himself as the star-crossed lover not of a woman but of a *place*. Commenting on the Italian radio plays that Reed wrote after *A Map of Verona*, James Beggs observes (Beggs 1995, 9):

". . . Reed presents himself as the star-crossed lover not of a woman but of a place*."*

> In a life which included only one sustained romantic relationship, with a young writer named Michael Ramsbotham in the late 1940s, Italy was Reed's enduring passion, and these six plays, collected and published in 1971, he said "constitute memorials, however ephemeral, to the love I have always felt for her" (Reed 1971, foreword).

Reed's love is passionate, at least on paper, where reading maps becomes poetic foreplay. First, it is Naples' mapped gardens he imagines "linger[ing] in at night." Once Reed transfers his desire to a map of Verona, he describes "the small strange city" as "river-embraced." Toying with the meaning of "map" as "face" or "portrait,"[2] he lists among her "enchantments" an "unsolved smile on a now familiar mouth"—certainly an allusion to that most enigmatic of Italian portraits, the Mona Lisa, whose artist, Leonardo da Vinci, also designed maps and architectural plans (see Harvey 1980, 154-55 and figs. VIII and 89). As Reed projects himself into the map, the sexual excitement of the penultimate stanza becomes unmistakable with its "warm" flutes, caves, and "shifting crowds [at] dusk." Curiosity and expectation lead to arousal as he anticipates entering Verona's "gates" at last "in utter darkness. . .where you are blooming." There is no mention of Catullus, yet Reed is writing erotic love poetry, the genre of that Veronese poet (Catullus 35.3, 67.34; Ovid *Amores* 3.15.7; Martial 14.195.1). And while other poets like Aristophanes (*Lysistrata* 1162-69, 411 BC), John Donne ("Love's Progress," ca.1590s), or Louise Bogan ("Cartography," 1938) have read the beloved's body like/as a map, Reed eroticizes a map into the beloved's body.

"While other poets like Aristophanes, John Donne, or Louise Bogan have read the beloved's body like/as a map, Reed eroticizes a map into the beloved's body."

While "A Place on the Map" reflects the narrator's past, "A Map of Verona" presages its author's future as well. The poet's reference to "Juliet's tomb and fountains" is more than an a passing allusion to one of Verona's tourist attractions (cf. Perbellini 1972/3). Only in the revised poem do Reed's travellers mention Juliet at all (Reed 1946, 9-10; 1991, 3-4); in the original version, they spoke merely "of parasols and fountains" (Reed 1942, 343). Guide books may warn that Juliet's tomb, however evocatively set, is every bit as counterfeit as Juliet's house (Bertarelli 1924, 157 and 159). Yet reference to the site identifies Verona just as Reed's naming Capri and Ischia identifies Naples. And his mention of this most famous of star-crossed lovers reminds us that Reed has already lost Naples, even as it foreshadows his inevitable loss of Verona as well.

"War—at least in Reed's experience—is as likely as another lover's arms to separate him from his passion."

Which brings us to the last stanza of "A Map of Verona":

> And in what hour of beauty, in what good arms,
> Shall I those regions and that city attain
> From whence my dreams and slightest movements rise?
> And what good Arms shall take them away again?

Those conversant in French, like Reed, will recognize that the first three lines translate the epigraph he added to his revised poem. The lines are adaptations of those ending Arthur Rimbaud's prose-poem "Villes I," a rapturous and nostalgic dream-vision of cities from *Les Illuminations*, written during and shortly after his relationship with fellow poet Paul Verlaine (ca. 1872-75).[3] Reed inserted the phrase "and that city" to highlight his preoccupation with Naples and, later, Verona. But the phrase also alludes to Rimbaud's fascination with "the city" generally, a theme supremely expressed in *Les Illuminations* (Hackett 1981, 62). Reed also created the final line, originally separated from the rest of the stanza in his 1942 version: "And what good Arms shall take them away again?" This second reference to "arms," now capitalized, suggests that war—at least in Reed's experience—is as likely as another lover's arms to separate him from his passion. The once "open" map of infinite possibilities and wonder closes on this fatalistic note.

"The once 'open' map of infinite possibilities and wonder closes on this fatalistic note."

"Maps are of place, not time." Or, at least, that is what Reed thought he had learned from his experience with Naples. But as he pores over the map of Verona years later, he discovers that maps can recall the past,

just as "the charted coast" in "A Place on the Map" revives memories of the spot where Hardy's narrator dallied with his lover one "hot and dry" summer. It was to be Reed's fate to pursue and lose his beloved again and again, to feel always the "stranger" who first "entered your gates." In 1974, over two decades after first visiting Verona, Reed penned another tribute in "The Town Itself." But though he calls Verona "my love" and "city of a long-held dream," Reed acknowledges in the final stanza that the romance is over (Reed 1991, 78)[4]:

"In the end, maps give Reed no more than an imperfect image onto which to project his desires."

. . .By now I know
I shall never be accepted as a citizen:
I am still, and shall always be, a stranger here. . ..
And on some day, not long to be postponed,
The police will knock at the door, and I shall be told to go.

In the end, maps give Reed no more than an imperfect image onto which to project his desires. They have nothing to say about "where the groups of people bar the way."

BAEDEKER'S *ITALY FROM THE ALPS TO NAPLES* (1928)

To compose his poem, Reed was staring at a map—most likely one in a travel book. Although a number of guides were published between the World Wars, two seem particularly appropriate: the German Baedekers and the British Blue Guides. The Blue Guides were the brainchild in 1918 of Findlay Muirhead. With his brother James, Findlay Muirhead had been joint editor of the Baedeker English editions until the war with Germany ended their association in 1914 (Robertson 1994, 1-3). Not surprisingly, Muirhead modeled the Blue Guides, at least in part, on the venerable guidebooks produced by the firm of Karl Baedeker, who had published his first travel guide in 1828 (*Baedeker's Handbook* 1975, preface). During the 19th century, celebrated writers and artists had been among the European and American travelers who toured Europe with their Baedekers in hand.

"To compose his poem, Reed was staring at a map—most likely one in a travel book."

Reed would have been interested in the Italian guides. From the 1860s until 1932, Baedeker published a series of three volumes on Italy—one each for the northern, central, and southern regions. Written in French and English as well as in German, the Baedeker guides catered to travelers from France, Great Britain, and North America. As a result, they "became more popular with these tourists than any guide-book published in their own countries" (Bruce Peel 1998, 3). In 1890, the three regional guides were combined to create a single "abridged" version, *Italien von den Alpen bis Neapel,* whose 8th and final edition was printed in 1931. *L'Italie des Alpes à Naples* appeared in 1901, and *Italy From the Alps to Naples*, in 1904. World War I delayed publication of new editions: the 1908 German edition was not updated until 1926 (7th edition); the 1909 French edition, not until 1926 (4th edition); and the 1909 English edition, not until its final incarnation in 1928 (3rd revised edition). During the 1920s, the travel guides overcame lingering anti-German sentiment so successfully that "Baedeker" became synonymous with "guidebook" (Hinrichsen 1989, 31). But the following decade was bleak. Baedeker's financial difficulties in the early 1930s, coupled with the take-over of the tourist industry by the Third Reich and the tensions leading to World War II, permanently ended both the regional and abridged guides to Italy (*ibid*., 32; Bruce Peel 1998, 21-22). So when Reed composed "A Map of Verona" in 1942, the editions published between 1926 and 1932 would have been the most recent available (see Hinrichsen 1981; Robertson 1994, 7-8).

"During the 1920s, the travel guides overcame lingering anti-German sentiment so successfully that 'Baedeker' became synonymous with 'guidebook'."

The attraction of Baedeker's 1928 *Italy from the Alps to Naples* is that Reed could have purchased this guide for his trip to Naples, then perused it years later when imagining his trip to Verona. The book is small, perfect for a pocket or the palm (4 1/2" x 6 3/8" x 1"). It is easy to imagine Reed staring at the foldout map of Naples and remembering a garden he might have "linger[ed] in at night"—the Villa Comunale, otherwise known as La Villa, filled with people promenading in the evenings along the waterside (Baedeker 1928, between 386 and 387). He could then unfold the map of Verona to find the Giardino Guisti, the garden that "affords a superb view (best in the evening) of Verona, the distant Apennines,. . .and the Brescian Alps" (Baedeker 1928, 78; H,3 on map opposite 73). The 1928 guide is also beautiful. The edges of its delicate "Bible" paper are marbled with a comb pattern in blue, red, black, white, and gold. A ribbon bookmark issues from its binding. The back endplates feature a map of the railroad lines that would bring Reed to Verona. Its cover and spine are red, stamped in gilt, and reminiscent of a prayer book.

"The attraction of Baedeker's 1928 Italy from the Alps to Naples *is that Reed could have purchased this guide for his trip to Naples, then perused it years later when imagining his trip to Verona."*

The fold-out map of Verona reveals some of the city's allure even as it attests to Reed's description (Figure 1, p. 72). The old town center is indeed "river-embraced." Reed conveys the rapid waters of the Adige with his adjectives "running," "impetuous," and "rolling"; the cartographers, by their use of long, closely spaced parallel lines. With a population of 87,000 inhabitants (Baedeker 1928, 74), Verona is indeed "small." The scale of distance (1 inch = 400 meters) indicates that the mapped area measures only 1.8 x 1.3 miles (about 3 x 2 kilometers). Capital letters on the top and bottom margins combine with numbers along the right and left to create a grid, allowing the reader to quickly identify sites mentioned in the guide (Baedeker 1928, 73-78). Labels and relative widths distinguish causeways (*strade*) and major roads (*corsi*) from streets (*vie*) and alleys (*vicoli*). A "wandering suburb" appears outside the eastern ring road (*circonvallazione esterna*) in the area of Borgo Venezia (I,5). "Rondella alla Grotta" in the map's upper-right corner recalls the caves found in that hilly part of Verona (I,1). At bottom center, Juliet's Tomb (*Tomba di Guilietta*) is visible just west of the Adige in a cloister by the Campo di Fiera (D,6-E,6). The lower left corner features the main train station, Stazioni Porta Nuova, where travelers—like Reed—debark before passing through the Porta Nuova or some other gate through the city's sixteenth-century walls. An inset details the Piazza Erbe, located on the site of the ancient forum (E,3-F,3), then guides the reader to the entrance of the 272-foot-tall Torre del Comune, towering above the courtyard of the Palazzo della Ragione (*Palazzo del Comune*).

"The fold-out map of Verona reveals some of the city's allure even as it attests to Reed's description."

As a poet, tourist and cryptographer, Reed would have appreciated the accuracy of Baedeker maps. Reputedly "made as if by spies for spies," these maps were often used for military purposes during World War II (Eric Newby, quoted by Wind 1975, 49).[5] In terms of aesthetic appeal, however, the Baedeker map of Verona is rather plain when compared to its rival in a contemporary Blue Guide (Bertarelli 1924). First published in 1924, *Northern Italy: From the Alps to Rome* was essentially an English translation of a guide produced by the Touring Club Italiano (Otness 1978, xvi). This Blue Guide competed directly with the abridged Baedeker guide to Italy, and ultimately won. The 1928 edition of *Italy from the Alps to Naples* was the last of the Baedeker series in English, the firm's map archives and lithographic stones having been destroyed in the RAF raids over Leipzig on December 3, 1943 (Wind 1975, 77).[6] By contrast, the 1924 Blue Guide spawned numerous volumes, including Paul Blanchard's 2001 *Blue Guide Northern Italy: From the Alps to Bologna* (11th edition). More important, the Muirhead-Blue Guide maps of Italy rivaled Baedeker's, since some of the

"As a poet, tourist and cryptographer, Reed would have appreciated the accuracy of Baedeker maps, reputedly 'made as if by spies for spies'. . ."

Wagner & Debes cartographers who had made maps for the German firm prior to the first World War went to work for the Touring Club Italiano afterward (*ibid*., 74; Otness 1978, xvi). The Blue Guide map of Verona is not only larger in size and scale than the Baedeker map, but its topography is clearer and its colors more tastefully varied: red for train and tram lines, pale blue for the Adige, a more vibrant orange for buildings, olive for churches and relief (Figure 2, p. 73). While lacking an inset, the map has on its reverse a detailed index of names, a feature absent from the Baedeker. Both maps, however, succumb to Reed's complaints. Not only do they fail to convey any sense of the "surprising height" or spectacular views of the Torre del Comune, but their limited palate cannot hint at the wealth of colors on the frescoed house-fronts or marble palaces surrounding the Piazza Erbe (Bertarelli 1924, 153).

"Reed might have been charmed had a traveler responded to his 'cautious questioning' by producing the 1936 brochure map for one of Verona's premier hotels, the Hotel Milano."

Reed might have been charmed had a traveler responded to his "cautious questioning" by producing the 1936 brochure map for one of Verona's premier hotels, the Hotel Milano (Figure 3, p. 73). Aside from its pleasing colors (pale green, turquoise, peach, black, and white), this map beckons the tourist with its oblique views, photographs, and numerical identification of important monuments, including Juliet's Tomb and the spectacular Roman amphitheater (*L'Arena*). On the other side, a simple map advertises what Reed's map and poem ignore: the city's proximity to neighboring mountains and Lake Garda, that fertile region long praised for its wines (Vergil, *Georgics* 2.95-96). But though the New York Public Library acquired its copy during World War II, at a time when Walter Ristow was not only Chief of its Map Division but also head of the Geography and Map Section in the New York Office of Military Intelligence (Hudson 1995, 146-47; and see 126), the Hotel Milano map of Verona sacrifices accuracy and other types of detail—most evident in its simplified street plan and absence of scale.

Yet one of Reed's generalizations about maps is certainly inaccurate. Despite his distinction, maps are of time *and* place. They have dates of publication; they depict a world that is past, present, or future; and they cover a specific duration of time. The 1928 Baedeker guide, for instance, informs us that its 93 maps and 49 plans include several not in earlier English editions. Among these are the map of central Naples and the map of Italy that serves as frontispiece (Baedeker 1928, preface; Hinrichsen 1981, 59). The map of Verona is a revision of one of 26 maps and 44 plans in the 1904 Baedeker edition. But the 1928 map identifies the "Torre" on its inset and updates the location of the Stazione Porta Nuova, which with its "fine new building" had become the main station following World War I (Baedeker 1928, 73 and A,6). (Today, these maps made before World War II remind us of the devastation that bombs and retreating German troops wrought on Verona due to her strategic location at the foot of the Brenner Pass [Richmond and Holford 1935, 69; *Columbia Encyclopedia*, 5th ed., 1993, 2877].)

"One of Reed's generalizations about maps is certainly inaccurate. Despite his distinction, maps are of time and place."

