

Human cartography: when it is good to map

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Abstract. In recent years quantitative geography and cartography have been devalued within human geography. This process has often been led by writers who have questioned the extent to which researchers who analyse numbers about people ignore other ways of studying society. Often examples of the 'unsympathetic' mapping of people's lives or the conspiratorial creation of particular statistical social landscapes are given as reasons to avoid quantitative research. In this paper I concentrate on some visual approaches to understanding society, in particular, the view of 'human cartography'. I argue, through a series of examples, that there is much more to mapping society than simply reinforcing an image of the status quo. There are many people involved in alternative mapping, few of whom would see themselves as geographers. Perhaps human geography should consider why mapping is now so popular, how mapping is changing, and the part geography could play in redrawing the world, before dismissing mapping as a means to understanding?

Introduction

There is a growing school of cartography which suggests, put simply, that many of the assertions made for mapping by quantitative geographers are a smokescreen for the actual purposes and origins of most maps (Harley, 1988; Pickles, 1995). This school argues that maps are about social control and are usually created to serve the designs of their creators rather than to inform 'the public'. Arguments about accuracy are often excuses for not showing certain things and for including others. The organisations which in practice control most cartographic production choose what information they collect and how they show it in quite partisan ways. Because of this we should not take maps at their face value or see cartography as the purely technical operation of translating reality onto paper or screen. Much more can be read into maps than this.

Maps are like clocks. Once we did not need them. Then, as people's lives became more interdependent, accurate timing started to matter more and more. There are few people in rich countries today who do not wear a watch on their wrist to tell them 'when' they are. Only a few generations ago people managed to get through their everyday lives without the need, and often without the means, to know the time. Then factories were built and their gates opened at a certain hour, the post had to be delivered at a certain time, trains ran to a timetable. Time became more important. So too with the map. Few cars will be found without a road atlas or street plan in the glove compartment. There are few diaries without a train or underground map in them, few city centres are now not adorned with maps for the tourist and other visitors.

Partly because there are now so many maps to view, these images are increasingly important in shaping our view of the world. Apparently innocuous map symbols can convey subliminal messages to the map reader. Take the hierarchical signs used to represent towns and cities of varying populations. When placed on a map these symbols present an image which often reinforces social-spatial hierarchies such as the organisation of government or the church, making this order of power appear given. Maps can give shape to abstract notions of who has power over what. They thus tend

to present the status quo, rather than other options, and they are often used as tools by those who are conservative to change. In general, maps are only changed years after social systems have altered. They present a picture of the past as 'correct': a picture against which current changes often appear as errors. But not all maps are like this.

Is cartography really so Machiavellian? In practice most cartographers are simply continuing conventions: there often is little else they can do. Any kind of real-world depiction, whether it is a map, a story, or even a photograph, contains unconscious messages as well as conscious ones from its author. There can be no neutral map of a place and certainly no neutral map of the world. However, maps are not like pieces of text or taped discussions. What makes maps different from other types of representation is that they are so fact filled. There is no other way of cramming so much readable information onto one piece of paper than by drawing a map. It is because maps are so full of facts that it is easy to forget that their drawing is not entirely constrained by some particular rigour. There are an infinite number of pictures to be drawn of any place.

How though can an infinite number of pictures be drawn? As this text is being written, the way in which maps are presented is changing more quickly than ever before. The engine of this change is the same as that which has always changed cartography—new technology. However, this change is a little different from its counterparts in cartographic history. Improvements in surveying and navigation technology and in drafting and printing techniques increased the extent and content of mapping by, at most, an order of magnitude with each innovation. In the past, innovations in mapping technology tended not to occur at the same time as increases in the amount of spatial data available to be converted into maps, or simultaneously with radical change in prevailing world-views. Today, however, we are in the midst of changes both in our interpretations of the world (along with the availability of data to support them) and in the technology at hand to render them as maps. Today's new technology is therefore having a far greater impact than previous leaps in mapping and will have a far greater impact still if it continues to evolve at its current rate.

Only a tiny proportion of the world's population have access to the Internet and fewer still have the resources to place detailed representations of the world on-line. Proponents of the technology argue that as the hardware and software become cheaper it will diffuse to become available to even more people, living in more and more isolated places. But did this happen when other new technologies were introduced? Why is cheap paper printing not universally available? Why cannot just about anyone publish a book of maps? Is it, perhaps, more likely that, as the Internet develops, sections of it will be cordoned off to outsiders, maybe through pricing it at a high level, maybe by citing excuses such as 'academic integrity' or that 'the technology cannot cope with all the traffic'? It is unlikely that those with most power in this world will be happy to give up some of it, just because it has become slightly easier to do so.

