Chapter 3

Maps 2.0: Map Mashups and New Spatial Media

"In the process, [map amateurs] are reshaping the world of mapmaking and collectively creating a new kind of atlas that is likely to be both richer and messier than any other." *The New York Times* (Helft 2007)

"What's happening now . . . is that instead of just GIS experts talking to each other, or experts making maps for regular people; regular people are talking to each other, and they're making maps for each other. And that's very important. . . . the story of the where is very important."
Michael Jones, CTO of Google Earth at GeoWeb 2007

Introduction: The Story of the Where

As the two quotes above indicate, there is an explosion of interest in mapping tools for regular people and map amateurs. These "peasants" as they have been described (Perlmutter 2008) are a long way from the traditional image of the expert map-maker with his qualifications and specialized tools. They are ordinary people from all walks of life who nevertheless want to share their lives with friends. And they know for that, they'll need to include the geographies of their everyday lives. As Michael Jones puts it: "the story of the where is very important."

In the previous chapter we examined how critical mapping has provided a one–two punch to traditional notions of mapping. One of these blows was landed by a relative upstart on the mapping scene. In this chapter we will take a closer look at the phenomenon of map mashups and the strangely named concept of the "geospatial web."

The crux of the challenge that these recent developments pose lies in the way that cartography has long been practiced. For most of its history mapping has been the

practice of powerful elites – the so-called "sovereign map" (Jacob 2006). The sovereign map for Jacob refers to the fact that the map was a dominant political force; one which held sway as a way of knowing the world (even as we look back on them now and see just how inaccurate they were). Maps held power; they *were* sovereign.

But maps were sovereign also in the sense that it was literally only sovereigns and those in power who made and used maps. Maps were elitist and were made for elites. Nation states, governments, the wealthy, and the powerful all dominated the production of maps (Buisseret 1992). For example Buisseret tells the story of a Lucayan Indian who was brought back to Spain by Christopher Columbus and presented to King Ferdinand. The Indian was able to lay out on the table a rough map of the Caribbean using stones as markers, and it seems likely that Columbus and his crew benefited from this indigenous knowledge in making their maps for the royal court (Buisseret 2003).

Map sovereignty is now being challenged by the emergence of a new populist cartography in which the public is gaining (some) access to the means of production of maps. This is certainly not an isolated development. It is part of a larger movement of counter-knowledges that are occurring in the face of ever-increasing corporatization of information such as the consolidation of the news media into the hands of a few global multinationals and their dominance by fairly narrow interests. The internet and web, blogs, and the netroots (online political activism) are all reasons for this "people-powered" control of information (Armstrong and Zúniga 2006). In this chapter I focus on some of the exciting new developments that can help create, visualize, and disseminate geographical information. And yet at the same time many of these developments are in the hands of quasi-monopolistic media companies (Google, Yahoo, Microsoft). We'll ask what it means for traditional expert-driven GIS and mapping if "map amateurs are reshaping the world of mapmaking." Is there a tension between this and traditional GIS? What do these tools offer – only visualization and sharing or analysis as well? And if so, will they transform or even replace GIS as we know it? In sum: is there a new politics of knowledge?

Because the field is so new, there is not yet a single, catchy name for these online mapping tools and services. Some of the suggestions include map mashups, map hacking (Erle et al. 2005), the geospatial web or geoweb (Scharl and Tochtermann 2007), neo-geography (Turner 2006), locative media, volunteered geographic information (Goodchild 2007), DigiPlace (Zook and Graham 2007b), and new spatial media. I would not like to say which (if any) of these will eventually be adopted. I've elected to mostly call it the geoweb or new spatial media.

The Google Experience and the First Mashup

Claudius Ptolemy, Gerardus Mercator, Christopher Columbus, Lewis and Clark . . . and Paul Rademacher.

Who?

Paul Rademacher may be the most influential cartographer of the twenty-first century, but you've probably never heard of him. He's not famous. Still, his achievement ranks alongside those of the great cartographers and explorers. Paul Rademacher invented the first successful map mashup.

