CAVEAT MANIPULATOR: (Re)forming

By Tres Fromme

Geographic Information Systems (GIS) have, within the last few years, engaged the interests of academics and professionals in the many fields- cartography, geography, computer science, remote sensing, and statistics among others-at whose intersection GIS emerges. An acknowledged limited survey of the writings and issues indicates that much of the material concentrates on methods, technologies, and applications. The dominant tone of the research and work is positivistic and rareified, as if GIS existed outside of any social situation. Writers enthusiastically concern themselves with data models, (hard/soft)ware issues, and quantifiable results and measures.

GIS technology allows for the dynamic collection, storage, recall, and manipulation of facts and data that are directly linked to geographic phenomena through maps. The synergisitc combination of information and analytical techniques from traditionally segregated disciplines and practices permits a high concentration of knowledge in one locus and in the service of an individual or group. GIS knowledge, moreso, is closely linked to physical space and the description and production of that space; abstract information is readily located in the physical world. As abstract informational landscapes immediately coincide with geological landscapes, the potential for control of various contested terrains emerges. The darker side of GIS' capabilities, however, has rarely been addressed.

Aangenbrug (1991) lists several weaknesses of GIS, one of which seems particularly reflected in the GIS literature. He includes the criticism that writers only present the "feel good" successes of their explorations, rarely mentioning failures and difficulties in respect to developing and implementing GIS. This comment appears to address only to the techno-economic issues surrounding GIS. Where are discussions of the direct or indirect failures or even successes of the GIS in respect to cultural and social issues?

Thomlinson comes close to posing a similar question when he lists problematic institutional and organizational acceptance and implementation of GIS as one of the major difficulties facing the development of the technology (Clarke,1991). Indeed, several other authors stated that "the most common reasons for failure [of GIS] are now organizational weaknesses or political naivety" (Rhind et al., 1991: 9) These organizational problems might very well present a model for GIS integration into the greater milieu of contemporary culture. If GIS generates or uncovers problems of power and social structure at the microlevel of the agency or department, what disturbances will it send rippling through overall social relations?

Even though authors such as Couclelis (1992) have dealt with issues of humans and perception in creating GIS's representational space, and authors like Epstein (1991) have addressed the issues of economic and legal issues, their work still exhibits a scientific bias that treats humans, the law, and the economy as objects of empirical scrutiny and experimentation. In other words, though dealing with cultural issues, their analyses do not focus beyond the realm of traditional "scientific" discourses.

The fields collectively known as "cultural studies" or "social criticism" also seem to have ignored the issues presented by the development of GIS. Perhaps this omission results from the recent emergence of the technology as well a certain discomfort with GIS on the part of the "humanities." Both fields, ironically, aspire to interdisciplinary inclusion and synergy.

This paper attempts to engage certain "postmodern" thinkers to critique GIS in respect to power relations and "metanarratives." Admittedly, the discussion will be brief and cursory but will hopefully provide a cultural critique less positivistic than many of the current GIS debates.

No technological development is "innocent"or autonomous, but instead exists at the intersection of many generative forces. There is a strong social and cultural component not only to technological applications but to the very formations of economic, academic, and political discourses and economies. These discourses call the technology into being and are, in turn, modified by the technology. The potential for a technological development to not only reify but also to replenish the oppressive power from which it emerges must not be ignored.

Throughout his career, Michele Foucault traced the intersections of power, knowledge, society, and the social body (which emerges from the play of power and knowledge). Foucault recognized that certain social phenomena do not generate new technologies and modes of organization but are generated by those technologies. He also observed inextricable connections between power and knowledge (Foucault, 1980). These realizations warned against accepting as absolute and "natural" (and thus unchangeable and unimplicated in power relations) ideas, social relations, and even forms of "human nature." Foucault recognized these as actually (re)produced by cultural discourses and forces.

