The National Information Infrastructure Initiative:

Space, Discipline, War Machine

Christopher E. Couples

Thesis submitted to the Faculty of Virginia Polytechnic Institute and State University in
Partial Fulfillment of the requirements for the degree of

Master of Arts
in
Political Science

Timothy W. Luke, chair
Stephen K. White
Gearoid Ó Tuathail

April 28, 1997
Blacksburg, Virginia

The National Information Infrastructure Initiative:

Space, Discipline, War Machine

Christopher E. Couples

(Abstract)

This thesis concerns itself with the changes wrought by the movement from analog to digital spaces. These changes are mirrored by changes in the way states practice sovereignty. Examples of new practices of sovereignty are found in the documents of the National Information Infrastrucure Advisory Council. Close analysis of these examples reveals the disciplinary projects of spatial (re)construction implied by these new practices. The effects of these types of spatial disciplinarity on individual subjectivities are also discussed.

this is dedicated to the music: of theory and of love,

and to my fellow musicians

Acknowledgments

I would like to take this opportunity to thank first and foremost Cindy Morarend, who willingly put up with endless workweeks, and a phoned-in relationship for the majority of the work which led to this thesis. This thesis not only marks the end of my MA, but the beginning of paybacks for her patience.

I also would like to thank the members of my thesis committee (Tim Luke, Gearoid Ó Tuathail, and Stephen K. White) for their exceeding patience in our collective pursuit of this thesis, and for trusting me enough to finish it outside of the confines of Blacksburg, VA. Tim Luke chaired that committee, but my debt to him is not only one of mentoring, but also one of friendship.

I owe Ilja Luciak far more than I can describe here — Ilja, thanks. Len Hatfield, of the English department at VPI, played a huge role in keeping me motivated (and occasionally sidetracked) during my time as a Master's student. Stephen, as graduate director, had a great deal to do with my being able to do my Master's work at all.

I also want to thank my other colleagues in the Department of Political Science at Virginia Polytechnic Institute and State University: the chair of the department, Richard Rich, gave me the pleasure of an extended appointment as a graduate assistant, allowing me not only to hone my research skills, but also to practice the skills which have kept me employed since my departure from the department; I'd like to thank Doug Borer, Chuck Walcott, John Aughenbaugh, and Steve Twing, who collectively suffered slings (of the basketball court) and swings (of the golf course), thereby providing me much needed vents for the stresses of writing; my graduate colleagues in the department were also splendid company — I'd like to specially thank Bob Walsh (who had to put up with me about 24 hours a day), Phil Atkins (phatkins), Jim Allan, Carolyn Lednum, D.J. Malazzi, and Kerst ter Weele for their support throughout my time in the department. I especially thank Kerst, who had the misfortune of reading the early drafts of the thesis. Glenn Richardson proved a more than able companion to conferences and Bulls games (Six would be great in 98!). More than in most other cases, all errors in this thesis are mine, and mine alone.

<div align="right">

Thank you all,

Chris

</div>

Table of Contents

0

Introduction

The movement from existence in analog spaces to existence in digital spaces demands that disciplinary International Relations reconsider the concepts of space and place which underpin its ideologies, and the notions of sovereignty these concepts engender. This movement is incomplete, and probably will always remain so; 'truly' digital spaces do not yet exist, at least for humans and states[1].

Digital spaces require analog infrastructure for their existence. MUDs, chat spaces, email systems: all these require for their existence the physical existence of computers, and the relays, switches, and cables which interconnect them. Thus, digital spaces (at present) do not exist absent analog ones: the difference is that the analog spaces required for digital spaces, due to the continuous move towards miniaturization in the computer and networking industries, continue to shrink, making the capital goods necessary for the existence of digital spaces much more mobile, and much less subject to the coercive power of the analog state.

The existential movement from analog to digital spaces is a tectonic one; the 'fault lines' between the two are the border spaces of hybrid existences. To the extent that the upper classes in Western society are the avatars of digital being (through their extensive use of digital information infrastructure), they lead a revolution in existence.

The current emphasis of government and corporate entities on moving the activities of the state and of commerce into digital spaces, portends an existential earthquake which demands a rethinking of the theories of international relations, and perhaps a refashioning of them into theories of inter-*spatial* relations.

Analog spaces are the spaces of corporeal existence, the spaces of atoms (Negroponte 1995). 'Presence' is determined in analog spaces by the existence of tangible values of the three dimensions of mass, distance, and time. Analog spaces are Cartesian spaces, the spaces of Objects distinguished from, and opposed to, Subjects. This dichotomy provides the space for the construction of the opposition of Self from Other, of Inside from Outside.

The impenetrability of the borders between these spaces comes into increasing

---

[1] Software agents do exist completely (or almost completely) in digital space.

question as these analog spaces become digital. It may be that the digitalization of spaces around which the present analysis centers begins in earnest with the invention of Einstein's theories of relativity[2]. The realization that the mass which gives 'real estate' its 'real' character is transmutable into energy, which serves as the animus of digital spaces, presents the first articulation of a general theory of the digitization of space.

In disciplinary International Relations, the Self/Other and Foreign/Domestic oppositions are re-iterated by the cartographies and geographies used to mark global spaces as 'nations' and 'states' for IR analysts to classify and upon which to operate. A move from analog spaces to digital spaces is of central concern to International Relations scholars, as this move calls into question the understandings of spaces and borders which until now have determined our conceptions of sovereignty.

The understanding of spaces currently dominant within International Relations poses the borders between Self and other, posed as the boundary between domestic and foreign, as immanently meaningful, natural occurrences.

