From a Dry Statement of Facts to a Thing of Beauty: Understanding Aesthetics in the Mapping and Counter-Mapping of Place

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ABSTRACT

Aesthetics plays a key role in cartographic design and is especially significant to the representation of place, whether by the state, the community, the crowd, or the artist. While state topographic mapping today demonstrates a rich diversity of national styles, its evolution (particularly since the Enlightenment) has led to the establishment of a particular aesthetic tradition, which has recently been challenged by counter-mapping initiatives and through map art. This paper explores the function of aesthetics in the cartographic representation of place. It offers an analysis of the aesthetic value of topographic maps and suggests how an appropriate wielding of the aesthetic language of cartography can communicate a sense of place more effectively.

KEYWORDS: Topographic Maps, Aesthetics, Cartographic Design

PROLOGUE

> *"The quality of a map is also in part an [a]esthetic matter. Maps should have harmony within themselves. An ugly map, with crude colours, careless line work, and disagreeable, poorly arranged lettering may be intrinsically as accurate as a beautiful map, but it is less likely to inspire confidence." (John K. Wright 1942, 23)*

> *"The assumption that effective cartographic technique and its evaluation is based in part on some subjective artistic or aesthetic sense on the part of the cartographer and map reader is somewhat disconcerting." (Arthur H. Robinson 1952, 16)*

> *"It is in accordance with practical experience, however, which the author has personally observed over many decades, that in cartographical affairs, as in all graphic work, the greatest clarity, the greatest power of expression, balance and simplicity are concurrent with beauty." (Eduard Imhof 1982, 359)*

Few topics in the theory of cartography can claim to divide opinion as much or suffer from being under-researched, yet carry so much relevance to the practicing cartographer, as that of aesthetics: "the branch of philosophy which deals with questions of beauty and artistic taste" (Pearsall 2001, 21). Aesthetics was established as a distinct area of philosophy in the 18th century, particularly with the publication of Immanuel Kant's seminal work *Kritik der Urteilskraft* (The Critique of Judgment) in 1790, generally regarded as the foundational treatise in modern philosophical aesthetics (Crawford 2005). For Kant (2007), aesthetic experience results from the harmonious free play between imagination and understanding and does not depend upon concepts or desires. Kant's argument for the subjective paradigm, i.e., that beauty is in the eye (mind) of the beholder, still enjoys widespread acceptance. More significantly, aesthetics is explicitly studied today in a range of fields associated with the theory and practice of design, such as degree courses in architecture (e.g., University of Edinburgh 2013), engineering (e.g., University of Warwick 2013), product design (e.g., University of Brighton 2013) and vehicle design (e.g., Royal College of Art 2013). The singular form "aesthetic" refers to questions of visual appearance and effect (Williams 1983, 82), and, put simply, in modern society, aesthetic sensibilities are relevant to all products, regardless of their function (Bloch 1995).

INTRODUCTION

There was little room for the more subjective elements of cartography in Robinson's post-war manifesto for a serious scientific discipline that was intended to rise above the rubble of Haushofer and the Geopolitik school (for examples of Geopolitik cartography, see Herb 1996). The aim of turning cartography away from expression and towards communication served to further polarize the artistic and scientific elements of mapmaking, which at one time had enjoyed a greater unity of purpose: "until science claimed cartography, mapmaking and landscape painting were kindred activities, often performed by the same hand" (Rees 1980, 60). While Wright (1942, 542) had stated that a symbol's suitability is dependent upon the cartographer's sense of taste and harmony, successive interpretations tended to treat aesthetics as no more than an elusive by-product of map design that requires no particular skill to achieve (e.g., Karssen 1980; Collinson 1997). The degree of subjectivity implied by its synonymy with taste suggests to some that aesthetic preference for one map over another is no more than personal opinion (de la

Mare 2011), while others have doubted the practical application of investigations in this direction (e.g., Dobson 1985), despite pleas for research (Board 1981) and earlier progress in related fields (e.g., Moles 1968). Debate surrounding the role of aesthetics in cartography continues today, with some calling for greater focus (e.g., Huffman 2013) and others asserting the opposite (e.g., Woodruff 2012). Nevertheless, aesthetics has tended to be seen as a fruitless topic for research in cartography, allowing its significance in both the creation and use of maps to be overlooked (Kent 2005).

We are witnessing an exciting stage in cartography where the traditional aesthetic language used to represent place is being challenged by multiple cartographies that use different aesthetic approaches.

By contrast, sixty years after Robinson's words of warning, the focus of mapmaking has shifted away from the user and is today characterized by a praxis that celebrates both the individual and the subjective. Online map mashups are more ubiquitous than state topographic maps and artists embrace maps as vehicles for expressing ideas about place (Cosgrove 2005; Wood 2006; Cartwright et al. 2009), while the mapmaking canon has broadened to incorporate emotional and sensory experience (Nold 2009; McLean 2012). Moreover, the relevance of these developments has been recognized in the creation of Commissions on Art and Cartography and on Neocartography within the International Cartographic Association (ICA 2013) and, at last, the aesthetic response to maps is emerging as a topic for research (e.g., Fabrikant et al. 2012). The different circumstances of cartographic production that reflect a shift in power from national mapping organization to non-expert mapmaker—made possible through technological capabilities afforded by the Internet and global positioning systems—have also helped to cultivate an attitude which is increasingly open to exploring cartographic aesthetics. We are therefore witnessing an exciting stage in cartography (notwithstanding the realm of map art) where the traditional aesthetic language used to represent place is being challenged by multiple cartographies that use different aesthetic approaches. These include applying famous painters' palettes to state topographic mapping (Christophe 2009) and experimenting with different styles for online web map services (e.g., Stamen Design 2012).

The scope of this paper is not wide enough to undertake a defense of the relevance of aesthetics in cartography, nor to attempt a deconstruction of cartographers' aesthetic judgments. To deny that aesthetics has played, and continues to play, a key role in map design would be to devalue the cartographic process of communicating geographical experience and the developments in (re)production technology that have brought greater control to the cartographer. The aim of this paper is simply to examine the role of aesthetics in topographic mapping, with a view to showing how this genre offers some insights into the wider relationship between cartographic aesthetics and society. It will explain how official topographic maps maintain an aesthetic tradition which serves the interests of the state, how counter-mapping has responded to this, and how cartographic aesthetics can be wielded to affect attitudes to place.

CONSTRUCTING THE AESTHETIC TRADITION

While practicing cartographers generally align to the idea that cartography is essentially about communication (Lilley 2007, 208), they also tend to support the

view that maps have aesthetic properties, which are necessary for a map to succeed (Wood and Gilhooly 1996). Indeed, Karssen (1980, 125) believed that "objective beauty" could be constructed in maps through the appropriate treatment of five subjective elements of map design: generalization (simplified shapes), symbolization (graphic representation), color (accent and balance), layout (composition), and typography (appearance). It is not difficult to appreciate how, at its simplest level, trained cartographic practice is ordered towards the construction of a particular aesthetic (i.e., visual effect), that is based upon conformity, harmony, balance, and uniformity (Figures 1 and 2).

Elements of this aesthetic tradition in cartography are easy to trace. Even a cursory glance at the historical development of map reproduction techniques reveals a desire to refine and apply aesthetic judgments as cartographers created maps to meet society's thirst for geographical knowledge and keep up with its changing taste. For example, copperplate printing enabled a finer quality of type and linework than could be achieved using woodblock, while centuries later, what-you-see-is-what-you-get graphical user interfaces allowed changes to the map to be seen immediately on the screen. The desire has been to present more data in graphically more sophisticated ways, while advances in technology have allowed higher levels of consistency and have given cartographers greater control over the end result.