Even more to the point is the observation made by Robert Downs and David Stea in their groundbreaking work on cognitive maps (Downs and Stea 1977, 27):

> We can organize personal experience along the twin dimensions of space and time. But the dimensions are inseparable—there can be no personal biography of "what" things happened "when" without a sense of the place in which they happened. Cognitive maps serve as coathangers for assorted memories. They provide a vehicle for recall—an image of "where" brings back a recollection of "who" and "what." This sense of place is essential to any ordering of our lives.

Another of Reed's poems reveals that he did understand the inseparability of place and time on maps. Consider what the instructor says in Reed's 1943 "Judging Distances," part of his humorous *Lessons of War*—one of the most acclaimed and anthologized British war-poems of World War II (Reed 1943 and 1991, 50-51). Although "Judging Distances" mentions maps only once, the entire poem describes how soldiers are to interpret them. As in other parts of *Lessons of War*, the soldier-speaker uses two competing voices—the instructor's and his own—to describe what he has learned. "Maps are of time, not place" is among the instructor's pat expressions. The antithesis of the opinion given in "A Map of Verona," the instructor's words exemplify for the recruit how bizarre and implausible his military education really is. Far from being unaware of the partnership between space and time, Reed uses inadequate generalizations about maps to contrast the instructor in "Judging Distances" not only with his day-dreaming recruit but with the narrator of "A Map of Verona." In so doing, Reed also reveals the limitations of each speaker. The instructor can't say *why* the army teaches that "maps are of time, not place. . .the reason being,/ is one which need not delay us." While the narrator of "A Map of Verona" wrestles with his own naiveté and romanticism:

"Whatever limitations Reed claimed to have discovered did not prevent him from using his experience in Naples or his map of Verona to imagine journeying to northern Italy in the second half of the poem."

> And all was useless that I thought I learned:
> Maps are of place, not time,. . .

BRAUN AND HOGENBERG'S *CIVITATES ORBIS TERRARUM* (1581)

Whatever limitations Reed claimed to have discovered did not prevent him from using his experience in Naples or his map of Verona to imagine journeying to northern Italy in the second half of the poem. His memory of Naples enabled him to imbue his verbal map with sensory images: sounds (whispers of music, vanishing phrases, flutes), touch (river-embraced), and movements (snowfall, shifting crowds, rolling river, thoughts that hover and pace[7]). By describing such images and his pain at losing Naples, Reed showed what static visual maps omit. Yet a gulf still separates the Baedeker map from Reed's characterization of Verona. For more romantic depictions of Verona, we need to be as nostalgic as Reed and look back to a time long before inexpensive paper and lithography combined with the development of mass literacy to revolutionize cartography.

"Yet a gulf still separates the Baedeker map from Reed's characterization of Verona."

Cartographers themselves recognize the problems associated with the kind of map Reed was using (Hodgkiss 1981, 133: emphasis mine):

> Modern town plans are primarily clear and functional and convey to the user a considerable amount of information about the urban scene. Rarely, however, are they visually stimulating and rarely do they communicate much feeling of a town's individual character. Indeed the presentation of the complex make-up of a town on a manageably sized sheet of paper has been, and still is, a teasing problem to the most ingenious of mapmakers. There is such a variety of information to convey and so many different user-needs to satisfy. . .. If a street layout only is required with an indication of the ground plan to buildings in order that the user may quickly find his way from A to B, then the plan view seen from directly overhead is the answer. *It will tell nothing, however, of building heights, architectural styles or the building materials used.*

The two-dimensional plan that focuses on the layout of streets and the ground plan of buildings is not, however, the only type of city map

available historically (Buisseret 1998, x-xii). Models, profile views, and bird's-eye views offer their own advantages and constraints. Outstanding for their clarity and accuracy in three dimensions, models are still ideal for public display and military strategy. But they are expensive, unwieldy, and difficult to reproduce. Profiles present a horizontal panorama, giving the traveler who arrives on foot an appreciation of the height and form of a town's monuments and topography. But the concealment of smaller buildings and street patterns made the profile view or "prospect" unpopular as early as the sixteenth century. The bird's-eye view, a genre that thrives to this day, combines the strengths of all other maps. Developed in Italy as a result of advances in projective geometry and perspective drawing during the first half of the fifteenth century, the bird's-eye view envisions the city obliquely from on high and offers the urban landscape the appearance of three-dimensionality. Despite errors in scale created by foreshortening of the orthogonals (Rees 1980, 69), the bird's eye view could be combined with the plan "to form the map-view or plan-view, in which the true ground plan was preserved, but which featured some or all of the buildings in elevation. By depicting a city in these ways, the cartographer's intention was clearly to impress and inspire the reader with the grandeur, power and wealth his works displayed. Urban cartography thus possessed a quality which sought a fundamentally emotional response, one which reflected the pride, dignity and sense of importance the city-dweller felt for his community." (Elliot 1987, 9)

"The bird's-eye view, a genre that thrives to this day, combines the strengths of all other maps."

Over its long history, Verona has been delineated on many plans and views.[8] But if ever a map succeeded in conveying Verona's character and celebrated beauty, it is Plate 49 in Book III of Braun and Hogenberg's urban atlas, *Civitates Orbis Terrarum*, published in 1581 (Figure 4, p. 74). Like Karl Baedeker centuries later, editor Georg Braun and engraver Franz Hogenberg responded to "a great upsurge of interest in the city" (Pagani 1990, 1:v; Popham 1936, 183). They also created a niche among the books and geographical guides that had proliferated because of changes in printing techniques. And they attracted the increasingly large numbers of people who were traveling to cities in Italy and other parts of Europe (Pagani 1990, 1:v; cf. Miller 2000, 15). *Civitates Orbis Terrarum* became one of the world's great books, expanding to six volumes over the period 1572-1617 and containing 363 plates with 546 plans and views of towns throughout the globe (Skelton 1966, x, xx, xxviii).

"Over its long history, Verona has been delineated on many plans and views."

From the late fifteenth to mid-sixteenth centuries, books containing urban views often reused an image to illustrate more than one city and combined imaginary scenes with actual ones (Talbot 1982, 106). For example, the small woodcut of Verona in *Supplementum Supplementi Chronicarum* by Jacobus Philippus (Foresti), Bergomensis depicts the upper and lower town as river-embraced and crowned with towers and an amphitheater (Figure 5: 1513 edition, p. 75). But just as we are scrambling to relate this early profile with the Baedeker map, we discover that the same wood-cut repre-sents Damascus as well. Even more startling is Hartmann Schedel's *Liber Chronicarum* or *Weltchronik*, commonly known as the Nuremberg Chronicle (1493). The most profusely illustrated book of its time, the Nuremberg Chronicle boasted 2000 woodcuts, including accurate portrayals of Rome, Florence, and Venice (Pagani 1990, 1:iii). But charming as Schedel's profile of Verona is, he reduces the Adige to a trickle and omits the amphitheater entirely (Figure 6, p. 75). Worse still, the view is shared by *nine* other cities and countries besides Verona and Damascus (Rücker 1988, 222). Had Reed perused the Nuremberg Chronicles while composing "A Map of Verona," the poem would have been as humorous as those in his *Lessons of War.* For Schedel's woodcut of Naples is identical to that of

"From the late fifteenth to mid-sixteenth centuries, books containing urban views often reused an image to illustrate more than one city and combined imaginary scenes with actual ones."

Verona!

The creators of *Civitates Orbis Terrarum* were more ambitious. Braun requested that contributors submit "portraits" of their native cities for his atlas (Rees 1980, 65). He then selected the best pieces available and, with Hogenberg, standardized their presentation before assembling them in order. In his preface to Book I, Braun emphasized that the images in *Civitates Orbis Terrarum* were based on precise observation (Braun 1581-82, "Praefatio," second page from the last; see Pagani 1990, 2:iii). Although the quality differs with each view, Braun and Hogenberg succeeded brilliantly in producing an atlas of city views that complemented Abraham Ortelius' *Theatrum Orbis Terrarum*, the first modern atlas (1570).

"Braun requested that contributors submit 'portraits' of their native cities for his atlas."

Braun and Hogenberg's "Verona" is a gem, comprising two complementary views of the city, one above the other. While neither is signed, the upper image may be the work of Joris Hoefnagel, a landscape artist from Antwerp whose travels throughout Italy in 1577-78 provided so many of the other Italian town plans (Skelton 1966, xli, xlv). Entitled *Magnifica Illa Civitas Verona* ("That Magnificent City, Verona"), the upper image is a profile view offering a panorama of the city from a low hill to the northwest (see Figure 4). In left center rises the Castel San Pietro (*Castellum S. Petri*), a medieval fortress built into the rocky heights in the northern part of the city. (*Castellum S. Petri* is identified by the number 3, written on the top of the view and in the upper-right box.) The Ponte Pietra bridges the river and leads (right) to the lower part of the walled town, whose colorful rooftops and church spires cannot compete with the Torre del Comune in their midst. Circling the town is the pale-green Adige, which continues south (upper right). The foreground pictures the pastoral setting from which the view derives. A road descending to the valley below cuts this scene in two. On the left, two shepherds converse while their sheep pasture between a steading and a house. On the right, a shepherd gazes over the shoulder of an artist—maybe Hoefnagel himself—who is sketching the view before him (Barron 2000). Between them and the walls are trees (left) and people on their way to the fields or town (right).

"Braun and Hogenberg's 'Verona' is a gem, comprising two complementary views of the city, one above the other."

The lower image, divided from the upper by an elegantly painted gold cord, offers a plan-view of Verona (see Figure 4). On the top right a plaque summarizes the town's early history: *Verona celeberrima, amplissimaque Cenomanorum urbs*. . .. In antiquity, this "very populous and spacious city" was associated with tribes called the Cenomani (Ptolemy, *Geography* 3.1; cf. Livy 5.35) and the Euganei (Pliny, *Naturalis Historia* 3.130-34; Livy 1.1.3). Then, in the sixth century, it became residence to the Ostrogoth king Theodoric (d.526), the prototype for Dietrich von Bern in the medieval German epic *Nibelungenlied* (Baedeker 1928, 74). To the left, women emerging from cornucopias surround the words *Colonia Augusta Verona Nova Gallieniana*, reminding us that Verona was once an important colony of Rome (Tacitus, *Historiae* 3.8). The text on the previous page informs us that the Latin phrase was inscribed on the Roman gate that bestrides Verona's Corso Cavour (see Figure 3: Porta dei Borsari). According to the inscription, the Emperor Gallienus placed it there when rewalling the city in 265 (Marconi 1937, 20, 84, 87).

"To further emphasize the city's importance in antiquity, a profile of its first-century amphitheater appears in the lower right of the plan view."

To further emphasize the city's importance in antiquity, a profile of its first-century amphitheater appears in the lower right. Above the ruins, the words "*Amphitheatrum in Foro Boario situm*" indicate its actual location, also evident from the bird's-eye view of the arena on the town plan (left). Able to hold 25,000 bloodthirsty spectators in its prime, the amphitheater was much restored by Reed's time. Instead of carnage, L'Arena showcased opera, one of the poet's favorite pastimes (Bertarelli 1924, 157; Beggs 1995, 9, 39).

With its northern orientation and detailed layout, the plan-view looks familiar. But countless details separate the Braun and Hogenberg views from the Baedeker ground plan. First the views display the heights and forms of Verona's architectural splendors. Then there are the colors, exquisitely applied by some late sixteenth-century hand. Water is pale-green; fields, pale yellow-green. Trees, grass, and some rooftops appear in blue-green. Brown accents cliff-faces and monuments, like the fortress and amphitheater. The sky is a rainbow of lavender, blue, peach, and pale yellow. Red highlights roofs and articles of clothing. Which brings up another difference in these idealized images: the importance of people—their occupations and dress. Braun hoped that these figures, so prominently displayed in the foreground, would prevent his maps from being used by the "infidel" Turks, who found any portrayal of the human form offensive to their faith (Skelton 1966, xiii). In fact, were the Braun and Hogenberg maps not replete with courting couples, the lovers in the lower left—a well-dressed gentleman offering a rose to his lady—might be thought an allusion to Romeo and Juliet; their names and Veronese setting having been familiar to Italians for over half a century before Shakespeare immortalized their story in the mid-1590s (Evans 1998, 7). Most intriguing of all, the artist self-consciously inserted into his own panorama is more reminiscent of Reed's own musings over a map than the disembodied and "objective" Baedeker map ever could be.

"Countless details separate the Braun and Hogenberg views from the Baedeker ground plan."

INFLUENCE AND AFTERMATH

In Braun's preface to Book 3 of *Civitates Orbis Terrarum*, the proud editor anticipated his readers' pleasure at being able to travel vicariously (Braun 1581-82, second page top):

> For what could be said or regarded as more delightful than—in some safe place, away from harmful fear of dangers, in one's own home—to contemplate, with the aid of these volumes, the entire form of the earth in which we live, distinguished by diverse regions, rivers, and seas, and decorated by the splendor of cities and towns? And, by examining the pictures and perusing the adjacent text, to come to know what others hardly ever have been able to achieve by long and difficult travels?
>
> *Quid etenim dici poterit, aut fingi iucundius, quam in loco aliquo tuto, et a periculorum metu alieno, apud penates domesticos, universam terrae, qua inhabitamus, formam regionibus diversis, fluminibus, et aquis discretam, urbium et oppidorum nitore ornatam, librorum istororum praesidio intueri, illudque inspectione picturae, et adiunctarum enarrationum lectione cognoscere, quod alii longis et difficillimis itineribus vix unquam consequi poterunt*?

"Braun hoped that these figures, so prominently displayed in the foreground, would prevent his maps from being used by the 'infidel' Turks, who found any portrayal of the human form offensive to their faith."

One of those impressed by *Civitates Orbis Terrarum* was Robert Burton. Author of *Anatomy of Melancholy*, Burton advised his own readers to ease their depression by "perus[ing] those bookes of Citties [*sic*], put out by *Braunus*, and *Hogenbergius*" (Burton 1632/1997, 2:86-87; cf. 1:22). Braun and Hogenberg's plates continued to be used into the eighteenth century (Bachmann 1965, 246-47; Moreland and Bannister 1993, 82-83). And imitators abounded. Joan Blaeu's map of Verona in his *Nieuw vermeerderd en verbeterd groot stedeboek van geheel Italie* ["Town Books of Italy"], for example, looks like an updated version of their plan-view with the Tomb of Juliet now included (Figure 7, p. 76). But the elegant couple is missing and a Venetian lion has replaced the profile of the amphitheater.

"Author of 'Anatomy of Melancholy', Burton advised his own readers to ease their depression by 'perus[ing] those bookes of Citties [sic], put out by Braunus, and Hogenbergius'."