Sovereignties based on analog understandings of space and place must be supplemented as analog existences are digitized. Analog conceptions of sovereignty, which have been emplaced and reinscribed over the course of three hundred years, will not simply wither away; the move from an analog understanding of sovereignty to a digitized understanding of sovereignty will not come only with the click of a mouse. States continue to rely on these understandings for the purposes of maintaining legitimacy and domestic hegemony. The meaning of sovereignty will change, sovereignty will no longer mean the ability to exercise control within terrestrial spaces, but will instead mean the ability to manage digital space.

The alterations of spaces and borders which accompany the digitization of state existence will be absorbed by states only slowly, as governments find that the old mechanisms of enforcement no longer work as expected online. Witness the Communications Decency Act of 1996: child pornography, something of a magic bullet for those who would regulate speech since the Fifties, was not strong enough to convince the Supreme Court of the need to regulate digital communication. Attempts to punish those on whose servers pornographic materials reside (whether the server operators had knowledge of the presence of these materials or not) in a fashion after the punishment of 'adult bookstore owners' trafficking in illicit materials, which ultimately failed court tests

---

[2] As will shortly be seen, the present study begins its discussion of the digitization of space with the early Sixties, instead of the early 1900s, as was just suggested, due to the constraints of the form. A more thorough survey of the 'Digitalization of American Society' would certainly be useful.

for the abridgment of free speech, show the problematic nature of applying analog fixes for problems in digital spaces.

Absent the familiar centers of gravity around which the primacy of the state has been assured and insured, individual states must cobble together enforcement mechanisms from leftover analog material. The United States government finds itself in precisely this position, as the burgeoning growth in the use of online services places unforeseen demands on government[3]. Software pirates, conspiracy theorists, child pornographers and anarchist cryptographers have surely existed offline, but the information superhighway presents a fertile new medium.

Realist International Relations is understood here as an operationalization of analog understandings of spaces and places. Realist IR operates ideologically upon the relations between the two categories of 'space' and 'place', and intervenes practically upon the relations between instances (nations, states, theaters) of these categories. These operations and interventions occur through the classification of phenomena and actors, privileging the existence of some and banishing others to the margins of existence. The 'rational' calculus of threat, interest, and power – explicit in Waltz, implicit in Morgenthau – marks realist IR as product and producer of analog spaces.

The understanding of what can be called domestic policy is founded first upon the distinction between the space of 'domestic' and 'foreign' policy. In the United States, this distinction has been founded upon a realist understanding of global politics as 'International Relations', which poses 'domestic' space as the Other of 'foreign' space. This counter-intuitive siting is due to the fact that 'foreign' space is the space of operation for International Relations, at least as it is practiced in its disciplinary formulation.

It is necessary to understand the ways in which the realist understandings of space (and therefore of sovereignty) are reworked to come to terms with the advent of digital spaces, which lack the sorts of reified borders which denote analog realist spaces. Only then will it be possible to analyze an ostensibly 'domestic' policy initiative – the National Information Infrastructure Initiative – in the spatialized terms of what I call digital IR, and to view this initiative properly as an act of interspatial relations.

Organization of the thesis

This thesis is organized into four chapters. The first chapter lays the theoretical

---

[3] at least by those in the upper-middle and upper classes

framework for the remainder of the project; it focuses on the analog IR of Morgenthau and Waltz. Following this, the thesis takes up the critique of the spatial foundations for 'analog IR' by theorists whose work is most relevant to 'digital IR'. The concept of the war machine is introduced, and its relevance to the current project explained.

The second chapter seeks to understand the early history of the internet as the formative period for digital information infrastructure in the United States, and focuses on two characteristics of this history which are key to understanding the disciplinary character of this (re)construction of a digital space for the 'United States'.

Chapter three examines the practices of (re)creating digital spaces as they are advocated within two documents from the National Information Infrastructure Advisory Council (NIIAC). The NIIAC was formed by executive order in September of 1993, to advise the Secretary of Commerce "on matters related to the development of the National Information Infrastructure" and "on a national strategy for promoting the development of a National Information Infrastructure" *(Exec. Order 12864*, Office of the President, 1993). The ways in which these practices exerts disciplinary power in digital spaces, and thereby lay the groundwork for an internet war-machine are examined.

In concluding this work, I seek to show that Virilio's vision of the war machine, while useful, is limited. A more nuanced understanding of the effects of the internet on the development of subjectivity and identity is needed. I make a preliminary argument for a dialectical understanding of the internet war machine, which joins the super-disciplinary understandings of Virilio, with the anarchic understandings of Deleuze and Guattari.

From Analog IR to Digital IR

Traditional Realism: Tenets and Geography

The traditional Realist understanding of International Relations is predicated upon six tenets (Morgenthau 1985):

1. "Political realism believes that politics...is governed by objective laws that have their roots in human nature" (4).

2. "The main signpost that helps political realism to find its way through the landscape of international politics is the concept of interest defined in terms of power" (5).

3. "Realism assumes that...power is an objective category which is universally valid, but it does not endow that concept with a meaning that is fixed once and for all" (10).

4. "Political realism is aware of the moral significance of political action" (12)

5. "Political realism refuses to identify the moral aspirations of a particular nation with the moral laws that govern the universe" (13).

6. "Intellectually, the political realist maintains the autonomy of the political sphere" (13).