For example, Foucault's Discipline and Punish traces the construction of the modern soul and the genesis of the modern penitentiary to reform this soul. He links this formation to, among other things, the rise of the Bourgeoisie and its need for certain economic and social freedom from monarchies (Foucault 1979). Social discipline and organization created "the" individual in an attempt to eliminate all "social and psychological irregularities" and to produce "useful and docile subjects through a refashioning of minds and bodies" (Best and Kellner, 1991: 47). The technology of the prison, the organization of space and the individual, sought to control and fashion a population that would eventually regulate itself. This allowed the *status quo* to expend energy elsewhere that would previously have been spent in forcefully repressing its members (Foucault 1980).

Marshal McLuhan also connects the transformation of technologies to radical changes in institutions, modes of thought, and human subjectivity (often a product of the previous two factors) which result in entirely different constructions of "reality" (McLuhan 1967). His suggestion that "societies have always been shaped more by the nature of media...than by the content of the communication" particularly bears on GIS (McLuhan, 1967: 8). The aggregate form of GIS technology-instant and extensive computer manipulated and maps and data- may be "new" but the classes of information involved – records, deeds, property boundaries – are not. The ability of GIS to allow swift and comprehensive collection (satellite surveillance), analysis (overlays), transformation (scale enhancements), and dissemination (electronic transmissions) of geographically linked data places old contents in a potent emergent medium.

McLuhan traces how the development of narrative writing as the description of a newly quantifiable world (based on a linear perspective) altered human consciousness and culture by compartmentalizing reality into discrete and sequential moments. An ordered, "assembly line" regimentation of institutions and social relations followed this twist of consciousness as the medium of communication modified and created the content being transmitted (McLuhan 1967). The Medium is the Message concludes with a manifesto for a "new" world and individual (re)formed by the constant stimulation,

the "message," of twentieth century electronic media. GIS, electronically immediate and transgressing traditional boundaries, embodies one of these media that challenges the old consciousness based on discrete and compartmentalized information.

GIS then, as a socio-political discipline and medium, appears to contain the potential for creating new disciplinary (or institutional) structures and, therefore, human subjects. How might GIS (re)form the individual and her relations to society? One must not presume GIS users, especially within an academic context, to operate outside of strategies of control.

Indeed, GIS bears an uncanny resemblance to Foucault's concept of the "Panopticon." The panopticon, embodied in Jeremy Bentham's eighteenth century prison design, offers a model of centralized surveillance where an organizing core is able to train its gaze on each individual within the system (Foucault 1980). This gaze directs and molds the subject through allowing what can and can not be said or performed. This panoptic system expands to replicate and generalize itself throughout social relations. For example the use of "dossiers, systems of marking and classifying, [and] the integrated accountancy of individual records" (the realm of GIS data!) as well as architecture and planning allows for surveillance and control of the population and its affairs (Foucault, 1981: 71). GIS technology expands the limited site/sight line of the panopticon in its ability to interconnect with spatially and temporally distant electronic systems through information technologies.

The oft-touted abilities of GIS users to analyze, collect, transfer, and quickly synthesize information of both a spatial and qualitative content might very well serve as a panoptic system (or series of integrated systems) for control of social relations. The technology's capabilities for record keeping and locational analysis might facilitate a totalizing system of surveillance and monitoring. Doubtfully could any one organization could use GIS to dominate a plural and culturally fragmented culture (as Jim Collins has suggested in a critique of Foucault in his 1989 Uncommon Cultures). However, multiple and perhaps competing groups might employ the technology on micropolitical levels and scales of influence. What new disciplines might it establish and how?

Philosopher Jean-Francois Lyotard's idea of grand "metanarratives" (Progress, Liberation, etc.) with which Western culture once attempted to generate a homogenous cultural system might suggest a means by which GIS could develop social control. Looking specifically at the metanarrative of Enlightenment-derived, Western, scientific discourse, Lyotard locates the "flaws" that undermine the supposed absolute autonomy of science (Lyotard 1984). His analysis deprivileges and demystifies the authority and power that circulate within the positivistic economies of scientific knowledge production. Once the "halo" is stripped from science, science's epistemological grounding is revealed as, not absolute laws of nature, but rules as arbitrary as those of any other discipline.