Rademacher is not a cartographer. He was an animator for DreamWorks, the film studio that makes the *Shrek* movies. In late 2004, Rademacher was looking for an apartment in the San Francisco Bay Area using Craig's List, the classified housing listings that was founded in 1995. As he drove around with piles of printouts and maps, Rademacher thought "wouldn't it be better to have one map with all the listings on it?" (Ratliff 2007: 157). His timing was excellent. On February 8, 2005, Google Maps went online and within only a matter of hours programmers had reverse-engineered it so that their own content, *rather than Google's*, would appear on the maps (Roush 2005). What this meant was that Google Maps had been hacked – not by mischievous trouble-makers, but by people who wanted to use Google's well-designed maps to display and share their own data.

Map hacking is the practice of exploiting open-source mapping applications or combining one site's functionality with another's. These are known as "mashups." A mashup is a website or web-based program that combines two or more sources of content into one tailor-made experience (Butler 2006; Miller 2006; Wikipedia 2007). These exploitations are possible because of something called extensible markup language (XML) and application programming interfaces (APIs). Open-source APIs define the way one piece of software connects up with another. Think of them as public interfaces. Many online mapping applications have APIs, including Yahoo Maps and Google. Google's map interface allows users to integrate data using only ten lines of code (Butler 2006). The Google API allows other data to be fed to it and displayed as a Google map.

In June of 2005 Google released Google Earth (GE), which uses the same underlying dataset (essentially a very detailed set of imagery of the entire earth), but which projects it onto a gorgeous-looking interactive digital earth. Both Google Maps and Google Earth were huge hits with the online community. Google claims GE has had more than 400 million unique activations, and the Google Earth community, a place where members share interesting geographic information, has over one million registered users.

Seeing all this, Paul Rademacher remembered his house-hunting experiences the previous fall, and he developed what would become recognized as the first successful map mashup. Called HousingMaps it combined Google Maps with Craig's List to provide the kind of online experience he had needed a few months earlier:

> One Thursday night, he posted a link to the demo on craigslist, and by the next day thousands of people had already taken it for a spin. "I had no idea how big it would be," he says. (Ratliff 2007: 157)

The site, like most mashups, is a hybrid of different data that is sent to Google Maps for display. The word "mashup" is a borrowed term from the music industry, where

it refers to the combination of two or more different songs to create a third, new song. With the advent of computers many groups now produce remixes or alternative versions of their original song, but the mashup goes one step further by combining two completely different sources. With the advent of the reverse-engineered Google maps, it was now possible to deliver just about any spatial information you could conceive of via their maps. Map mashups were a significant advancement in people-powered mapping.

Google's clever insight into this development was not to try and prevent it, but to endorse it by deliberately opening up the part of the code that allows people to hang their mashups onto the maps. In June 2005 Google released the API so that reverse engineering would no longer be necessary. By putting put their weight behind "open-source" software for maps, Google's return is that they are now the second-most trafficked mapping website (MapQuest is number one) even though their business is not solely geospatial.

In the fall of 2005, Hurricane Katrina hit New Orleans, and millions of people used Google Earth to visualize the area and obtain information that was not otherwise available (Ratliff 2007). The US government agency NOAA posted hundreds of freshly flown aerial imagery on GE, and the exploding user community posted photographs and personal accounts of the floods; GE also provided rapid response imagery updates. Katrina was a big test for the nascent Google Earth. By flocking to GE to learn more about it, and by using it to help each other out, its profile was raised at a time when Americans were looking for answers about Katrina. No less remarkable was that the American government used GE as a distribution tool, rather than their own usual channels – they essentially admitted that GE was better.

More recently, Google have released MyMaps, a kind of do-it-yourself map mashup capability (April 2007) and "mapplets" or map applets (May 2007). MyMaps allow anybody to annotate a Google Map with a location, route, or area (polygon) and to save and share the map (they can also be turned into Google Earth files known as KML files). Mapplets are special pieces of code that allow extremely varied applications to be added into Google Maps – essentially they are like little GISs. As for Paul Rademacher, his story had a happy ending: Google hired him.