These characterizations of Realist thought are founded upon particular understandings of space. From the first, Morgenthau draws a boundary with the 'objective' on one side, and (one assumes) the 'subjective' on the other. The objective realm, which is where Morgenthau sites the laws (but not the practices) of politics is a tangible, geophysical space, where properly equipped analysts can ascertain the timeless imperatives of the relations among nations. Objective space is the space, according to Cartesian realism, outside of the Subject, which is sensible to the Subject, and which is thus open to analysis by the Subject.

In the second tenet, the trope of 'path-finding' is employed to describe international politics. In this instance, Morgenthau describes international politics as a landscape, through which analysts wander, guided by the concept of power. This ecological trope reinforces the objectivist conception of space, as it opposes the 'landscape' of international politics and the explorers of that landscape, who are separate from it. Morgenthau leaves the possibility that the presence of these analyst-explorers

may alter the landscape of international politics unexplored(!).

Morgenthau's third tenet reinscribes the objective space of international politics, this time with regard to the 'signpost' of power. Morgenthau finds a sign of 'power' in every arena of international politics; he fails to recognize that this perceived universality is itself already refuted by the fact that power is not endowed by Realist thought "with a meaning that is fixed once and for all" (10). This presents a contradiction because the existence of a particular phenomenon is dependent upon its definition; in order for international relations to classify a certain action as a 'power play', it is first necessary to have a definition in hand.

Morgenthau differentiates between the objective space of the laws of international politics and the subjective(?) space of the practices which constitute international politics in the fourth tenet of realism he offers. Here, Morgenthau recognizes "the moral significance of political action" (12). In his fifth pronouncement of Realism, Morgenthau claims: "moral laws that govern the universe" are to be differentiated from the context-laden "moral aspirations of a particular nation" (13). Morgenthau does not characterize whether or not it is in the universal moral laws of the universe or the moral aspirations of the particular actions that the moral significance of political action is to be found. The failure to see how his own situation colors his judgment concerning the existence of universal moral law allows Morgenthau to maintain the dichotomy between the universal and the particular.

Finally, Morgenthau separates the spaces of politics from other spaces of human endeavor and interaction. Underpinning this claim to autonomy is an understanding of politics limited to those interactions which take place between states which involve the use of some or other forms of coercive force. This view of politics fails to register the crucially political nature of enterprises which occur within states, and those which occur extra-governmentally or extra-statally.

Morgenthau moves on in *Politics Among Nations* to describe some of the factors which determine the 'power' of individual states. He directly addresses the question of space in his consideration of 'geography'. For Morgenthau, 'geography' is concerned with the positioning of states in territorial space, which is, for him, one of the elements which constitutes national power. It is here that we find the opposition of spaces and places described earlier.

The 'world' of Realist IR is a space, an arena, within which the power plays of International Relations occur (Shapiro 1989). The 'states' of realist IR are places within

the space of this 'world-arena' – at once, the 'Subjects' in the games of IR, and the 'Objects' of study for IR[4]. For Morgenthau, this positioning of states is: "[T]he most stable factor upon which the power of a nation depends" (127). This positioning is, then, pre-given. That the boundaries between nations are mutable, and that the 'empty' spaces of the world which divides nations can be traversed, is not considered. In the American case, "the geographical location of the United States remains a fundamental factor of permanent importance" (127). This assumption of fixity ignores the realities of border transgressions by human (the Cuban exoduses of 1980 and 1994), capital (Japanese auto exports in the 1970s, Korean semiconductor exports in the 1990s), and military flows (the nuclear arms race of the post World War II era, weapons proliferation on a worldwide scale).

Morgenthau discounts the seriousness of the threat to the 'sovereign spaces' of realist IR by technology:

> It is fallacious to assume, as is frequently done, that the technical development of transportation, communications, and warfare has eliminated altogether the isolating factor of the oceans. (Morgenthau 1985, 127).

When the munitions of info-war transgress oceanic boundaries in micro-seconds, it would appear that oceans are reduced from the lofty status attributed to them by Morgenthau to that of merely another medium through which the digital signals of fast capitalism travel with impunity. Oceans, penetrated by fiber-optic cable, dotted with GPS (Global Positioning System) transceivers, and lined with sonar sensors, no longer present a barrier to the flows of the data of digital infrastructure: instead, oceans provide an environment for the extension of these flows.

For Morgenthau, sovereignty exists in the hegemonic exercise of power with and over territory demarcated by enforceable (and enforced) borders. Sovereignty depends on the ability to effectively enforce law within a purportedly sovereign territory, and the univocality and hegemony of that sovereignty, and of the agents seeking to enforce it (330). This further operationalizes the Self/Other binary in terms of 'domestic'/'foreign'. Morgenthau would confer sovereignty and 'State' status when political structures are able to enforce domestic hegemony, while preventing the intrusion upon this hegemony from 'foreign' sovereigns. Sovereignty, for Morgenthau, is the achievement of 'Subject' status in the 'World' of International Relations. Sovereigns are manipulators, not the manipulated.

Literally then, IR scholars can think of themselves as 'game theorists'.

The Realist fetish for territorial borders upon which Morgenthau's understanding of sovereignty is founded is undermined by the movement of life-activity from analog, territorial spaces to digital spaces. Absent territory, how can traditional Realism formulate a conception of sovereignty? The notion of domestic, territorial-ized hegemony is rendered increasingly moot in a society which is in the process of self-digitization and hyper-networking: the theoretically possible extension of territory into a digital (and yet neo-medieval) conception of realm is shown practically implausible as the failure of the boundary enforcing mechanisms authored by Sun Microsystems and Microsoft into the web-surfing languages of Java and ActiveX amply illustrates. In digital spaces, there are no immanent borders - the quest for greater productive efficiency supersedes State desires for discrete administrative spaces.

