Interpreting Map Art with a Perspective Learned from J.M. Blaut

Dalia Varanka
U.S. Geological Survey
dvaranka@usgs.gov

Map art has been mentioned only briefly in geographic or cartographic literature, and has been analyzed almost entirely at the interpretive level. This paper attempts to define and evaluate the cartographic value of contemporary map-like art by placing the body of work as a whole in the theoretical concepts proposed by J.M. Blaut and his colleagues about mapping as a cognitive and cultural universal. This paper discusses how map art resembles mapping characteristics similar to those observed empirically in very young children as described in the publications of Blaut and others. The theory proposes that these early mapping skills are later structured and refined by their social context and practice. Diverse cultural contexts account for the varieties, types, and degrees of mapping behavior documented with time and geographic place. The dynamics of early mapping are compared to mapping techniques employed by artists. The discipline of fine art serves as the context surrounding map artists and their work. My visual analysis, research about the art and the artists, and interviews with artists and curators form the basis of my interpretation of these works within varied and multiple contexts of late 20th century map art.

Keywords: Blaut, cognition, cultural universal, spatial development, mapping behavior

INTRODUCTION

Art that takes maps or mapping as its subject matter has found a place in the cartographic literature since at least the 1980s. Yet, literature on map art remains scarce. The cartographic significance of map art has been trivialized, and the subject lacks a developed theoretical base. This may be because prevailing cartographic dogma holds that, because of its subjectivity and individuality, art has only peripheral relevance to cartography. A passage in Robinson's influential *The Look of Maps* (Robinson, 1952) exemplified this attitude when it "implied that artistic thinking is often the cause of design failure" (Montello, 2002). Although the question about the degree to which cartography is art or science has been more or less resolved (Krygier, 1995), map art remains marginalized. In the few instances where map art is taken seriously, its understanding remains stuck at the interpretive level. My assertion in this essay is that map art is rooted in universal human map-modeling behavior, but it is motivated by different values than what motivate conventional map-making.

Art and Design

Most of the professional literature about map art takes a post-modern approach. The viewpoint is that art uses social and semiotic strategies to deconstruct modern map concepts in an effort to restore values excluded from modern cartography. This is done to especially highlight the ethics of mapping and its historical contexts. Curnow (1999) interprets map art as challenging the claims of cartographic objectivity, and as questioning the hegemony of the visual that is implicit in the inscribed map. Silberman (1999) looks at map art from a post-colonial perspective: maps reflect the governing assumptions of the cultures that made them. For example, Silberman (1999) interprets the painting of Miguel Angel Ríos, *Magellanes en la confusión emcontró un océano, #3* (1994), as destabilizing the Cartesian geometric order of the European explorers. Oliver (2003) takes a similar position: "Artists use maps to bring into the work an area from outside the work—to claim an area within a piece of work in order to comment on it. In the same way that maps have been used to claim physical space, maps are used in art to lay psychological claims to concepts."

Such post-modern interpretations are often powerful, especially where critical theory addresses the political uses of cartography, but these interpretations do not always work for map art. To an extent the problem

Initial submission, September 9, 2005; revised submission, January 5, 2006; final acceptance, February 7, 2006

lies in the difference between art and design. As is true of critical cartography (Wood, 1992; Pickles, 2000; Harley, 2001; Crampton, 2002), postmodern criticism of map art works because the maps are (at least partially) the product of design, not art (Wood and Keller, 1996). The history of art is convoluted but it is emphatically distinct from the history of design. During the Renaissance and Enlightenment, painters exploited keen perceptions of the world around them to realistically reproduce the appearance of things (Gombrich *et al.,* 1972; Arnheim, 1974). Early modern artists developed their skills in progressive studies of volume, space, and color, and their representations attempted to capture feelings and other emotional qualities. Though the increasingly abstract art of the later-nineteenth and twentieth centuries abandoned mimesis to focus on less representational content—and more recent art is even more broadly decoupled from representational skill—there are few criteria for evaluating its utilitarian qualities.

In contrast, visual design is utilitarian first and foremost. It exploits elements of visual language, the sign and symbol systems whose meanings are broadly shared by members of a society, to compose cohesive messages (Kress and van Leeuwen, 1996). Of course, visual design shares with painting, as with every authored "text," a profoundly rhetorical dimension. That is, art and design both intend to persuade. As products of cartographic design, then, maps communicate a message that is coded as utilitarian but which is also ideological, and both of these dimensions are present in art that takes maps or mapping as its subject.