Free and Open Source Software (FOSS)

While these developments benefit from Google's API, a lot of them have come out of the free or open software movement. Google itself is not making any mashups. The basic idea of open source software is that it is "configured fundamentally around the right to distribute, not the right to exclude" (Weber 2004: 16). Open source proponents talk about free in the sense of freedom, or *libre* not *gratis*. Richard Stallman, an early and ardent advocate of free software in the "libre" sense, describes four essential freedoms:

- the freedom to run the program for any purpose;
- the freedom to modify the program at the source code level;
- the freedom to distribute copies (sell or donate);
- the freedom to distribute modified copies (Stallman 1999: 56).

These freedoms are deliberately contrary to international copyright law which protects both the original work and any derivatives made from it. (The exception is the US Federal Government whose works are not copyrighted, but this exception does not apply to data created by others countries – the Ordnance Survey in the UK for example.) In the map world this has meant that if you own the copyright on your map other people cannot use any part of it – even if it is combined with other new data – without your permission. Since in practice most maps are made from other maps, many people feel this has served to stifle innovation. Probably the strongest feelings about this have been aimed at the UK's Ordnance Survey, a governmental body that has been charged with full cost recovery.

The Ordnance Survey's closed source effect on the availability of geospatial projects is best seen in the collapse of the Virtual London Project which was developed by the Centre for Advanced Spatial Analysis (CASA) at the University College London. The CASA project was designed to place over three million of London's buildings in three dimensions online via Google Earth. Technically, the project succeeded. Working over a period of about six years, CASA produced 3D models of the buildings in outline and with photographically realistic facades of an area about 2,000 square kilometers in size at 1-meter resolution. This model can be populated with almost any kind of data (live pollution readings, for example). Because the model was created in part from Ordnance Survey data, a license was required to make this available via Google Earth. Although Google was willing to pay the OS for this license, they preferred a fixed-rate fee, rather than the pay-per-use fee demanded by the OS (Cross 2007). In August 2007, CASA announced that the project had been discontinued. (Other city 3D projects are being developed in Dresden, Berlin, and Hamburg.)

Stallman went on to found the Free Software Foundation which instituted a special kind of software license known as the General Public License (GPL), as well as concepts such as "copyleft" and Creative Commons licenses. Because the word "free" can be misleading however, the more common name for this software is open source or free and open source (FOSS). In 1997 the open source concept reached a wider audience in a well-distributed work "The Cathedral and Bazaar," which later appeared as a book (Raymond 2001). Histories and the appraisals of open source are numerous (DiBona et al. 2006).

A key insight possessed by the FOSS movement is that it can more easily create and share information than a closed source, such as traditional GIS. While these capabilities are based on geospatial technology, the point is that they did not spring from the disciplines of cartography or GIS. They have been developed by programmers intrigued by mapping's potential to deliver meaningful information. Indeed, it is rare to find references to cartographic literature at all in these new developments

(Bar-Zeev 2008; Miller 2006; Zook and Graham 2007a). Yet providing accessible and inexpensive mapping tools may radically reshape how mapping is done (Fairhurst 2005; MacEachren 1998; Taylor 2005).

The bottom line is that map mashups have become trivially easy to make and, more important, much more visible. They can be shared and embedded in other webpages as "live" map services (i.e., not just as images of maps, but with the ability to zoom, pan, and query) through the use of keyhole markup language (KML). KML is a file for sharing geospatial data, along with GeoRSS, both of them based on a common standard web format known as XML (extensible markup language). Many of these standards are coordinated through the Open Source Geospatial Foundation (OSGEO).

If the acronyms bespeak a strong technical element of these developments, another effort epitomizes the fuller societal implications of open source mapping. The OpenStreetMap (OSM) is nothing less than a project to independently map the world. It started in the UK because of closed source mapping providers like OS. Participants use GPS units to capture waypoints along roads and streets, as well as around area features like parks. They then upload these, symbolize and label them, and add them to OSM dynamic "slippy map" style database. These data are subject to the Creative Commons license, making them open source and therefore usable by others for free (with proper attribution). While this may sound like a daunting task, progress has been remarkable and several areas of the world (mostly in Europe) have been "completed."[1]

The OSM benefits from another benefit of the crowd: the fact that a little contributed by many adds up to a lot. OSM draws its data from a myriad of people hiking, biking, driving, or taking the train who carry GPSs with them. No person, no team could provide enough data by themselves. OSM is the Wikipedia of mapping.