From the parchments of a millenium ago, to the digital animations you can view in a few seconds from now (assuming you are reading this near a networked computer!), maps have always been about knowledge and power—selecting what to show and how to show it. It is easy to forget this. It is easy to see mapmaking on a trajectory of ever-increasing accuracy and objectivity. It is easy to see the arrival of technologies such as the Internet as heralding a new age of openness and equality, and it is easy to forget who pays for maps to be made and who is allowed and able to make them. Here a few examples of mapping which have not followed the dominant concerns of spatial accuracy and objectivity are considered. These examples are all of published paper maps which are easily available. Unfortunately because of restrictions of space and copyright most are not reproduced here (many more are reproduced in Dorling and Fairbairn, 1997).

Maps have become a very common currency. People in Western societies now consult maps so often that they often do not remember using them. These images have become commonplace, from bus maps to maps of offices, to maps in newspapers, in books, and on the news. They are so common that we often fail to question their authority, fail to ask why they are drawn as they are. We routinely accept them as the 'truth'. The implications of this can be most severe when the maps are of places and people of which we otherwise know very little. We can criticise, with some knowledge, maps of our own times, neighbourhoods, towns, or country; but maps of foreign lands often shape our perceptions with impunity. It is when we are presented with maps of far-off times, or far-off places, that we are at our most fallible and vulnerable, and it is when we are representing the people and places we know least about that we can do most damage.

For all the power they contain, maps are just pieces of paper or merely ephemeral pixels on a computer screen. It is people who order, draw, purchase, use, and learn from maps. And it is people who will improve them—not necessarily by making them more accurate or objective but, for a start, by being more honest about how and why they are made and by teaching more carefully about how to read them. We can all be more open about why we make particular choices to map certain things, certain people, and certain places. We can all think more carefully than we have done in the past about these things. We can also all look at other maps with a slightly more open and inquisitive mind and ask why the map shows what it shows, rather than try merely to understand how best the relationship between land and people can be painted onto paper. In all these things geography has a part to play.

Alternative mappings

Most maps represent the world in quite conventional ways. Mapping, in this sense, is all about convention. However, there are many maps which have not been produced by anonymous government agencies and there are many which have not been drawn by using traditional cartographic methods. These maps often represent the world in very different ways to the standard topographic sheet. They may stretch the projection to highlight the areas their authors are interested in (Dorling, 1996). They are often not greatly interested in minute details of accuracy and they concentrate on subjects usually avoided in mainstream cartography. Here, examples are taken from ecological mapping and green politics, from human cartography and mapping in Sweden, from alternative atlases of the state of the world, of wars, of the place of women, and of the social and economic geography of individual countries. To illustrate how evocative the images of the world created with some of these alternative views can be, the paper finishes with two examples of a subject rarely discussed and hardly ever mapped: the cartography of genocide and the Holocaust. However, this discussion begins at the opposite extreme, with mapping which is widely discussed and overtly presented: propaganda cartography.

When is a map an alternative view and when is it propaganda? How 'correct' are traditional views and when is a map misleading? These are not easy questions to answer or simple words to define. Perhaps the most straightforward reply is that all maps present alternative views and all represent some form of propaganda (meaning to propagate a particular doctrine, usually with some subtlety and often by the state). In practice, however, some maps stand out much more than others as unusual, unconventional, or controversial. This is done either by the way in which they present information or by what information their makers have chosen to present. Most maps which are unconventional are blatantly so, and that is what is meant here by 'alternative views'. Some are not so explicit in their intent: they masquerade as conventional maps, and

these can be defined as ‘map propaganda’. There is no hard and fast line between these types of mapping and there is huge variation within these typologies.

An introduction to map propaganda is Mark Monmonier’s *How to Lie with Maps* (1991). For Monmonier, propaganda maps begin with national maps and national atlases, which are usually produced to assert a nation’s right to exist and to legitimise its geography. The creation of many new states after the Second World War and in the following era of colonial independence resulted in a spate of national atlases. National atlases typically contain maps of the ‘natural’ physical geography of the country closely followed by diagrams of its political, economic, and social makeup which often serve to present an overall picture suggesting that this country itself is ‘natural’. Some of the clearest examples of map propaganda come from territorial claims where two countries’ maps include the same piece of land within their borders and choose to name it differently: the Falkland/Malvinas Islands is a well-known example, but there are many others, particularly following the end of the communist era in Eastern Europe and the rebirth of nationalist identity in its plethora of newly created states.

More subtle examples of map propaganda include the use of particular projections to make areas with possible aggressive intent appear huge. The Mercator projection was never designed to show the northern coast of Russia (which was not navigable in the 16th century), but Russia (and even more so its previous incarnation as the USSR) can look very threatening when its exaggerated land area is boldly shaded on a world map which uses that projection. Arno Peters used the weaknesses of the Mercator projection to popularise an equal-area world projection which he had worked on. Among other groups and agencies the idea of the projection was sold to the United Nations Educational, Scientific, and Cultural Organization (UNESCO). This projection could also be seen as propaganda, however, for as Monmonier points out, an equal population projection would have been a more equitable world map. The equal-area projection highlights the relatively low populations of Africa, Latin America, and the Middle East, from which a disproportionate number of UNESCO diplomats come.

