Maps on Stone: The Web and Ethics in Cartography

Cartographers have struggled with a variety of ethical questions that relate both to how maps should properly convey information and the role of maps in society at large. Monmonier questions the ethics of authoring single, highly authored interpretations of reality. Wood points to the close relationship between cartography and government. A number of ethical questions also surround maps and the Internet. The World Wide Web has emerged as an important new medium for cartography. It is estimated that over 50 million maps are distributed via the web on a daily basis. In the transition to a new medium, ethical questions emerge about the role of cartographers as purveyors of information about the world, and the ethicacy of choosing a medium that limits access to maps.

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INTRODUCTION

Ethics are the moral principles, based on social values, that define a code of right and wrong or good and bad. Some ethical codes are set in law but most are simply unwritten rules. Acceptance of a common ethic forms the basis of society. The ethical codes may be set in place by society at large or by any particular sub-group of society. The medical profession, for example, is guided by implicit and explicit ethical codes that have a large influence on how doctors provide medical care to patients.

Cartography is also guided by a set of ethical considerations. For example, cartographers value accuracy and communication. It would be unethical, for example, for a cartographer to intentionally falsify a map, as was the case in some of the former communist countries of Eastern Europe. It would be equally unethical to deliberately create a map that purposely did not communicate information to a potential map user. A host of ethical considerations underlie the entire decision-making process in cartography.

The role of cartographers as neutral "presenters of information" has been brought into question in recent years. In The Power of Maps, Wood (1992, 43) argues that maps are an instrument of the nation-state to wage war, to assess taxes, and to exploit strategic resources. The nation-state is mostly interested in stability and longevity. To this end, cartography is "primarily a form of political discourse concerned with the acquisition and mainte-nance of power" (Wood 1992, 43).

McHaffie, Andrews and Dobson and two anonymous employees of the US federal government (1990) identify personal and institutional vigilance in product quality assurance, map plagiarism through violation of copy-right law, and conflicts of interests as important ethical issues. They question the nature and validity of cartography's claim to truth ("accu-racy"), and assert that cartographic ethics cannot be extricated from the values of the larger society that commissions the production of cartographic information.

Monmonier (1991) questions the ethics of the "Single Map Solution." He argues that any single map is a highly selective, authored view reflecting map scale, geographic scope, feature content and data classification. He suggests that the skeptical map viewer should question whether a) an ulterior motive led to a biased view of reality favoring the author's biases, and/or b) whether a lazy map author failed to explore designs offering a

more coherent or complete picture of reality. Technology, on the one hand, has aggravated the problem of the one map solution by placing powerful mapping software at the disposal of amateurs. But, he argues, technology can foster greater openness and a more complete understanding of maps and their meaning, and thereby provide a more ethical approach to carto-graphic analysis and communication. He goes on to present six strategies for a more open and overtly critical cartography in which one-map solu-tions are both rare and suspect.

Certainly, the major development in cartography in the 1990s has been the dramatic increase in the use of the Internet for distributing maps. Having its beginnings as ARPANET in 1969, the Internet now consists of several data communications protocols including e-mail and the file-transfer protocol (FTP). The dramatic increase in the use of the Internet during this decade can be attributed to the World Wide Web (Crampton 1995). The Web is now a major communications medium. In the process, it has also become the primary means of map distribution (Peterson 1999). The use of the web for map distribution and map use raises a number of ethical questions. First, we examine the growth and usage of this new medium.

THE WEB

Conceived at the European Particle Physics Laboratory (CERN) in Switzer-land, the WWW introduced the principle of "universal readership," a concept that networked information should be accessible from any type of computer in any country with a single program. A prototype of the new protocol was finished in 1991. The first widely available browser, Mosaic, was introduced by the National Center for Supercomputer Applications (NCSA) in 1993. Netscape, a commercial successor to Mosaic, was intro-duced at the end of 1994.

The web has grown rapidly. In June of 1993 there were only 130 web servers. By mid-1995 there were 23,500 web servers and this had grown to 230,000 by 1996 and 2.4 million by 1998. The web now dominates the Internet. By 1999, the web generated 68% of all Internet traffic while e-mail and FTP each had about 11% (www.cyberatlas.com). Estimates of Internet use in the United States are fairly consistent at about 30% of the population (the US ranks fifth in the world behind Iceland, Finland, Sweden and Norway).

Once primarily used by the upper-middle class and the well educated, the Internet has become more mainstream. A MediaMatrix.com report found that 51 percent of those planning to get Internet access are over the age of 35. Almost half (49 percent) of the group have only a high school education or less. More than half of those planning to go online (58 %) make less than $50,000 a year.