The Disciplinary International Relations of neo-realism

For Kenneth Waltz and the neorealists, international relations is truly a worldview, wherein the analyst seeks to understand the 'big picture' of global interactions, while eschewing consideration of the characteristics of the individual States which constitute the field. In the neorealist formulation, system is treated as an abstraction from the real world, in the pursuit of theoretical validity.

Neorealism is a further operationalization of Realist IR. The major focus of neorealism is to enhance the predictive power of analysts, using 'laws' of international politics. For these thinkers, the particular spaces of States are not themselves of interest - indeed, Waltz chastises the traditional realists for 'reductivist thinking' because of their focus on historical context in considering international politics. What were, for Morgenthau, the 'Subjects' of IR ('States') are now purely 'Objects' of study for neorealist IR analysts, who are (and who, through their analysis, constitute fields of knowledge which become) the 'Subjects' of IR. The spaces of interest for neorealists is the scientific space of international relations which allows it the predictive power which ultimately should lead to control. The neorealists, are, quite literally concerned with the disciplinary spaces of international relations.

Neorealist International Relations could afford to ignore individual states and their particular characteristics because these were, to a greater or lesser extent, given facts of life- throughout the Sixties, Seventies, and Eighties, most states which resulted from or survived World War II remained in existence, and, save for the post-Colonial boomlet, not many more nations came on the scene. The day to day realities of international politics could be ignored in pursuit of abstracted theories because of this relative stability. This

stability is very quickly eroding in the movement from analog spaces to digital ones (Luke 1996). The absence of stable, immanent boundaries which is a fact of life in digitally networked spaces already is creeping into the reality of the analog world. The neorealist pursuit of grand theories of international politics seems anachronistic, as the very units which provide the underpinning of the neorealist understanding of international politics and which allowed disciplinary abstraction are now increasingly in a state of disintegration.

A Critique of Analog Realism

In the last decade, the tenets of Realist IR (in both its major flavors) and political realism, more generally[5] have come under a trenchant attack from a group of theorists more directly concerned with issues of space, both as objects of study, as well as fields of knowledge which constitute those objects. One of the central threads of this critique has been an exposition of the spatial bases of the concept of sovereignty, and of the historical contextuality from which these understandings of space issue.

The spatial critique of realism focuses on the discursive construction of borders and spaces, instead of relying on an understanding of these concepts as being immanently linked to geo-logical real estate. The alternative understanding of the tentative character of space engendered by this critique results in a more problematized and less absolute conception of sovereignty.

The work of the two theorists to be considered here originally appeared in the late 1960s and early 1970s; it antedates much of the digitalization of state existence which is the focus of the present essay. The fit between the theory to be presented shortly and the experiences related in the second and third chapters is not exact. The discussion here will concern itself with pointing out the strengths and weaknesses of this work for analyzing the digitalization of space. The work of Henri Lefebrve and Michel Foucault will be brought to bear on the questions of space and sovereignty here; the work of Paul Virilio is presented as an extension of the work of Foucault and Lefebrve which bears more directly on the question of information infrastructure.

In *The Production of Space*, Lefebrve argues for an understanding of spaces as social formations always in process of re-construction, instead of as pre-existing givens which provide the uncontested background for social action. Lefebrve claims that there are

---

[5] See Jim George's *Discourses of Global Politics* for an more extended discussion of the linkages between political realism and Realist IR theory.

three components of the social construction of spaces. These components are spatial practices, representations of space, and representational spaces (Lefebrve 1991, 44). Each of these occurs in a particular social, political, sexual, and material context. In constructing spaces in a certain way, particular groups make use of spaces and practices to the effect of re-inscribing certain meanings of space, which sanction other practices, and forbid others.

As existence moves from analog to digital spaces, these components of social construction of space are conflated to a greater degree: the practices of creating spaces on the World Wide Web, for example, are those practices of encoding the spaces - literally, for writing the code which organizes electrons in certain ways to allow for the conduct of life online. The writing of the code represents the digital space in a certain way - as a commercial space, a sexual space, an intellectual space, a criminal space. Inasmuch as the identities of the author/coder of these spaces are caught up within these productions, the practices of encoding spaces are part and parcel of the use of those spaces to represent identities.

Lefebrve takes a fairly statist position on the question of sovereignty. That is, he sees States as having hegemony over other economic and institutional formations:

> Even if...one proves to one's own satisfaction that the state and its constitution are not independent of the relations of production, of classes and their contradictions, the fact remains that the state with its sovereignty rises above these factors and reserves the right resolve contradictions by force. The state legitimates the recourse to force and lays claim to a monopoly on violence (Lefebrve 1995279-80).

This understanding comes under intense question in digital spaces; as more and more of existence moves into digital spaces *not* controlled by the government, the sanctions government is able to apply in analog space become less and less salient. Further, the monopoly on 'force' which Lefebrve attributes to the State (and which one assumes is intended towards the body of the ruled) becomes less important as existence is carried out (practiced) in digital, or non-corporeal, form(at)s.

Michel Foucault refuses to privilege one or another actors with regard to the sort of monopoly of force which Lefebrve confers on the state. His work is notable for its refusal to naturalize the presence of space; in *Discipline and Punish*, he describes the movement from physical incarceration and its physical architectures to 'virtual' architectures of disciplinary power.