Political Applications

"Republicans still control the maps." Chris Bowers, MyDD.com, October 2006[2]

There is now some intriguing evidence that suggests that access to, control of, and dissemination of geospatial information is changing political participation (Talen 2000). While much political discussion occurs in the traditional or "mainstream media" (MSM), much is now also held in the emerging arena of blogs. Blogs now constitute a significant and noteworthy component in today's political landscape (Perlmutter 2008). Blogs and online political activism (the netroots) play important roles in getting out the vote (GOTV) and online fundraising. Since the 2004 elections and the success of Howard Dean and organizations such as MoveOn.org, the intersection of the so-called "netroots" (Armstrong and Zúniga 2006: 2) and politics has only become stronger.

Alongside the netroots (a pun on grassroots) and often in conjunction with them are a range of mapping and GIS tools now available for the public. These tools often rely on making linkages between different kinds of knowledges; for example

between different sources of data (such as Google Maps and the Federal Election Commission), and different software programs (such as between GIS and Google Earth). These linkages, effected through open source software and APIs, mark a potentially new phase of political activism and collaboration characterized by more democratic access, control and production of information and knowledge, a more local "micro-politics," and potentially a way to break the hold of establishment "big money" incumbents.

A sense of the influence of political blogging can be gained by considering the following achievements:

- **Investigation:** Talking Points Memo (TPM), a New York City-based blog, won a George Polk Award in February 2008. The Polks are often described as the Golden Globes of journalism, and TPM's award was the first to a blogger. During 2007, TPM aggressively pursued and broke news concerning the United States attorney firings, which turned out to be politically motivated by the Bush administration. As a result a senior official in the Department of Justice resigned, and the Attorney General himself, Alberto Gonzales, stepped down under a cloud.
- **Participation:** The proportion of Americans using the Internet as their source of political information has sprung from less than 10 percent in 2002 to about 60 percent in the 2008 Presidential election (Rainie and Horrigan 2007; Smith 2009; Smith and Rainie 2008). While television still dominates, the Internet has now eclipsed newspapers.
- **Fund-Raising:** This has also burgeoned massively. Between its launch in 2004 and spring 2009 for example, a single online website, ActBlue.com, raised over $100 million for 3,200 Democratic campaigns from 420,000 contributors. Republican candidate Ron Paul raised $4 million dollars or more online in a single day on more than one occasion during his presidential campaign, mostly through small contributions.
- **Popularity:** Political blogs regularly rank among the most-visited blogs on the web of any kind. DailyKos gets at least three-quarters of a million visits a day and often more than a million. Perhaps more impressively, because it is a community rather than the work of an individual, it has produced nearly half a million diary entries, and over 15 million comments since 2003.[3] The Huffington Post (#4), DailyKos (#11), Think Progress (#26), Crooks and Liars (#33), Drudge Report (#39), Talking Points Memo (#42), and The Daily Dish (#47) are political blogs in the Technorati 50 Most Authoritative rankings (i.e., most linked to) on the Web.
- **Organization:** Social network sites such as Facebook have a strong utility for political organization. Successful organization often depends on communicating effectively with your members, for example in a labor dispute with management, in getting out the vote, or in organizing caucusing or campaigns. Facebook and MySpace groups can sign up large numbers of people, send out mass emails, and provide key facts and information. With American union membership holding steady or rising slightly in 2008 (to 12.6%) online organizing has much potential. The Trades Union Congress, National Union of Journalists, and other unions have all used Facebook to organize, though as yet the results are mixed.

- **Culture jamming:** Activists interested in pursuing resistance to commercialism have several web-based tools at their disposal. Adbusting can be achieved by buying Google ads for a company, so that anyone searching for it will see anti-corporate ads on the results pages. So-called "cyber pickets" were used during the Writers Guild of America (WGA) strike in the USA in 2007–8 to plaster pro-WGA graphics all over the shows on the major networks.