Some of the best examples of map propaganda were generated by the Nazi regime in Germany around the time of the Second World War. Maps were produced, in 1939 and 1940 for the (then neutral) American public showing how Germany was surrounded by aggressive countries, had too little land to exist in and was tiny in area compared with the British Empire. These maps were produced to try to encourage Americans not to enter the war. A very different picture of wartime Germany is given below, of the mapping of the Jewish Holocaust (which, of course, the USA’s entry into the war did not prevent). If Germany had won the war we may now have been using examples of mid-20th-century wartime British or American maps as illustrations of propaganda. English-language geography textbooks from the 1920s and 1930s contain many classic examples of propaganda. One of the most famous is Huntington’s map of the “Distribution of Civilization” based, classically, “on the opinion of fifty experts in many countries”. An astute reader can guess what the map tries to show—which countries have ‘civilization’ and which do not. Huntington’s deterministic geography led him to propose prevailing climate as the primary arbiter of ‘level of civilization’, and subsequently into overtly racist explanations of patterns of distribution on the earth’s surface.

How to Lie with Maps also includes (what its author sees as) positive examples of maps being used by environmental pressure groups and social activists. The site of a proposed polluting waste incinerator is plotted on one map with bold concentric circles radiating from it. The use of differently scaled text to mark the radiating circles produces an oppressive image of danger concentrating in the centre of the map. The example from social activism is of a map of local districts in San Diego, California, on which each district bears the name of the country with the closest infant mortality rate

to its own. Thus, the outer suburbs are given names such as Sweden, Switzerland and Australia, whereas the inner-city districts are labelled USSR, Jamaica, and Hungary. This method provides a very dramatic way of getting a simple message across—that, within one city in the United States of America, social divisions are as great as are found right across the world. Maps such as these can be thought of as resistance maps, rather than propaganda, because their message is more blatant. One rapidly growing form of resistance mapping concerns the environment.

With the rise of the green movement over recent decades the number of researchers engaged in mapping the environment has quickly grown. Green activists often stress the importance of the mapping of local areas by local people. Behind this viewpoint, the theories of ecological mapping provide very different ways of looking at the world. These also tend to be both conspiratorial and romantic in nature. A pioneer of ecomapping is Doug Aberley. Aberley (1993) argues that maps can be used to make starkly visible the harm that 'big business' and 'centralised government' do to the environment and to social justice. Maps, he says, can magically communicate the larger evils of a society divided by poverty, race, sex, and age. Maps can also be used to stir up action by presenting utopian visions of how the world could be. He argues that anyone can map and that everyone should, and a great deal less reverence should be paid to professional and scientific cartography. What matters to Aberley is that people start drawing their own maps of their 'own' neighbourhoods and begin to understand the 'bioregion' they live in. Aboriginal mapping is used as the inspiration for this understanding with input from more modern trends such as the Garden City

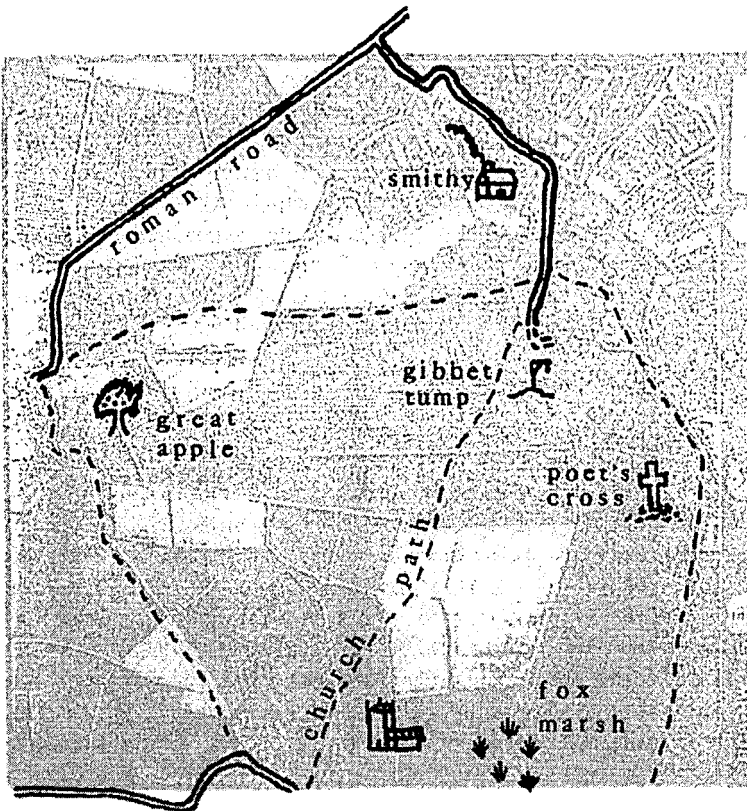


Figure 1. Front cover of the "Parish maps" brochure (Greeves, 1987).