More compatible with Reed's erotic focus is the unusual emblem-map in Daniel Meisner's *Thesaurus Philopoliticus* or *Politisches Schatzkästlein* of 1623-31 (Figure 8, p. 76). Immediately recognizable is Braun and Hogenberg's profile view of Verona. But in the foreground, at separate tables, sit a man reading (left) and a couple carousing (right). The studious man wears a hat and crushes a quiver of arrows under his right foot. His table is strewn with books; that of the couple, with food and wine. To the couple's left, a winged cupid takes aim, presumably at the bald man, who is being pushed away by the young woman he seeks to kiss. To clarify this *pictura*, we consult the other two parts common to all emblems of the 16th or 17th century. The German *inscriptio* offers the motto or proverb that the picture illustrates: "Better in youth than age" (*Besser in der Jugend dann im Alter*). Below the picture is the *subscriptio*, the poetic and scholarly quotations that give further information (Daly 1979, 6-7). Here we learn that "no one will escape the arrows of the wanton boy" (*Nemo tuis immunis erit, puer improbe, telis*). "Isocrates," so the Latin continues, "studied when young and loved when old" (I*socrates juvenis studuit, grandaevus amavit*). The German couplets enforce Meisner's theme:

"Compatible with Reed's erotic focus is the unusual emblem-map in Daniel Meisner's Thesaurus Philopoliticus *or* Politisches Schatzkästlein *of 1623-31."*

> Isocrates studies diligently
> In his youth. But in the end,
> He becomes a lover by force.
> Cupid strikes young and old.
>
> *Isocrates fleissig studirt*
> *In seiner Jugendt, letztlich wirt*
> *Aus ihm ein Buhler mit gewalt*
> *Cupido trifft Jung oder Alt.*

"Meisner's emblem-map would have delighted Reed with its whimsical earnestness and its interweaving of various arts to please his readers and illustrate the discomfitures of love."

Perhaps the men in the picture are one and the same: Isocrates as the young man spurning love for knowledge, then as the old man struck by cupid's barb.[9] Although the message is universal, what better setting can there be for a ill-fated love than Verona?

Meisner's emblem-map would have delighted Reed with its whimsical earnestness and its interweaving of various arts to please his readers and illustrate the discomfitures of love (Praz 1975, 49). But it cannot compete with Braun and Hogenberg's Verona. Nostalgic and romantic, their plans of the city seem closer in tone to Reed's verses than any map before or since.[10] When Reed conceived his own "Map of Verona" three-and-a-half centuries later, he created—as if by some miracle of chance—a poetic counterpart to the breathtaking town plans in *Civitates Orbis Terrarum*.

CONCLUSION

What does this unabashed romp through poetic maps of Verona have to teach the aspiring geography or cartography student? First, cities can be mapped in all sorts of ways. Models, profile views, and bird's-eye views offer alternatives to the ubiquitous two-dimensional plans and elicit different responses in us even as they reveal different aspects of a town. Second, the age of a map is only one indicator of its (in)accuracy or (un)trustworthiness. Because Verona is such an old town, the Braun and Hogenberg plan-view is surprisingly similar to the 1928 Baedeker map in its street layout and ground plan of many buildings. Also recognizable is the picture-map of Verona created during the mid-fifteenth century when the town and its district were under the sway of Venice (Harvey 1980, fig. IV). Yet the unsuspecting reader of the Nuremberg Chronicle, printed a few decades later in 1493, is likely to think Verona looks just like Naples.

Perhaps the simplest lesson of all is that maps are enthralling. And not just the maps, but the "package" surrounding so many early maps as well as the plans found in travel guides—the detail of their covers, the choice of paper, their physical dimensions, the text surrounding them. The 1928 Baedeker Guide may be recent compared to Braun and Hogenberg's views, yet it too belongs to a bygone era. On its delicate plan, Verona remains oblivious to World War II even as our last veterans fade from view. To touch these books, to leaf through their pages is a sensuous and nostalgic experience, one that a fine research library can offer our students. When cartographer Keith Clarke and I teamed up a decade ago to teach "Maps in History, Art, and Literature" at Hunter College, he insisted on bringing our students to the Map Division of the New York Public Library. Since then my "maps" class regularly visits Alice Hudson and her incomparable staff, then marvels as maps and books of various periods appear before our eyes. For some, this visit has proved life-altering (see Ludmer-Gliebe 1999).

"The 1928 Baedeker Guide may be recent compared to Braun and Hogenberg's views, yet it too belongs to a bygone era."

Like glossy photos of exotic places, the overtly artistic plans and views of previous centuries elicit in us an emotional and aesthetic response. But in "A Map of Verona," Henry Reed imbued a far plainer map with sensuality. As a poet he may be unique in eroticizing a map into the body of the beloved. Admittedly, it is unlikely that the nameless Wagner and Debes cartographer(s) who created Baedeker's "Verona" intended the plan to be used in such a way (or anticipated, perhaps, how attractive Baedeker plans would be to the military as well as to competitors in the travel guide industry.) But as with all "imaginative map readers," Reed's knowledge and desire conditioned his response to the map. His earlier experience of Naples, his longing for the pleasure and warmth of pre-war Italy, his hard-won recognition that "the map is not the territory"--all enriched a static plan designed to guide tourists, as clearly and accurately as possible, from A to B. By filling his poetic map with sensory images like sound, movement, and cycles of day and night, Reed anticipated the animated maps that cartographers create on computers today.

"By filling his poetic map with sensory images like sound, movement, and cycles of day and night, Reed anticipated the animated maps that cartographers create on computers today."

As Braun boasted, travel guides are meant to delight. But even the most utilitarian Ordnance Survey map can hold the key to unlocking memory. Two English poets used these maps to (re)trace youthful journeys in time and space. In her "A Map of the Western Part of the County of Essex in England," Denise Levertov reminisced over a map of her childhood home even as she recognized how other maps helped feed the wander-lust that led her to emigrate (Levertov 1983, 21-22):

> . . .when I was ten burning with desire
> for the world's great splendors, a child who traced voyages
> indelibly all over the atlas, who now in a far country
> remembers. . .

"Even the most utilitarian Ordnance Survey map can hold the key to unlocking memory."

And Grevel Lindop begins "O.S. Sheet 117: Chester" with the evocative lines: "Spreading it, I uncrease a map of childhood Sundays. . .places I may dream of when I'm dead" (Lindop 2000, 44-45). For our students, the most poignant recollection of all may be "The Map as Biography: Thoughts on Ordnance Survey Map, Six-inch Sheet Devonshire CIX, SE, Newton Abbot." Written by cartographic historian J.B. Harley for *The Map Collector* a few years before his untimely death, the essay describes his "favourite" map—the one that shows the lane where he met his wife, and the cemetery where she and his son lie buried (Harley 1987). But that is another story (Haft 2001a).

NOTES

1. Quoted by Stallworthy in his edition *Henry Reed: Collected Poems* (1991). Stallworthy's remarkable introduction provided much of the background on Reed recounted in the second, third, and final paragraphs of my section on Reed's "A Map of Verona."
2. Eric Patridge suggests that the meaning of "map" as "face, head, or skull" was commonplace among the lower classes and the military in the earlier part of the twentieth century; he compares this use to the Scottish definition of "map" as "portrait" (Partridge 1989, 278).
3. Rimbaud's exact words were: "*Quels bons bras, quelle belle heure me rendront cette région d'où viennent mes sommeils et mes moindres mouvements?*" For the French and facing English translation of "Villes I," see Rimbaud 1991, 132-33.
4. Note that the words "strange/r" recur four times in "A Map of Verona." According to Beggs, "the theme that nearly every late poem of Reed's elaborates is that of exile or intrusion; his characters are outsiders, separated from others or from places of comfort and peace" (Beggs 1995, 237).
5. The successful invasion of Norway by the Nazis in April 1940, for example, was planned with the use of the 1931 Baedeker guide to Norway (Wind 1975, 49). And "Baedeker raids" were carried out in April 1942 by the Luftwaffe, who promised to bomb anything in England that had earned three stars in the Baedeker guide. Baedeker actually gave no more than two stars (ibid., 50).
6. Rosemary Arnold's *Baedeker's Italy* (Arnold [1983?]) differs completely from the earlier Baedekers. Despite its larger size, two-column format, and color plates, this alphabetical guide offers less information on Verona (pp. 315-19) and ignores its geographical context.
7. In the 1942 version of "A Map of Verona," the last line of the first stanza was much more passive: "With streets on the map, my thoughts have been interlaced."
8. A lost tenth-century map of Verona, reproduced in an eighteenth-century manuscript, was perhaps connected with a poem: the panegyric "Versus de Verona" (Biblioteca Capitolare, MS. CXIV, fol. 187; in Cavallari et al. 1964, 2:39-42, 232-33, 481-85; figures opposite 2:192, 193, 485). During the second half of the fifteenth century, Verona—then under the sway of Venice—appears on several district maps that focus on Verona's territory and defenses. (See Harvey 1980, 15, 59-61, 78, 80-81, 146, and figures IV and 30). Verona also appears on "Transpadana Venetorum Ditio," one of the forty large maps of Italian regions that cover the walls of the Vatican's Gallery of Maps. The brainchild of Pope Gregory XIII and cartographer Egnazio Danti in 1580-82, these frescoes harken back to the Roman tradition of placing enormous maps on public buildings to promote the size and scope of the state's power (Dilke 1985, 39-53). The cross above San Zeno Maggiore—one of the most beautiful Romanesque basilicas in Northern Italy—reveals the Church's influence on Verona even as the map's title and coverage emphasizes Venice's control over the area north of the Po and west of the Piave (see Gambi and Pinelli 1994, 1:83-84, 107, 289-94, and 2: Pl.20).
9. Considered by ancient and Renaissance scholars to be "the preminent rhetorican of ancient Athens" (Too 1995, 1), Isocrates was remarkably long-lived (436-338 BC). According to a *Life of Isocrates*, comic poets linked him with the prostitute Lagiske (see Fairweather 1974, 245).
10. For other antique maps of Verona, see Bachmann 1965, 246-47.

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cartographic techniques

Mapping for the Internet with Macromedia Director

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Publishing maps on the Internet presents today's cartographers with a new set of challenges. The Internet allows anyone, anywhere, anytime to view maps. Cartographers must now decide how to make them available, which format to use, which technology, and what map reading features to include.

The most basic issue that impacts the effectiveness of maps on the computer is *display resolution*. A screen's display resolution for today's computers ranges between 72 and 96 pixels per inch, while modern maps are printed using many times that resolution. It is as if cartography is stepping back into the days of wood-block prints. This loss of resolution can be mitigated using several techniques.

Today, many of the maps on the Internet are static. They are low-resolution images with poor data-ink (colored pixels) ratios. Better techniques must be used to increase the computer screen's ability to convey cartographic information. These techniques yield maps that are more interactive or animated, in other words, more informative. Users can query and explore maps; movement and sound can also be introduced to reinforce the user's experiences. To provide this sort of rich content, cartographers will need to use the right tools to make and publish their map. One such tool is Macromedia Director. This article will focus on techniques for creating rich map content for the Internet using Director.

Macromedia Director

Macromedia Director is a raster-based multimedia presentation tool distantly akin to Microsoft's Power-Point or the old Apple HyperCard environment. Historically Director was targeted towards the creation of kiosk presentations and interactive CD-ROMs but over the past few years it has been revamped for the web.

Once a project has been created in Director, it can be saved as a Shockwave movie that can be played by a plug-in for web browser such as Netscape Navigator or Internet Explorer. Most modern computers now have these plug-ins installed by default and Macromedia estimates that 65% of Internet users have it enabled (December 2001).

Example Project: Annual Precipitation in California

The following project, which contains several maps are taken from a recent NACIS Web Mapping Contest entry. This project was completed at Humboldt State University with the assistance of Dr. Margaret Pierce during an Advanced Cartography semester in 2000. You can view and should refer to this project and its source files while reading this article at: www.nacis.org/contest.html

The project has an interactive, animated, and sound-enhanced interface detailing recent precipitation data for the state of California. The maps were designed in Adobe Illustrator and then exported to Macromedia Director for composition and sequencing.

Director Basics

While Director provides a useful environment for arranging and sequencing is not useful for creating or designing map or interface content. The program can, however, import most raster image formats including GIF and JPEG, which are the most commonly used formats for the web. For Adobe users, versions 9 and 10 of Illustrator now include ImageReady, which is quite handy for optimizing web graphics.

When images are imported into Director they become cast members, available to use within Director's layout and sequencing environment. Director is modeled after the Hollywood format of movie production. Each movie has a cast of characters called "sprites", is orchestrated with a "time line" and takes place on a "stage."

Adding Motion to the Display

It is important to create a user experience where the map elements are clearly arranged and logical interaction is not only facilitated but also encouraged. For cartographers, thinking of a map or maps in terms of potential sequential experiences is new, but hardly foreign. Director provides a useful architecture for defining navigation and interaction parallel to the display of the maps.

Director uses a timeline metaphor for arranging action on the stage. The timeline consists of a sequence of frames in which any of several channels (similar to the layers found in cartographic design packages) exist. These channels can have their visibility toggled on and off in any frame. [Figure 1]

The timeline allows a movie to be planned out in a linear progression, left to right. However, a movie need not be set for linear viewing; a frame or group of frames can act independently of the other frames allowing the movie to be manipulated by the viewer as it plays. It may be helpful to conceptualize each section of the movie as the chapters found on a DVD.

Director is useful for animating sequences of maps. Each map can be placed in a frame and Director will play through a series of frames until a "stop on frame" com-

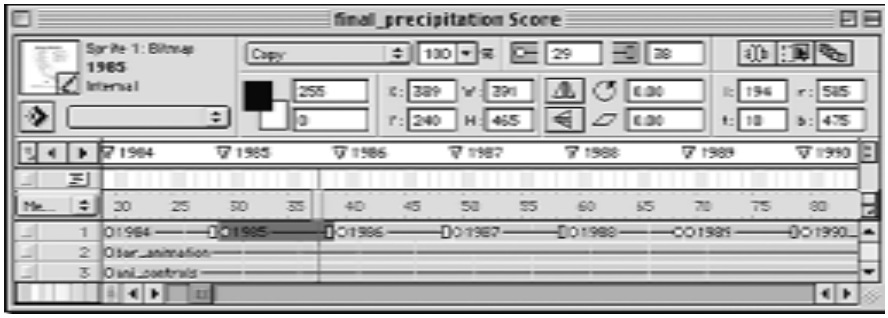

Figure 1. The score shows the movie is currently on Frame 37, Channel 1 has the map for 1985 displayed, Channel 2 has the user-interface navigation bar displayed, and Channel 3 contains the animation controls (pause, backwards, forwards). The top portion of the score window displays information about the selected object; where it is positioned on the stage and how long it is on the stage (1984 is on the stage in Frames 29 through 38).