Map art expresses perceptual, aesthetic, and attitudinal qualities about places through mapping and other visual language systems. Universal map-modeling skills are what bring the map to map-art, and are what provide its cartographic foundations. Map artists make maps that intuitively draw on cognitive way-finding and orientation skills. Rather than detract from cartography, the qualities of map art augment and enrich cartography. Because it is art, aesthetics is a high-priority, but like conventional cartography, art maps are also representations of places in the world.

Mapping as a Cognitive and Cultural Universal

The ideas in this paper about mapping as a cognitive and cultural universal draw on theories advanced by James M. Blaut and others. Blaut sometimes referred to his central idea as "natural mapping" (Blaut, 1991), but also called it "map-like modeling behavior" (Blaut et al., 2003). In experiments from the 1960s through the 1990s, Blaut and various colleagues asked children in numerous cross-cultural settings to perform a number of spatial tasks. These tasks included identifying features on an air photo and drawing routes between these features, creating representative landscapes of real places by using toys, and using simple maps to find things hidden in the immediate surroundings. It was observed that distances and directions roughly corresponded to the real world, as was characterized by the representations created by the children. Many three-year-olds and most four-year-olds could demonstrate geographic behaviors including orientation and way-finding. The conclusion was that children develop and exhibit map-making abilities at a very early age.

Blaut argued that these experiments proved that map-like model making was like language, and that it did not depend on formalized cartographic, geometric, or other learning. Though the ways that specific skills were expressed varied from culture to culture, some sort of map modeling behavior was an innate human ability. Blaut argued that the universal nature of mapping was to be expected if you took an ecological approach to human cognitive and behavioral development. He asserted that mapping serves a universal need for humans to move through and function in the world, and to communicate with others about it by making visible, from a single vantage point, what is otherwise too large to see (Blaut, 1987; 1991; Stea *et al.,* 1996; Blades *et al.,* 1998; Blaut *et al.,* 2003).

Spatialization has been postulated as the basis of all cognitive functioning (Jaynes, 1976), but Blaut argued that natural mapping is a specific cognitive development that predates the understanding of systems of visual representation, linguistic rules, the exigencies of dealing with the macro-environment, conventional developments in cartography, and art. Natural mapping begins with imagining large landscapes (acquired through some experience with them), cognitively projecting an overhead viewpoint onto this landscape, and attaching geographical meaning to signs about it. This mapping, the translation of macro "place" to micro "object", is an adaptive behavior. Map-like models are the ecological and probable evolutionary source of cartographic maps (Stea *et al.,* 1996). This paper proposes that map art draws from this same source.

Natural mapping differs from conventional cartography because it proceeds without the need for social conventions in the codification of features. It also has no broadly shared conceptualization of orientation, units of distance, degrees of direction, projections, or of an advanced technology capable of constructing these systems. Nor does natural mapping necessarily involve linguistic interpretation. While representational systems are critically affected by linguistic categories, natural mapping signs often are based on direct perception. Natural mapping is a form of imagination that creates personal images of places, movement, and landmarks that are highly invested with meaning. It draws freely on the unconscious and memories, and

is experimental in forms of depiction. All these are characteristics of map art as well. Unlike conventional cartography that can be reduced to points, lines, and areas within grids and is accompanied by legends, natural mapping creates landscape-type representations without atomizing its features. Without formal categorizations and boundaries, representative systems in natural mapping are highly flexible.

Blaut strictly differentiated two important concepts of space that tend to get confused in the study of environmental behavior (Blaut, 1999). The first refers to a geographical place, delimited in some way, no matter how naively. The second refers to abstract space, such as the space of geometry. A cognitive map of a geographical place is not the same thing as a cognitive model of pure space. Pure space is distilled or abstracted from experience in space and time, exists only in the mind, and plays important roles in mathematics, engineering, and science. The two spaces, geographical and pure space, each have roles in cartography. One appeal of map art may derive from the fact that "the particular opportunities maps provide visual artists—and their special appeal to modern sensibilities—result from their being the ultimate pictorial coincidence of exacting representation and total abstraction" (Storr, 1994, 13).