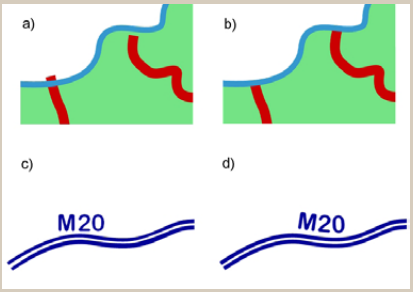

Figure 1: The elimination of undershoot and overshoot (a, b) and irregularity of linework (c, d) not only removes error but the resulting unity of form exhibits an aesthetic that implies correctness or goodness and the concept of being "fit for purpose."

Maps can maintain aesthetic value and relevance long after the quality of scientific information they comprise has been surpassed. Although decoration and ornamentation are generally regarded as obsolete in modern cartography, they have also formed part of the design process and may be mandatory within a particular time or culture (Figure 3). At the zenith of the decorated estate map, for example, decoration and ornamentation were nuances of the society that produced them and were not out of place, even if, as Hodgkiss (1981) asserts, topographical information was rendered subservient to the decorative elements. In his historical survey of art and cartography, Rees (1980, 63) claims:

> *"The most fanciful maps belong to the Middle Ages, the least scientific period of European cartography; the most aesthetically pleasing were the gift of the Renaissance. For cartography the Renaissance fusion of art and technology was particularly felicitous. Painting and mapmaking were so closely related that the first professional cartographers were pictorial artists who had engaged in the work of copying, decorating, and even compiling maps."*

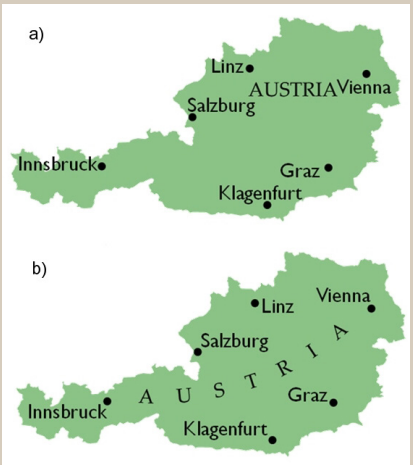

Figure 2: Maps may offer no more functionality with simple improvements to lettering, but the application of cartographic principles to text placement maintains an aesthetic tradition that serves to improve visual efficiency and make type more comfortable to read.

An aesthetic appeal may also lend a sense of validity to a map. Modern maps may fall short in gaining the trust of the user if a sense of authority is not supported by at least the appearance of scientific validity and "unauthoredness"—yet this appearance is itself socially constructed and ordered towards a particular aesthetic. In commenting on a topographic map of the Kashmir Valley presented at the Royal Geographical Society in 1859, Colonel George Everest stated: "The beautiful map behind the chair, which could not be characterized in terms that were too high, was a good proof of the knowledge and skill employed in the survey" (Purdon 1859, 32). The aesthetic here not only serves to validate the authenticity of the map

Figure 3: "America or New India, in an abridged version based on the universal description by [his] grandfather Gerard Mercator" by Michael Mercator, Duisberg, c.1630 (reproduced courtesy of www.RareMaps.com—Barry Lawrence Ruderman Antique Maps).

but also attributes some special value to its accomplishment. In this case, "beauty" results in part from a commitment to achieving correctness in cartography (through the skill and care of execution) that implies a dedication to completing a survey which is both accurate and "correct." Indeed, Jervis (1938, 118) later described Everest's triangulation of India as "beautiful," no doubt in terms of its mathematical proof. Advancing methods of survey may provide more accurate results, but if the ensuing maps do not conform to certain aesthetic ideals, they may not retain their value and authority.

This authority is, of course, in part derived from the apparent scientific accuracy with which symbols on the map correspond to features in the real world, but is also a reflection of state authorship and production; modern topographic maps are not produced by an individual map-maker:

> ***"Most of our maps are made by organizations, principally governments and large companies, but mostly governments. Cartographers and cartographic technicians might be involved in various stages of planning and producing these maps, but the important decisions are institutional—federal, political or corporate, rather than individual." (Monmonier 1982, 99)***

Since the design of a national topographic map series involves the collective experience and judgment of many, it incorporates a wider understanding of landscape that characterizes the institutional cartography of national mapping organizations. Moreover, this lends a particular aesthetic of "unauthoredness" to the state topographic map, reinforcing its portrayal of nature as raw and unconditioned—despite both landscape and aesthetic being social constructions.

In meeting their function as serving the interests of the user, maps (particularly topographic maps) can also simultaneously employ both artistic and scientific means of creation; perhaps to work towards a goal summarized by Eckert (1908, 347): "The ideal is the intimate union of the scientific spirit with artistic execution, and when this is realized it produces those maps which for years remain models of their kind." Whether cartographers may or may not consciously seek to endow their maps with an "objective" aesthetic appeal, as suggested by Karssen (1980), this appeal is constructed by society. Achieving a universal aesthetic appeal may be the conscious goal, but this appeal is nevertheless historically and culturally

situated. It is a case of finding resonance between the ideas and experience of both cartographer and user, despite, as Kant (2007) suggests, claims from either that what each regards as beautiful is universally so.

Maps typically synthesize various geographical data by utilizing a range of graphical (or visual) variables to communicate spatial and non-spatial information. The value of modern graphics software lies in the power of manipulation, flexible viewing scales, and instantaneous display, facilitating experimentation with different effects. For practicing cartographers who enjoy more freedom from rigid specifications, the creation of symbols and the construction of the map in general is an exploratory one—different graphic variables are manipulated and chosen for the best expression of the subject matter—where the process is often one of trial and error in refining symbols to reach the best outcome. Naturally, the context and clientele of the map will set some boundaries for that expression, but the cartographer tries different combinations, shapes, arrangements and colors, until the result "looks right" (Kent 2013). While the cartographic production process involves working in detail, the goal is to ensure that map symbols work together in their specification to provide an overall coordinated effect of clarity, harmony, and balance. Woodward (1982), for example, explains how the style of type plays a significant role in forming the image of the map. But however small the adjustments and refinements may be, each resulting from a cycle of reaction, judgment, and action, together they construct the aesthetic of the map.

This holistic view is worth considering because the user's aesthetic response is a reaction to the entire design of the map (Petchenik 1974). Indeed, according to Keates (1984), it is only the map's complete form which commands aesthetic attention. A recent online questionnaire (Kent 2013) found that being drawn to explore the map further was considered by most respondents to characterize their aesthetic experience of maps. Indeed, as Eaton (2008) states, what has aesthetic value sustains attention, and we can often return to gain more pleasure and understanding.

It is tempting to suggest that such aesthetic goals are restricted to individual cartographers who are able to exercise the most control over map design in their desire to create something of lasting value and worth, as an expression of their own aesthetic ideals. The significance of aesthetics in the pursuit of cartographic excellence is nevertheless also prevalent in the corporate environments of state mapping organizations such as Ordnance Survey. For example, in a discussion held at The Royal Geographical Society in 1933 concerning the introduction of a grid to Ordnance Survey maps:

> ***"…though it may spoil the aesthetic form of that beautiful map, for instance, that has been produced of Plymouth, it is a distinct advantage to the present map reader that he should have a number and a letter to mark the different sections." (Goodenough et al. 1933, 53)***

The importance placed on preserving aesthetic quality over the introduction of something so fundamental on the maps of today is perhaps surprising, given the

neglect aesthetics has suffered in cartographic theory. So whether by an individual or a corporation, a major objective of the cartographic enterprise is to create a map that is at least as beautiful as it is accurate and useful.