Movement which produced many maps at the turn of this century of how cities could be. These alternative maps combine age-old interests, such as the location of water sources, with new concerns, such as the distribution of pollutants, to produce images which are designed to incite people to action.

A further example of this kind of resistance mapping is that promoted by the Common Ground organisation which was established in London in 1983 to promote a common cultural heritage of areas in Britain, celebrating their local distinctiveness and their links with the past. Their motto is "know your place—make a map of it!" and they have produced a booklet describing just how this can be done (Greeves, 1987; see figure 1). Again, the maps which this project promotes will serve particular purposes, but a purpose different from official maps of areas. One purpose, which is made explicit in the booklet, is to use the maps as a tool to try to stop planners, far removed from the locality, allowing changes to be made to parts of the country. In practice, they have been used most often to preserve rural parts of southern England from the perceived threats of development and it is interesting to question whose interest they serve best. Which groups of people do the 'environmentalists' not want to be living next to? Figure 1 shows the cover of the Common Ground booklet. A 'gibbet tump' or a road built by ancient invaders are to be valued. A new estate or symbols of religion other than Christianity are, presumably, to be feared.

Human cartography

"Sometimes peculiar things happened during the lengthy work with analyses, comparisons, drawing, checking. It sometimes seemed as if the red symbols and yellow ground colour of the urban landscape faded away and were replaced by forests, lakes and fields, criss-crossed by roads, which turned out to be filled with streams of sleepy early-morning travellers in cars, buses and trains, on their way to work in the towns. There were times when the coloured areas on the colour ink-jet map were suddenly obscured by white summer clouds which seemed to scud in from nowhere between the map and the author's eyes, and among which he could glimpse the sparkle of the sea by the coast, the rivers which rolled down to meet it, the towns and villages and people. Sometimes old people materialized out of the map of Norrland and observed with melancholy the exodus of the young towards the coast and the south. From the diagrams which display households suddenly appeared a throng of people who with muted voices told of their lives, of their loneliness, of their joy in their children and of their hopes on their behalf?"

Szegö (1984, page 20).

'Human cartography' was the term Szegö gave to mapping where the focus was on people, where they lived, where they were going, what they did. Conventional cartography has been focused on land, even if there has been a human aspect in the mapping of landownership or the navigability of the terrain for armies of men. Human cartography, in contrast, concentrates on the human experience of space and portrays the human encounters with 'reality', rejecting the view that behaviour (and, therefore, features such as population distribution and the location of industrial activity) is governed so totally by the framework of the earth and the 'tyranny of distance'. During the 19th century, as interest in population statistics grew and as people who had been peasants became consumers, the relative value of land to human life fell, and human geography began to matter more. The emergence of detailed census cartography after the Second World War grew out of these shifting priorities. But Szegö argues that much census cartography was still not concentrating enough on people: the daily and yearly ebb and flow of the people is of vital importance to human lives. The population

should be seen as a 'vertically rising stream in space-time' in which each individual's life history is marked out as a path in a three-dimensional structure (see figure 2). The combination of many paths creates a picture, a picture which human cartography (Szegö, 1987) should draw. In arguing for this perspective human cartography follows a Swedish academic tradition of studying diffusion which is most closely associated with Torsten Hägerstrand, but it does depart from this somewhat, with its greater interest in producing images, rather than models, of these processes.

If there were one major criticism of human cartography it would be that these methods work well for showing the space-time development of a small community or the commuting patterns between (and to) a couple of towns (Szegö, 1994), but where an overview of an entire country is wanted then much simpler graphical methods have to be used. The space-time history of even just a hundred people presents too complex an interwoven picture to be drawn on a single page of paper, and the detailed patterns of commuting within a major metropolis are very difficult to depict clearly with arrows which suggest stream-like flows (streams tend not to cross one another). Imagine adding a few more 'lifetime spirals' to just the three shown in figure 2. In many ways creating the cartography of people is a far more complex challenge than producing the cartography of land. Most challenging, perhaps, is the mapping of all the peoples of the world. This is represented by another section of the broad church of alternative cartography: the 'new' world atlases.