Cognitive mapping skills can appear in children before extensive environmental perceptual and navigational experience, because these skills can be practiced using creative play as a surrogate (Stea and Blaut, 1973). In toy play, children remain stationary and move their toys around them, controlling the environment, labeling landscape features, building landscapes and communities with gestalt names, and recognizing consistencies in shape carried between scales. Many sensory modalities are being brought to bear: touch, smell, and taste. By manipulating the environment, children experience an enhanced sense of change over time. In short, spatial learning and mapping involve more than spatial perception. They involve movement, various descriptive modes of sensory inputs, and a framework for their integration over time. This too is true of map art. The art is a surrogate for the elements of landscapes and communities, controlled by the artist through manipulations of these elements, a kind of environmental toy-play for adults.

Formal Elements and Analysis in Map Art

Of course, artists map the world the way they see it or the way it strikes them. The world is aesthetic to artists, and map art abstracts reality aesthetically. Artists "see the world through new eyes" much the way children or non-native residents do. In an effort to come to terms with this art as a type, a catalogue of sixty some examples was compiled (see Varanka, 1987). These examples adhered to criteria developed by combing the literature on cartography, art, and design. These criteria included a view of the land from a high angle, signs representing features on the earth, and depictions at comparatively small scales. In some highly abstract cases, titles, for example Calder's *The River: Chicago* (1974), were taken into account [see Figure 1]. This is an arrangement of flat, two-dimensional forms against a white background. Although it is uncertain if Calder intended any use of naturalistic color, the blue band at the lower right hints at a river. The lower black quadrilateral slopes towards the river, crosses it, and narrows to an acute angle, as if in bird's-eye perspective. Is this a map? In this collection it stands at the extreme edge of abstraction.

More commonly, design elements in the art made explicit references to cartographic conventions (such as borders and neatlines), or suggested an implicit equivalency to the representational nature of maps. These elements comprised a hypothetical map-art system that included view, surface plane, borders, scale,

Figure 1. Alexander Calder. The River: Chicago *(1974). Gouache. Museum of Contemporary Art, Chicago. (see page 70 for color version)*

color, orientation, signs, and text; all of these were used to make sense of a given piece of map art. But because Blaut postulated that natural mapping underlies, and thus precedes formal visual systems (Bertin, 1984; Rose, 2001), this analysis also involved a degree of intuitive reading. For instance, some works of art appeared map-like despite the comparative (or total) lack of visual clues to identify them as such simply because of their "expressive content." Public statements about the content and meaning of the art found in letters, exhibits, publications, biographies, art history, interviews with artists and curators, and the reactions of other viewers were also used in this analysis.

Of course, the way elements of map art worked together to create a total impression or message transcended the aesthetic dimension. Artists effectively drew on maps and mapping to reflect on the rising environmental movement, on issues of social equity, and on human relationships generally. Because it depends on universal map-modeling behavior, map art is not confined to any particular movement of twentieth-century art, and indeed is found in movements in conflict with each other.

The Mingling of Subjectivity and Objectivity

Although landscape in perspective has been a primary subject of art for centuries, early modern art embraced geometrical perspectives of the kind used in map projections. Map-like aspects were enhanced by the rotational view around the subject, and the planar organization of space; both characteristics of Cubism (Golding, 1981). The reduction of scale and the use of figurative representation were already established in the art of earlier periods, but representational means were expanded in the early twentieth century to include other types of visual systems as well, such as numbers, letters, and other conventional signs. After Constructivists and other geometrical abstract artists of the early twentieth century appropriated science and mathematics as sources, the approaches and objectives of science were broadly incorporated into art. Already masters of visual perception (displayed in the skills of depicting the recognizable world via visual illusion), artists in modern art movements experimented with more abstract studies of color and motion as well. Futurism, Orphism, and Synchronism are principle examples of this.

Although there are examples of map art to be found in the early part of the twentieth century (see Wood, this issue), the rise of map art as a significant body of work takes place in the 1960s and 1970s. Earlier examples might include Joan Miro's *Object* (Miro, 1936) and Joseph Cornell's boxes of the 1940s. Cornell constructed boxes with maps and small artifacts that seem to the viewer to carry the imagination to some other specific time and place, set against the larger spatial context represented by the map (Cornell, 1969). Cornell's compositions of objects in space transcend scale in symbolic and spiritual ways. The important developments in map art of the 1960s and 1970s can be traced to the influence of Cornell's friend, Marcel Duchamp, whose work, perhaps especially his "found objects," inspired the movements that would launch the map as a source for important art. (Duchamp himself made map art. See Housefield 1992, and Wood in this issue.)