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If aesthetics plays such a significant role in cartography through the symbolization of features and their design, it is as relevant to the systematic production of maps through their recognizable and standardized forms as it is to the creation of individual maps with a unique symbology. In this case, the resulting aesthetic or "look" gives rise to a certain "style" that can be applied to other maps. Indeed, Keates (1996, 251) points out that style and aesthetics are "intimately connected" and the relationship described in Captain Withycombe's (1925, 533) appraisal of "recent products" of the Ordnance Survey in 1925 implies that the style of a map actually determines its aesthetic appeal:

> ***"Just as good literary style is of the utmost practical value in the presentation of scientific facts in a book or pamphlet, so good cartographic style enhances the practical value of a map besides converting it from a dry statement of facts to a thing of beauty."***

This would suggest that following a "good cartographic style" is important, both for the optimum presentation of geographical information and also, it would seem, to attain lasting aesthetic value. Aesthetics therefore plays a vital role in the creation of a good cartographic style, which in turn determines map symbol specifications—and standards of portrayal. Faithfully following these specifications to reproduce the appropriate style becomes a practical way of enhancing the aesthetic appeal of a map. If a style has been established and is versatile enough to portray a range of subjects, it can be applied rather like a filter for portraying information with a particular aesthetic. The aesthetic judgment of the cartographer is crucial because this determines how a map symbolizes its subject and therefore how the map might appeal to its users. In order to explore this further, it is necessary to examine how aesthetics has played a role in the symbolization of landscape and the user's response to this.

LANDSCAPE CARTOGRAPHY: MAPPING THE AESTHETIC

> ***"Almost every Englishman, if asked what he meant by 'beauty', would begin to describe a landscape—perhaps a land and mountain, perhaps a cottage garden, perhaps a wood with bluebells and silver birches, perhaps a little harbour with red sails and whitewashed cottages; but, at all events, a landscape." (Kenneth Clark 1949, 132)***

> ***"Clarity and a helpful presentation of our still beautiful country must take first place. Too heavy a marginal decoration detracts the eye and overshadows even so fine a feature as Dartmoor." (Brigadier H. S. L. Winterbotham 1932, 18)***

> *"To capture the essence of landscape requires that the components be blended graphically so as to have an iconic quality, a unique sense of place and character. This aspect of topographic mapping is rather like portrait painting in that the objective is to produce an image blending feature and expression that conveys the essence of personality." (Arthur H. Robinson 1989, 93)*

Mapping the landscape, which requires the selective generalization of features from the land, is one of the earliest applications of cartography. The introduction of institutionalized survey from the Enlightenment onwards brought greater levels of standardization, while the adoption of color lithographic printing by the early 20th century saw further steps towards a general style of topographic mapping which Keates (1996, 256) identified as the "Classical" style. The development of broader symbologies to portray the diversity of national landscapes and meet the changing needs of users within the realms of each national aesthetic tradition has contributed to the stylistic individualism present today (Kent and Vujakovic 2009).

In topographic mapping, scales can be large enough to allow the representation of features in enough detail to present an image that approaches a mimetic (albeit pictorial) view. Indeed, in the seventeenth century, a fondness for topographical views and details made maps closer to our idea of pictures (Alpers 1987, 60), while the Enlightenment's systemization of knowledge brought greater standardization. Due to the restrictions suggested by scale, symbolization involves abstraction and this affects the aesthetics of mapping the landscape. As the degree of abstraction tends to increase as scale decreases, it seems possible that smaller scale maps such as thematic or special-purpose maps that concern the presentation of phenomena far beyond the normal human perspective (e.g., a map of Europe) in particular, will embody an altogether different aesthetic. As Robinson (1965) implies, at larger scales we tend to see reality while at smaller scales we tend to see symbols, which carry associations. Furthermore, the less an artifact interests our eye as imitation, the more it must delight our eye as pattern (Clark 1976). Abstract forms also allow more freedom of expression because they are not tied to mimesis. Harry Beck's design for the London Underground map was successful not solely because of its rational approach to navigating the Tube, but also because its pattern of regular angles and vibrant colors were in step with the Art Deco aesthetic that was burgeoning in the 1920s and 1930s.

The aesthetic response to larger scale maps that are more representative of the surface features of the subject (i.e., the landscape in topographic maps) is influenced by the user's imagination, experience and memory of the phenomena. Some landforms, however, are perhaps more likely to take precedence over others because their aesthetic appeal attracts more observation and study. While many share a particular fascination for Swiss topographic maps because of their detailed expression of this natural landscape (e.g., Knowles and Stowe 1982, 108), others dismiss the Swiss map on the grounds that it is the subject matter, the Alps, which is impressive (Keates 1984, 39). Indeed, the landscape shown by topographic maps tends to affect the user's ability to read the map to a greater degree than its cartographic design (Raposo and Brewer 2011). However, this does not imply that the

cartographic style employed by different national mapping organizations should not also be aesthetically pleasing, regardless of the fact that the terrain may be very different. According to Brady (1998, 142), "It may take less effort to see the beauty of a particularly grand landscape than a mudflat or a wasteland. However, mudflats and wastelands may also have aesthetic value, and perceiving that is dependent upon the effort of the percipient." Indeed, as Hodgkiss (1981, 174) suggests, "The landscape of the Netherlands hardly seems likely to inspire the making of such beautiful maps but the country has an unrivalled cartographic tradition and is one of the world's leading mapmaking nations."

Tempered by professional and public scrutiny, state topographic maps express a particular—aesthetically conditioned—view of the landscape; the map is a symbol of the mapped. If the aesthetics of landscape influences the cartographer's judgments and the user's response to these, then a successful cartographic style would express these aesthetics through a whole national series of topographic maps. The representation of landscape outside this tradition therefore demonstrates a lack of authenticity because it falls short of the particular aesthetic ideals developed and maintained by the state mapmaker, as illustrated in Figure 4.

State topographic maps utilize a national style that is generally rooted in a particular aesthetic tradition, which is itself derived from a broader aesthetic associated with topographic mapping. They may also be considered to have particular aesthetic value for several reasons. The simultaneous presentation of multiple sets of geographical data often results in a complex interplay of features that requires the application of several principles of cartography to create an effective result on a holistic level (as intended in the creation of the map symbology). These may include: a logical visual organization (hierarchy) that typically prioritizes point and line symbols; a harmonic range of colors (particularly those used in the background) which also demonstrates a visual hierarchy so that the use of stronger colors are minimized in surface area; a level of standardization throughout (where repeated symbols are identical); a layout that demonstrates balance and alignment (applicable to marginalia); and lettering that is evenly spaced and whose size and typeface matches the character of geographical features. These may be supported by certain factors regarding how the user approaches a topographic map, e.g., as a "natural" representation (nature itself) free of bias; as a reliable document derived from "objective" survey and mathematical proof in its underlying geodetic framework; as a souvenir providing a connection