For Foucault, disciplinary power is a product of the control of space. This management of space is undertaken through the management of the objects within space, as well as through the surveillance of those objects. Foucault offers us, in the chapter of

Discipline and Punish entitled "Docile Bodies" a way of understanding how it might be that actions on the part of governments which organize space can be seen as acts of disciplinary power. These organizations of space represent the productions of spaces on the part not of a single Sovereign, but on the part, instead, of multiple sovereigns. The exposition of discipline in *Discipline and Punish* provides a reading of Realist IR as disciplinary practices, both in terms of its marking of the 'body' of global politics, as well as in its constitution of 'International Relations' as a field of knowledge. Organization denotes a putting of things (grammatically understood) into their proper *place,* proper being understood as that place which is most conducive to their use. The result is that organization connotes a useful distribution of objects in space.

Foucault identifies four techniques of distributions in "Docile Bodies" (the fifth chapter of *Discipline and Punish*), which begin to offer a glimpse of how it is that State actions aimed at the organization of space can be viewed as disciplinary projects. The first of these techniques is *enclosure* (Foucault 1977), 141, which is "the specification of a place heterogeneous to all others and closed in upon itself." The second technique Foucault describes is the act of *partitioning*, the intent of which is to dismantle "collective dispositions" and is "aimed at knowing, mastering, and using"; ultimately, partitioning "organizes an analytical space" (Foucault 1977, 143). The third technique of distribution Foucault describes is the use of "functional sites" to multiply and strengthen the effects of partitioning and enclosure, and to enhance productivity and to maintain power relations (143-145). The fourth technique of distribution is *ranking*:

> Discipline is an art of rank, a technique for the transformation of arrangements. It individualizes bodies by a location that doesn't give them a fixed position, but distributes them and circulates them in a network of relations [my emphasis] (145-146).

Taken together, the practices of distribution of which Foucault speaks represent a segmentation of Objects into individualized spaces, which are then collectively articulated in order to achieve the desired end – which is control. One could think of this articulation as the 'object-orientation' of disciplinary society, wherein each individual and its spatial container constitute and Object, which can be articulated and disarticulated in multiple combinations according to the particular product required.

Discipline implies surveillance. In the penal case described by Foucault in *Discipline and Punish*, the *sine qua non* of surveillance is the panopticon. Conceived by Jeremy Bentham as a way in which the repentance inmates in eighteenth century prisons could be ensured to repent, Foucault examines the ways this instrument of surveillance has been generalized outside of the prison: "The Panopticon, on the other hand, must be

understood as a generalizable model of functioning; a way of defining power relations in terms of the everyday life of men" (205). The point of the panopticon is the normalization of those under its gaze: "...the major effect of the Panopticon: to induce in the inmate a state of conscious and permanent visibility that assures the automatic functioning of power" (201). In *Discipline and Punish*, Foucault concentrates on the physical surveillance which was the object of the disciplinary architectures of the prison, school, and hospital. In digital space, surveillance is effected through databases and logs. The panoptic nature of databases has been described elsewhere (Lyotard 1984; Poster 1994)[6]; the panoptic nature of logs of system and network usage needs further explanation. Each time a computer workstation performs a task which results in a network transaction, a log of that transaction is created, most frequently on the network 'host' machine. Staying with the example of the World Wide Web, on each Web server that a user visits, is a log of what that user saw, sent, and downloaded to and from the websites she visited. Similarly, email transactions are logged.

Critics of the 1996 film *The Net* criticized the movie on the grounds that the obliteration of the heroine's identity from all the computer networks in the world was far-fetched. Technically, however, such obliteration is not implausible. In virtual spaces, the actions taken by a user are cataloged and cross-referenced; from databases, the patterns of behavior can be reconstructed, so that a user becomes the target of precisely aimed messages concerning his or her life. The productivity which is worshipped in modern societies:

> can be insured only if, on one hand, it can be exercised continuously in the very foundations of society, in the subtlest possible way, and if, on the other hand, it functions outside these sudden, violent, discontinuous forms that are bound up with the exercise of sovereignty.

The explicit relation of this type of discipline to considerations of space and geography is taken up schematically by Foucault in an interview with the editors of *Herodote* (Foucault 1980, 63-77). In this interview, Foucault observes the link between his work in *Discipline and Punish* and that of geographers, explicitly in terms of the distributions of spaces:

> Tactics and strategies deployed through implantations, distributions, demarcations, control of territories and organisation of domains which

---

[6] It must be noted that, strictly speaking, databases are not panoptic in the sense that they do not enact surveillance - they do not "watch" over the cases catalogued within them. They are governmental tools. The network programs which enact or facilitate the collection of this data *as it happens* are the panoptica.

could well make up a sort of geopolitics... (77)

The realm of geopolitics is that of sovereignties and their construction.

The concept of the war machine provides a way of understanding the re-articulation of disciplinary power within digital spaces, and of reconciling the move from realist Sovereignty (as the exercise of terrestrial hegemony) to digital sovereignty (the exercise of digital hegemony). Foucault understood that disciplinary power only began with carceral confinement (incarceration). Paul Virilio, in his understanding of the 'vision machine,' both during and after the Cold War, sees an extension of disciplinary power into communications architectures, the realms of virtual confinement (encarceration).

The idea of the war machine is not new — Sun Tzu speaks of it in *The Art of War*, and Deleuze and Guattari expand on this notion in *A Thousand Plateaus*; Virilio's understanding of the war machine is much darker than Deleuze and Guattari's, which sees the war machine as an anarchic disarticulation of the structures which practice social and mental bondage. Virilio sees the war machine as the radical super-articulation of the structures which ensure the domination of the Politico-Military-Entertainment complex.