Duchamp had a particularly profound influence on the precedent-setting work of Johns and of Cage. Johns' intentions, and the meaning of his map paintings (*Map*, 1961; *Map*, 1962; *Map*, 1963) are obscure, but Johns is broadly credited by critics with highlighting American icons, especially objects that served as important symbols, such as the outline map of the United States that Johns took as his subject. Johns was particularly sensitive to the constant change in life and to society's attempts to maintain stability and constancy (Yau, 1996). His maps suggested a kind of fluidity in the image of the United States. At one moment the states seem to be recognizable, but then they fragment or dissolve. Cage, a close friend of Johns', also equated art with living, and exploited maps in his musical compositions (Cage, 1978; Cage 1987). Rather than attempting to impose control on his art, Cage allowed it to emerge from a creative interaction with a world that was largely beyond his control. The resulting incorporation of real-life experience in his art, in a systematic and engaged way, was an empirical experiment. Both of these influential artists sought a deep epistemological engagement with art, the world, life, and knowledge, but distanced by a calculated irony about the nature of existence. Rivers was another transitional artist who used maps in his work, most notably about Africa (1962, 1963) (Harrison, 1981).

Drawing on the examples of Duchamp, Johns, Cage, and Rivers, Pop and Minimalist artists of the late 1950s and 1960s set out self-consciously to construct an ontology and epistemology of their work with "cool" sensibilities. These artists forsook associations with the subjective to view things for themselves. The stress now was on the object, not on its human originator. During the later 1960s and the years following, these developments would open the way for the incorporation of maps and mapping in work that reached out toward the environment, especially in what became known as Landscape or Earth Art, but little of this is conceivable without the example of Pop Art.

Pop Art drew for its subject on the objects of mass consumption and disposability characteristic of American material culture. Unlike earlier usages of found objects in collage or assemblage, the visual vocabulary emerging from Pop Art was sometimes indistinguish-

able from that of the mass-produced objects it was based on, especially since much of the art was produced by commercial and other mechanical means. This eliminated the mark of the artist's hand from the depiction of objects. In this way the image was dissociated from the mental or cultural ideal of transcendence traditionally associated with art. The everyday subject matter, the anonymity of the original designers, the mechanical means of production, and the indifference toward the audience's reaction made Pop Art indistinguishable from conventional commercial mapmaking. Although commercial maps are made for people, maps are void of people, as if the places were uninhabited. Pop Art strove for precisely the level of shallow subjectivity achieved by most mapmakers.

Though Pop Art rejected human expression, gesture, or interpretation, criteria of quality remained in the choices of subject matter and in the formal composition. Certain formal elements, including scale, context, and borders were transformed in their appropriation from the American commodities landscape. These transformations are what made the images art, and are where the images' meanings lay (Curnow, 2002). Art maps didn't eliminate the map's "map" qualities, but instead pointed to aspects of these qualities obscured by conventional design and use. For example, by twisting the actual function that road signs play in a city, Robert Indiana's *South Bend* [Figure 2] gave the public a view of the symbolic or cultural meaning of maps. Similarly the cool aesthetic of Warhol's map of missile bases, with its numerous locational symbols of missiles, conveys Cold War militarism in stark, plain, black-and-white line work [Figure 3].

Pop Artists also used maps to reflect on places. For example, Oldenburg explained that his work grew out of his relationship to places and his attempts to reconstruct his experiences. The greatly exaggerated scale of Oldenburg's objects, including his soft sculptures, recalls the roadside advertising of highway travel. Oldenburg was first noticed for his "happenings," but in 1961 he opened an actual store filled with sculptures of everyday objects, including food items, made of plaster. Soon he and his wife were making gigantic versions of these out of vinyl and canvas, and these soon included sculptures of homes, street scenes, and cities. *Soft Manhattan* (Oldenburg, 1966) is a soft sculpture of Manhattan Island Zip Code zones. The introduction of postal Zip Codes in 1963 was an attempt to handle the booming business mail made possible by new computers, but the status associated with the social spaces designated by Zip Codes allowed Oldenburg to create a map of Manhattan unrelated to the intention of the Zip Code designers.