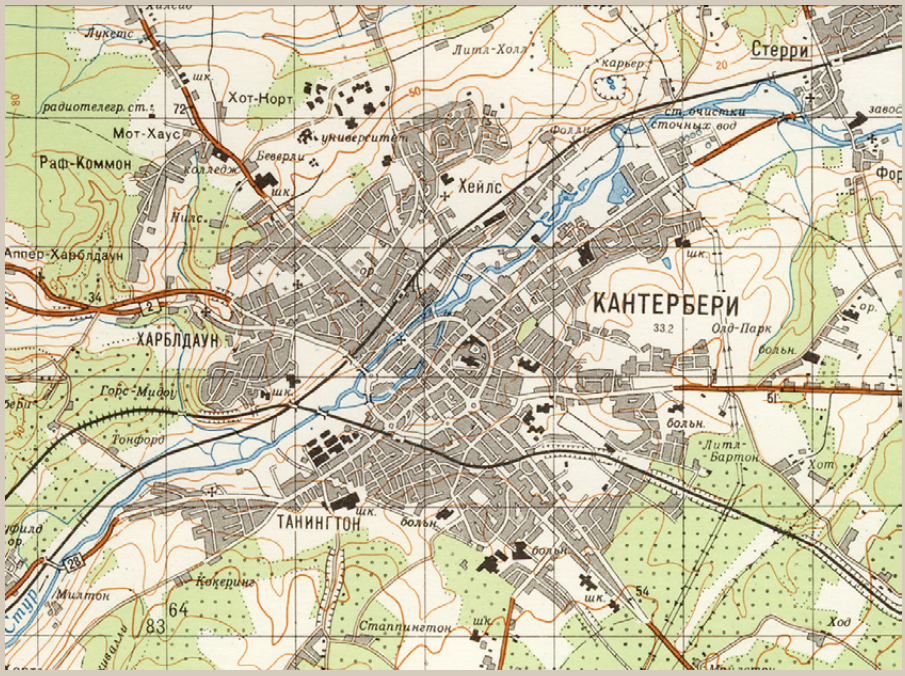

Figure 4: Extract from 1:50,000 topographic map sheet M-31-XXVII-A "Canterbury" produced by the General Staff of the Soviet Armed Forces, 1981.

between memory and place; and whether they approach the map in a state of disinterestedness (i.e., without the need for the map to exist), which, for Kant, was an essential condition for aesthetic experience. The presence of these elements—particularly when coupled with the factors affecting user response—lends the topographic map a sense of unity, conformity, harmony, and (perhaps more significantly) intricacy, that has made this wider aesthetic tradition successful and supranational. The map shown in Figure 5 for example, utilizes some of these characteristics to an extent that its appearance suggests the sublime—perhaps by challenging our imagination and by presenting nature as both irrational and infinitely complex.

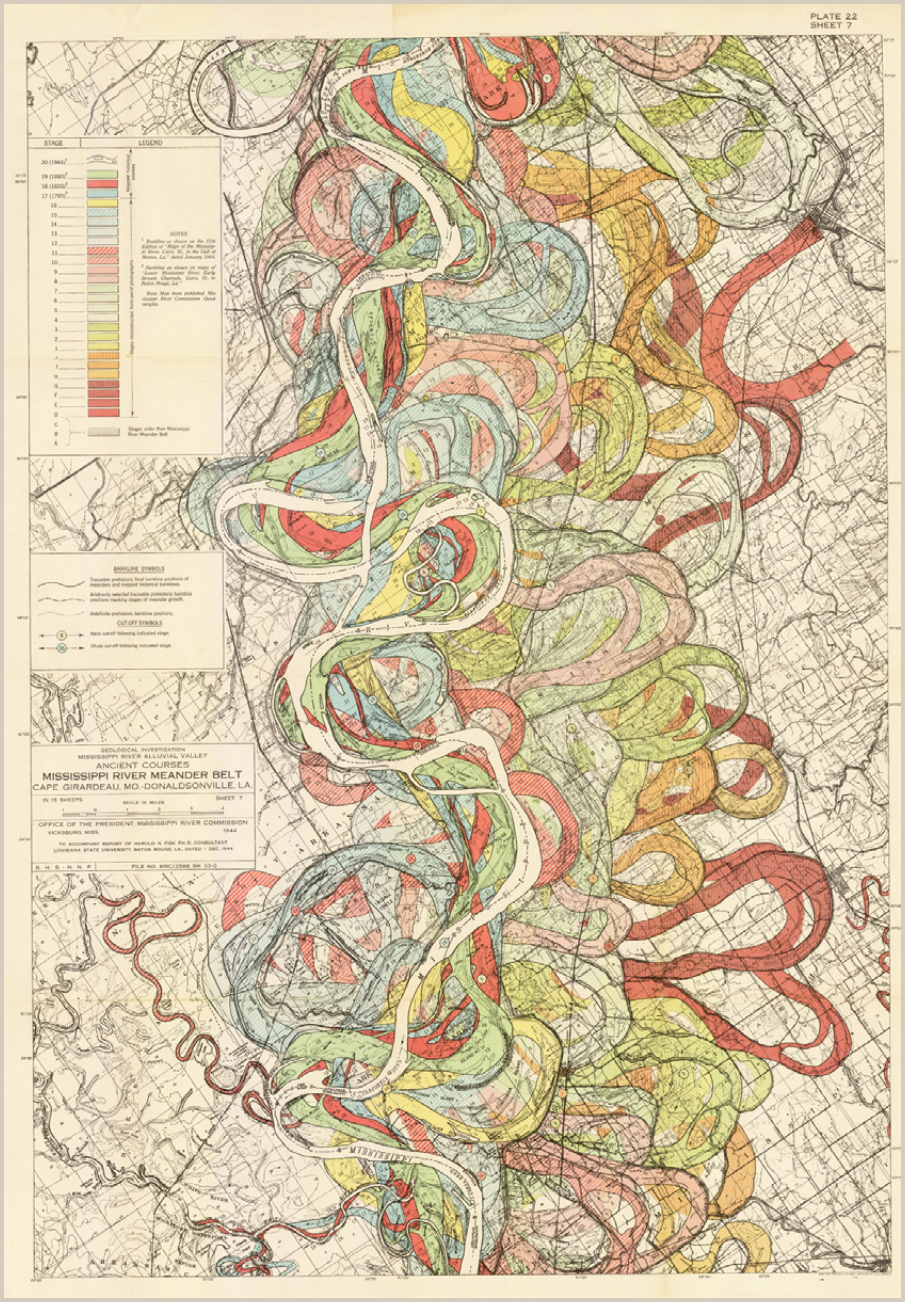

Figure 5: Plate 22 Sheet 7 from a geological survey of the Mississippi Basin (Fisk 1944).

It is important, however, to remember that the aesthetic impulse does not direct the inception of a topographic map in the same way as, for example, a landscape photograph. So, while Ansel Adams (1983, 79–80) could declare "Unless I had reacted to the mood of this place with some intensity of feeling, I would have found it a difficult and shallow undertaking to attempt a photograph," topographic maps are typically initiated from a utilitarian desire to understand, manage, control, and defend territory. While the emotional association with a specific place would perhaps be affected by the amount of detail apparent in its portrayal—and hence the scale of the map—the absence of detail inherent to cartographic symbolization allows a free play of the imagination necessary for the development of emotions associated with that sense of place. It consequently provides the map with advantages over the photograph.

Yet it is possible to communicate a more general, as opposed to a more specific sense of landscape through a particular combination of language, style and abstraction. An example, albeit using a very different language, can be found in the music of Symphony No. 6 ("Pastoral") by Ludwig van Beethoven (1770–1827). The title of the first movement, "*Erwachen heiterer Empfindungen bei der Ankunft auf dem*

Lande" (Awakening of Happy Feelings on Arrival in the Countryside), would imply that a successful interpretation of the music depends on the experience of countryside. But the music does not necessarily evoke feelings associated with the countryside surrounding the village of Heiligenstadt outside Vienna, where the music was composed (Jones 1995, 38), but rather the "countryside" in general. The emphasis is not on communicating the sense of a particular place—a *genius loci*, as often in the "tone poems" of the later 19th century—but a particular *type* of place. Although some elements in the symphony are deliberately mimetic (such as the call of the nightingale, quail, and cuckoo), these do not communicate the sense of countryside so much as the particularity of melody, harmony, orchestration, and timbre within the early nineteenth century style of musical composition in general. As Jones (1995, 34) suggests, the music is sufficiently allusive so that the listener can discover, rather than be told, what the "picture" is. The music expresses an experience of countryside, but this is broad enough to appeal to the particular experiences and imagination of the individual.