And what of political geography? For example, the FairData website provides community-based interactive maps down to the precinct and census block group level for the whole nation.[4] These data are linked to open source mapping APIs such as Google Maps for visual display. Users can pan and zoom across the maps and display different layers of information (the site uses a sophisticated online GIS as a backend to the web pages). For a GOTV effort, community organizers can create maps of the number of non-voters by precinct. In this map of Philadelphia, the voting turnout is shown for each precinct, allowing the GOTV team to target non-voting neighborhoods (see Figure 3.1).

The map shows that turnout varied quite considerably across the city, and in many areas was below 40 percent. These can then be targeted by the GOTV effort. The maps can also show individual households that did not vote for even more targeted efforts. As far as I am aware these are the first tools available to the public that were previously only compiled in secret party political precinct maps.

Other geographical tools have also been devised to get out the vote or to manage organizations. These include Catalist, which uses a web-based map front-end for accessing and integrating data (e.g., from the Census) and for producing voter contacts for field workers, and the Donkey. The latter is:

> a volunteer management program developed in 2005, along with bar-code scanners, Palm Pilots and Google Maps, whose satellite feature allowed field organizers to cut turf without having to physically explore the routes, produced huge efficiency gains. (Stoller 2008: 22)

Other efforts that have proved effective are to better generate voter files following the Howard Dean Democratic campaign in 2004. One of the issues there was that there was no shortage of volunteers, but their help couldn't be easily assimilated. As Stoller remarks "if it takes all night to prepare a map for a canvasser, you can't absorb very many volunteers, and you can't talk to many volunteers face to face" (Stoller 2008: 22). (Studies consistently show that face to face meetings are more effective than mailers or phone calls, and a good field or ground campaign can swing voting by as much as 3 to 5 percent.) For Stoller, politics is about networks:

> Political power is more and more situated in far-flung networks that can be activated and deactivated quickly, and the new millennial generation that will be the political backbone for the new progressive America likes it this way. (Stoller 2007: n.p.)