*Figure 2. This script is associated with a specific frame and is accessed via **Modify > Frame > Script**. The script is called when the movie plays through that frame (exits the frame) and keeps the movie on that frame (keeps cycling through that frame).*

Figure 3. This script is run when the user releases their mouse button on the movie button. The instruction is for the movie to go to the frame marked by the "1984" label and start playing there.

mand is encountered [Figure 2]. The movie can jump to a different series of frames while playing and the content of those frames can be changed on the fly with more advanced programming techniques.

These techniques were used when constructing the sample project. The maps representing each water year were placed in separate frames. The map presentation's interface allows the user to step through the maps one-by-one or in an animated series.

Because of Director's timeline, the program is well suited for mapping projects that emphasis motion or change in the dimensions of time and space. It is also useful for orchestrating interactivity.

Designing a Button

Version 8 of Macromedia Director does not anti-alias text. Therefore, use a graphics package or other software that can produce a professional appearance. Export this interface element just like the map images.

Procedure:

1. Create a button in your preferred graphics software package.
2. Export the button as a raster image. (**File > Export**, File Type: JPG or GIF)
3. Import the image into the Director Cast as a Sprite. (**File > Import**)
4. Place on Stage by dragging the Sprite from the cast to the Stage.
5. Set up a Script for the button; for example, go to Frame Number or Marker in the timeline [Figure 3]. (**Modify > Sprite > Script**)

Introducing Sound

Sound can provide feedback for data exploration, provide background music, be a confirmation soundtrack for actions undertaken (button clicked > sound of bell rung), or provide narration.

Introducing voice-overs can serve to grab the user's attention and this narrative technique can hold the visuals together and provide the viewer with an explanation of what they are seeing, as they see it. These words must be planned and integrated with the map presentation *before* recording the voice-over.

There are many different types of voices; some sound warm,

others cold. A voice can make the listener edgy or make them feel at home. When recording narration voice-overs it is important to select an appropriate tone of voice for the material at hand.

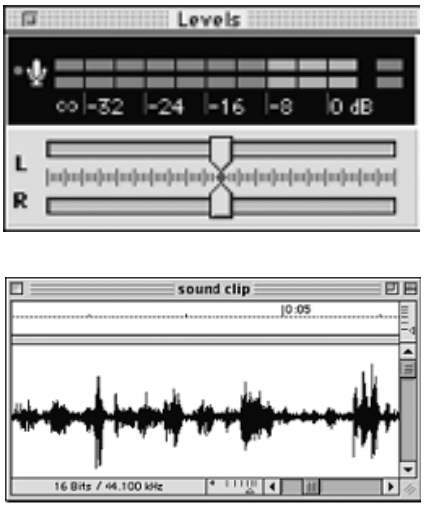

Figure 4. Examples of feedback user interfaces. When using the first, try to keep your voice in the middle, with peaks in the orange and valleys near, but not at the left edge. The second shows the volume wave form—this example is good because it has a range of peaks and valleys, i.e., a dynamic engaging set of voice content—hopefully the map is equally dynamic and engaging.

Record the voice-over in a quite room and use your recording software's feedback facilities. Figure 4 shows two kinds of interfaces for letting you know to speak up or back away from the microphone.

Digital sound can be recorded with a modern computer using programs like Peak LE for the Mac or SoundForge XP for Windows (those programs are included with Director). Once they are digitized, save them in a format compatible with Director (WAV, AVI, sound, or Quicktime at 22,050Hz, 16-bit, and mono) and import them into your cast (**File > Import**). The sound (now a sprite) can now be placed into your timeline to occupy a frame in one of the two sound channels. As the movie plays through the score it will automatically play any sound clip found in a frame. For instance, in the example project voice-over narration is used to audibly introduce each section of the animation.

Director's ability to integrate sound into the map presentation allows cartographers to make use of several senses to deliver more information to the user. The voice-over technique allows the user to interpret the map animation in real-time as the movie plays and the narrator gives viewing pointers.

John Krygier provides basic terms and concepts for using "Sound and Geographic Visualization" in the volume *Visualization in Modern Cartography* edited by Alan MacEachrn (1994). At the recent NACIS 2001 meeting in Portland, Oregon the father & son team of Keith and Steven Rice (University of Wisconsin at Stony Point) presented the first of their three papers, "Scoring and Scripting Music for Animated Maps," on using sound in cartographic products and their next two are highly anticipated.

Publishing to the Web with Director

To publish your Director project to the Web it needs to be saved as a Shockwave Movie.

1. Preview your movie (**File > Preview**)
2. Export your finished movie (**File > Save as Shockwave Movie**)

Once the movie is exported and copied to a location on a web server it can be linked to a normal HTML web page that introduces the movie, its topic, and viewing requirements (plug-in information).

Conclusion

Macromedia Director is just one way of creating content-rich Internet maps. The learning curve for Director is moderate to steep so keep your map presentation simple and do as much of the map design in a graphics package.

There are other tools for creating Internet compatible maps. For in-stance, Macromedia's Flash pro-duct enables vector graphics to be used. If you want users of your map to be able to print at high resolution then Flash is a good alternative.

A relatively new format for web vectors is the World Wide Web Consortium's SVG or Scalable Vector Graphics format. Carto.net, based in Switzerland, has online tutorials and information on this emerging technology: http://www.carto.net/papers/svg.

In general, if you want high quality printed maps, use a vector-based format such as SVG or Flash. If you only need high quality on-screen maps use Director or tradi-tional HTML.

Content-rich maps on the Web have the potential for negative side effects. Often these content-rich maps require more bandwidth and modern multimedia capable computers with specialized software for viewing and getting information from the maps.

Modern cartography can embrace this change in medium using new delivery techniques that meet the demands of increasingly multimedia literate and expectant map users. The opportunities that these new Internet-based technologies bring are well worth the effort.

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FURTHER READING

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book reviews

The Grammar of Graphics

By Leland Wilkinson
New York: Springer-Verlag, 1999.
ISBN 0-387-98774-6, hardcover, $69.95, xvii, 408 pp., tables, 248 illustrations (169 full color), references, index.

Reviewed by Russell S. Kirby, PhD, MS, FACE
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Some books defy simple classification. This volume is at once a text and a philosophical treatise, and to some may seem to be an advertisement for a companion statistical software program. Moreover, given its title, many cartographers and geographers might miss its considerable relevance to their work. That would be unfortunate, for there is much of interest to be found within its pages.

The book's title at once promises more and less than the text delivers. Leland Wilkinson, the book's author, is a legendary figure in the field of statistical software, having been an academic, a programmer, and an entrepreneur who wrote and marketed the SYSTAT program and is now senior vice president for SYSTAT products at SPSS, Inc. Wilkinson has spent an entire career thinking about how to array, visualize, analyze, and interpret data, and this book summarizes his current thinking on the subject. While much of his work may seem theoretical, Wilkinson is a very practical man who has also developed a data graphics software package designed around the grammar described here.

The heart of this book is a series of chapters describing the concepts and structure of Wilkinson's understanding of the grammar of graphics. The grammar consists of verbs, nouns, and adjectives, and processes from the input noun "data" through the successive steps "dataset," "varset," and "graph," to the output noun "graphic." Along the way, the verbs "dataview," "varmap," "grapher," and "aesthetic" transform the data as it is shaped into a graphic, modified by the adjectives "reference," "algebra," and "coordinate." Each of these steps and modifications is described in general terms in a series of ten chapters, with illustrations of the application of most concepts discussed. Cartographic examples appear throughout, although Wilkinson takes pains to remind the reader that his grammar does not create or emulate a geographic information system.

Wilkinson's purpose is to identify the general rules that govern the creation and presentation of data graphics, and to set forward a structure within which these rules might be operationalized most efficiently. If the grammar is successful, it should be possible to reduce any data visualization problem into a graphic utilizing the rules outlined. Wilkinson is the first to admit that this structure is only one of many that might be constructed while following these rules, and that the purpose of the book is to further the scientific understanding of the display of quantitative data in graphical forms. To this end, Wilkinson builds on, and in some instance criticizes, the work of Tufte, MacEachren, Bertin, Cleveland, Tobler, and many others who have contributed to this field over the past fifty years.

The final chapter pulls together the elements of the grammar of graphics by attempting to graph complex problems solely through the rules proposed. To demonstrate the versatility of his grammar of graphics, Wilkinson shows how it might be applied to generate a replica of Minard's well-publicized "Figurative map of the successive losses of men in the French army during the Russian campaign, 1812-13" (Tufte 1983), and a complex dataset concerning the annual northward migration of the Monarch butterfly across North America.

Among its many strengths, this book is very methodical, at times obsessively so. It is also very well illustrated, with numerous charts and graphics, a lengthy and comprehensive bibliography and index. For this reviewer, the most significant weakness is that it is difficult to grasp many of the nuances of the proposed grammar without the opportunity for a hands-on experience. A companion CD-ROM including the examples in the book, so that readers can experiment with the various functions and elements of the grammar of graphics, would greatly enhance the text.

This book is not for the faint of heart, and certainly not for the novice reader. It would not be recommended reading for those without several courses in statistics; geographers who lack training in cartographic methods may also find the book difficult. However, those who read the book cover to cover and take some time to ponder the concepts and proposed theoretical structure for data graphics will find the experience worthwhile. All geography and

map libraries should add this book to their collections; the serious scholar of quantitative data graphics will place this book on the same shelf with those by Edward Tufte, and volumes by Cleveland, Bertin, Monmonier, MacEachren, among others, and continue the unending task of proselytizing for the best in statistical data presentation by example and through scholarship like that of Leland Wilkinson.

Reference

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The New Nature of Maps: Essays in the History of Cartography

By J. B. (John Brian) Harley, edited by Paul Laxton, with an introductory essay by J. H. Andrews. Baltimore, MD: The Johns Hopkins University Press, 2001. xviii + 334 pages, 36 illustrations, $45.00 cloth (ISBN 0-8018-6566-2)

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A collection of seven essays by the late Brian Harley (1931-1991), *The New Nature of Maps* is an unusual book. Harley had such a book in mind but published its chapters separately in the late 1980s and early 1990s, in a variety of anthologies and academic journals, including *Cartographic Perspectives*. What he no doubt never intended was a posthumous volume that is as much about the author himself as it is his own critique of late-twentieth-century approaches to the history of cartography. Meticulously edited by Paul Laxton, a former student who inherited the role of Harley's "literary executor," *New Nature* is introduced by a lengthy and insightful critique of Harley's ideology and scholarship by John Andrews and topped off by a comprehensive list of Harley's publications, compiled by Matthew Edney, and a consolidated bibliography for the seven essays, compiled by Laxton.

In the preface, Laxton explains his rationale for putting Andrews's essay first. Brian Harley is the closest thing cartography has had to a cult figure, and even though his essays "will survive as important statements in map history . . . a critical evaluation is now both necessary and healthy" (xi-x). As a friend, critic, and frequent correspondent of Harley's, Andrews was not only "well placed" to offer an "objective" overview but readily able to contribute a shorter version of his essay "Meaning, Knowledge, and Power in the Map Philosophy of J. B. Harley," published in 1994 in Trinity College's occasional papers series.

Andrews's lively narrative and provocative opinions are a fitting complement to his subject's fluent, elegant, and at times inflammatory prose. Harley, he observes, was a "widely read" scholar who eagerly sought cartographically relevant insights in a diverse array of disciplines that included art history, literary criticism, Marxist ideology, and semiotics. But in what reads as a benevolent deconstruction, Andrews notes that "Harley considers most map makers to be less objective than they think they are," but asks, "Can the same judgment be applied to him?" (3). Probably not, one must conclude from Harley's tendency to unduly emphasize a map's minor decorative elements and to read unfriendly intent onto the map maker's use of size, centrality, color, and vernacular toponyms. Putting one's own country or continent at the center of a map—arguably an appropriate strategy for user-friendly design—thus becomes evidence of arrogant ethnocentricity. Andrews also questions the Harleyian concept of "silences," which allows the critic to read sinister motives into what are merely "blank spaces" on a map. Is it fair, Andrews wonders, to accuse a cartographer with nothing to show of withholding relevant information? But as Harley argues later, in several of his essays, the answer at least occasionally can be a resounding yes.

Especially intriguing is Andrews's critique of Harley's use of cleverly phrased, seemingly broad generalizations. Of course, Andrews also indulges in generalities, as when he suggests "it may just be bad luck that when Harley's theories hit cartographic bedrock the results are often unsatisfying and sometimes factually incorrect" (29). Or when he observes that "a notable failure of Harley's explanations, then, is how much of their weight is borne by his contexts and how little—sometimes none—by the maps themselves" (30). And in what strikes me as the epitome of backhanded complements, Andrews asserts, "The fact remains that on a 'weak' interpretation Harley's essays may yet prove to be ahead of their time. His predecessors and contemporaries have known perfectly well that cartography works against a background of capitalism, elitism, nationalism, imperialism, and religious prejudice . . . [but] when young map historians start asking 'Daddy, what is class?' Harley's arguments will come into their own" (31). Don't hold your breath, eh?

As for the contemporary popularity of Harley's writings among humanities scholars, Andrews offers the understandable if not cynical explanation that Harley "has subjected the 'technocratic' claims of modern cartography to the kind of critical onslaught that outsiders are always glad to see leveled at any entrenched professional group" (32). Even so,

Andrews concludes that "Harley's philosophical writings deserve praise as a stimulus to thought in readers who might otherwise have remained consciously empirical" (32). And he predicts the essays' survival "as tokens of intellectual light-footedness and literary skill" (32).

Is there any reason, after Andrews's introduction, to read Harley's essays? Definitely. Not only well-written and often witty, they invite a skeptical reading certain to stimulate useful questioning on many levels, not just of old maps themselves but of scholars who purport to understand them—a broader and more thorough ques-tioning that was, if we believe An-drews, Harley's underlying goal.

In the first essay, "Texts and Contexts in the Interpretation of Early Maps," Harley examines historians' reluctance to acknowledge maps as "social constructions" that reflect the interests and ideology of the people in power. Among his varied examples of maps that ought not be taken wholly at face value are U.S. Geological Survey topographic maps, on which a military interest in tree cover determines the placement of the green tint for woodland, and bird's-eye views of North American cities, which are "cultural texts that take possession of the land . . . proclaim a social gospel and serve to reinforce it" (45). Instead of looking only at what a map shows, Harley warns, historians would do well to "search for silences" (45), that is, for features the map author omits, deliberately or unconsciously, because of ideology. But in Harley's view, satellite images are as suspect as eighteenth-century topographic maps. "Representation is never neutral," he reminds readers, "and science is still a humanly constructed reality" (46). To reinforce this practiced skepticism, Harley invokes the work of art historian Erwin Panofsky to suggest a trio of iconographic parallels in art and cartography. For instance, in the sense that symbolic meaning in maps is akin to the intrinsic meaning of paintings, "a Rand McNally highway map speaks to the American love affair with the automobile" (48). I'm not certain how much salience Harley's examples hold for most historians, but the essay should surely impress cartophiles with the power of maps and map makers.