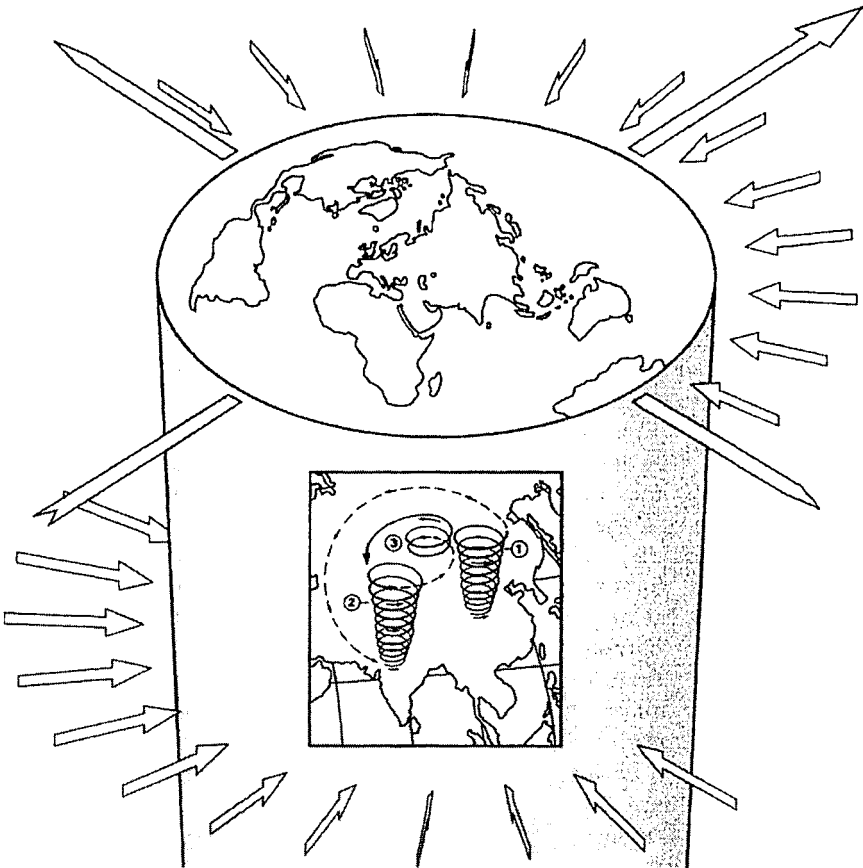


Figure 2. Human cartography and a space-time diagram (Szegö, 1987).

A key way in which alternative mapping has emerged and has been published widely has been in the form of alternative atlases. Given the controversy which surrounded the introduction of the Peters projection and the Peters *Atlas of the World* (Peters, 1989) it is surprising how little anger has greeted the arrival of far more alternative atlases. The assumption has to be that they were not taken that seriously. Many of these atlases were not reviewed in the academic cartography journals. This is a pity because this is another area of cartography which is growing very quickly. Soon more students may be directed to look up facts about the world in alternative atlases than are using the standard school-board-approved atlases of the world.

Perhaps the best known alternative atlas is *The State of the World Atlas*, first published by Michael Kidron and Ronald Segal in 1981 and quickly followed by a 'new' atlas in 1984. What is most striking about these atlases is that they use area cartograms on many pages to show how inequitably the world's health, weapons, and food are distributed. Each cartogram has been designed by hand to keep the shape of the world familiar while still showing clearly how unfair the current distribution of resources and power is. These are some of the first detailed world maps many children growing up in the 1980s studied at school. Thus the social effect of these images should be with us for some time to come.

In many ways *The State of the World Atlases* are not alternative. In essence they simply show, for a couple of hundred sovereign states, statistics which are generally accessible from United Nations Yearbooks. What is alternative about these atlases is the subjects they choose to cover and the way in which they present those subjects. Pictograms are often used with small symbols to show, for instance, people, rockets, or coins. The atlases received a warm welcome when published, but, as the authors themselves say: "most flattering of all has been the spate of imitations in books, newspapers and on television, confirming the value of our method, even where views very different from our own have been advanced" (Kidron and Segal, 1995, page (i); see Dorling, 1995, for one imitation).

After *The State of the World Atlas*, Pluto Press, the publisher pushing this alternative view, moved on to other similar projects (although they were published by larger companies). Notable among these was *Women in the World: An International Atlas*, drawn by Joni Seager and Ann Olson and published in 1986. This atlas used a similar format to its predecessors but covered a very different set of subjects ranging from the geography of women in the military to the world map of female circumcision. In terms of its cartography, the atlas differed from its predecessors in that around the edge of each map there tended to be far more adornment. Graphs, tables, and pictograms surround each map. Sometimes they even took over whole pages showing the most complex of statistics such as the proportions of women working in four levels of education or as nurses, doctors, and gynaecologists for dozens of countries.

In one sense these 'alternative' maps can also be seen to have strong historical precedents. Just as ecological mapping traces its history to aboriginal maps and the introductions to human cartography begin with fairy tale images (see the introduction to *Human Cartography*, for example), there are precedents in mediaeval mapping for the 'new' state of the world atlases and their successors. Mediaeval mappers were often unconcerned with equal-area projections. Their maps scaled and orientated areas by their social importance (just as many *Mappae Mundi* were centred on Jerusalem). Some regional mediaeval maps also tended to contain a great deal of extra material around their borders. These images were not extraneous to the maps, but contained more information (in the form of sketches of the local inhabitants, coats of arms of the local gentry, and pictures of the primary craft industries, for example) about the social, political, economic, and ecological priorities of their times. Maps may be alternative in

focus, but they are rarely entirely new in design. One of the oldest inspirations for mapmaking, and now a subject of increasing interest for mapping itself, is warfare.