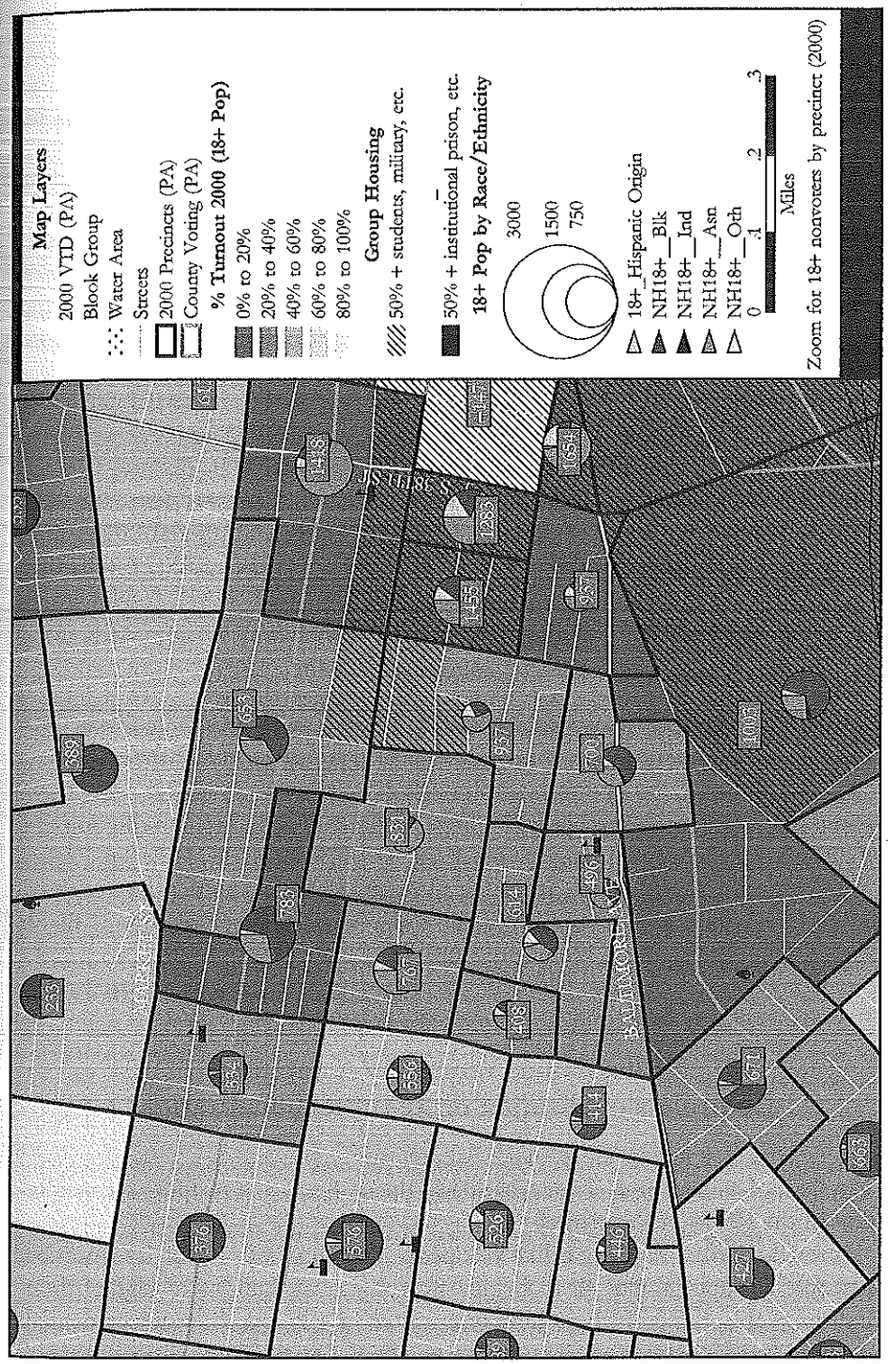

Figure 3.1 Turnout and race in Philadelphia. Source: Bill Cooper, www.fairdata2000.com. Used with permission.

For people like Stoller, the political landscape is shifting. Where television was the means of persuasion in the past, this is fading and becoming less important, due in part to the atomizing of TV viewership:

> Social networks like Facebook, Blackplanet, blogs and SMS, as well as basic e-mail, can be layered onto the clean new databases to reach voters wherever they are, for much less than TV advertising. (Stoller 2008: 23)

Do these tools by themselves mean that the political landscape is now more democratic? Not necessarily. As Foucault observed, power and knowledge go together, and nowhere is this more salient than the relationship between digital mapping and geovisualization with the military. The size of the military investment in GIS, such as the geospatial intelligence community (GEOINT), is not known, but was formally recognized in the creation of the federal National Geospatial-Intelligence Agency (NGA) in 2004, and the military's doctrine on GEOINT has been described in recent reports (United States Joint Forces Command 2007). Because GIS has historically been largely associated with government and industry (e.g., the 2006 GEOINT 2006 Symposium was keynoted by the Director of National Intelligence, John Negroponte), there are many who view GIS as being just another mechanism of government control and surveillance (Pickles 2004; Smith 1992). Pickles argues that many of the new mapping capabilities are wonderful:

> They provide more powerful tools for local planning agencies, exciting possibilities for data coordination, access and exchange, and permit more efficient allocation of resources, and a more open rational decision-making process. (Pickles 2004: 148)

Yet these systems are taking place in a larger context of economic production and a "culture of military and security practices" (Pickles 2004: 152). Trevor Paglen, a geographer at Berkeley, has investigated many of these "hidden geographies" and even provided a map mashup of the CIA's "extraordinary rendition" flights (Paglen 2007; Paglen and Thompson 2006).

Professionals Versus the Amateurs: De-professionalization or Re-professionalization?

There has, of course, been if not a backlash, then a hesitation or fuller reconsideration of the effects of the geoweb.

If crowd-sourced mapping is like Wikipedia, that comparison worries a number of people. Wikipedia after all is formed from the contributions of tens of thousands of people, none of whom have been vetted or asked to show any credentials (or even identify themselves). If as the cartoon has it "on the Internet no one knows you're a dog" then on Wikipedia no one knows if you're an expert.