"Maps, Knowledge, and Power" offers a more theoretical view of maps as a form of discourse and surveillance: ideal tools of a state intent on declaring nationhood, claiming territory, or establishing private-property rights. Under the heading "Subliminal Geometry," Harley raises the now-familiar ethnocentric worldviews of the European Renaissance and asserts that a Mercator chart centered on Europe so that "two-thirds of the earth's surface appears to lie in high latitudes must have contributed to a European sense of superiority" (66). An interesting hypothesis, perhaps, but nowhere does Harley (or anyone else for that matter) offer convincing evidence that this sense of superiority really existed or, even if it did, that carto-inflation has ever had even a minor impact on war, conquest, or diplomatic intrigue. (Ten years ago, in the smog of postmodern theorizing, I might not have said this. But see how well a critical reading of Harley stimulates questioning.)

Published in *Imago Mundi* in 1988, "Silences and Secrecy: the Hidden Agenda of Cartography in Early Modern Europe" is perhaps Harley's single most famous essay. Rejecting the term "blank spaces," favored in older texts on map history, he asserts that "silences" merit interpretation as "active human performance," a phrase borrowed from the philosopher Bernard Dauenhauer. In developing his theory of cartographic silences, Harley leans heavily on the writings of French philosopher Michel Foucault, who "seems to have accepted the map as a tool of state measurement, enquiry, examination, and coercion" (87). If one buys Foucault's thesis that knowledge is power, it's a short deductive leap to conclude that when the state is the map author even unintentional silences can be meaningful. More intriguing are those silences presumed to be intentional for reasons of military strategy, political propaganda, or commercial advantage. In pre-eighteenth-century Europe, of course, the entire map was often secret. But at least a few intriguing instances of censorship are apparent, such as the suppression of knowledge about Terra del Fuego as demonstrated by a pair of facsimile excerpts from 1617 and 1618 versions of Willem Janzoon Blaeu's *Nova Orbis Terra*. Harley's suspicion that map authors were neither telling it all or telling it like it is (or was) led him to endorse cartographic educator Phillip Muehrcke's comment that a map is "a controlled fiction" (107).

The fourth essay, "Power and Legitimation in the English Geographical Atlases of the Eighteenth Century," evokes memories of the 1984 Library of Congress symposium on atlases, for which an industriously provocative Brian Harley mined the library's atlas collection for examples of maps as instruments of power. He didn't have to look far because atlases in eighteenth-century England often depended on powerful patrons, eager to assert social or political superiority, in particular the wealth and influence of the nobility and landed gentry. Maps and atlases legitimated the prevailing social-economic-political-class structure by portraying its relationships to landscape and territory as normal. Harley argued this thesis effectively with eleven maps, map excerpts, title pages, cartouches, and subscriber lists that reveal at-

las making as a convenient means for reinforcing claims to power at home and to colonies abroad. Convincing exhibits make this one of his least contentious essays.

Harley's penchant for borrowing philosophical or humanist buzzwords is most readily apparent in "Deconstructing the Map," in which he argues that maps are often not what cartographers assume them to be. If the notion of deconstruction is both troubling and muddled, it's partly because there's no insightfully lucid *Deconstruction for Dummies* telling us how to do it. Although the concept of understanding something by taking it apart seems straightforward in college chemistry, where it's called analysis, the process seems orders of magnitude more complex when applied to literary texts or maps for which context is largely speculation. For Harley and most literary theorists, deconstruction thus becomes an interpretative act in which taking apart looks a lot like tearing down.

One of Harley's prime targets is the "myth" of "progressive science," which those academic and professional cartographers who eagerly appended the label "science" to mapmaking and GIS seem to have bought into. It's here that I feel a strong intellectual kinship to Brian Harley, who was not impressed with the hype of disciplinary posturing and the rush to rename journals. But as I write in late 2001, his vigorous attack on cartographic rhetoric seems a bit dated insofar as it's abundantly obvious, or should be, that most maps are not the objective, value-neutral tools that some naïve map makers apparently think they are. I know what Brian was trying to say, but his closing argument that postmodernism offers a reliable way to discover meaning in maps is undermined by the feeling that needlessly complex, whimpering rhetoric has little to do with serious, fruitful questioning.

Published posthumously in 1994, the essay "New England Cartography and the Native Americans" reveals Harley at his best, in this instance as a critic of the omission, if not suppression, of indigenous settlements on colonial maps of New England. In clear and elegant prose, he describes the use of maps as weapons by colonists who not only renamed and subdivided the lands of peoples they displaced but left a cartographic legacy that Harley eloquently labels "a discourse of the acquisition and disposition that lie at the heart of colonialism" (195).

The final essay, "Can There Be a Cartographic Ethics?" begins by asking what one means by "ethics" in the context of present-day professional cartography. Here Harley challenges the notion of ethics based on traditional values, practices, and standards of conduct. One villain is the "internal standards" of a profession whose products at least occasionally promote conquest, oppression, and questionable warfare—all with serious moral impact outside the professional activities of map makers. Other villains are positivism, the "'cartographer knows best' fallacy," "introspective technophilia," and federal restrictions on cartographic content. I think I know what Brian was trying to say here—surely it was more than just another round of GIS bashing—but I wish he had been more specific about policies and practices he found abhorrent. It's important for map makers to question what they do, but I'm not sure there's much point in questioning their existence.

I knew and liked Brian Harley, and greatly appreciate his fluency with language as well as his eloquent and original insights on maps, maps authors, and map use—all of which are excellent reasons for appreciating Loxton's and Andrews's careful packaging of his most philosophically challenging writings. That said, I am curious to see how others read this book. Will they succumb uncritically to Brian's persuasive rhetoric, or be strongly influenced, as I was, by Andrews's introduction? Either way, I'm certain, they will find the experience rewarding.

Reference

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FIGURES

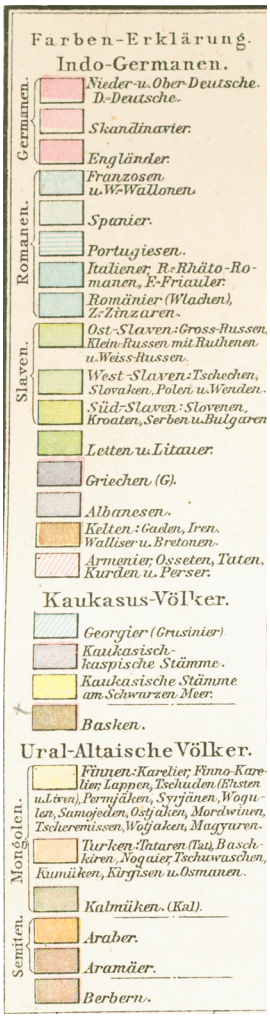

Figure 1. Völkerkarte von Europa

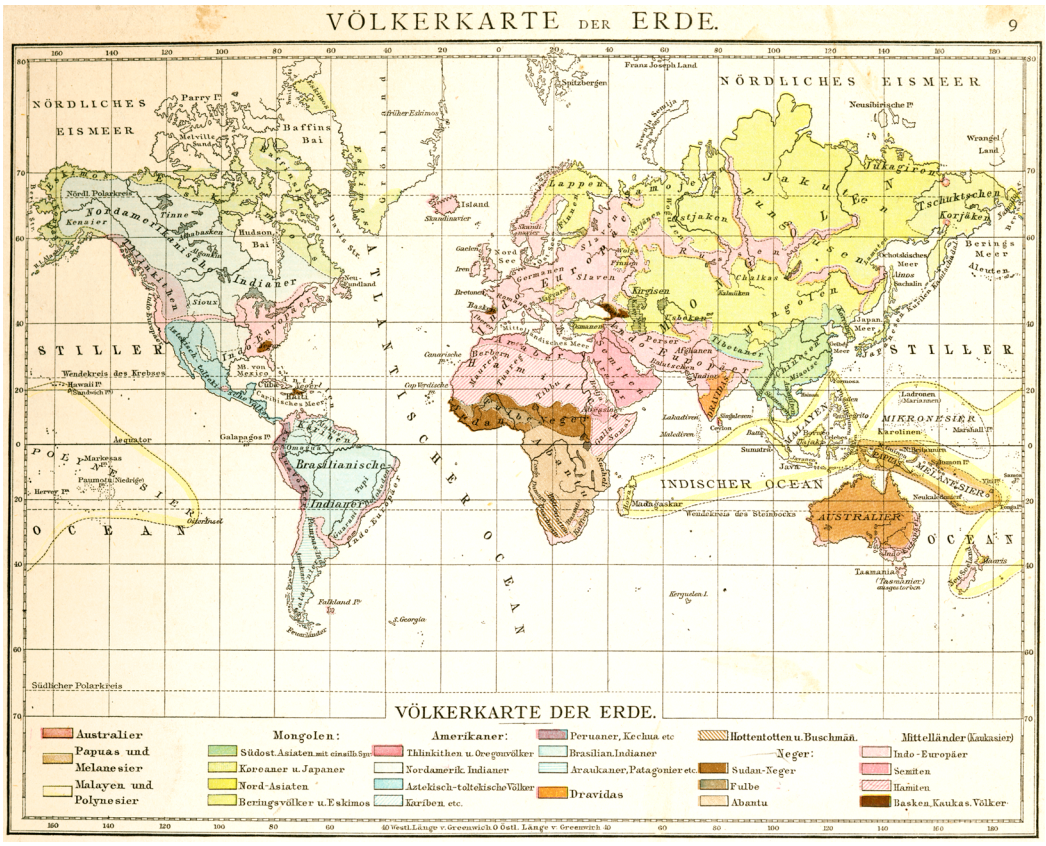

Figure 2. Völkerkarte der Erde

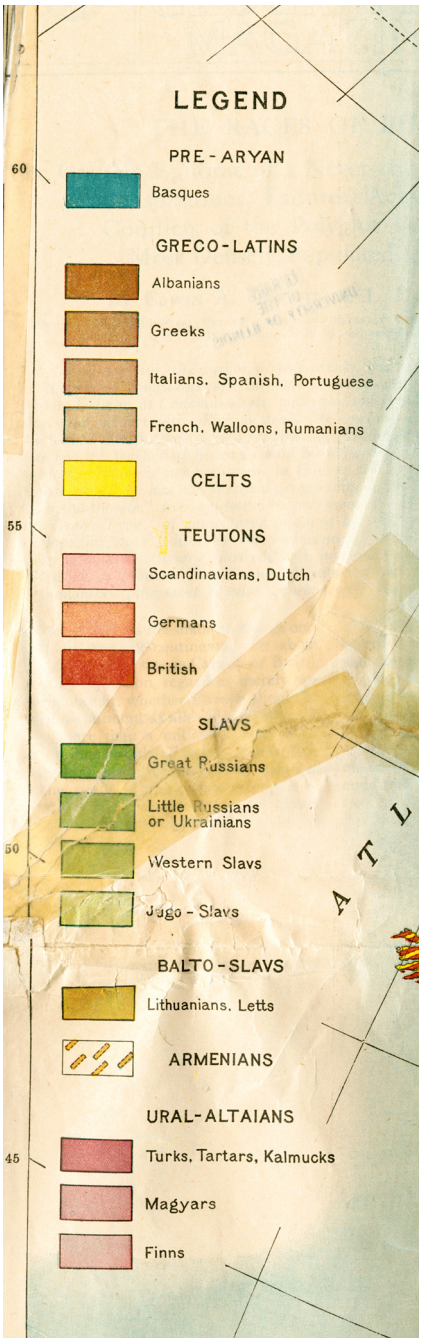

Figure 3. Map of the Races of Europe and Adjoining Portions of Asia and Africa, Legend

Figure 4. Map of the Races of Europe and Adjoining Portions of Asia and Africa, Basques

Figure 5. Map of the Races of Europe and Adjoining Portions of Asia and Africa, Fiume