Through a familiarity with cartographic style and experience of landscape, the user's imagination and memory may be combined to enable a greater exploration and understanding of place. The establishment of national styles—particularly by a state mapping organization—therefore not only facilitates map reading to those familiar with this particular cartographic language of symbols but also serves as a "centripetal force" that suppresses regional differences through the homogenous representation of state territory. Moreover, the aesthetic tradition of topographic mapping reinforces the values of a faithful portrayal of the landscape, based on precise survey and objective science, and also exudes order and control.

THE AESTHETICS OF COUNTER-MAPPING

> ***"Nowadays, to the map-maker's eye, all water is blue. Even the Avon at Bristol, the Mersey at Liverpool, the Thames at Waterloo Bridge, and the very mud which, during most of the day, fringes the rivers, all are as blue as a Mediterranean seascape." (Walker W. Jervis 1938, 40)***

People invest deep emotional associations with places and so their representation or portrayal can trigger strong responses, which can be positive or negative. The homogenous cartographic style that characterizes state topographic mapping is intended to offer a versatile yet standardized portrayal of the national landscape. Where this homogenization has driven some to undertake mapping initiatives of their own, often these have sought to promote the uniqueness of place and the voice of community over state. In the UK in 1987, the environment and arts group *Common Ground* launched its first major public initiative—the *Parish Maps Project* (Crouch and Matless 1996). The aims of the project may be summarized as follows:

> ***"The idea is to encourage groups of volunteers to celebrate what Common Ground calls "Local Distinctiveness" so that people can***

> *identify what is particular and special about their home surroundings. The maps are all about people and their sense of place." (West Sussex County Council 2007)*

Collectively, the Parish Maps present a series of unique landscapes, each of which appears to uphold the values and interests of the community associated with each place. In a way perhaps not too dissimilar from Dutch topographical views of the seventeenth century, most maps incorporate pictorial representations. Drawing the community together through the theme of a common, localized space—if making the maps somewhat exclusive to outsiders—the depiction of local inhabitants and wildlife is in clear contrast to the "dehumanised landscapes" of state topographic maps and it would appear that they provide an authentic alternative. However, as with any cartographic language, Parish Maps are also influenced by the aesthetics and politics of selectivity. For example, particular features were dropped on grounds of their aesthetic value, ensuring that social inequality crept onto the map as in the case of Charlbury, Oxfordshire:

> *"The Charlbury map appears as an exercise in comprehensive realism but its imagery is carefully selected. A particular iconography of the place is set up: older buildings, a flora and fauna denoting a settlement in harmony with its parish land, a landscape written over by layers of history. The making of a map "like an old painting" is bound to a particular social aesthetic: "we wanted the map to be interesting to look at and council houses are not pretty."* […] *Unwilling to register a very visible architectural and social presence, placing part of their village out of cartographic sight, the mapmakers undercut their desired holistic vision of place and community." (Crouch and Matless 1996, 250)*

The fundamental premise of counter-mapping initiatives such as this lies in a rejection of the view that the landscape presented by state cartography is the only valid representation. The creation of OpenStreetMap (OSM) in the UK by Steve Coast in 2004, which launched the idea of crowd-sourced mapping of the nation as a potential alternative to state topographic data, has encountered a similar aesthetics and politics of selectivity. The drive to develop rendering toolkits such as Mapnik to "make beautiful maps" (Pavlenko 2007, 13) and the subsequent integration of these within OSM demonstrates the underlying belief that these maps should also be aesthetically refined creations, and more significantly, suggests that the mapping of place necessarily involves the integration of aesthetic values. Nevertheless, as Hacklay (2012) observes, spatial biases in contributions to OSM are noted—the concentration on highly populated places, the gap between rich and poor places, and the difference between rural and urban areas. So in their resistance to the state's "landscape of power," the exercising of aesthetic judgment over the selection and portrayal of features in order to present a particular landscape is nevertheless evident in counter-mapping. It would seem that the desire to present an aesthetically conditioned view—with its inherent process of selectivity—there-

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Ironically, perhaps, Harley's (1991, 13) warning is no less relevant to the makers of these maps: "we may create a design masterpiece but it will merely be a projection of an unethical landscape in whose making we have no part and for whose social consequences we have abrogated responsibility." So, just as there is no one map for one area (Peil 2006), it would appear that topographic maps produced by the state are no less "authentic" as cartographic expressions of landscape than those produced by a local community or the crowd as volunteered geographical information: all are socially constructed mapping initiatives which exercise their selectivity from political and aesthetic values. The major differences in their cartographic representations arise from how they construct meaning for, and embody relevance to, the users that they are intended to serve.

According to Crouch and Matless (1996, 251), in the empowerment offered by the Parish Maps Project, "Conservative aesthetic technique may constrain the social content and complexity of a map, fixing the locality rather than letting place flow." If national mapping organizations aim to design and produce maps with the greatest possible relevance to society, it might appear that the *genius loci* is an elusive, but nevertheless important, element to consider:

> ***"Our sense of a place is in many ways more important than objective fact. The impressions we carry of the house we grew up in and the places where we played as children are more important to us than any mathematical measurements of them." (Turchi 2004, 29)***

The abstraction of features in state topographic maps allows them to operate as "open texts," inviting imaginative interpretation. According to Brady (1998, 143), "imagination provides a more intimate aesthetic experience, and thus allows us to explore aesthetic qualities more deeply than through perception alone." As they define the landscape in a highly subjective way, Parish Maps are perhaps almost "closed texts," not least because they provide pictorial representations of specific locations and features, but also because they are deliberately embedded with meanings that essentially have relevance to a smaller, and therefore more exclusive community. State topographic maps, especially perhaps at the scale of 1:50,000, present landscapes with enough mimesis to denote a basic, recognizable character of place, but, crucially, enough abstraction to connote personal experience, allowing an intimate, imaginative interpretation. A user's familiarity with the language of 1:50,000 state cartography and the particular style—or dialect—of symbology enables this to be performed more effectively (Kent and Vujakovic 2011).

A problem faced by the creators of web map services and topographic map series alike is the creation of a symbology and style that is versatile enough to portray a diversity of landscapes that meets the expectations of users. However, few topographic map series extend far beyond state borders and reach across the globe. Topographic mapping projects which have sought to achieve this, such as the International Map of the World at 1:1,000,000, proposed by Albrecht Penck in

1892, have often been unsuccessful. Those which have prevailed have tended to adhere to a special purpose or serve a limited user group, and are usually at the small scale (e.g., world aeronautical charts, or military mapping programs such as that of the former Soviet Union and NATO standardization agreements). Hence, a detailed portrayal of landscape is avoided, as can also be seen in the current initiative for supranational mapping in Europe:

> *"EuroRegionalMap (ERM) is a pan-European multifunctional topographic reference dataset at scale 1:250,000 based on national contributions from EuroGeographics member organizations. In one of its regional production groups data providers of eight Central European countries faced the challenges of harmonizing their national medium-scale databases in matters of content, geometry and quality standards." (Pammer et al. 2010, 20)*

Most web map services, such as Google Maps, base their portrayal of landscape on a minimalist aesthetic that includes enough topographic detail to allow users to identify locations and perform route-finding queries (and to use as a base for their own data), even if they do not adequately communicate a sense of place (Spence, quoted in BBC 2008). OpenStreetMap offers more detailed representations and the potential to (at least) provide regional symbologies that more strongly evoke this sense of place. However, experimentation with different styles of cartographic representation, such as those provided by Stamen Design for OSM, allows users to experience cartographic representations that draw on an altogether different aesthetic, such as watercolor painting (Figure 6). Hence, counter-mapping has led to a re-engagement with the expressive power of cartography.