The War Atlas by Michael Kidron and Dan Smith was published in 1983, at the height of the nuclear arms race and revised eight years later (Kidron and Segal, 1991). In cartographic form it documented the history of wars up to the geography of the 300 wars which took place in the world in the four decades from 1945. From the maps it is apparent that very few countries have been at peace over even this short period. The atlas also mapped the 40 000 strategic sites throughout the world identified as nuclear targets by the USA (places the Americans planned to strike and places they thought would be others' targets). From just this one map it is clear that very few people would escape the instant effect of a nuclear war. However, the atlas goes on to show where poison gas and nerve agents have been used in wars across the world; how military satellites track the earth's surface; the size of different armed forces in each country; the locations of 'military advisors'; the geography of military spending and of the arms trade. Cartography can produce emotive images, images which make a political point. This is not simple propaganda because the aim of these images is explicit: to show just how much human effort goes into making war possible and the scale of the human misery which results.

The ultimate mapping of the misery of war is to be seen in the mapping of holocausts. Literally, holocaust means the wholesale destruction of a people, especially by fire. Two examples of holocaust mapping are considered here as the final examples of mapping which shows a different geography. The first is *The Atlas of the Holocaust* written by Martin Gilbert and published in 1982. This is one of the most evocative atlases ever produced. The second example is William Bunge's *The Nuclear War Atlas*, telling of the holocaust to come and first published in 1988.

At one level *The Atlas of the Holocaust* presents, in exhausting detail, graphical depiction of the evidence of the genocide, largely of Jews, which took place in Europe between 1933 and 1945. At another level the atlas goes beyond this by trying to begin to show graphically what the sheer numbers of deaths meant. Previously this had usually been done by physical memorials and museums of the holocaust and through media such as film. One aspect of the holocaust which these filters had difficulty conveying was the level of geographical organisation involved in its execution. For instance, one map in this atlas (see figure 3, over) shows the movements of a family, the Hirschsprungs. The mother of the family, Helene, was born in the nondescript village of Auschwitz in 1909 and married a man from Cracow in what was then the Austro-Hungarian Empire. They emigrated to Amsterdam in Holland, where their children were born in the 1930s, and then fled with their children to Lille in France when the war broke out. On 15 September 1942, along with another 1000 Jews, they were seized by the SS and transferred to Malines before being deported to Auschwitz to be killed. A second map (also in figure 3) shows all the deportations to Auschwitz in a two-week period a month after the Hirschsprung family were seized.

By showing a map of the path to death of one family and then of the thousands of families who were systematically transported in a short space of time, *The Atlas of the Holocaust* attempts many things. It tries to show us the story of individual tragedy and of how that could be related to the movements of many thousands of families and individuals without losing all of the meaning. It tries to show what level of organisation was required to arrange the deaths of so many millions of people in such an apparently orderly fashion. Most importantly, perhaps, it presents the evidence of an event—stretched over hundreds of maps of Europe—which could not have gone unnoticed by the people living in these places. It makes us question the received history of the Holocaust by putting the event in our faces—on the map.