Virilio's conception of the war machine, offered first in *L'insecurité du térritoire* as a conceptual frame for the analysis of the nuclear war machines of the 1970s, can be usefully extended to understand spaces and sovereignties in network spaces (Couples 1996). By applying his conception of the war machine to the practices advocated by the NIIAC, the disciplinary nature of these practices is spotlighted. This allows analysts to be more conscious of the disciplinary effects which the construction of spaces online in accordance with the vision of the NIIAC might have, and forces those who would remain free online to be vigilant. In Virilio's formulation, the Cold War provided a turning point from a war machine oriented towards exo-colonization toward one oriented towards endo-colonization; the result may well be that International Relations becomes Endonational Relations.

Seeing the ways in which the NII suggests/is suggestive of the war machine depends on seeing two things: first, the connections between the development of the NII and the American war machine (which Eisenhower dubbed the "military-industrial complex). The internet had its genesis within the Pentagon, the zero-point for the US war machine, as shall be seen in the next chapter. What must also be understood is that the messaging architecture implemented in the national information infrastructure is created to circumvent analog attacks on sovereignty — bombings, roadblocks, assassinations — are meaningless.

This disciplinarity has at its core the 'assembled-ness' of collections of digital objects, be they in/on Gopherspaces, Webspaces, or Virtual Realities. These spaces are

programmed, in all the senses of the word. First, they are coded, in a binarized, unambiguous fashion, i.e., they are computer programs. As Moulthrop notes,

> After all, what is computer programming but the zenith (or nadir) of the western attempt to invest language with presence?" (Moulthrop 1995) [i.e. to make language work].

Second, these spaces are programmed in the sense that they seek to convey a message to an audience. Whether the site in question is the Levi Strauss website, which wants to sell you jeans, or the Department of Political Science's webpage, which wants to sell prospective students on the virtues of their program over others, there is a program to the site. The sites are then organized to appeal to their presumed audience. Third, a visitor to a particular space on the internet, while having the ability to randomly access (at least to some degree) a wide variety of information, can only do so within the discipline of the space in which she finds herself.

From ARPANET to NSFNET – Constructing Digital Spaces

The beginnings of the construction of the ARPANET by the United States Department of Defense in the early 1960s mark the beginning of the as-yet unfinished movement of the State from analog to digital space. The internet, initially a program which had as its focus the solution of a military/foreign policy problem, moves through its institution as 'information infrastructure' the solution of an economic/spatial policy problem. By paying attention to these beginnings, the present undertakings of the United States Government with regard to information infrastructure can be better understood.

The internet is the foundation upon which the National Information Infrastructure initiative, and its constituent projects, are based. In order to understand more fully the practices of spatial creation advocated by the NIIAC in the National Information Infrastructure project, and the disciplinary dynamics those practices imply, it is useful to consider the early history of the development of the internet.

The Military-Industrial Heritage of the Internet

The internet, or the ideas underpinning its development, came out of the experience of the first Cold War of the Fifties and Sixties. Realizing that a nuclear strike by the Soviet Union would target all of the major cities of the United States as well as the communications infrastructure which was concentrated around these cities, the US Department of Defense saw that there was a necessity to develop an alternative infrastructure for communications in a post-first strike situation (Miller 1996, 44).

This infrastructure would have to be qualitatively different from the telecommunications infrastructure which was already present. While the existing communications infrastructure of the mid-20th century United States was centralized to the extent that it relied on major switching centers to direct voice and data communications, the new infrastructure had to be decentralized, so that enough of it would survive a nuclear first strike that command and control communications could still occur. This dictum of survivability mandated that the new infrastructure be redundant; any messages sent over the network would have multiple possible paths to their destination. In the extant telecommunications infrastructure only a relative few paths

were available for message traffic, particularly those which needed to travel great terrestrial distances. finally, the new infrastructure, while funded by Defense Department budgetary allocations, was not to be open for the use of the general public, as the existing telecommunications infrastructure was.

These mandates for the internet provide a glimpse of the disciplinary nature which the internet was to have throughout its development. The first demand for the new infrastructure was that it be decentralized in order to adapt to the change in conditions which would accompany nuclear conflict. This decentralization is an articulation of the infrastructure, as the network would function more closely in line with the current state of the environment. As some or other parts of the network were destroyed by nuclear attack, those remaining would pick up the slack in order to ensure that the communications of the military got through. Second, the network spaces of the internet were (originally) to be the province of the Department of Defense, which was to have control over the message traffic traveling over the internet (then known as ARPANET), as well as the construction of the network.

In order to accomplish these objectives, a method of articulation for individual messages needed to be found, so that messages were not bound, logically or materially, to any one path. The United States Advanced Research Projects Agency (ARPA)[7], operating from within the Department of Defense, contracted with the firm of Bolt, Beranek and Neumann (BBN) to construct a computer network which would meet the objectives as laid out above (Miller 1996, 45).

The relation to discourses of security and sovereignty at this stage of the development of the internet is manifest in the fact that the funding and initiation of the ARPANET project came from the US Department of Defense, which is the executive branch agency jurisdictionally most manifestly concerned with national security, and the maintenance of national sovereignty. More concretely, the ARPANET's original functional purpose was to serve as a second-line communication system to be brought on-line in the event of a nuclear first strike by an enemy of the United States, envisioned at this point in time to be the Soviet Union.