From Wikipedia's point of view that's precisely the point. Wikipedians accept that while not all entries are correct there is an inherent self-correcting process performed by people with a vested interest in the content of the article. And it is an encyclopedia, not an academic journal and thus reflects our culture, warts and all (the entry on Pamela Anderson is longer than the one for Hannah Arendt according to one critic). But parts of it do deal with scientific matters, so the question arises how we assess this material given that students are increasingly turning to it?

In 2005 the British journal *Nature* decided to assess the accuracy of Wikipedia for itself. It asked a group of area experts to assess content within their expertise from both Wikipedia and from the online portion of the *Encyclopedia Britannica* (Giles 2005). The experts determined errors in articles without knowing from which source they came. Remarkably, reviewers found only eight serious errors, four from each source. They also found that the overall error rates (including factual errors, misleading statements, and omissions) were similar: four in each Wikipedia article and three in each *EB* article.

Nature's study goes some way to forming a picture of the quality of new media content, though it is surely far from being the last word. No similar studies have been performed on geospatial data, for example comparing OSM to Ordnance Survey maps.

The study is also unlikely to allay fears of those who feel that open source mapping is de-professionalizing the geospatial field. Critics of "amateurism" point out that because there are no controls on quality the result is the Internet is awash in low-quality content – not just in the geospatial industry but as a whole. The journalist Andrew Keen for example recently issued a strong condemnation of the "cult of the amateur," identifying it as being responsible for the proliferation of blogs, YouTube videos, the fragmentation of identity, and the betrayal of ethics (Keen 2007).

Another criticism is that proponents of the geoweb may be shooting themselves in the foot by emphasizing its amateur status. If, after all, anyone can deploy these ready-mades, then what future for the profession not just of cartography/GIS but geography? The expertise presumably held by geographers is no longer needed, or at least no longer recognized. What obtains to this situation then, is a sort of critique of expertise, its necessity, and relevance. From the experts' point of view, this is a threatening development.

Online maps wiping out history?

This criticism got a more direct airing in a widely reported talk in the fall of 2008 given by Mary Spence, the President of the British Cartographic Society. According to Spence, online maps are destroying Britain's heritage:

> Corporate cartographers are demolishing thousands of years of history – not to mention Britain's remarkable geography – at a stroke by not including them on maps which millions of us now use every day. We're in real danger of losing what makes maps so unique, giving us a feel for a place even if we've never been there. (BBC 2008)

The implication of this, she felt, was that future generations of map readers would suffer from inferior mapping. Already we can read headlines like "Fifty Per Cent of Drivers Cannot Read a Map" (Massey 2007).

Spence added "But it's not just Google – it's Nokia, Microsoft, maps on satellite navigation tools. It's diluting the quality of the graphic image that we call a map" (BBC 2008). Ironically although this talk created quite a stir in the geoweb, Spence also pointed to efforts such as the OpenStreetMap as a response to these cartographic erasures.

Possibly as a response to these and other issues, there is a growing movement in the US toward certification and approved "bodies of GIS knowledge" (DiBiase et al. 2006). The GIS Certification Institute (GISCI) is a national body which accredits "GIS Professionals" (GISPs). The governing body of GISCI includes representatives from the AAG and from its parent organization URISA. Some 1,500 people have been accredited, according to the most recent data on its website.

If the GIS wars during the 1990s were about the kinds of knowledge or epistemologies produced by GIS (e.g., positivist) then those wars in the 2000s are about ontology: should mapping be closed or open source?

A further question lies in the way users consume geospatial data. Will they use the geoweb with discernment and with critical evaluation? How can users acquire the skills to do that (are there educational implications?).