Figure 6. Volkstumskart von Jugoslawien

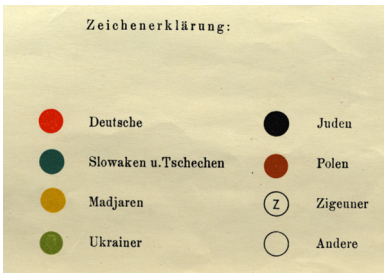

Figure 7. Volkstumskart von Slowakei, legend

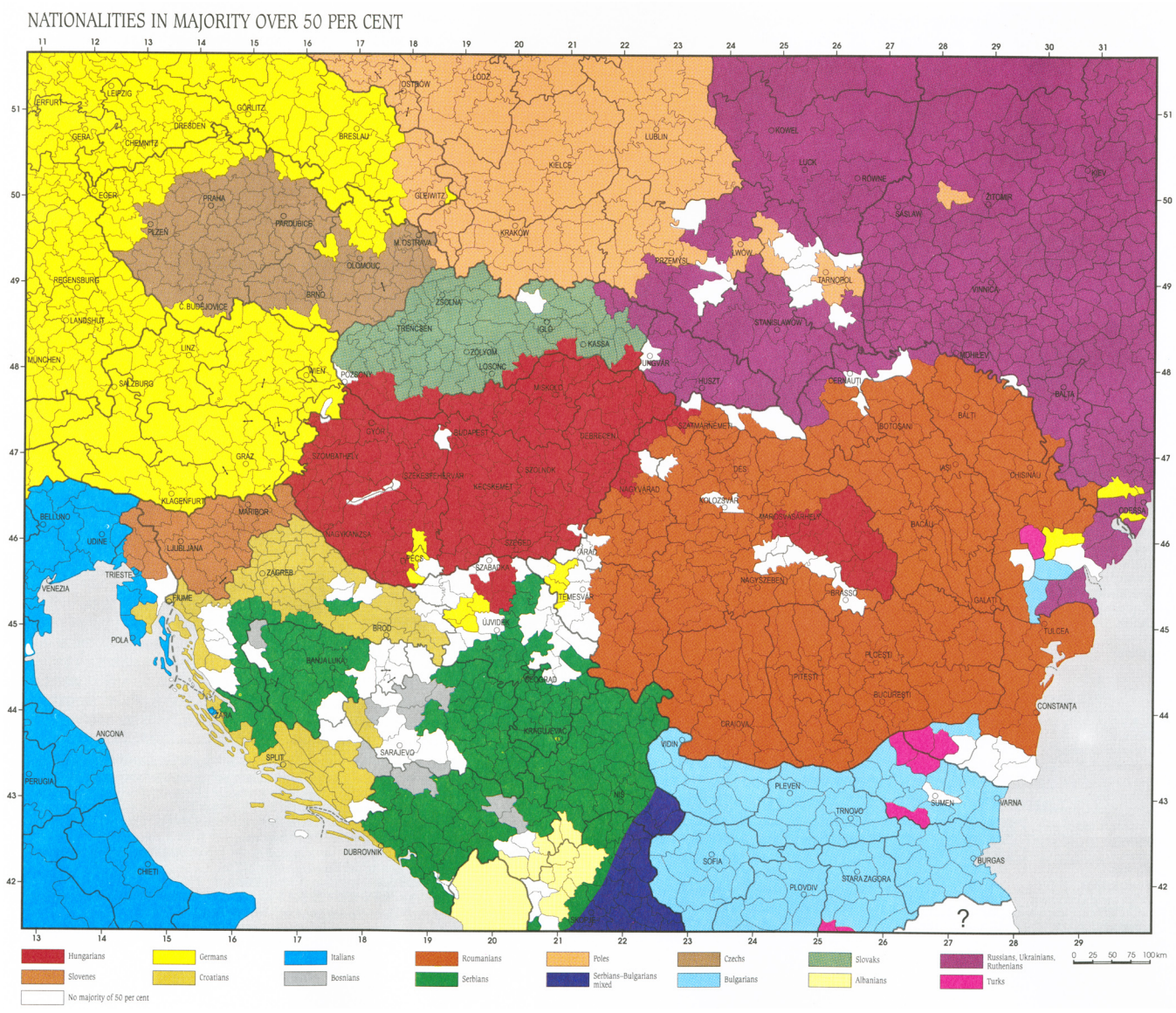

Figure 8. Nationalities in Majority over 50 percent

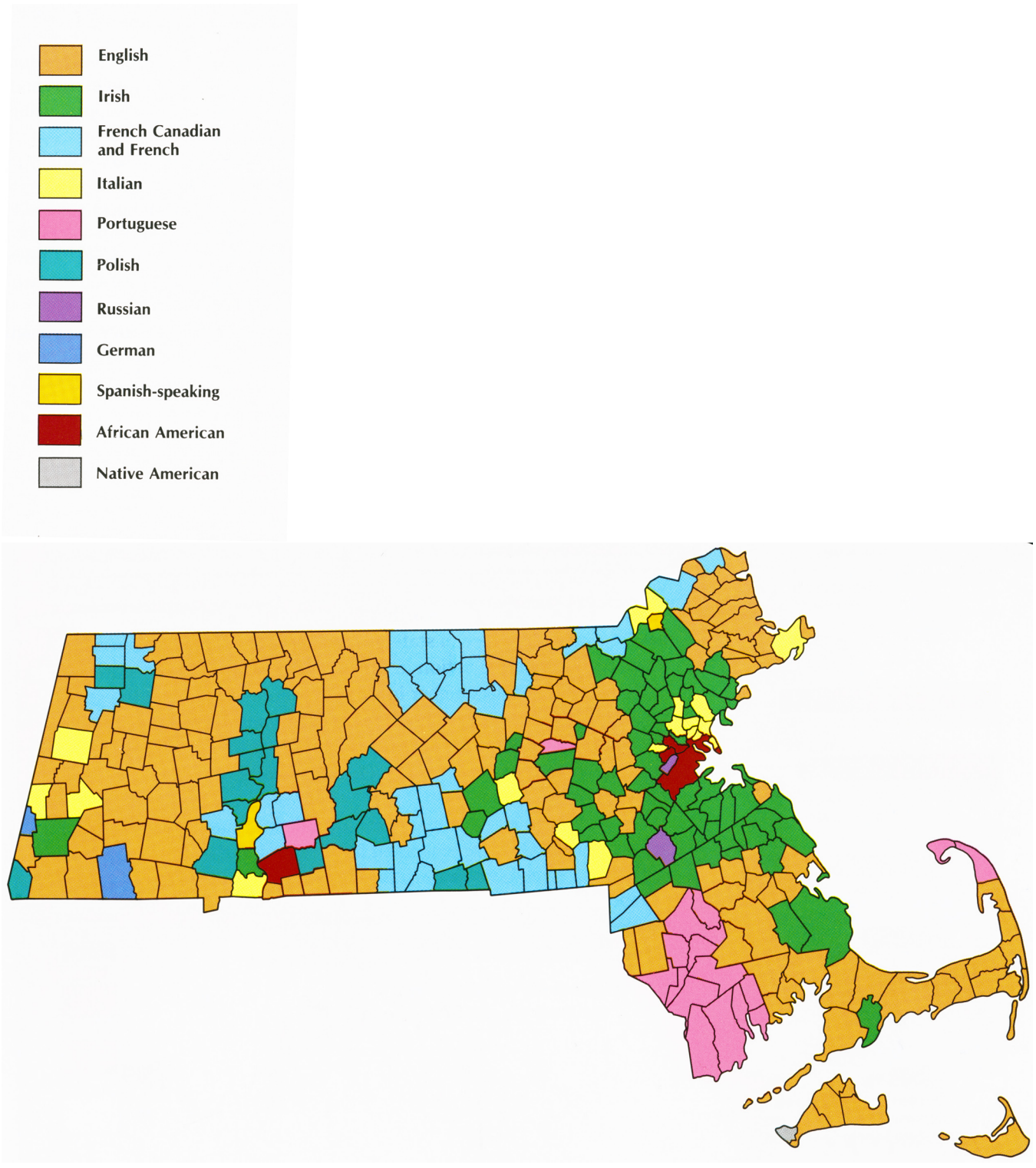

Figure 9. Dominant Ethnic Groups

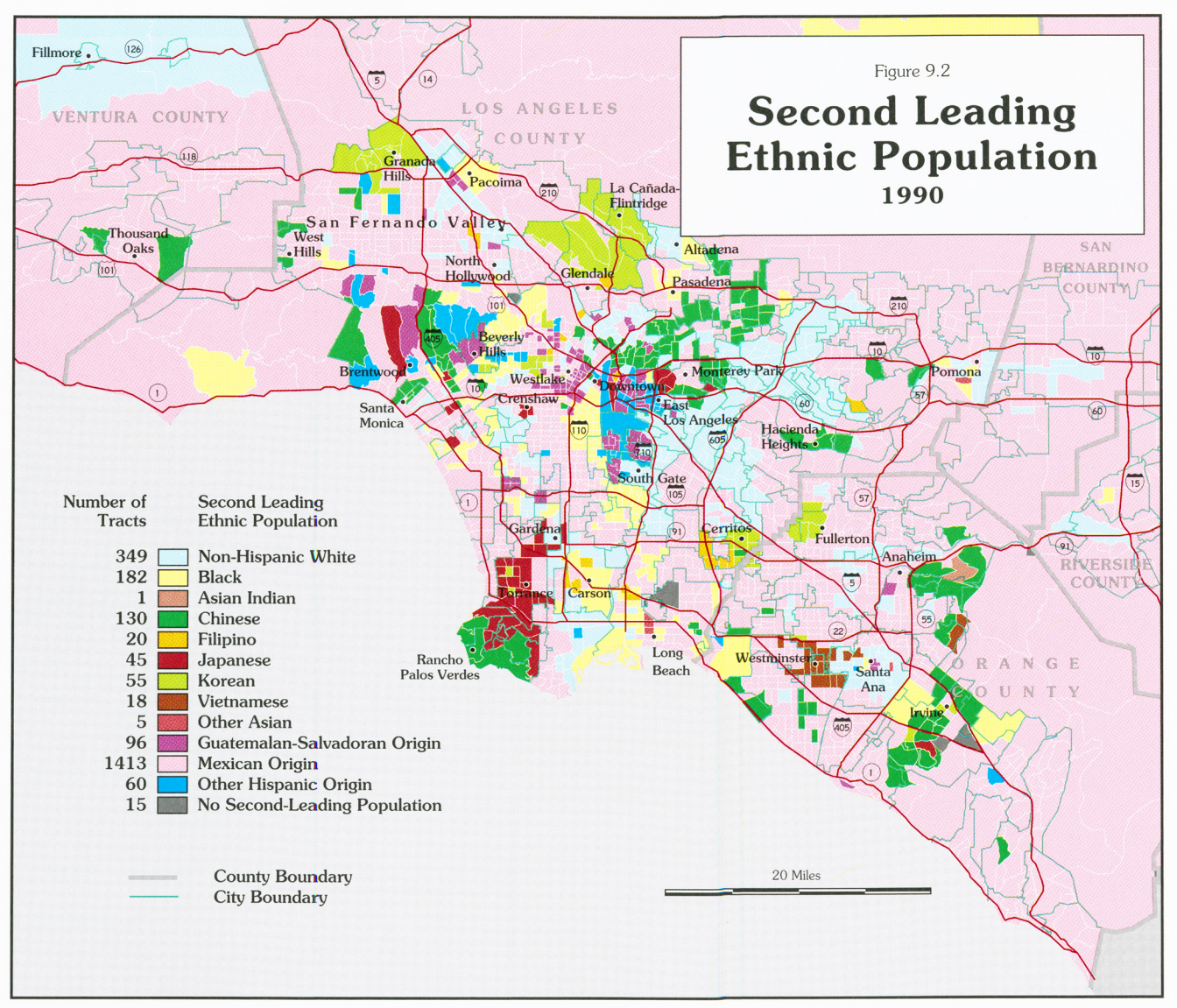

Figure 10. Second Leading Ethnic Population, 1990

