Critical Cartography

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Glossary

Art Maps Maps created by artists.
Cartography Mapmaking, including allied theoretical and practical aspects.
Critique Assessment.
Eco-Mapping Mapping for ecological purposes, usually at the grassroots by environmental activists. Similar to green mapping.
Ethnocartography Study of non-Western mapping practices. Similar to indigenous mapping.
Green Mapping Mapping for ecological purposes, usually at the grassroots by environmental activists. Similar to eco-mapping.
Hegemony Domination of one group or person or idea over others.
Indigenous Mapping Study of non-Western mapping practices. Similar to Ethnocartography.
Mapmaking General practice of making maps, usually thought of as separate from more theoretical or philosophical issues.
Parish Mapping Large-scale, local mapping of areas usually for activist purposes or the collection and mapping of local knowledges.
Participatory Mapping and GIS Practices for gathering and mapping information whereby participation of nonexperts is encouraged.

The standard story about critical cartography is that it developed during the late 1980s and early 1990s in opposition to the hegemonic tradition of mapmaking as a progressive and value-free transcription of the environment.

Often cited in this account is the deconstruction of a North Carolina state highway map by Denis Wood and John Fels in 1986; the publication of the first volume of Brian Harley and David Woodward's monumental reconstruction of the history of cartography in 1987; a series of polemics by Harley, especially 'Maps, knowledge, and power' in 1988, 'Deconstructing the map' in 1989 and 'Can there be a cartographic ethics' in 1991; the first of a number of papers by Robert Rundstrom reassessing the place of mapping among First Nations peoples in 1990; the publication of a paper critical of GIS by John Pickles in 1991; *The Power of Maps*, an exhibition curated by Wood for the Cooper-Hewitt National Museum of Design in 1992, and the Smithsonian in 1994, and Wood's best-selling *The Power of Maps* in 1992; David Turnbull's critique from the perspective of the sociology of scientific knowledge, *Maps Are Territories* in 1993; Doug Aberley's *Boundaries of Home: Mapping for Local Empowerment* in 1993; and Pickles' *Ground Truth* in 1995.

Binding these disparate efforts together was the nature of their critique. This was less about ferreting out bad maps or making better ones than about trying to lay bare, understand, and call into question the presumptions of professional cartography, 'professional cartography' referring at once to official mapmaking, the dominant map houses, and academic cartography.

As a story about the origins of a now pervasive critique of the assumptions and practices of professional cartography, the story has undoubted merit. The period did see a self-conscious engagement with the fundamentals of cartographic thinking and behavior. But construing critical cartography in the narrow beam of contemporary critical theory forecloses an awareness of both a precedent history of critique within professional cartography and a much longer history of critical practice in mapmaking at large.

Mitigating against this vision of a critical past has been the conflation of cartography – a comparatively recent professionalization of mapmaking dating to the first third of the nineteenth century – with the whole of mapmaking, much of whose history preceded the development of cartography, and the balance of whose history has run parallel with it. A strategic move in this conflation was the effort on the part of Max Eckert and others to articulate mapmaking around a hegemonic vision of timeless principles (what Arthur Robinson called 'the essential cartographic process') in an effort to recast mapmaking as a science, as a *Wissenschaft*, rather than a form of human communication closer to writing. As a science, cartography was understood to progress from the solution of one problem to another – as other sciences were construed – and its past was recast as a seamless accumulation of knowledge and technique.

Early Critique in the History of Mapmaking

In fact, mapmaking has been perpetually transformed, all but dialectically, by successive critiques. These may not have been critiques in the sense inaugurated by Immanuel Kant, but they were emphatically critiques, embedded, often as not, in novel ways of making maps, novel map subjects, or both. A classic example is the world map

published by Gerard Mercator in 1569 and the projection implicit in it. This was not, as it is so often presented, the solution to an urgent problem (as is made amply plain by the fact that it took two centuries for the projection to be widely adopted), but neither was it merely a novelty. It was, however, deeply critical, of both the conical Ptolemaic projections popularized by Renaissance scholars and the plane charts (*portolanos*) long used by mariners.