GIS users' desire for standardization and universalization does indeed instigate what Rhind et al. (1991) label a "technological imperialism" as a few world powers colonize developing countries with an alien, abstract technology and technological language that forms into a scientific metanarrative or discursive hegemony (and parallels the political and cultural heegemonies of Western culture imposed on developing nations). The need for GIS to locate, catalog, and quantify information on both global and minutely detailed levels seeks to (real)ize everything, to, in Lyotard's words, "supply reality" to an almost neurotic degree. GIS, in this view, could emerge as a force of aggression and violent colonization of almost every social aspect, both spatial and non-spatial. Everything will be revealed and subsumed into the universal databases of the system that imposes a "return of terror" Lyotard associates with metanarratives (Lyotard, 1993: 46).

Though the collapse and deprivileging of the various modernist metanarratives disallows a complete hegemonic domination, multiple totalizing schemes might possibly arise within localized cultural spheres. GIS could easily serve as an agent of a renewed hegemonic impulse. Those who control the development of the systems control the very structure and discourse of those systems. They control what can and cannot be said and thus thought into existence, the discipline of Foucault. Following Foucault, these reimposed metanarratives generate new subjects and subject positions. Any definition of terms could easily serve to privilege the cultural status of the creators while excluding the identities and voices of those marginalized in the development process.

The issue of language and linguistically-influenced concepts in respect to GIS provides a good example of marginalization (Frank and Mark, 1991). As Roland Barthes and others have realized, language is intimately connected to power and the realization of that power in the world (Eco, 1987). Those who currently lead GIS development appear to hail from predominantly western, English-speaking countries: The United Kingdom, the United States of America, Canada. If not a native speaker of English, then an individual's research appears to be largely translated into and shared in English as perhaps a new "Latin," or dominant language of scientific pursuit.

As research and communication develop in a hegemonic language, certain concepts of space and organization in other languages are lost in the translation (Frank and Mark 1991). Indeed, cultures often structure space and the experience of space/time in radically different manners from each other. These concepts then precipitate into the native language and culture (Hall, 1969). Translation can become difficult if not impossible. One not familiar with the dominant language is forced to grasp a new tongue and conceptual world (assuming such is fully possible) or to submit to the dominant discourse of the system, to be colonized and to abandon their own linguistic environment.

If both culture and landscape exist as polyglot matrices of perceptions, discourses, and idiosyncratic responses (as well as hard data) then any attempt to totalize or quantify that landscape in terms of one system or standard has the potential to obliterate the multiplicity of landscapes to some degree. Cultural Geographer D.W. Meinig identifies a modest ten frameworks operating in American culture through which individuals interpret the landscape (Meinig, 1979). The systems of GIS I am familiar with encompass less than half of these. Should GIS technology become the privileged and "valid" means of describing, interpreting, and approaching the landscape through its databases and cartographic perspectives, then much of the landscape will have been lost to the detriment of those invested in the marginalized frameworks.

GIS, unlike previous technologies, might have the power to generate something approaching a landscape metanarrative due to its multidisciplinary and electronically systematic (and almost instantaneous) structuring. If standards and univeral languages for the GIS community crystallize, then any discipline that uses GIS will subsume part of its own discourse within that of GIS, so what is essentially a fragmented and plural matrix of voices and perception

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could become transversed and subordinated to an overarching discipline of GIS. GIS vocabulary further limits a language already limited in its ability to describe the world.

Cultural critics such as Jim Collins who see hegemony and other theories positing a central, controlling, power are correct in identifying "postmodern" North American culture as one incapable of being subsumed by any one group or interest due the sheer multiplicity of identity groups (Collins, 1989). However, might not such a "new" discipline and technique such as GIS throw this assumption into question? GIS technology's ability to collect, analyse, represent, store, and transmit immense amounts of interconected information concentrates in one set of techniques and data an unprecedented amount of knowledge and power.