In the spirit of the sixties, there was less focus on judgment in relation to human values, but quality still mattered and was debated in art circles. Disas-

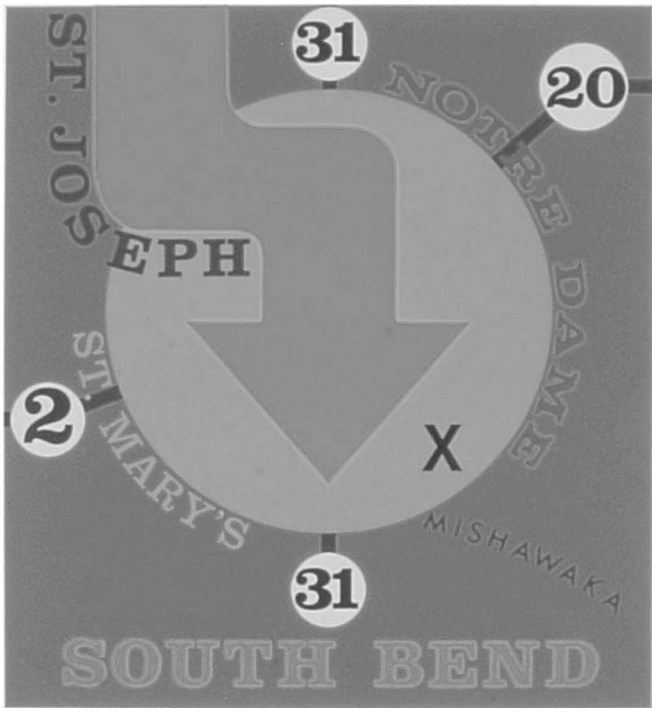

Figure 2. Robert Indiana. South Bend *(1978). Museum of Contemporary Art, Chicago. (see page 71 for color version)*

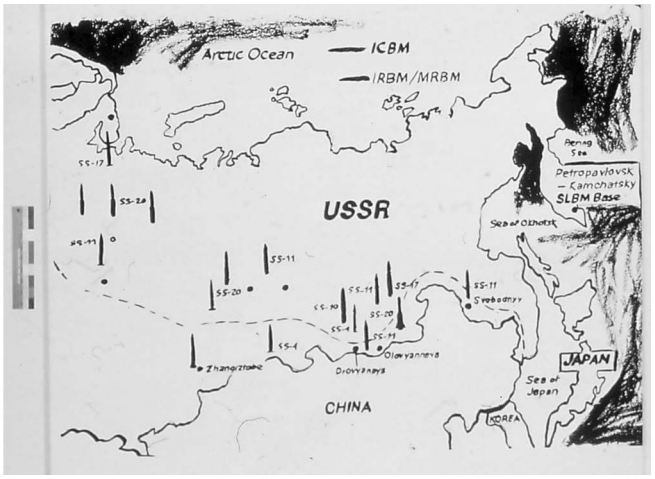

Figure 3. Andy Warhol. Map of Eastern U.S.S.R. Missile Bases *(1986). Andy Warhol Foundation for the Visual Arts, New York. (see page 72 for color version)*

sociated and relative, criteria of quality moved fluidly across the boundaries of style, object, and setting. The attitude spilled over into a broader acceptance of wider forms of art, as long as the art was well done. In contrast to the cool New York school, in California the sensuality and eccentricism of Dada and Surrealism led to Funk Art after 1960. Funk artist Wiley drew on national fantasies about the western frontier. For instance *Thank You Hide* (Wiley, 1972) ambiguously suggests both a naturalized and political United

States [Figure 4]. That map artists made map art in all of these styles is not surprising if they were indeed drawing on map-modeling skills that were universal. Furthermore, the map art of these diverse movements made reference to places but also played with ideas of pure space; this too in keeping with the confusion between the forms described by Blaut.

Later Developments

Social and physical environments were priorities that moved to the forefront of art in the 1970s. Earth Art opened a geographical side to art by turning outward toward the world for the materials to make art, and by using maps and mapping to document and explain that art. The concern of art with environment was paralleled by an analysis of the relationship between art and space inherited from the concerns of Minimalism. Art moved beyond isolated objects, such as paintings on canvas or prints on paper, into the "visual field" of the viewer. The form this work took sometimes resembled the landscapes of traditional figurative art, and sometimes the form of an installation, where instead of viewing it from outside the viewer could step inside the space of the work of art. In some cases, it was the process of creating this art, accomplished in a given place or bounded space, that was the object of attention.