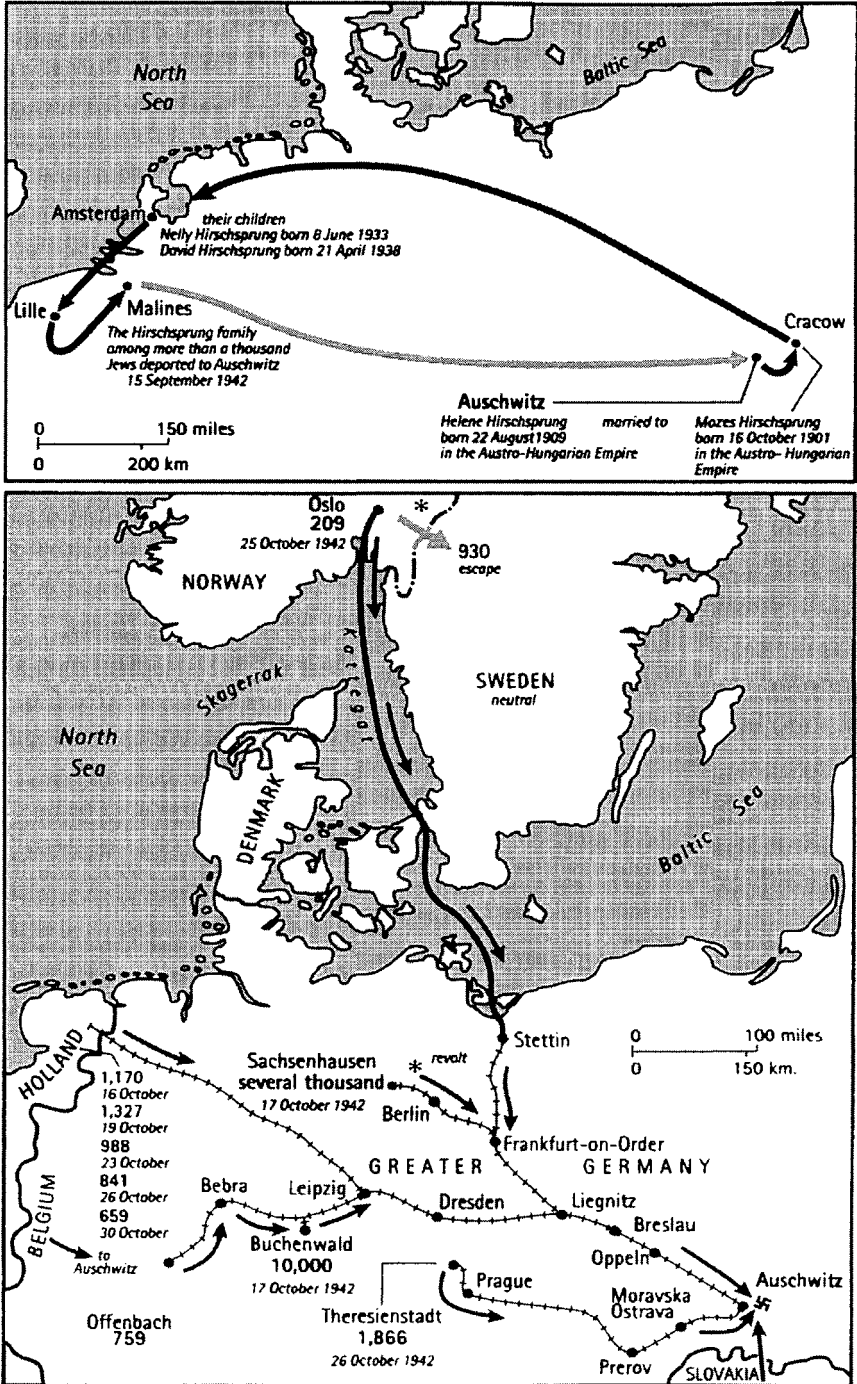


Figure 3. Geography of the Holocaust (Gilbert, 1982).

The second example, of possible future holocausts, is from William Bunge. Bunge began his academic studies as a mathematical geographer in the late 1950s. In February 1965, when the United States of America began the bombing of North Vietnam in earnest, he left his studies of abstract topological space in the classroom and moved, full time, into peace work. However, Bunge never quite left mathematics completely behind. For instance he comments on the American protests against the Vietnam war: "... the peace chant against President Lyndon Baines Johnson was instantaneous, if at first just a tiny minority voice; 'Hey, hey, LBJ, how many kids did you kill today?' I have recently computed the answer to that old question. On average we Americans killed 300 Vietnamese children each day, for ten years reaching a grand total of 1,000,000 and they did not kill one of ours" (Bunge, 1988, page xviii). Such simple quantification may appear trite, but we find it hard to envisage huge numbers of deaths as more than large figures. Breaking these down to conceivable quantities may help. A very large primary school contains 300 children.

During the Detroit riots of July 1967 Bunge began work on *The Nuclear War Atlas* which was finally published some twenty years later. In many ways the central aim of *The Nuclear War Atlas* is similar to that of *The Atlas of the Holocaust*: to convey a horror of unimaginable proportions. The atlas is an attempt to envisage the gravity of nuclear war; to show how many people would be killed and just how enormous the effect of these bombs would be. Choropleth maps of the Hiroshima bomb blast are transposed onto a map of Chicago to bring the effects 'home'. Other maps show the global geography of the spread of radiation from nuclear 'tests' and the proliferation of nuclear weapons to other states. This atlas is an excellent introduction to the understanding of alternative mapping and the efforts of one academic to produce a different image.

Conclusions

Maps provide powerful images. For people who want to change the way we think about the world, changing our maps is often a necessary first step. For those defending the status quo they are equally important. Often very subtle touches show just who is in power. British maps of South Africa before the Boer War were printed in two colours: red for the roads and blue for the rivers, upon a white background. The red, white, and blue images literally stamped Britain's authority to rule over that colony. After that war this subtly continued with maps of the Republic of South Africa under apartheid using a small typeface to label large black townships while small white settlements with considerably fewer residents were annotated in a larger bold type. Today the cartographers of South Africa have a new problem. With eleven official languages, 'politically correct' maps of South Africa may be too cluttered with text to be useable.