The perception of the need for this type of network arose from a certain conception of the reality of world politics in the late 1950s and early 1960s. ARPANET "belonged" to the United States Department of Defense; the DoD funded the

---

[7] As is well know, ARPA was renamed DARPA (for Defense Advanced Research Projects Agency) in 1972; DARPA was re-christened ARPA in 1993. In this chapter, the moniker used to refer to the agency will vary with the time frame under consideration.

construction, maintenance, improvement and expansion of the ARPANET in order to construct, maintain, improve and extend its conception of United States sovereignty and security. These conceptions provided the policy impetus for the development of ARPANET.

A second function of the ARPANET project was as a test-bed for new data communications technologies which could eventually be brought to bear on the task originally intended for the ARPANET (Rogers 1996, 94). Again, the importance of the discourses of security and sovereignty is manifest; the test-bed function of the ARPANET was, however, at cross-purposes with the explicit role the ARPANET was to play. The experimental nature of the protocols under development but in use on the network made its reliability over time uneven; for national security purposes, this was viewed as unacceptable. As a result, the Department of Defense split the experimental network (to be known thenceforth as ARPANET) from the workaday DoD communications network, known as MILNET, in 1983 (Rogers 1996, 95).

This split of ARPANET and MILNET provides insight into the contested nature of these spaces which had begun to be constituted by the US Department of Defense. At this point, two contending conceptions of ARPANET were at play. At once:

> The ARPANET was more than a communicating system for researchers doing work under DARPA contracts. IT was an experimental network, and, therefore, also functioned as a *laboratory in which experiments in computer communications were conducted* [my italics] (Rogers 1996, 94-95)

but also:

> When groups and agencies connected to the ARPANET need a *production facility* and were not willing to sustain the flexibility that its experimental character required, DoD split the network.... [italics mine] (Rogers 1996, 95)

The ARPANET, then, had become both a laboratory in which experiments were conducted, as well as a production facility to be managed and for which "policies...were put into place." (Rogers, 95).

It should also be noted that the spaces of the ARPANET were exclusive spaces of the United States Department of Defense and its employees and contractors. The US DoD granted and refused access to ARPANET to those groups and organizations seeking it; this effectively constituted a boundary-drawing practice, a geo-graphy (Tuathail 1996, 2). Those who were excluded from this geo-graphy (and by it), began to respond by creating their own spaces on computer networks.

While the ARPANET was expanding to include the growing number of

contractors and research universities carrying out its research, a growing number of users outside of the defense industry began to construct their own networks to allow researchers in non-DoD research the ability to share resources. During the first phase of internet development, non-DoD researchers had begun to clamor for an expansion of the ARPANET (and a slackening of the rules for approval for expansion), but were rebuffed at every turn. In response to the refusals of the DoD, a group of universities in the northeastern section of the US assembled themselves into BITNET (for Because Its Time NETwork) in 1981 (Rogers 1996, 86). BITNET marked, along with the NSF-supported CSNET, the first major networked-computing solutions which did not have direct ties to the US Department of Defense.

As BITNET and CSNET went online, the value of networks for collaborative research and communications began to become more obvious. Prior to this stage in the evolution of what we now call the internet, the schools and contractors doing DoD work had been quite happy to reside on the ARPANET; with the advent of BITNET and CSNET, however, the value of having access to the alternative networks began to make itself more obvious, as it expanded the pool of networking, computing, and intellectual resources available to researchers on all three networks. As Rogers points out, the CSNET, by allowing for the interconnection of the ARPANET with CSNET and (by extension) BITNET (Rogers 1996, 125). CSNET, from its inception, was geared to be international in origin. It is worthy of note that the list of locations chosen to be CSNET sites in foreign countries was first vetted by DARPA (Rogers 1996, 132)[8].

Up to this point, the rhetorics of security and sovereignty had not been invoked in a significant way **other** than in the initial planning and development stages of the ARPANET. This I attribute to two different circumstances: first, as noted above, the ARPANET was split off from the MILNET in 1983 – this split was the culmination of the tension between the command and control mission of the ARPANET, and what I have called the 'testbed' mission of the ARPANET; second, the United States, up to this point, saw itself as the world leader in computing across disciplines – this unquestioned superiority meant that there was no pressing need to push for faster development of the existing network resources, no need for the more explicit involvement of the national government, and so no need for the motivation of the dual discourses of national security

---

[8] Not only was the list of overseas CSNET associates vetted by DARPA, but mail flowing across the CSNET to overseas locations was limited by agreement to only those sites which were approved by DARPA. This is to say that overseas CSNET sites were subject to limitations not in place for domestic sites.

and sovereignty to ensure the development of network resources.

In the early-Eighties, however, this mood of unquestioned superiority began to change. In 1981, the Japanese government announced the implementation of a national advanced computing program; this announcement provided the impetus for those favoring an expansion of networked computing in the United States a window of opportunity for articulating their agenda in a manner which would capture the imaginations of those in governmental positions, so that this expansion of networked computing would be undertaken (Rogers 1996, 137-8). In order to do this, the dual rhetorics of national security and national sovereignty were mobilized in an effort to convince legislators and executive-branch administrators that an increase in government support for networked computing was necessary for the preservation of national security and sovereignty.

The program for the construction of the NSFNET was the first major incident which saw the mobilization of the discourses of national security and national sovereignty to ensure programmatic support:

> Even though computer networks were not a central concern at this stage, scientists and policy-makers invoked in the process the strategic importance of the networks… (Rogers 1996, 138).