Just before 1970, this art moved outdoors. Earth Art is a term that refers to art made from large displacements of natural materials on the earth's surface. Central themes of Earth Art included attitudes toward the landscape, the play of natural processes, and themes revived from nineteenth century American art, such as the sublimity of nature, and the romance of the West. Because Earth Art was destined to succumb to entropy from natural forces, a central concern of Smithson's work, it would eventually deteriorate and disappear, so the artist in various ways, including maps, documented it. Debate followed (and continues) about whether the earth work itself, the map and other documentation, or both were the actual art objects.

Other Earth Artists were motivated by environmentalism and anti-commercialism. Artists joined the environmental movement, which arose in counterpoint to consumerism and its resulting shallowness of values. This art expressed concern for the land as a personal and public value (Harrison and Harrison, 1985; Romey, 1987; Heartney, 2003) [Figure 5]. Likewise, artists recognized the geographical elements of social problems and the social aspects of geopolitics. Chunn exhibited a series of paintings in the 1980s that speak to the tensions of political oppression in places around the world [Figure 6]. Blaut argued that man-land relationships, such as Earth Art explored, are a form of directly negotiated environmental learning and behavior rooted in his concepts of natural mapping.

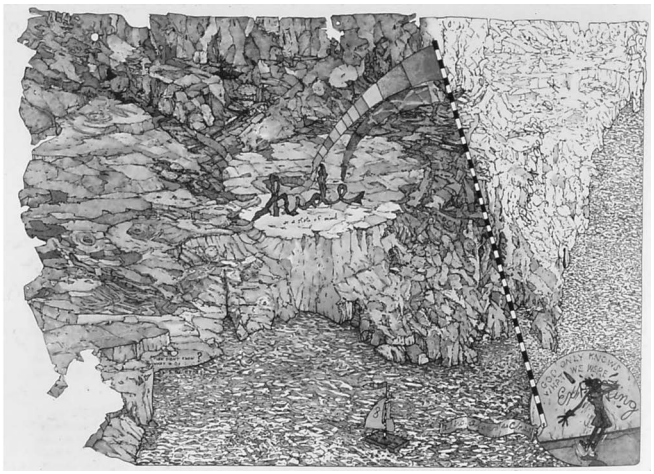

Figure 4. William Wiley. Thank You Hide *(1972). Art Institute of Chicago. (see page 73 for color version)*

Figure 5. Newton Harrison and Helen Mayer Harrison. The Lagoon Cycle *(1973-1985). Ronald Feldman Gallery, New York. (see page 74 for color version)*

Conceptual Art also arose around 1970. Conceptual art elevated the artistic idea to the main focus of attention. Whether an object was ever constructed or executed didn't matter since the art was lodged in the idea. Though conceptual art was non-material, it often used material forms for presentation; but because these weren't essential, the objects didn't need to be aesthetic, though an aesthetic of ideas could be considered as criteria for whether an idea was good or bad. For maps, the space of Conceptual Art was mental imagination. The mental mapping behind the material presence of maps in Conceptual Art was the art. The question to artists was not "can art be a map," but rather "is a map art." Even though a map follows all of the cartographic conventions, though was conceived