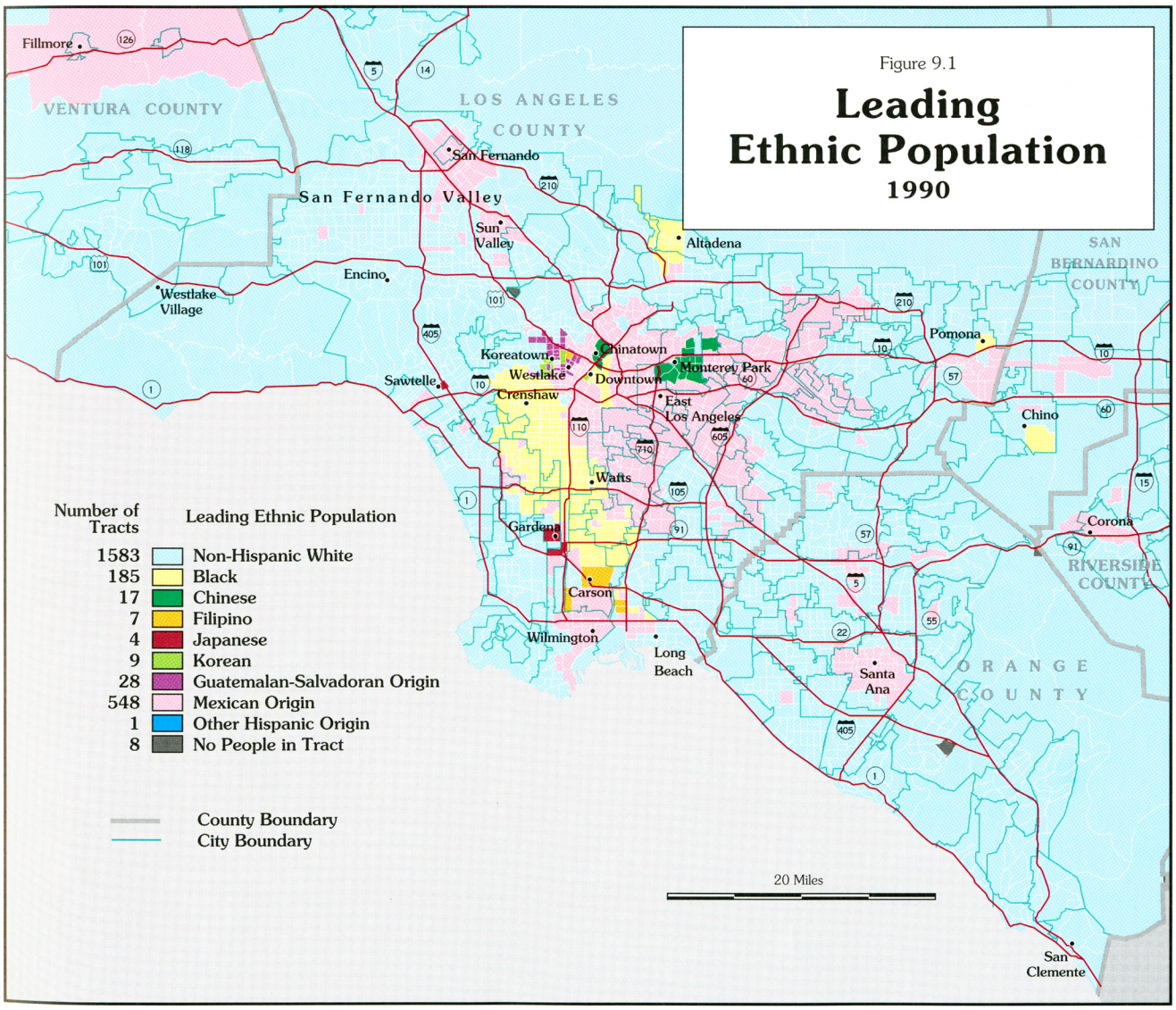

Figure 11. Leading Ethnic Population, 1990

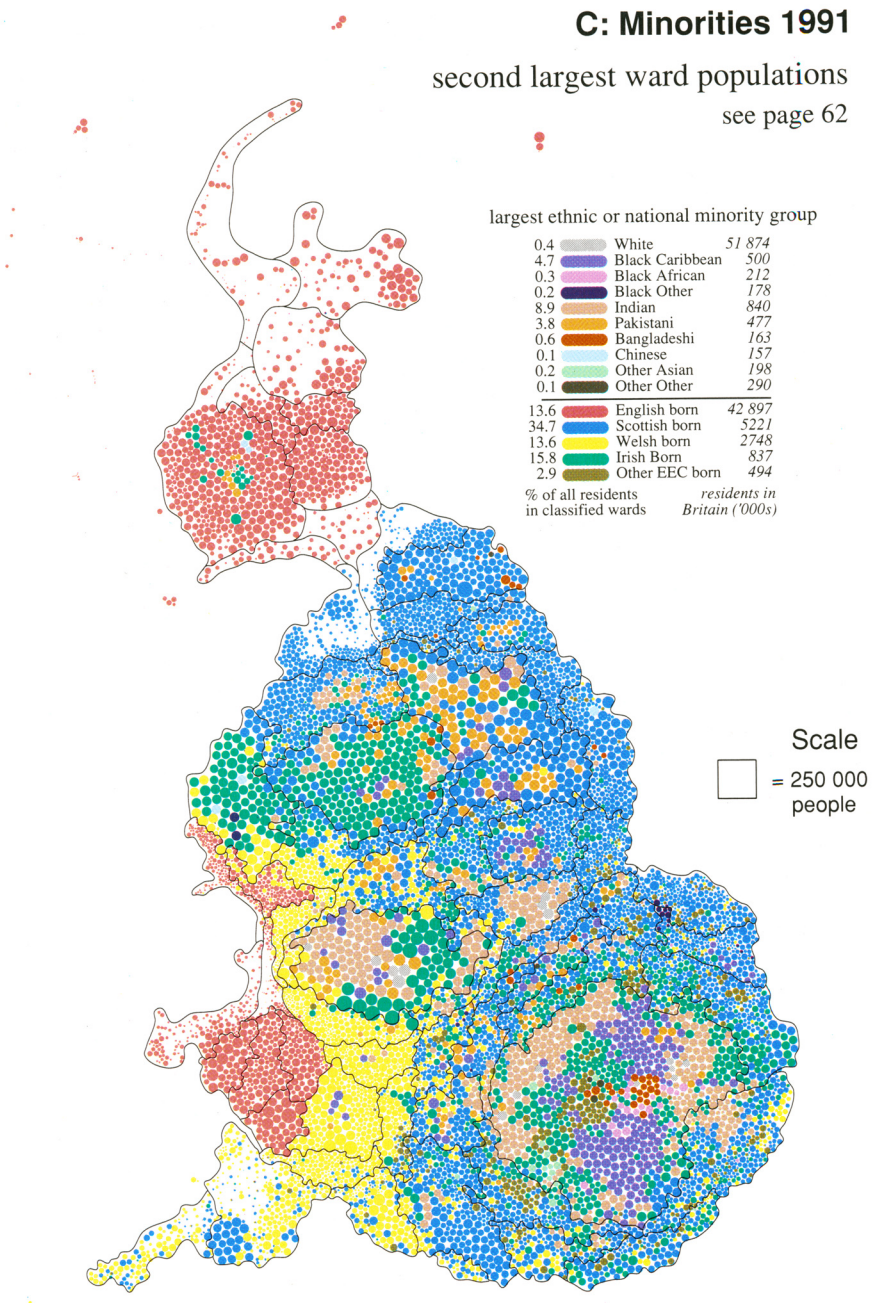

Figure 12. Minorities, 1991

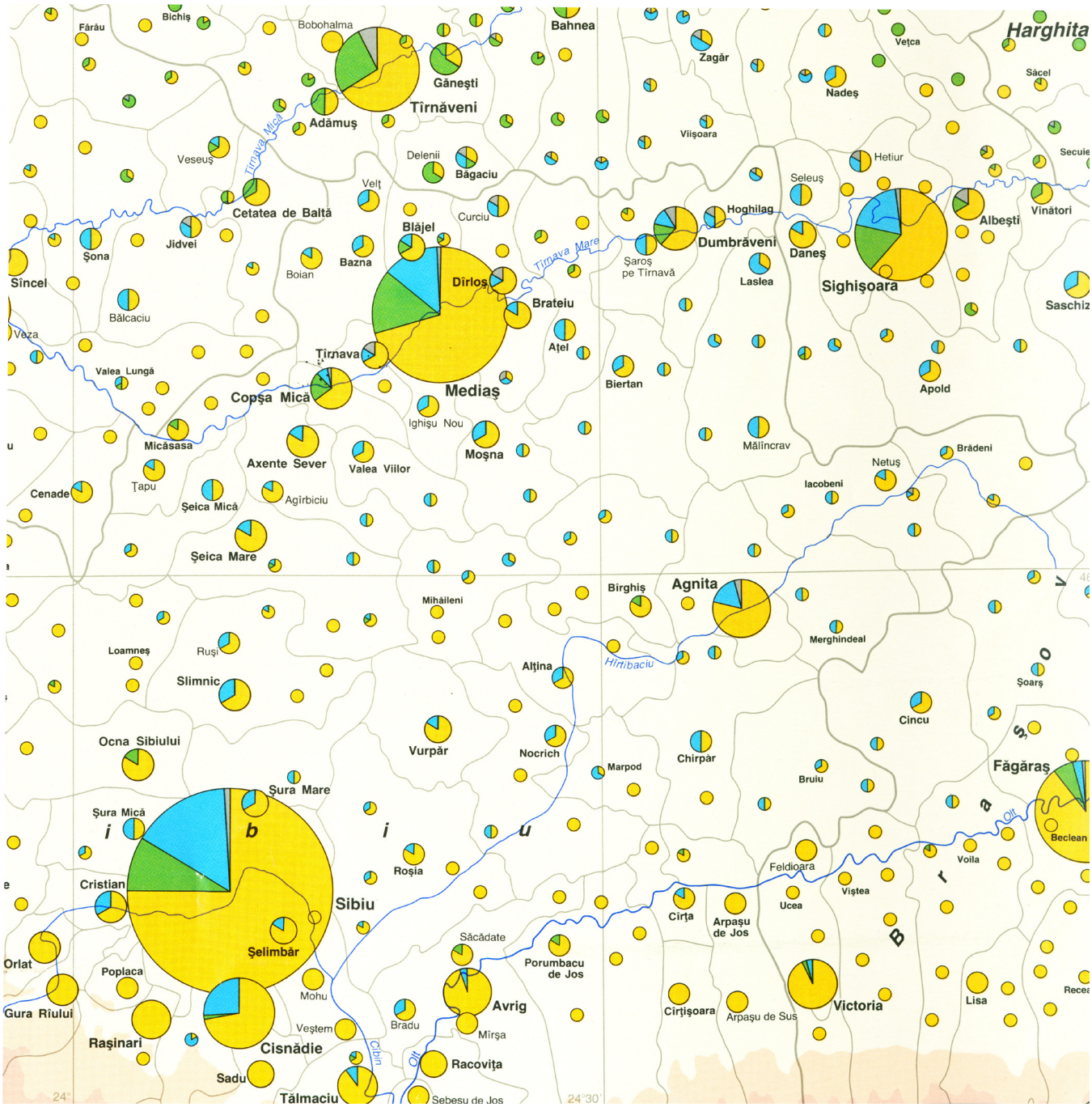

Figure 13. Sprachenverteilung in Siebenbürgen

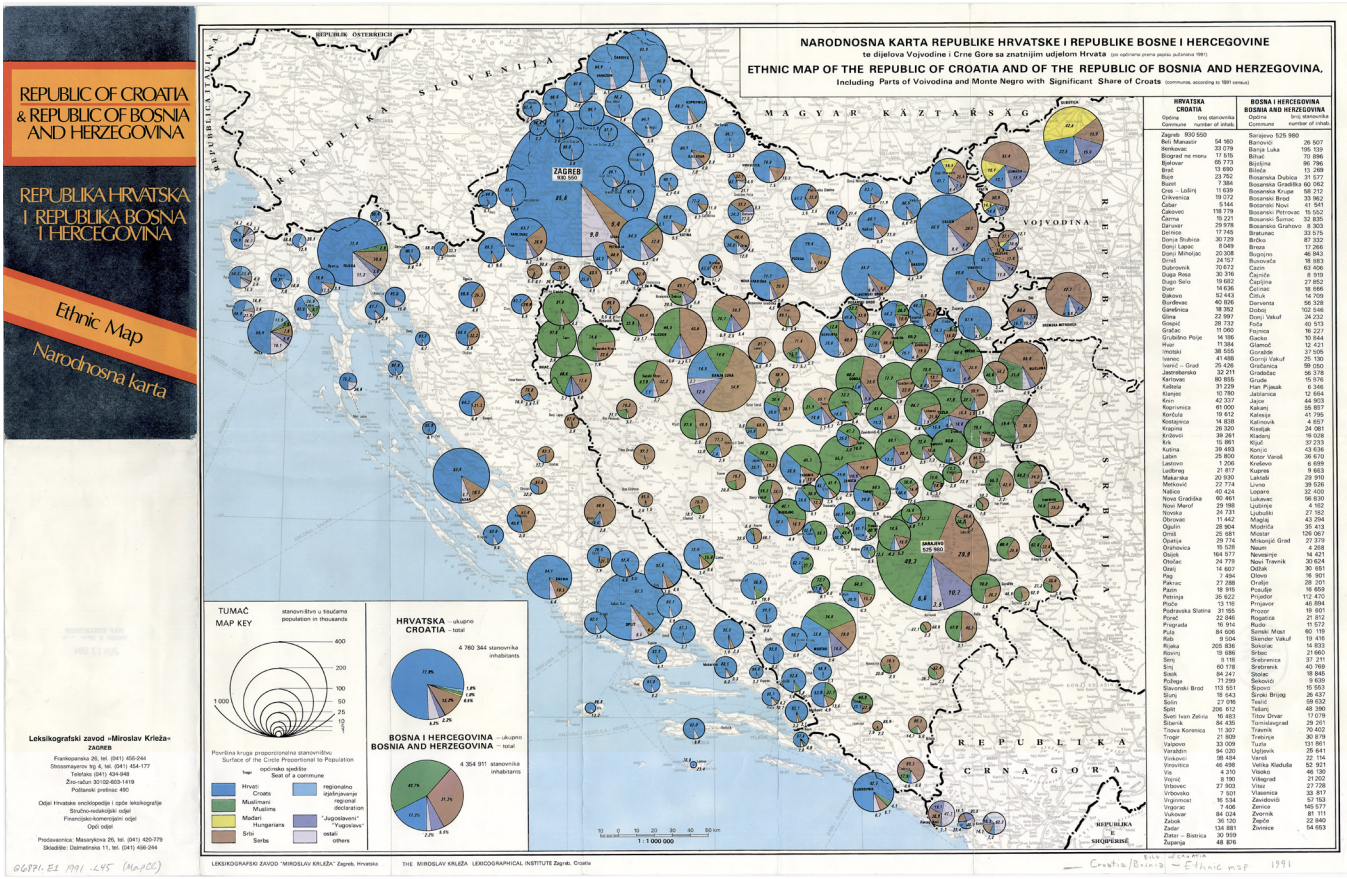

Figure 14. Ethnic Map of the Republic of Croatia and of the Republic of Bosnia and Hersegovina