This is not something we have to infer. Mercator made his critique explicit in the 15 texts scattered over his map. About the Ptolemaic maps, for example, Mercator wrote that, "Indeed the forms of the meridians as used till now by geographers, on account of their curvature and their convergence to each other, are not utilizable for navigation; besides, at the extremities, they distort the forms and positions of regions so much, on account of the oblique incidence of the meridians to the parallels, that these cannot be recognized nor can the relation of distances be maintained." As for the charts of the mariners, "the shapes of regions are necessarily very seriously stretched and either the longitudes and latitudes or the directions and distances are incorrect; thereby are great errors introduced." Nor was it solely with respect to form that Mercator was critical. Among other things, Mercator abandoned the Ptolemaic prime meridian for another, and adduced a north polar landmass, a second Greenland, and a huge protuberance in southwest South America.

Traditionally staged as "a paradox of advances and retrogressions" in the drama, *The Progress of Cartography*, Mercator's map is praised for its ingenuity and condemned for the 'cartographical mistakes' it disseminated. In fact, both the map's form and its content are more usefully approached as embodiments of Mercator's critical engagement with his sources. Not only did nautical charts disagree with each other, as did the maps of the scholars, but also the two sets of maps were difficult to reconcile, a compelling problem for Mercator whose life work consisted in compiling maps from the maps of others. "I had to wonder," Mercator once wrote a friend, "how it could be that ship-courses, when the distances of the places were exactly measured, at times show their differences of latitude greater than it really is, and at other times on the contrary, smaller … [T]he matter caused me anxiety for a long time, because I saw that all nautical charts, by which I was hoping especially to correct geographical errors [that is, errors in the maps of the geographers], would not serve their purpose."

Confrontation with conflicting reports inescapably brings the problem of knowledge to the foreground, raising its contingent status before even unwilling eyes. Mercator's critique of the *portolanos* and the Ptolemaic conics famously took the form of his eponymous projection, a spatial frame which was no sooner published than it too became the subject of a critique that continues into the present. Among those objecting to it first were the navigators for whom it was expressly designed. They found it an oddity on which it was hard to measure distances as a consequence of the projection's increasing scale with distance from the equator. It is this characteristic that has sustained the most extended critique. J. H. Lambert's 1772 critique, which took the form of a veritable counter-projection, shrank what Mercator had stretched to preserve area instead of shape. Lambert's cylindrical equal-area projection became the first of a family of such projections driven by resistance to the world brought into being by Mercator. Among them were those of James Gall in 1855; Walter Behrmann in 1910; Trystan Edwards in 1953; and Arno Peters in 1967.

Gall critiqued Mercator's commitment to navigators, writing, in 1855, that "Mercator's projection sacrifices form, polar distance, and proportionate area, to obtain accurate orientation for the navigator; whereas to the geographer, form, polar distance, and proportion of area are more important than orientation," which, while reversing it, recalls Mercator's critique of the Ptolemaic conics popularized by the scholastic geographers. Peters, on the other hand, critiqued Mercator for being "the embodiment of Europe's geographical conception of the world in an age of colonialism." Though like Lambert and Gall, Peters was not a cartographer (Lambert was a physicist and mathematician, Gall a clergyman, Peters historian), Peters had no hesitation about critiquing the profession for clinging to a "closed body of cartographic teaching which has developed into a myth." In response to Peters, an embattled cartography united to condemn all rectilinear world projections, hysterical reaction that underscored the depth of the wound sustained from Peters' critique of the profession's epistemological foundations.