Alternative mapping is rarely produced by the official cartographic offices of the state. More often it is single individuals who are inspired to draw a different picture of part of the planet. Here mapping from ecological, humanist, socialist, and pacifist cartographics have been grouped along with examples of feminist and fascist cartography. There are a large number of ways of labelling human views of the world and for each label alternative ways of mapping have evolved. Not all maps are drawn by people studying geography or who see geography as important (figure 4, see over). Not all maps simplify, subvert, collude, or conceal.

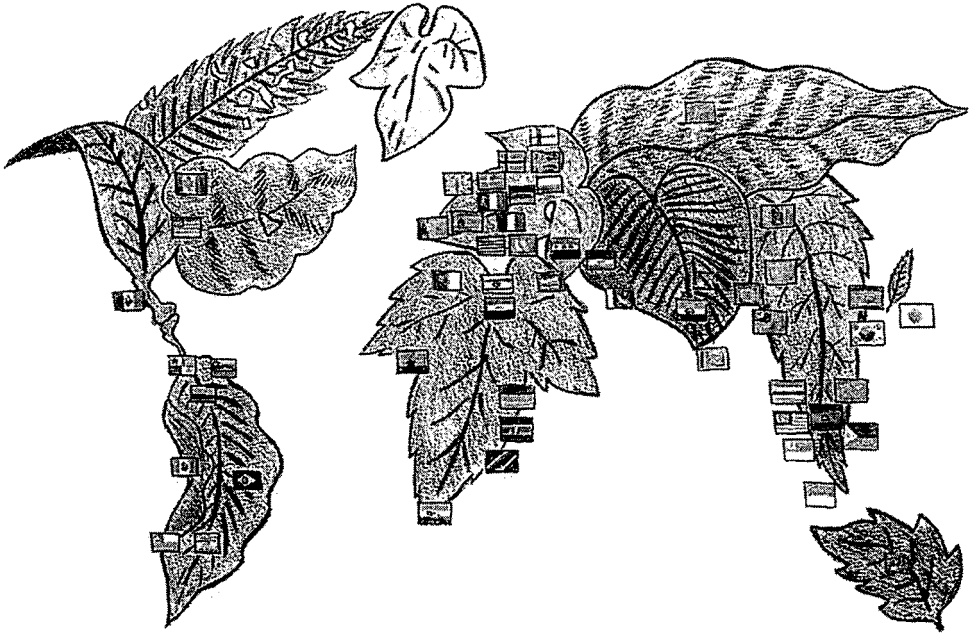


Figure 4. A winner of the International Cartographic Association's Petchenik Children's Map Competition, 1993.

References

- Aberley D, 1993 *Boundaries of Home: Mapping for Local Empowerment* (New Society Publishers, Gabriola, BC)
- Bunge W, 1988 *The Nuclear War Atlas* (Basil Blackwell, Oxford)
- Dorling D, 1995 *A New Social Atlas of Britain* (John Wiley, Chichester, Sussex)
- Dorling D, 1996 *Area Cartograms: Their Use and Creation* Concepts and Techniques in Modern Geography series 59 (Environmental Publications, University of East Anglia, Norwich)
- Dorling D, Fairbairn D, 1997 *Mapping: Ways of Representing the World* (Longman, Harlow, Essex)
- Gilbert M, 1982 *The Atlas of the Holocaust* (Michael Joseph, London)
- Greeves T, 1987, "Parish maps: celebrating and looking after your place", Common Ground Ltd, 1 Munro Terrace, London SW10 0DL
- Harley B, 1988, "Maps, knowledge and power", in *The Iconography of Landscape* Eds D Cosgrove, S Daniels (Cambridge University Press, Cambridge) pp 277–312
- Kidron M, Segal R, 1981 *The State of the World Atlas* (Heinemann, London)
- Kidron M, Segal R, 1984 *The New State of the World Atlas* (Pluto Press, London)
- Kidron M, Segal R, 1991 *New State of War and Peace: An International Atlas* (Grafton Books, London)
- Kidron M, Segal R, 1995 *The State of the World Atlas* 5th revised edition (Penguin Books, Harmondsworth, Middx)
- Kidron M, Smith D, 1983 *The War Atlas: Armed Conflict – Armed Peace* (Heinemann, London)
- Monmonier M, 1991 *How to Lie with Maps* (University of Chicago Press, Chicago, IL)
- Peters A, 1989 *Atlas of the World: The Earth in True Proportion for the First Time* (Longman, Harlow, Essex)
- Pickles J (Ed.), 1995 *Ground Truth: The Social Implications of Geographic Information Systems* (Guilford, New York)
- Seager J, Olson A, 1986 *Women in the World: An International Atlas* (Heinemann, London)
- Szegő J, 1984 *A Census Atlas of Sweden* (Swedish Council for Building Research, Stockholm)
- Szegő J, 1987 *Human Cartography* (Swedish Council for Building Research, Stockholm)
- Szegő J, 1994 *Mapping Hidden Dimensions of the Urban Scene* (Swedish Council for Building Research, Stockholm)