Jack Dangermond, the CEO of ESRI, reflects the uncertainty and doubt about the effects of the geoweb on professionals. From his perspective user-generated content is dubious: "He worries that even the best-intentioned amateur could provide inaccurate data that could lead to a disaster. 'Who wants to dig a hole and run into a pipe?' Dangermond asks" (Hall 2007). The conference attracted the attention of *Computerworld*, which wrote:

> The debate about whether GIS is a domain for experts or the rest of us raged throughout last month's GeoWeb 2007 conference in Vancouver, British Columbia. According to Michael Jones, Google Earth's chief technologist, by giving everyone access to GIS tools, you'll end up with "a big number of users converging on a truth." Locals, he insists, are closer to most GIS data than experts and have a vested interest in its accuracy. (Hall 2007)

It seems then that the battle lines are being drawn. Big GIS claims it is more than visualization and "eye candy" because it can do modeling and analysis. FOSS cartographers claim they are doing more and more of that too, as well as providing a true 3D world (with 3D buildings for example that can be used in urban planning). Nor is GIS particularly adept at crowdsourcing or social networks. But perhaps it need not be so binary. ESRI's new ArcExplorer software (a free download) is their version of Google Earth and it can import both Google files and ArcMap shapefiles. Perhaps if ArcMap ever permits files to be exported into Google we'll see more integration of big GIS with the geoweb.

"The Democratization of Cartography"

"It turns out that when we talk about 'the world's information,' we mean geography too". Google

Up until the 1980s it had always been assumed that maps were essentially devices that communicated information that had been gathered and processed by the expert cartographer. As the historical examples cited above testify, this had been the case for hundreds of years. The craft of cartography had a guild-like status; requiring years of training and the mastery of specialized techniques. These ideas about how maps worked were formalized in the post-war years by Arthur Robinson, a professor of geography at Wisconsin-Madison. Robinson provided the conceptual apparatus of what later became known as the Map Communication Model (MCM), which explains mapping as a process of communicating information from the map expert or cartographer to the map reader. The information is acquired, marshaled, and selected by the map expert and set down on the map.

As Mark Harrower, a leading proponent of populist cartography has observed:

> One of the themes of my profession right now is the *democratization of cartography*. . . . Mapping used to be a job of the elite, the Rand McNallys and National Geographics of the world. Now people are taking it upon themselves to map their passions. (Science Daily 2006: n.p., emphasis added)

In other words, desktop mapping and geovisualization provided the beginnings of new forms of people's mapping. But the true democratization of cartography would only arrive with the advent of new advances in web technology, often referred to as Web 2.0 functionality such as massively distributed and hyperlinked datasets, mashups, and customizable open-source tools. These tools are profoundly different from their precursors because they allow *collaboratively linked* mappings.

Conclusion: Can Peasants Map?

Many of the obstacles such as the digital divide and net neutrality are not at base technological issues that can be addressed through market incentives, rather they are complex socio-political problems. Lack of access to online information parallels the very underserved populations it could be benefit. Community and participatory GIS, the netroots, and web-based mapping are therefore not likely to provide solutions for underserved populations to bootstrap themselves out of poverty. But if underserved and well-served communities work together then problems can be more ably addressed. This is a big if and as this chapter shows there are enduring

aat is, after all, because we live not in isolated com-
etworks.

-based activism, David Perlmutter explores the ques-
vism and the netroots are a representative constituency,
re "the people" (Perlmutter 2006). He points out that
re overwhelmingly young, white, male, well-educated,
ot representative of the population as a whole. As he
In this chapter I have introduced a number of develop-
te obstacles for access and usage of geospatial informa-
out of a genuine realization that the ways we visualize
ound us – its places, geographies, and relationships –
sformation. If the media (TV, newspapers, and news
incorporate new models of information dissemina-
f publishing is undergoing a similar transformation,
n equivalent transformation working on our mappings.
owever are to what degree, how much, and with what
ont the obstacles and barriers. The answers to those
deciding the future of information.

Notes

completed because things change. If mapping could be com-
ould have gone out of business after it finished its national
the early twentieth century.
y/2006/10/9/232648/805.
oryonly/2008/1/10/234313/397. On the question of solo vs.
t all the progressive blogs have transitioned from the former
chnology, a so-called "collaborative media application" intro-
to be community driven by submitting stories, comments,
te managers. It is free under the GNU General Public License.
er "The days of the major, solo content generator, pundit
ttp://www.mydd.com/story/2007/2/6/142748/3955).
is so vast that no description can really encompass it. It
census data, precinct maps, or registered non-voters by race,
t the vote data, and much more.