Critique within the Profession of Cartography

Not all critique has come from outside the profession. Though some internal critique has echoed that of outsiders, more has been directed toward transforming cartography into a science. Max Eckert, for example, published the first volume of his 1500 page *Kartenwissenschaft* in 1921, the second in 1925. Although vehement in its opposition to the use of non-equal-area projections in geography (especially the Mercator), the *Kartenwissenschaft* was most influential in shaping cartography's reconstruction as a science. Though generally traditional in his goals – who could ever have disagreed with Eckert's demand that maps be "correct, complete, appropriate, clear and distinct, readable, and handsome"? – the route Eckert sketched for reaching these goals was distinctive, largely the application of psychology to map

design. "The question," he wrote, "whether an economical map should demonstrate the distribution of only a single phenomenon or of a lot of them will not bring anyone to confusion if his thinking is logically based and if the designer has paid regard not only to the scale and to the purpose of the map, but also to the visual capability of the human eye and to the receptivity of the human brain," adding that, "It would be an extraordinary progress if a scientifical cartographer and a psychologist could jointly proceed to empirical tests clearing up by which map charge the human eye and the human brain will be overcharged."

Since it may be doubted that Eckert's question had ever brought many into confusion (who, making a map, or any communication, would want to 'overcharge' the human brain?), Eckert's program may be more appropriately appreciated as a critique of the practices of his peers, a critique arising, in fact, from what one of Eckert's memorialists has referred to as "Eckert's rage against overcharging maps with signs." Eckert's desire to 'scientifically' validate his Apollonian preferences resonated with enough others that from the 1950s onward, academic cartography was heavily invested in the psychological testing of map readers' abilities. Arthur Robinson's textbook, *Elements of Cartography*, encouraged this point of view, especially its later editions. While acknowledging that cartography was not a science, Robinson's third edition (1969) stressed that cartography "employs the scientific method in the form of reason and logic in constructing its products … It has its foundations in the sciences of geodesy, geography, and psychology." Eric Arnberger's text, *Handbuch der Thematischen Kartographie* in 1966 also followed Eckert in attempting to impose order on the "wild branch that has grown untended and unpruned on the trunk of the topographic map" by formulating a theoretical framework for the establishment of cartography as a *Wissenschaft*.

It was the unrelenting focus on how undergraduate students read various arrangements of graduated circles, line widths, and color schemes (undergraduate students were invariably the subjects of the psychological tests) that ultimately led to the countervailing internal critique of the profession, its construction of mapmaking as a science, and its construction of its history as a value-free and progressive transcription of the environment. Wood, Fels, Harley, Woodward, Rundstrom, and Pickles were all professionally involved with cartography. Their critique aimed at overturning the paradigm of Eckert and Robinson by shifting attention from the 'form' of the map, with which the profession was obsessed, to its 'meaning for behavior'. Instead of asking whether the brain was overcharged by the density of symbols, these critics asked how the body of the subject was constructed by the map, that is, how the map oppressed, subjugated, or otherwise impinged on people.

This shift in commitments first surfaced in differences over Peters' projection, and Peters' explicit outsider's critique of cartography's political, indeed colonialist, even racist, dimension. Most professionals, and the official professional organs, pretended to either outrage or bemusement, wondering how a projection (only a mathematical formula after all!) could be political in the first place, but nonetheless took time to swipe at Peters' projection as ugly, not Peters' (it's identical to Gall's), or otherwise inappropriate (world projections should never be rectilinear). Internal critics, on the other hand, understood and in their various ways empathized with Peters' project. By 1994 Jeremy Crampton had characterized the affair as "cartography's defining moment." In 2003 Wood claimed that the affair had been, "in its way, the death knell of the profession."

The Outside Critique

Paralleling the internal critique was an external one. Doug Aberley, a bioregional planner, published *Boundaries of Home* in 1993, but the book reflected mapmaking that had been going on for a while, in the case of First Nations mapping, for quite a while. First Nations, or Indigenous, mapping offers a critique of official mapmaking with respect to its prerogatives, form, and content. The origins of the contemporary movement may be traced to the early 1970s, especially to the publication in 1976 of the three-volume *Inuit Land Use and Occupancy Project,* which pioneered the use of individual map biographies. In these, "hunters, trappers, fishermen, and berry pickers mapped out all the land they had ever used in their lifetimes, encircling hunting areas species by species, marking gathering locations and camping sites – everything their life on the land had entailed that could be marked on a map."