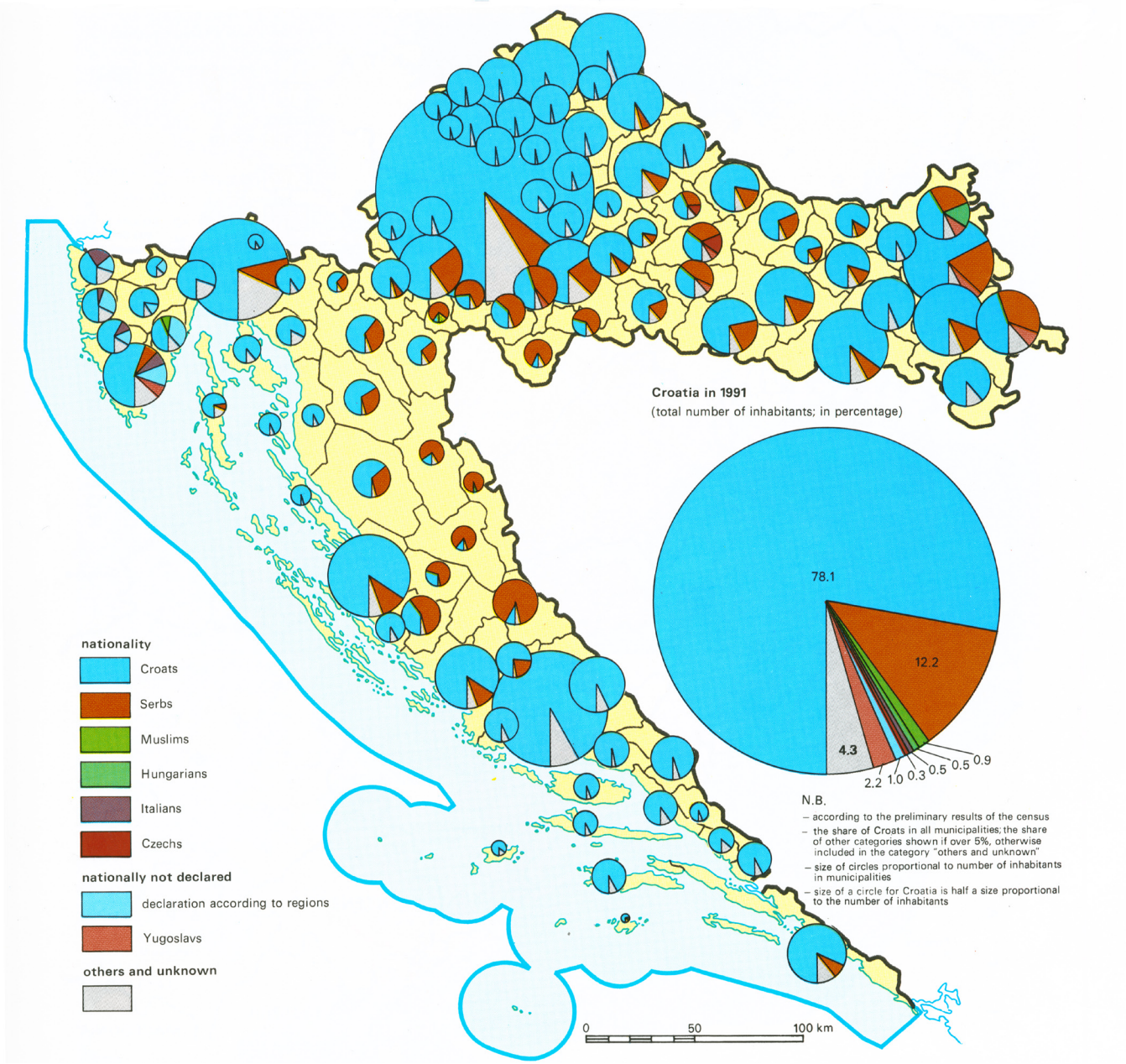

Figure 15. Population according to Nationality in 1991

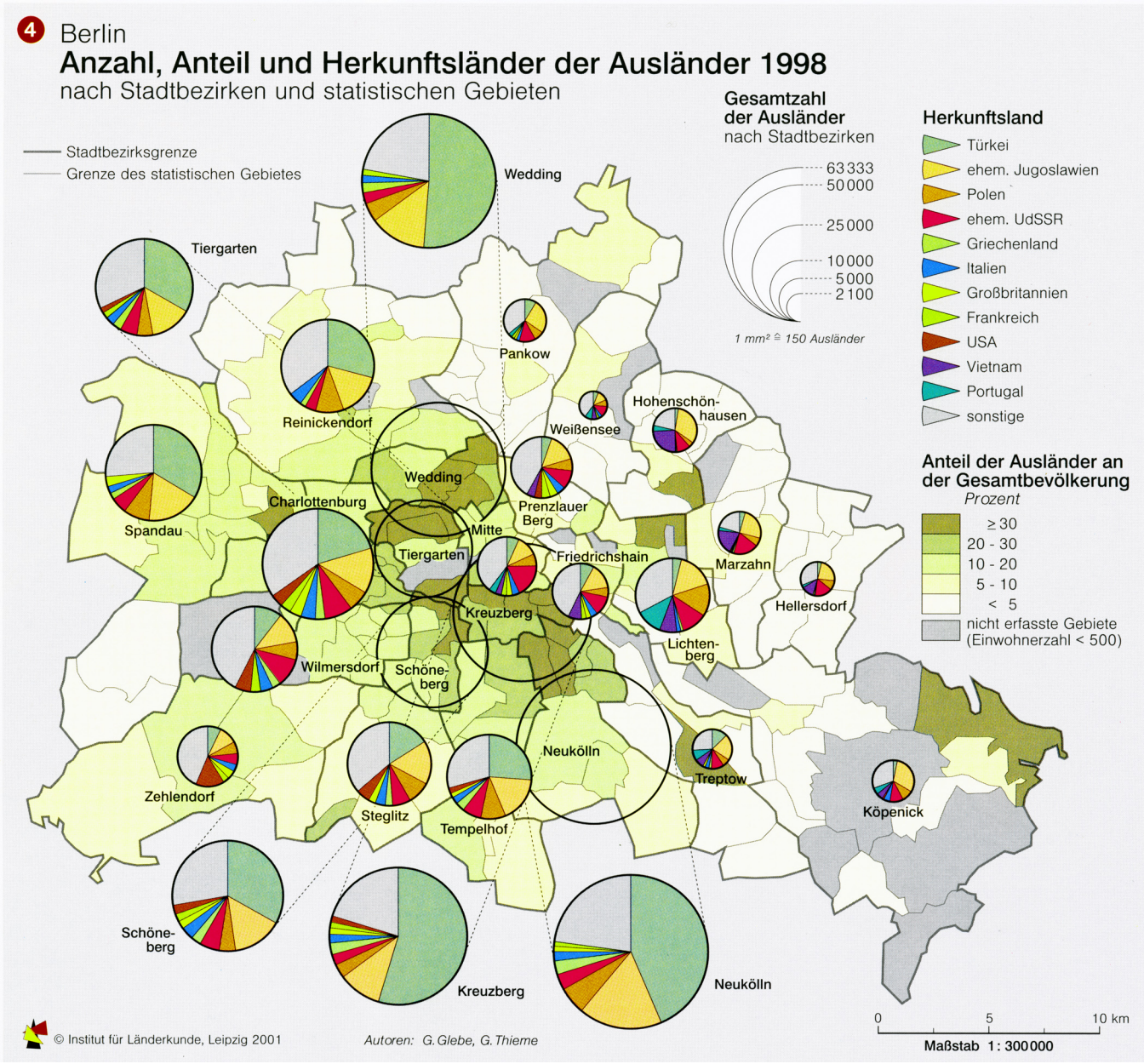

Figure 16. Berlin, Anzahl, Anteil und HerkunftslUander der AuslUander 1998

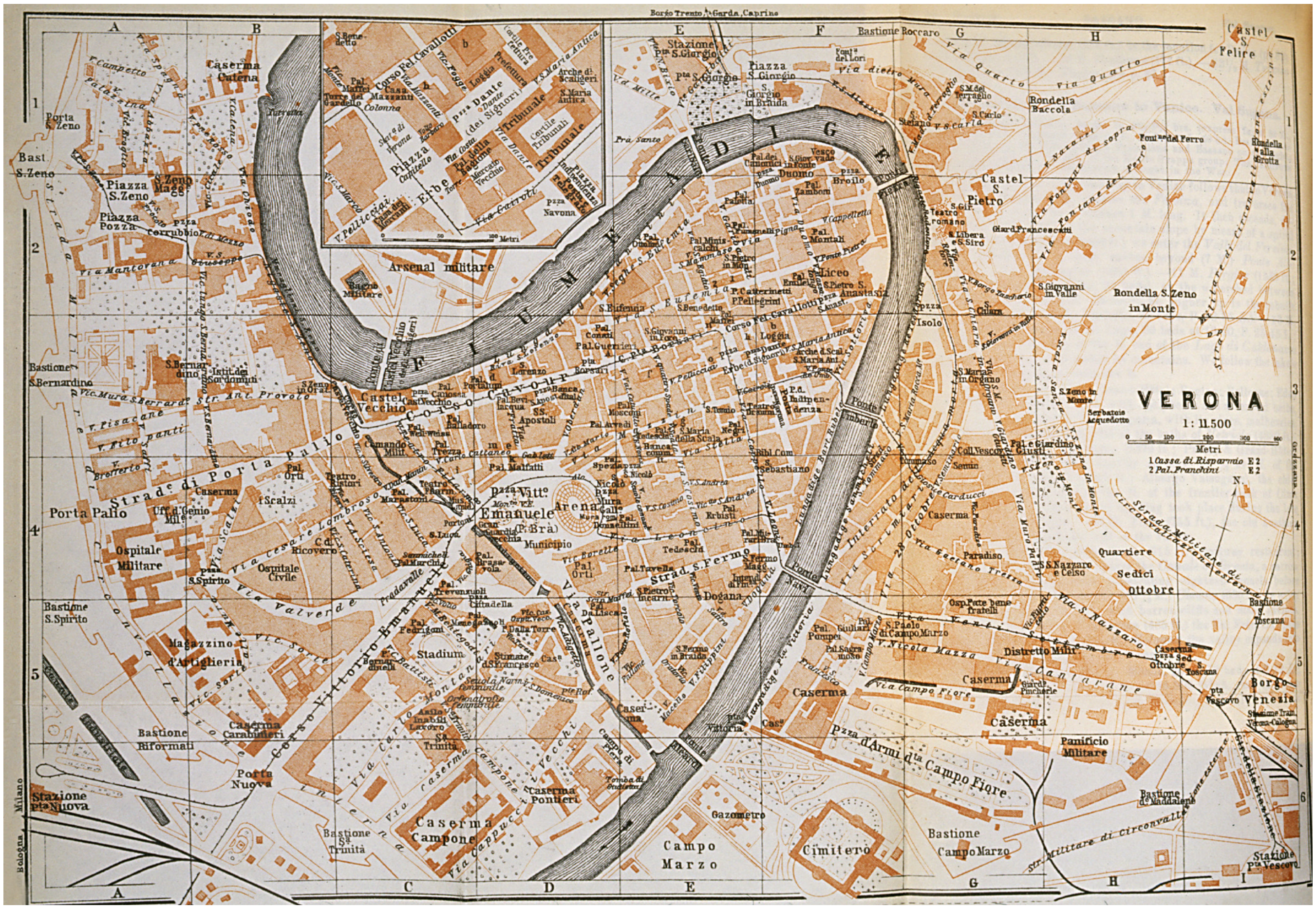

Figure 1. Fold-out map of Verona. From Karl Baedeker, Italy from the Alps to Naples: Abridged Handbook for Travellers, *Leipzig: Karl Baedeker, 1928, opposite 73. Produced by the cartographic firm of Wagner and Debes, Leipzig. Scale, 1:11,500. Lithographed and colored map,* *10 1/2″ W x 7 1/8″ H on a sheet 11 1/4″ x 7 3/4″. General Research Division of the New York Public Library—Astor, Lenox and Tilden Foundations. Courtesy of Karl Baedeker Verlag.*

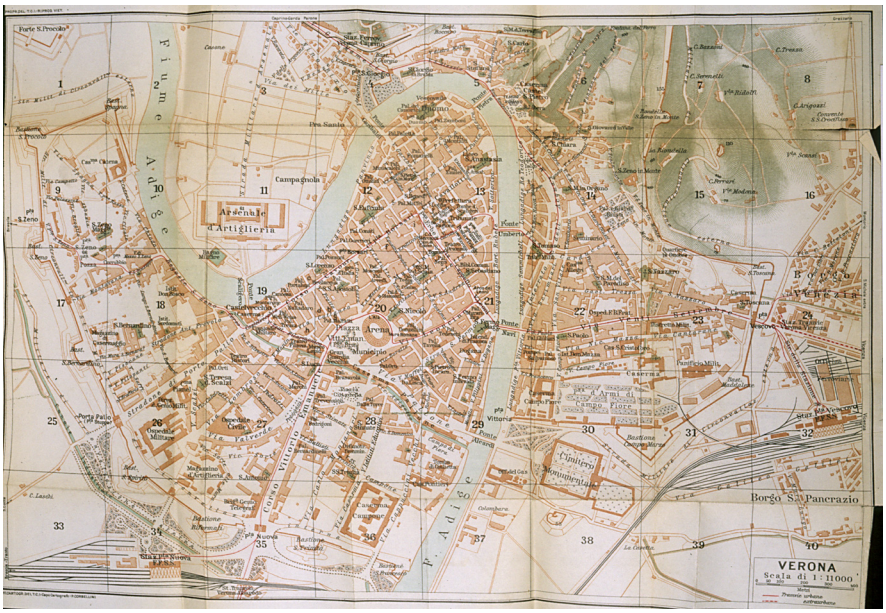

Figure 2. Fold-out map of Verona. From Luigi Vittorio Bertarelli, Northern Italy: from the Alps to Rome, *edited by Findlay Muirhead,* The Blue Guides, *London: Macmillan and Co.; Paris: Librairie Hachette, 1924, opposite 160. UFF. Cartogr. Del T.C.I. [Touring Club Italiano]; chief cartographer, P. Corbellini. Scale, 1:11,000. Lithographed and colored map, 13 1/2" x 9" on a sheet 13 3/4" x 9 1/2". General Research Division of the New York Public Library—Astor, Lenox and Tilden Foundations.*

Figure 3. Brochure Map of Verona. Printed by Richter and Company, Naples, for Hotel Milano, Verona, 1936. Lithographed and colored map, 7 1/4" x 6 1/4" on a sheet 11 3/4" x 8 1/2". The brochure was acquired by the New York Public Library's Map Division on 8 March 1944. This side contains views in the margins; at the bottom, a numbered list of monuments indicates their location on the map. The reverse side contains a simpler map showing Verona's proximity to Lake Gardo. The Map Division of The New York Public Library—Astor, Lenox and Tilden Foundations.

Figure 4. Map of Verona. From Georg Braun, Franz Hogenberg, and Simon Novellanus [van den Neuvel], Civitates Orbis Terrarum, Liber Primu [-Tertius], *Cologne: Gottfried von Kempen, 1581-82, Book 3, Plate 49. Engraved on copper, 18 5/8" x 14 1/4". The profile view on top, entitled "Magnifica Illa Civitas Verona," measures 18 1/2" x 6 7/8"; the lower plan-view, 18 1/2" x 7 3/8". Rare Books Division of the New York Public Library—Astor, Lenox and Tilden Foundations.*

Figure 5. "Verona Venetiae Civitas." From Jacobus Philippus (Foresti), Bergomensis, Supplementum Supplementi Chronicarum, *Venice: Georgius de Rusconibus, 1513, Book 6, 90 (recto); see also Book 14, 167 (verso). Incunabula view, 4 1/2" x 3 1/2". This woodcut is identical to that representing Damascus in Book 3, 16 (recto). Rare Books Division of the New York Public Library—Astor, Lenox and Tilden Foundations.*

Figure 6. "Verona." From Hartmann Schedel, Das Buch der Chroniken, *Nuremberg: A. Koberger, 1493, LXVIII and CCXXXVII (recto). Incunabula view, 8 3/4" x 7 1/2". The same woodcut is used for Damascus (XXIII, verso), Naples (XLII, recto), and eight other cities and countries, including Spain (CCLXXXVIIII, verso). Rare Books Division of the New York Public Library—Astor, Lenox and Tilden Foundations.*

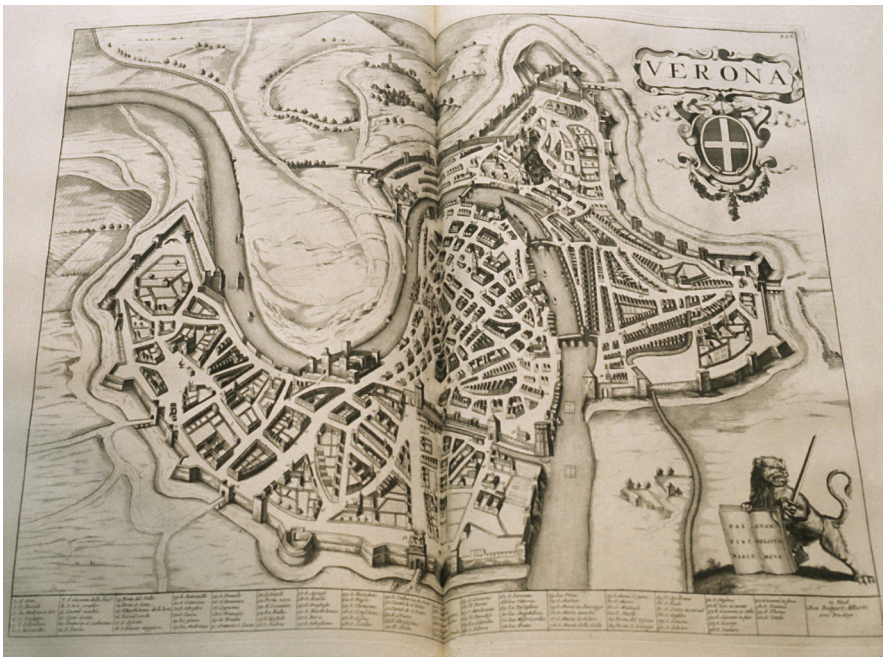

Figure 7. "Verona." From Joan Blaeu, Nieuw vermeerderd en verbeterd groot stedeboek van geheel Italie *["Town Books of Italy"], The Hague: R.C. Alberts, 1724, vol.1, Plate XXX. Engraved on copper, 20 1/4" x 16 1/4". Verona's amphitheater appears on Plate XXXI. The Map Division of The New York Public Library—Astor, Lenox and Tilden Foundations.*

Figure 8. "Verona in der Lombardey." From Daniel Meisner, Thesaurus Philopoliticus *or* Politisches Schatzkästlein, *Heidelberg: C. Winters, 1927, 1:375. This emblem-map is a reproduction of the one contained in the original edition, published at Frankfurt am Main, 1623-31. General Research Division of the New York Public Library—Astor, Lenox and Tilden Foundations.*