Exploring the expressive power of state cartographic styles has also become an emerging theme in map art. The work of British artist Layla Curtis, for example, challenges these naturalized views of the national landscape through collages of topographic maps from around the world in arrangements that retain a recognizable geospatial framework (Figure 7). These have a destabilizing effect on the familiarity of representation that users have come to expect of a state topographic map through its particular appearance, construction of meaning, and homogenization of landscape. Curtis' collages also serve to illustrate that without their capacity to communicate using a familiar style, state topographic maps lose their power to convey the nationalized sense of place. The application of colors from famous paintings to state topographic maps (Christophe 2009) challenges their established aesthetic tradition more directly. Here, the underlying geospatial framework is retained, allowing a fuller experimentation with style and hence aesthetic effect.

These recent experimentations with the representation of place have tended to focus on challenging the established aesthetic of topographic mapping and mark an important step in the development of cartographic treatment of landscape. Moreover, we are perhaps also witnessing a return of the cartographer's role to incorporate that of the "pictorial artist." It is important to remember, however, that such visualizations offer no more functionality than their source (indeed, some offer less, such as the omission of lettering in the watercolor OSM map). Ulti-

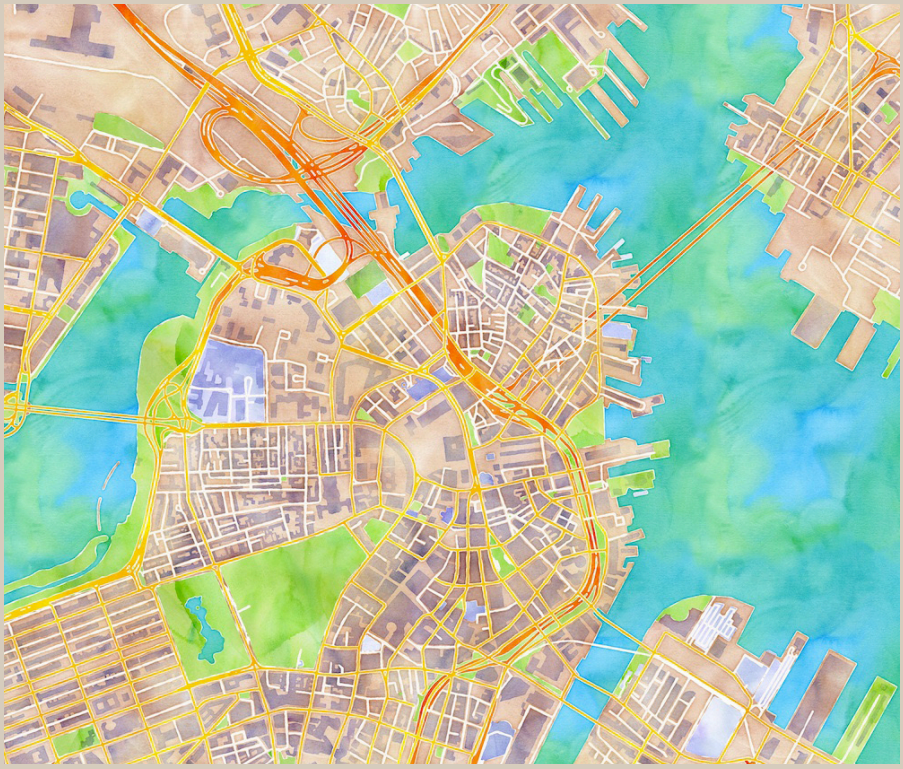

Figure 6: The "Watercolor" map (style) by Stamen Design that can be applied to OpenStreetMap data for any worldwide location (in this case, Boston, Massachusetts), that was inspired by watercolor paintings based on Google Maps as part of the Bicycle Portraits project (Stamen Design 2012; Engelbrecht & Grobler, 2013).

Figure 7: Extract from NewcastleGateshead (2005) by Layla Curtis. Collaged road and topographical maps in two parts, each 50 cm x 70 cm. Image reproduced courtesy of the artist.

mately, maps are tools, and although these developments have stressed the form over function in their design, the progression and application of this tenet to topographic mapping (and cartography in general) can have consequences. Cartography is not alone as a discipline that involves art, science, and technology and seeks to meet functional and aesthetic demands and expectations from its users. Architecture is often quoted as a field whose constraints to some extent are analogous with those of cartography (Hurni and Sell 2009). A building may be designed to meet some aesthetic ends but fail to function properly (or worse, it may collapse), or it may be designed to function well but its form may inhibit its use. The consequent neglect of the needs of the user (especially when coupled with an ignorance of the effects of climate or weathering) has meant that few examples of Brutalist architecture have earned the respect of preservationists. As Graham (1997, 143) points out, "In short people are not cars, and aesthetic form can no more determine function exhaustively than function can determine form." At its finest, architecture unifies form and function, providing the example of the Gothic cathedrals of Europe:

> ***"It has been pointed out many times that everything about a Gothic cathedral, but especially the spire, draws our attention upward, just as the minds and souls of those who worship in it should also be drawn upward. The gigantic nave of the cathedral at Rheims must fill those who stand in it with a sense of how small and fragile they themselves are. The important point is that this is an attitude***

singularly appropriate for those entering the presence of God." *(Graham 1997, 145)*

It is for this sort of intimate relation between form and function that those involved in cartographic design should strive; each symbol on the map must meet its user's need effectively and express the object or idea it is intended to symbolize. Mapmakers who treat aesthetics as no more than a way of injecting appeal or charm will create maps that are simply just "pretty," lacking the depth that befits maps of greater aesthetic value that can be achieved through innovation or multi-layered effective functionality.

Perhaps the most effective maps, therefore, are those which succeed in utilizing the aesthetic language of cartography to express their subject in such a way as to create in the mind of the user an attitude appropriate for engaging with its subject. The aesthetics of cartography need not construct a positive emotion or pleasing effect. Visitors to the Sachsenhausen Memorial and Museum, the former concentration camp near Berlin where an estimated 30,000 prisoners died during World War II (plus several thousand later under Soviet administration), are offered a map of the site. The minimal and suggestive use of color (grays, white, blood red), lack of natural detail (despite the large scale), and clinical typeface, together construct an aesthetic that communicates a bleak, soulless landscape (Figure 8). The map successfully utilizes the aesthetic language of cartography both to communicate the sense of place while also suggesting an attitude appropriate for contemplation during the visit.