Neither the mapmaking of their Inuit ancestors nor that of contemporary cartography, these 'map biographies' inaugurated a new trajectory in the history of mapmaking. If the maps were scientific, it was not in the vein of geodesy, geography, and psychology as Robinson had dreamed, but in that of ethnography (the practice has been called a kind of ethnocartography), though more significant by far was their use in land claims negotiations. Thanks to a Royal Proclamation of 1763 which asserted an Aboriginal title – a form of property right arising from long and continuous use and occupancy of land prior to the arrival of colonial peoples – their maps enabled the Inuit to assert an Aboriginal title to $2\,000\,000\,km^2$ of Canada. A land claims settlement was proclaimed in 1993, and in 1999 the new Territory of Nunavut was created. When its 19-member assembly assumes all governing power in 2009, the Inuit of the former Northwest Territories will be among the first

indigenous peoples in the Americas to achieve self-government in recent times.

The role of indigenous mapping in this process was lost on no one. Similar mapping projects were immediately initiated among the Inuit, Settlers, and Naskapi-Montagnais of Labrador, the Dene of the Mackenzie River basin, the Indians of the Yukon, and the Inuit and Cree of northern Quebec, among others, and the idea rapidly spread around the world. An important benchmark was the publication of *The Nunavut Atlas* in 1992, and the identification, also in 1992, at the United Nations Rio Summit, of community-based mapping, using both local and computer technologies, as a key research, community-building, and planning method. Publication of the special issue of *Cultural Survival Quarterly*: *Geomatics*: *Who Needs It?* in 1995 with its examples of ethnocartography from around the world, Nancy Peluso's articulation of counter-mapping, also in 1995, and *Maya Atlas*: *The Struggle to Preserve Maya Land in Southern Belize* in 1997, were other signal moments. The 1998 establishment of the Aboriginal Mapping Network marked a coming-of-age for the movement. In 2003, some 120 Aboriginal mapmakers from across North America and as far away as Panama, Taiwan, and Malaysia met for the third international GIS-mapping conference hosted by the Aboriginal Mapping Network.

This wholesale assault on the presumptions of professional cartography extends to its most fundamental categories. "Mapping, and cartographic technologies have progressed immensely over the past decades," write the initiators of a project for the International Polar Year 2007–08. "And yet, the representation of landscapes, topology, toponymy, and landforms remains focused on just that – land. North American topographic maps continue to represent landscapes as interpreted, described, and named over a history of European, American, and Canadian exploration. In Canada and Alaska, efforts have been made, and are currently underway, to begin 're-mapping' the North according to the rich diversity of Inuit knowledge (e.g., place names, oral history, and land use and occupancy projects) that is generally overlooked in conventional mapping initiatives. However, the large expanses of blue that delineate the Arctic Ocean and Hudson Bay, among other major water bodies, are left relatively empty in most maps. These 'blank' areas are actually ice-covered white expanses for three-quarters of the northern year." The project proposes to map each Inuit community's past and present sea–ice use patterns using methodologies and philosophies patterned after those of the 1976 Inuit Land Use and Occupancy Project.

As suggested by this example, First Nations mapping has ties to other forms of what has become known as counter-mapping, counter, that is, to the mapping of professional cartography. These linkages, proliferating today – to bioregional mapping, community mapping, public participation GIS (PPGIS), participatory rural appraisal, green mapping, and still others – had already been anticipated in Aberley's book which, while pointing to the achievements of the Inuit in the Northwest Territories and Labrador as exemplars, as also to Common Ground's Parish Map Project and others, was essentially a bioregional primer. What united most of Aberley's projects, of course, was an emphasis on the local, but most of them also shared an indifference to, if not a disdain for, professional cartography and its obsessions. Invariably the focus was on significance at the expense of formal values as when, in a complete rejection of Eckert's overriding concern, Aberley advised, "Alternately, you can either purchase multiple copies of your base map, or chart all your data directly on the base map. The latter technique will create an extremely busy image which will be useful in conveying the richness of natural and human activity in your neighborhood area, but can be short on clarity."