Web users in the United States are also divided relatively equally by sex. 52% of web users are male and 48% are female (the actual percentage of male and female is 52% female and 48% male). In terms of age, web usage remains high until about the age of 55. Only 6% of 55-64 year old people had accessed the web in the past 30 days. This is compared with 26% in the 25-34 year old category and 28% in the 35-44 age group (Thompson 1999b).

The number of Internet users around the world is growing quickly. The Computer Industry Almanac has reported that by the year 2000, 327 million people around the world will have Internet access. This is up from 61 million in 1996 and 148 million in 1998. Estimates for 2005 are 720 million. The top 15 countries will account for nearly 82% of worldwide Internet users (including business, educational, and home Internet users). By the year 2000 there will be 25 countries where over 10% of the population will be regular users of the Internet (Cyberatlas 1999).

Maps represent a major component of Internet. In 1997, computers at the commercial MapQuest.com site were able to generate 1000 maps a minute. By 1999, MapQuest responded to an average of about 2,500 user-defined maps a minute. An average of over five million, user-specified maps were distributed by MapQuest on daily basis during 1999.

The World Wide Web (WWW) has become a major communications medium. In the process, it has also become the primary means of map distribution. On a daily basis, more maps are distributed through the web than are printed on paper. More importantly the web has changed map user expectations. Users expect interactive maps. It is clear that we need to better understand how this new medium can be used for cartography.

ETHICS AND THE WEB

The introduction of the web has fostered a new set of ethical questions. McGranaghan (1999, p. 3) argues that "anyone with a modicum of technical savvy can 'publish' any content they wish on the internet, without the editorial and market constraints which ostensibly encourage accurate, well-crafted content in traditional media." He goes on to question whether we can place any trust in the maps that are available through the web. How-ever, he admits that the initial trust in maps based on necessity and the leap of faith guided by critical assessment is many times all we have to establish trust in any map.

Other ethical problems are associated with the distribution of maps through the Internet. Computer monitors can be set to have different display characteristics, which means that maps will not be displayed at the same size. It is somewhat like printing a series of maps on paper and then having each map change in size after it has been printed. The representative fraction (e.g. 1:24,000) and verbal scales (e.g., 1 in:10 miles; 1 cm: 10 KM) are rendered meaningless. Only the bar scale remains a valid way of expressing map scale. Is it ethical to print maps when the size of that map cannot be controlled? Colors also appear differently on different monitors, raising similar ethical questions.

These problems are not unique to cartography. Online stores, for ex-ample, will certainly want a system that shows the colors of its products correctly, such as clothes, so that customers know what they are ordering. Some monitors already incorporate color correction software. Depicting the size of objects correctly will be another concern in some parts of the commer-cial sector. Market forces will demand better standards for the display of their products, which, in turn, will benefit the display of maps.

While there are many problems with the distribution of maps through the web, the most troubling ethical question that it raises concerns its status as a medium. For, if the web is regarded as a significant medium that conveys information to large groups of people, where does this place other mediums, like paper? For example, most would agree that it is unethical to put maps on stone because these maps cannot be easily duplicated or transported and only a few people would have the opportunity to view them. It would be unethical for cartographers to use stone as a medium because this would limit access to the information presented in the maps.

The same, of course, can be said for maps on paper. They also can not be as easily duplicated or transported as maps through the Internet. Is it, therefore, unethical to print maps on paper? Why would cartographers want to intentionally limit access to their products by using a medium that has such a relatively small potential for readership compared with distrib-uting maps through the web? Is it that cartographers only want a few, select people to be able to view their products or are economic consider-ations the overriding concern? It would seem that printing maps on paper can only be justified if we have the intention of limiting their distribution. If

limiting access to information is unethical, then so is the printing of maps on paper.

Economic considerations are, of course, important. Cartographers must earn a living and paper is a tangible medium that can be exchanged for money. Maps are printed at a larger size and a finer resolution partly because they cannot be easily duplicated. The paper medium forces the map user to pay. But, maps and the information they convey should be something more than an economic commodity. They are like a window to the world. They present information that we all need to navigate and understand world distributions. Maps can not be left in the hands of the few.

CONCLUSION

Maps are an important source of information and the cartographic process by necessity guided by a variety of ethical considerations. An important consideration is which medium should be used to distribute maps. In a few short years, the World Wide Web has become a major medium for the distribution of all sorts of information, including maps. Hundreds of millions of people now access the web to access information. More maps are now distributed via the Internet than are printed on paper.

Cartography is now faced with a major ethical question: Continue to distribute limited quantities of maps on paper or provide maps through the Internet to a much wider audience. The information that is presented on maps is seen here to be crucial to gain an understanding of the world. It would, therefore, be unethical to limit access to this information, and equally unethical to continue to print maps on paper.

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