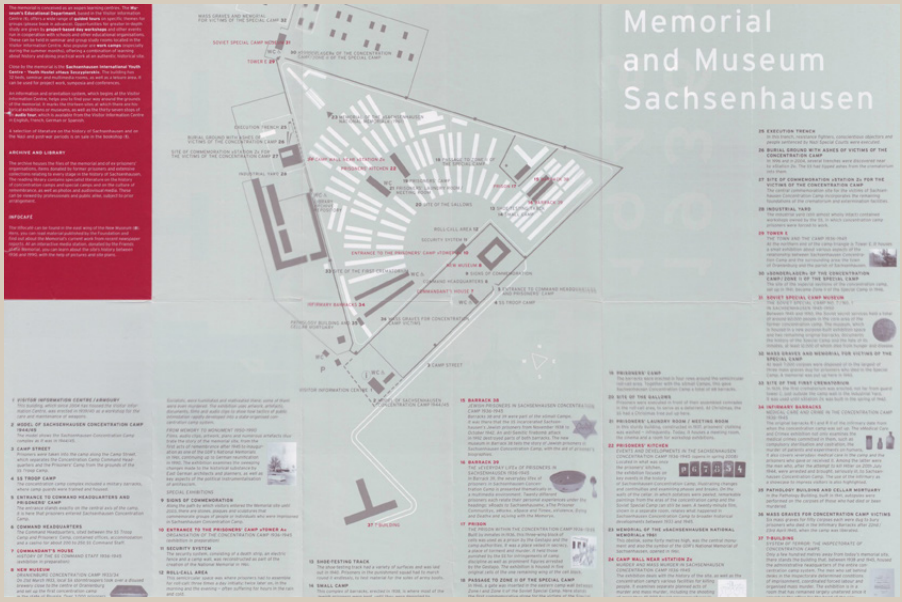

Figure 8: Sachsenhausen Visitor Map (2008) designed by L2M3 Kommunikationsdesign GmbH, Stuttgart. Reproduced with permission from Sachsenhausen Memorial and Museum/Brandenburg Memorials Foundation.

CONCLUSIONS AND AVENUES FOR FUTURE RESEARCH

"We must be sensitive enough to our surroundings to preserve their beauty, and mould it, if at all, into something as fine as its natural fineness. […] *with maps we can devise plans—indeed, our maps are our plans—for remoulding the land after our desire." (Walker W. Jervis 1938, 149–150)*

The effective mapping of place depends upon the measurement and representation of phenomena using a combination of scientific and artistic methods. The scientific tradition, since at least the Enlightenment, has led to the cartographic portrayal of landscape through the development of a particular aesthetic which became more standardized during the early 20th century. The democratization of mapping and broadening of the cartographic canon during the last decade, especially through neocartography and map art, has inspired a growing community of user-cartographers to wield the expressive power of maps, while cultivating a greater appetite for appreciating their artistic (as opposed to scientific) value. Technical and societal change has seen the aesthetic tradition of state topographic mapping challenged and has led to experimentation with the representation of place, yet the aesthetic language of cartography still tends to be used to ennoble the landscape or lend a sense of beauty to the character of its subject.

Cartography utilizes a graphical language that allows a wide range of aesthetic possibilities and the application of this language to fully express the characteristics of place is long overdue. If one of the main goals of a (topographic) map is to communicate geographical reality, this should not be restricted to evoking positive emotional experience. While the sensory maps of Christian Nold (2009) and Kate McLean (2012) embrace this gamut through recording emotions and smells respectively, the visualization of place is inherently biased towards the beautiful. If another goal is to effect change through transforming attitudes or feelings towards a subject (for example to combat urban decay or to assist a vulnerable population), there is much scope to wield a breadth of aesthetics through cartographic language.

It is perhaps, at last, time for cartography to move beyond the emotional security of the Enlightenment. Technological advances can no longer assume a definitive role in determining the character and direction of the discipline. Indeed, "Understanding how technology works is important, but the partnership between art and science, and their contributions to the discipline, are more important" (Cartwright 2000, 11). Not surprisingly, more research into how cartographic aesthetics influences users is needed. Instead of focussing on the individual elements of cartography, there is huge scope to investigate what characterizes the aesthetic response to maps and how different aesthetics affect map interpretation. Furthermore, user studies should embrace the wider functions of map design to explore emotional associations and with this the communication of a sense of place and its effective recall. It is hoped, then, that a more informed understanding of cartographic aesthetics will help us to map, portray, and visualize our landscapes with more authenticity.

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REFERENCES

Adams, A. 1983. *Examples: The Making of 40 Photographs.* Boston: Little, Brown and Company.

Alpers, S. 1987. "The Mapping Impulse in Dutch Art." *Art and Cartography,* edited by D. Woodward. Chicago: University of Chicago Press.

BBC. 2008. "Online Maps 'Wiping Out History,'" Accessed July 29, 2013. **http://news.bbc.co.uk/2/hi/uk_news/7586789.stm**.

Bloch, P. H. 1995. "Seeking the Ideal Form: Product Design and Consumer Response." *Journal of Marketing.* 59 (3): 16–29.

Board, C. 1981. "Cartographic Communication." *Cartographica.* 18 (2): 42–78.

Brady, E. 1998. "Imagination and the Aesthetic Appreciation of Nature." *The Journal of Aesthetics and Art Criticism.* 56 (2): 139–147.

Cartwright, W. 2000. "Future Cartographies: Where to Now?" *The Bulletin of the Society of Cartographers.* 35 (1): 1–12.

Cartwright, W., G. Gartner, and A. Lehn, eds. 2009. *Cartography and Art (Lecture Notes in Geoinformation and Cartography).* Berlin: Springer.

Christophe, S. 2009. "Making Legends by Means of Painters' Palettes." *Cartography and Art (Lecture Notes in Geoinformation and Cartography),* edited by W. Cartwright, G. Gartner, and A. Lehn, 81–92. Berlin: Springer.

Clark, K. 1949. *Landscape into Art.* London: John Murray.

Clark, K. 1976. *Landscape into Art, 2nd Edition.* New York: Harper & Row.

Cosgrove, D. E. 2005. "Maps, Mapping, Modernity: Art and Cartography in the Twentieth Century." *Imago Mundi.* 57 (1): 35–54.

Crawford, D. W. 2005. "Kant." *The Routledge Companion to Aesthetics, 2nd Edition,* edited by B. Gaut,and D. M. Lopes. London: Routledge.

Crouch, D. and D. Matless. 1996. "Refiguring Geography: Parish Maps of Common Ground." *Transactions of the Institute of British Geographers (New Series).* 21: 236–255.

de la Mare, A. 2011. "A Picture of the Land: An Aesthetic Appreciation of the Depiction of Relief on OS Small Scale Maps." *Sheetlines.* 70: 29–35.

Dobson, M. W. 1985. "The Future of Perceptual Cartography." *Cartographica.* 22 (2): 27–43.

Eaton, M. M. 2008. "The Beauty that Requires Health." *Nature, Aesthetics and Environmentalism: From Beauty to Duty,* edited by A. Carlson and S. Lintott, 339–362. New York: Columbia University Press.

Eckert, M. 1908. "On the Nature of Maps and Map Logic." Translated by W. Joerg. *Bulletin of the American Geographical Society.* 40 (6): 344–351.

Engelbrecht, S. and N. Grobler. 2013. *Bicycle Portraits.* Accessed July 29, 2013. **http://www.bicycleportraits.co.za**.

Fabrikant, S. I., S. Christophe, G. Papastefanou, and S. Maggi. 2012. "Emotional response to map design aesthetics." Paper presented at the *7th International Conference on Geographical Information Science,* Columbus, Ohio, 18–21 September 2012. **http://www.giscience.org/proceedings/proceedings-ext-name.html**.

Fisk, H. N. 1944. *Geological Investigation of the Alluvial Valley of the Lower Mississippi River (Report for the Mississippi River Commission).* Viksburg, Mississippi: US Department of the Army.

Goodenough, W., M. MacLeod, G. T. McCaw, A. R. Hinks, and H. S. L. Winterbotham. 1933. "The Use of the New Grid on Ordnance Survey Maps: Discussion." *The Geographical Journal.* 82 (1): 47–54.

Graham, G. 1997. *Philosophy of the Arts: An Introduction to Aesthetics.* London: Routledge.

Hacklay, M. 2012. "'Nobody Wants to do Council Estates'—Digital Divide, Spatial Justice and Outliers." Paper presented at the *57th Annual Meeting of the Association of American Geographers,* New York, 24–28 February 2012.