More difficult to deal with was professional cartography's spatial epistemology, including its reliance on discrete boundaries, especially when these came bundled in computer-mapping technologies, like GIS and GPS, exported to support indigenous mapping activities. Indeed, counter-mapping called forth critiques from the very practitioners who first advocated its adoption, aware as they were of the conceptions of property implicit in cartographic conceptions of space, conceptions wildly at odds with those of many of the peoples attempting to exploit computer mapping's potential. As Peluso wrote as long ago as 1995, "The key theoretical questions about the impacts of counter-mapping on resource control are to what degree new notions of territoriality reflect older ones; how the reinvention of these traditions benefits or works to the detriment of customary practice, law, and resource distribution; and how the intervention of NGOs … affect the villagers' access to and control over … resources." In contradistinction to Bernard Nietschmann's 1995 insistence that an indigenous map made with computer technology, "… will have transcendental powers because it can easily be translated by everyone everywhere; it transcends literacy; [and] it is visually comprehensible," comes Peter Walker and Pauline Peters' 2001 caution that, "The job of mapping should not end with the drawing of boundaries; where social scientists assist social groups to draw maps, it is crucial that they also document and communicate what these boundaries mean for local people," that is, it has to be an ethnocartography in fact.

Ethnocartography, eco-mapping, PPGIS, anticipatory rural appraisal, green mapping, Parish mapping, all these and others have fed the stream of maps, growing in volume ever since the late 1950s, that have been made by artists. From the hands of surrealists, situations, pop

artists, conceptual artists, Earth artists, eco-artists, installation artists, and others have come a flood of maps challenging not simply Western capitalist society, but the authority of Western capitalist cartography to map the world. Art maps contest not only the authority of professional mapmaking institutions – government, business, and science – to reliably map the world, but they also reject the world such institutions bring into being. Art maps are always pointing toward worlds other than those mapped by professional mapmakers. In doing so, art maps draw attention to the world-making power of professional mapmaking. What is at stake, art maps insist, is the nature of the world we want to live in. In pointing toward the existence of other worlds, real or imagined, map artists are claiming the power of the map to achieve ends other than the social reproduction of the status quo. Map artists do not reject maps. They reject the authority claimed by professional cartography uniquely to portray reality as it is. In place of such professional values as accuracy and precision, art maps assert values of imagination, social justice, dreams, and myths; and in the maps they make hurl these values as critiques of the maps made by professionals and the world professional maps have brought into being. Artists insist that their maps chart social and cultural worlds every bit as 'real' as those mapped by professional cartographers. Some, Guy Debord among them, have explicitly called for a 'renovated cartography' as a form of intervention. The project of art mapping is nothing less than the remaking of the world.

Narrowly construed, critical cartography was a late phase in the history of cartography, a professional moment in the broader history of mapmaking; but criticism more broadly understood has been an aspect of mapmaking from its earliest days. In some sense it is inherent in the practice, in which even the most fundamental forms of field mapping involve the self-conscious resolution of conflicting reality claims. In more common forms of mapmaking, compilation surfaces the problem of knowledge in an inescapable fashion (as it did for Mercator), as do symbolization, generalization, and classification. Undoubtedly professionalization, with its guidelines and texts, handbooks and standards of practice, constituted a form of anxiety reduction during a period of rapid growth in mapmaking, pushing aside any need for an overwhelmed class of mapmakers to directly confront the problem of knowledge. But in the end, even for professionals, the problem would not go away, and hence the rise of the internal critique. Outside the profession, conflicting reality claims lay at the heart of the practice. It may be anticipated that the critical claims making of these nonprofessionals will increase exponentially as the technologies developed over the past century and a half by the professionals are increasingly embedded in increasingly accessible online mapping and mapmaking tools. It may not be anticipating too much to look forward to the day when mapmaking remakes itself into a completely critical practice.

See also: Cartography, History of; Counter-Mapping; Critical GIS; Mapping, Philosophy; Mapping, Race and Ethnicity.

Further Reading

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