As various scholars have forwarded, "representations are social facts" that construct the world individuals perceive and within which they dwell (Rabinow, 1986; Milgram, 1984). Those who control the representations or the modes of representation can thus control the "reality" individuals know. GIS with its cartographically-derived concerns over representational strategies might actually limit possible representations of the landscape and thus limit the actual *landscapes* possible for realization. As McLuhan posits:

> *Media, by altering the environment, evoke in [individuals] unique ratios of sense perceptions. The extension of any one sense alters the way we think and act – the way we perceive the world (McLuhan, 1967).*

Might not conservative factions mobilize GIS technology to (re)collect the disparate fragments of culture within a time of radical pluralism where meaning is relative, multiple, and where no great myth unites various identity groups? Through an almost complete and limitless capability to control economies of knowledge/space/representation, GIS might radically change the very nature of the landscape and thus the individual in an environmental context and reinforce modernist notions of a universal culture of Man? Some of these concerns may seem to border on Orwellian paranoia, but GIS technology has, by its own presumptions, almost unlimited possibilities for social restructuring.

Academics have an obligation to explore and trace the lines of influence and force which this technology is generating and will only continue to produce. Beyond the positivistic concerns with data quality, processing times, and other "hard science" issues hovers the human population whom these technologies will radically effect.

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References

Best, Steven and Douglas Kellner (1991) Postmodern Theory: Critical Interrogations. New York: The Guilford Press.

Collins, Jim (1989) Uncommon Cultures: Popular Culture and Post-Modernism. New York: Routledge.

Clarke, A.L. (1991) "GIS Specification, Evaluation, and Implementation," In Geographical Information Systems: Principles and Applications vol.1: Principles, eds. D.J. Maguire, M.F. Goodchild & D.W. Rhinds, 477-488. Essex, England: Longman Scientific and Technical Publications.

Couclelis, Helen (1992) "People Manipulate Objects (but cultivate Fields): Beyond the Raster-Vector Debate in GIS," In International Conference GIS – from Space to Territory: Theories and Methods of Spatio-Temporal Reasoning in Geographic Space, eds. A. Frank, I. Campari & U. Formentini, 64-77. Pisa: Springer-Verlag.

Eco, Umberto (1987) Travels in Hyperreality. London: Pan.

Epstein, E.F. (1991) "Legal Aspects of GIS," In Geographical Information Systems: Principles and Applications, Volume 1: Principles, eds. D.J. Maguire, M.F. Goodchild & D.W. Rhind, 489-502. Essex, England: Longman Scientific and Technical Publications.

Foucault, Michel (1979) Discipline and Punish. New York: Vintage Books.

Foucault, Michel (1980) Power/Knowledge: Selected Interviews and Other Writings 1972-1977. New york: Pantheon Books.

Gutpil, S.C. (1991) "Spatial Data Exchange and Standardization," In Geographical Information Systems: Principles and Applications, Volume 1: Principles, eds. D.J. Maguire, M.F. Goodchild & D.W. Rhind, 515-530. Essex, England: Longman Scientific and Technical Publications.

Hall, Edward T. (1969) The Hidden Dimension. Garden City, New York: Anchor Books.

Lyotard, Jean-Francois (1993) "Answering the Question: What is Postmodernism?" InPostmodernism: A Reader, ed. Thomas Docherty, 38-47. New York: Columbia University Press.

Lyotard, Jean-Francois. (1984) The Postmodern Condition: A Report on Knowledge. Minneapolis, MN.: University of Minnesota Press, 1984.

McLuhan, Marshall and Quentin Fiore (1967) The Medium is the Message. New York: Random House.

Meinig, D.W. (1979) "The Beholding Eye: Ten Versions of the Same Scene." In The Interpretation of Ordinary Landscapes: Geographical Essays, ed. D.W. Meinig, 33-51. New York: Oxford University Press.

Milgram, Stanley (1984) "Cities as Social Representations." In Social Representations, eds. Robert M. Farr & Serge Muscovici, 289-309. London: Cambridge University Press.

Rabinow, Paul (1986) "Representations are Social Facts: Modernity and Postmodernity in

Anthropology." In Writing Culture: The Poetics and Politics of Ethnography, eds. James Clifford & George E. Marcus, 234-262. Berkeley CA: University of California Press.

Rhind, D.W., D.J. Maguire, and M.F. Goodchild (1991) "Introduction." In Geographical Information Systems: Principles and Applications,Volume 2: Applications, eds. D.J. Maguire, M.F. Goodchild, and D.W. Rhind, 515-530. Essex, England: Longman Scientific and Technical Publications, 1991.