Harley, J. B. 1991. "Can There Be a Cartographic Ethics?" *Cartographic Perspectives.* 10: 9–16.

Herb, G. H. 1996. *Under the Map of Germany: Nationalism and Propaganda 1918–1945.* London: Routledge.

Hodgkiss, A. G. 1981. *Understanding Maps: A Systematic History of their Use and Development.* Folkestone: Wm Dawson & Son.

Huffman, D. 2013. "Is Cartography Dead?" Accessed July 29, 2013. **http://blog.visual.ly/is-cartography-dead/**.

Hurni, L. and G. Sell. 2009. "Cartography and Architecture: Interplay between Reality and Fiction." *The Cartographic Journal.* 46 (4): 323–332.

Imhof, E. 1982. *Cartographic Relief Presentation.* Translated by H. J. Steward. Berlin: Walter de Gruyter.

International Cartographic Association (ICA). 2013. "Commissions." Accessed July 29, 2013. **http://icaci.org/commissions/**.

Jervis, W. W. 1938. *The World in Maps: A Study in Map Evolution, 2nd Edition.* London: George Philip.

Jones, D. W. 1995. *Beethoven: Pastoral Symphony.* Cambridge: Cambridge University Press.

Kant, I. 2007. *Critique of Judgement.* Translated by J. C. Meredith. Oxford: Oxford University Press.

Karssen, A. J. 1980. "The Artistic Elements in Map Design." *The Cartographic Journal.* 17 (2): 124–127.

Keates, J. S. 1984. "The Cartographic Art." *Cartographica.* 21 (1): 37–43.

Keates, J. S. 1996. *Understanding Maps, 2nd Edition.* Harlow: Longman.

Kent, A. J. 2005. "Aesthetics: A Lost Cause in Cartographic Theory?" *The Cartographic Journal.* 42 (2): 182–188.

Kent, A. J. 2013. "Understanding Aesthetics: The Cartographer's Response." *The Bulletin of the Society of Cartographers.* 46 (1–2): 31–43.

Kent, A. J. and P. Vujakovic. 2009. "Stylistic Diversity in European State 1:50 000 Topographic Maps." *The Cartographic Journal.* 46 (3): 179–213.

Kent, A. J. and P. Vujakovic. 2011. "Cartographic Language: Towards a New Paradigm for Understanding Stylistic Diversity in Topographic Maps." *The Cartographic Journal.* 48 (1): 21–40.

Knowles, R. and P. W. E. Stowe. 1982. *Western Europe in Maps: Topographical Map Studies.* Harlow: Longman.

Lilley, R. J. 2007. "Who Needs Cartographers?" *The Cartographic Journal.* 44 (3): 202–208.

McLean, K. 2012. "Sensory Maps (Cities)." Accessed July 29, 2013. **http://www.sensorymaps.com/maps_cities/newport_smell.html**.

Monmonier, M. 1982. "Cartography, Geographic Information, and Public Policy." *Journal of Geography in Higher Education.* 6 (2): 99–107.

Moles, A. 1968. *Information and Esthetic Perception.* Translated by J. E. Cohen. Urbana: University of Illinois Press.

Nold, C., ed. 2009. "Emotional Cartography: Technologies of the Self," Accessed July 29, 2013. **http://www.emotionalcartography.net**.

Pavlenko, A. 2007. "Open Source Renders the World." *The Bulletin of the Society of Cartographers.* 41 (1–2): 13–16.

Pammer, A., A. Hopfstock, A. Ipša, J. Váňová, I. Vilus, and N. Delattre. 2010. "EuroRegionalMap—How to Succeed in Overcoming National Borders." *Cartography in Central and Eastern Europe (Lecture Notes in Geoinformation and Cartography),* edited by G. Gartner and F. Ortag, 19–40. Berlin: Springer.

Pearsall, J. ed. 2001. *The Concise Oxford Dictionary, 10th Edition.* Oxford: Oxford University Press.

Peil, T. 2006. "'Maps of Meaning': Landscapes on the Map and in the Mind—Discovering Paldiski, Estonia." *Norsk Geografisk Tidsskrift.* 60: 110–122.

Petchenik, B. B. 1974. "A Verbal Approach to Characterizing the Look of Maps." *The American Cartographer.* 1 (1): 63–71.

Purdon, W. H. 1859. "On the Trigonometrical Survey and Physical Configuration of the Valley of Kashmir." *The Geographical Journal.* 4 (1): 31–33.

Rees, R. 1980. "Historical Links between Cartography and Art." *Geographical Review.* 70 (1): 61–78.

Raposo, P. and C. Brewer. 2011. "Comparison of Topographic Map Designs for Overlay on Orthoimage Backgrounds." Paper presented at the *25th International Cartographic Conference*, Paris, 3–8 July 2011.

Robinson, A. H. 1952. *The Look of Maps: An Examination of Cartographic Design.* Madison: University of Wisconsin Press.

Robinson, A. H. 1965. "The Future of the International Map." *The Cartographic Journal.* 2 (1): 23–26.

Robinson, A. H. 1989. "Cartography as an Art." *In Cartography Past, Present, and Future*, edited by D. Rhind and D. R. F. Taylor. London: Elsevier.

Royal College of Art. 2013. "Vehicle Design." Accessed July 29, 2013. **http://www.rca.ac.uk/Default.aspx?ContentID=160475**.

Stamen Design. 2012. "maps.stamen.com is live." Accessed July 29, 2013. **http://content.stamen.com/maps_dot_stamen_dot_com_is_live**.

Turchi, P. 2004. *Maps of the Imagination: The Writer as Cartographer.* San Antonio, Texas: Trinity University Press.

University of Brighton. 2013. "Product Design." Accessed July 29, 2013. **http://www.brighton.ac.uk/cem/prospective/epd/product.php**.

University of Edinburgh. 2013. "Degree Programme Specification 2013/14." Accessed July 29, 2013. **http://www.ed.ac.uk/studying/undergraduate/dps-2013-2014?cw_xml=utarch.htm**.

University of Warwick. 2013. "Engineering—Module Information." Accessed July 29, 2013. **http://www2.warwick.ac.uk/fac/sci/eng/eso/modules/year1/**.

West Sussex County Council, 2013. "West Sussex Millennium Parish Maps Project." Accessed July 29, 2013. **http://www.westsussex.gov.uk/leisure/explore_west_sussex/record_office_and_archives/current_projects/west_sussex_millennium_parish.aspx**.

Williams, R. 1983. *Keywords, 2nd Edition.* London: Fontana.

Winterbotham, H. S. L. 1932. "The Small-Scale Maps of the Ordnance Survey." *The Geographical Journal.* 79 (1): 17–24.

Withycombe, J. G. 1925. "Recent Productions of the Ordnance Survey." *The Geographical Journal.* 66 (6): 533–539.

Wood, D. 2006. "Map Art." *Cartographic Perspectives.* 53: 5–14.

Wood, M. and K. J. Gilhooly. 1996. "The Practitioner's View? A Pilot Study into Empirical Knowledge About Cartographic Design." *In Cartographic Design: Theoretical and Practical Perspectives,* edited by C. H. Wood and C. P. Keller, 67–96. Chichester: John Wiley & Sons.

Woodruff, A. 2012. "The Aesthetician and the Cartographer." Accessed July 29, 2013. **http://www.axismaps.com/blog/2012/10/the-aesthetician-and-the-cartographer/**.

Woodward, D. 1982. "Map Design and the National Consciousness: Typography and the Look of Topographic Maps." *Technical Papers of the American Congress on Surveying and Mapping.* 42: 339–347.

Wright, J. K. 1942. "Map Makers are Human: Comments on the Subjective in Maps." *Geographical Review.* 32: 527–544.