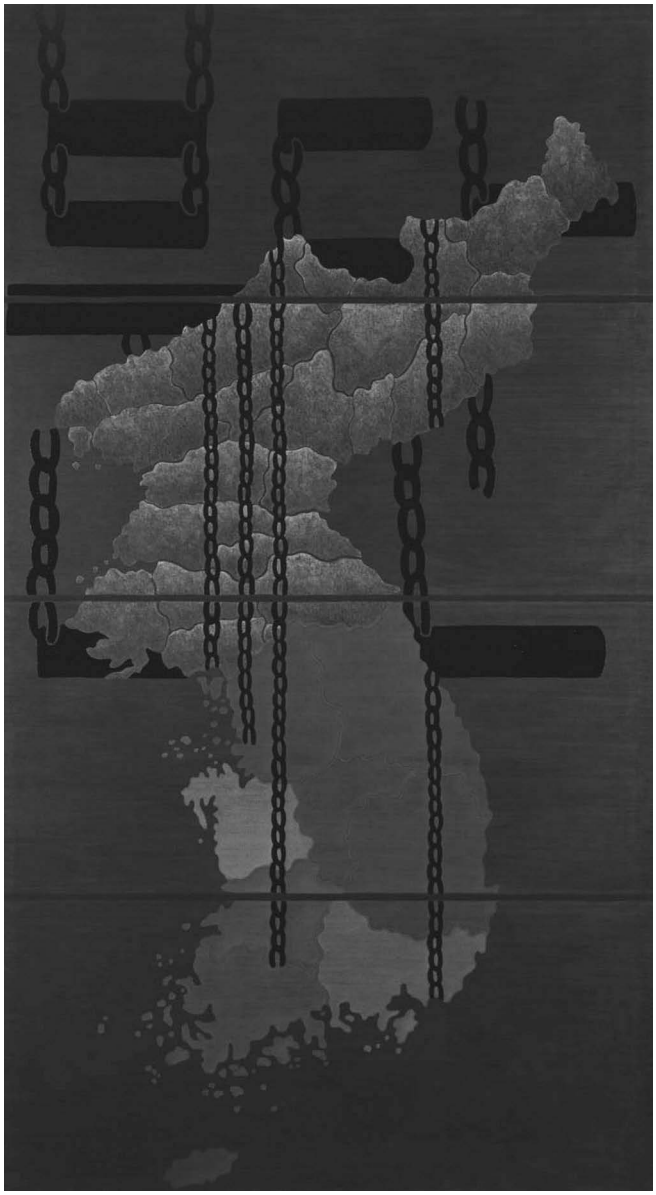

Figure 6. Nancy Chunn. Korea: Divide and Rule *(1988). Ronald Feldman Gallery, New York. (see page 75 for color version)*

by an artist to further the conceptualization of an artwork, is a map art?

After 1980, post-modern impulses in art established critical positions with respect to the broadest movements of the modern period. These impulses expressed themselves in art through an eclectic borrowing of a wide range of styles, often for furthering personal initiatives at the expense of any kind of social cohesion. Jameson (1991) has written that culture is inexorably linked to capitalism, producing an array of cultural signs that are detached from significance, and that are manipulated for commercial purposes, thus lack meaning for people. An example of map art that at least one critic feels falls into this category is that of Schnabel (Hopkins, 2000). Post-modern art also flourished, however, as a reassessment of modernism in the world, particularly in its colonial and capitalist forms. Maps and mapping in post-modern art reflect the shifting relations between the artists, their subjects, and their audiences.

The cartographic literature from the 1960s through the 1980s was not capable of accommodating map art within its terms. Blaut's theory of natural mapping is one way to ground the artistic use of maps, a way that holds potential for explaining the wide range of styles and movements that have made use of maps. When negotiating unfamiliar situations, whatever they may be, people turn to innate cognitive mapping and way-finding skills to orient themselves. Artists are no exception to this general rule, and once they were freed from the bonds of mimesis, they were able to use maps themselves in their work of cultural orientation. Given this explanation, we should expect the use of maps in art to expand as the need for orientation becomes ever more acute.

ACKNOWLEDGEMENTS

My thanks and acknowledgements are extended to Denis Wood and reviewers of this paper for their critical comments, and to David Perdue for preparing the illustrations.

REFERENCES

Arnheim, R., 1974. *Art And Visual Perception: A Psychology of the Creative Eye, The New Version*. Berkeley and Los Angeles: University of California Press.

Bertin, J., 1984. *Semiology of Graphics: Diagrams, Networks, Maps*. Madison, University of Wisconsin Press.

Blades, M., Blaut, J. M., Darvizeh, Z., Elguea, S., Sowden, S., Sonni, J., Spencer, C., Stea, D., Surajpaul, R., Uttal, D., 1998. A cross-cultural study of young children's mapping abilities. *Transactions of the Institute of British Geographers* 23:269-77.

Blaut, J. M., 1987. Notes Toward a Theory of Mapping Behavior. *Children's Environments Quarterly*, 4:4:27-34.

Blaut, J. M., 1991. Natural Mapping. *Transactions of the Institute of British Geographers*, 16:55-74.

Blaut, J. M., 1999. Maps and Spaces. *Professional Geographer*, 51:4:510-515.

Blaut, J. M., Stea, D., Spencer, C., and Blades, M., 2003. Mapping as a Cultural and Cognitive Universal.

Annals of the Association of American Geographers, 93:1:165-8.

Cage, J., 1978. *A Dip in the Lake: Ten Quick Steps, Sixty-two Waltzes, and Fifty-six Marches for Chicago and Vicinity*. Museum of Contemporary Art, Chicago.

Cage, J., 1987. [Handwritten letter to this author]

Calder, A., 1974. The River: Chicago. Gouache. Museum of Contemporary Art, Chicago.

Crampton, J., 2002. Thinking Philosophically in Cartography: Toward A Critical Politics of Mapping. *Cartographic Perspectives*, 41:12-31.

Curnow, W., 1999. Mapping and the Expanded Field of Contemporary Art. In Cosgrove, D. (Ed.) *Mappings*. London, Reaktion Books, 253-68.

Curnow, W., 2002. Andy Warhol: First Capitalist-Realist. *Michigan Quarterly Review,* 9:4:239-45.

Golding, J., 1981. Cubism. In Stangos, N. (Ed.) *Concepts of Modern Art*. New York, Harper & Row.

Gombrich, E., Hochberg, J., Black, M., 1972. *Art, Perception, and Reality*. Baltimore, Johns Hopkins University Press.

Harley, J., 2001. *The New Nature of Maps, Essays in the History of Cartography*. (Laxton, P. (Ed.) with an Introduction by Andrews, H.) Baltimore, The Johns Hopkins University Press, 281-96.

Harrison, H.A., 1981. *Larry Rivers*. Harper and Row, New York.

Harrison, N. and Harrison, H., 1985. *The Lagoon Cycle*. Exhibition Catalogue, Johnson Museum of Art, Cornell University, New York.

Heartney, E., 2003. Mapping a Better World. *Art in America*. October:114-119.

Hopkins, D., 2000. *After Modem Art, 1945-2000, Oxford History of Art series*. Oxford University Press, Oxford England.

Housefield, J., 1992. Marcel Duchamp's art and the geography of modem Paris. *Geographical Review,* 82:478.

Jameson, P., 1991. Postmodernism or, the Cultural Logic of Late Capitalism. Durham: NC, Duke University Press.

Jaynes, J., 1976. *The Origin of Consciousness in the Breakdown of the Bicameral Mind*. Houghton Mifflin Co., Boston.

Johns, J., 1962. Museum of Modern Art.

Kress, G. and van Leeuwen, T., 1996. *Reading Images, the Grammar of Visual Design*. London, Routledge.

Krygier, J. B., 1995. Cartography as an Art and a Science? *Cartographic Journal,* 32:6:3-10.

Montello, D., 2002. Cognitive Map-Design Research in the Twentieth Century: Theoretical and Empirical Approaches. *Cartography and Geographic Information Science*, 29:3:283-304.

Oldenburg, C., 1966. Soft Manhattan#1 (Postal Zone) Albright-Knox Art Gallery.

Oliver, A., 2003. *The Use of Maps in Contemporary Art*. M.A. dissertation, Cardiff School of Art. http://www.annao.pwp.blueyonder.co.uk/texCdissertation.htm

Pickles, J., 2000. Cartography, Digital Transitions, and Questions of History. *Cartographic Perspectives*, 37:4-18.

Rivers, L., 1963. Africa II. Reproduced in Larry Rivers, Artnews Books.

Robinson, A., 1952. *The Look of Maps*. Madison, University of Wisconsin Press.

Romey, W. D., 1987. The Artist as Geographer: Richard Long's Earth Art. *Professional Geographer*, 39:4:450-456.

Rose, G., 2001. *Visual Methodologies, An Introduction to the Interpretation of Visual Materials*. London, Sage Publications.

Silberman, R., 1999. *World views: Maps and Art*. Frederick R. Weisman Art Museum, University of Minnesota. Minneapolis, MN.

Stea, D. and Blaut, J., 1973. Toward a Developmental Theory of Spatial Learning. In Downs, R. and Stea, D. (Eds.) *Image and Environment, Cognitive Mapping and Spatial Behavior*. New Brunswick, New Jersey, Aldine Transaction.

Stea, D., Blaut, J., and Stephens, J., 1996. Mapping as a Cultural Universal. In Portugali, J. (Ed.) *The Construction of Cognitive Maps*. The Netherlands, Kluwer, 345-360.

Storr, R., 1994. *Mapping*. New York, The Museum of Modern Art.

Varanka, D., 1987. *An Analysis of Contemporary Map-like Art*. Unpublished M.A. thesis, University of Illinois at Chicago.

Wiley, W., 1972. Thank You Hide. Art Institute of Chicago.

Wood, C. and Keller, C., (Eds.) 1996. *Cartographic Design, Theoretical and Practical Perspectives*. New York, John Wiley & Sons, Inc.

Wood, D., 1992. *The Power of Maps*. New York, The Guilford Press.

Yau, J., 1996. *The United States of Jasper Johns*. Cambridge, MA, Zoland Books.