In many ways, the mobilization of these discourses in support of the NSFNET presaged the ways in which these discourses are being mobilized today in support of various projects relating to the National Information Infrastructure initiative, and so it is worthwhile to examine the process leading to the construction of the NSFNET.

The NSFNET was originally envisioned by its supporters as a network to give access to supercomputer centers to researchers whose work required the large scale computational power of supercomputers. The movement to provide governmental support for networking within the context of the movement for NSFNET is very tightly linked to the movement within certain academic circles in the United States during the early 80s for more government support for high performance computing.

It is within the high-performance computing movement that the rhetoric of national security and sovereignty first appears in linkage to networks. The motivation of these discourses was articulated in two ways with respect to high-performance computing the first was the claim that "the key to national security and economic prosperity in the future was the supercomputer;" the second was the articulation of the agenda "in terms of the central role of science for the viability the defense and economy of

the country" (Rogers 1996, 169-70)[9].

TCP/IP: The Practice of Constructing Digital Space

Easily the most important innovation of the original ARPANET, which was first activated in 1969, was the adoption of a packeted protocol, called TCP/IP, to convey the message information as well as the messaging information in conjunction with a web-shaped network topology, which allowed any node on the network to pass messages to any other node. As hindsight has clearly shown us, this architecture is more than adequately extensible, both for the original military-specific network originally envisioned by ARPA and BBN, as well as for the explosion of use we are currently seeing.

TCP/IP is the software protocol which is pre-eminent in the technical implementations of the spaces of the internet. It provides a common standard with which communications applications can send and receive information. In much the same way that a postal service specifies the location and form for the recipient's address on a package - for a letter, this appears on the wrapper or envelope in a certain location - as well as the location of the message - for a letter, enclosed within the package -, the TCP/IP protocol provides for a standard method of identifying the individual packets of data which constitute a message in its entirety.

The construction of spaces on/in/around the internet centers around the TCP/IP protocol. In order for the spaces to exist in network space, they must be constructed in a fashion which is ultimately resolvable to TCP/IP datagrams. These packets provide the framework in which spaces can be understood by those living within them.

Referring back to Lefebrve's understandings of the functions of social space, it is clear that TCP/IP packets, and the spaces which they constructed during the late 1960s and 1970s, were both politically instrumental, and contributed to the mode of production in the late capitalist society of the United States at that time. On one hand, these packets, and the infrastructure over which they traveled were designed to serve as instruments of political control: their very existence depended on an economy of fear on the part of the US State which defined the existence of networks to carry TCP/IP packets as essential to the ensurance/insurance of 'national security'. On the other hand, these packets served to reproduce the late capitalist mode of production in the United States, as defense contractors (of whom BBN was only the first) moved to help engineer, construct, and expand the original ARPANET into the internet; further, the contents of the TCP/IP

---

[9] The quotations in the following paragraph come from these pages, as well.

packets was by and large research material which surrounded technical innovations, not only in networking, but also in other areas of research which generated millions of dollars for the corporations undertaking this research at the behest of the DoD.

These claims set the tone for many of the discussions of (then) the internet and (now) the National Information Infrastructure. By motivating the rhetorics of national security and sovereignty to greater governmental involvement[10] in the construction of information infrastructure, the supporters of these movements made it very difficult for elected officials to oppose them, not only in an historical context which was seeing an unprecedented increase in defense expenditures (with respect to NSFNET) , but also later on (in the current case of the NII), when defense expenditures are decreasing, much to the chagrin of many legislators.

During the upturn in defense expenditures of the second Cold War[11], it seemed reasonable to attempt to preserve and (if possible) extend US hegemony in analog and digital spaces; as a result, expenditures for networking and computing were granted without much fanfare – they were simply seen as part of a defense bill which was necessary to contain the Communist threat (seen at that time as the Soviet Union). During the present era of a relative scaling-back of defense spending, these same rhetorics of security and sovereignty are being motivated in support of the National Information Infrastructure initiative, ostensibly to ensure United States hegemony in digital spaces, in terms not only of military security, but in terms of economic and social security, as well. Chapter three will discuss the ways in which these rhetorics are brought to bear within two documents of the National Information Infrastructure Advisory Council.

---

[10] The types of government involvement in the development of the NII, as well as the internet previously, are articulated in various ways, as shall be seen in general terms in the next section of the present chapter, and in much more detail in the following chapter.

[11] Again, following Dalby.

Projecting Sovereignty Across Space – The National Information Infrastructure Initiative

President Bill Clinton authorized the creation of the National Information Infrastructure Advisory Council (NIIAC) with Executive Order 12864. The role of the NIIAC was twofold: it was to provide advice to the administration concerning the creation of digital infrastructure, as well as to help formulate a vision for the form which such infrastructure should take. The projects of the NII represent an attempt by an analog power (the United States government) to dictate the development of digital space, thereby extending the sovereignty based on analog understandings of space into the digital environment, by constructing the architecture of digital spaces in a way favorable to its influence. In its first and last reports (entitled "Common Ground: Fundamental Principles for the National Information Infrastructure" and "A Nation of Opportunity: Realizing the Promise of the Information Superhighway"[12], respectively), the NIIAC defines the concept of a 'national' information infrastructure, and the functions of the United States government with regard to the (re)construction of information infrastructure within the United States.

"Information" is defined by the NIIAC in "Common Ground" in two differing, yet complementary ways. First, information is a "strategic resource" which is "the bedrock of economic security" and which will "serve as a much needed resource for our nations current and future workers to continuously upgrade and improve their job skills." The NIIAC employs here the trope of 'security' to privilege not only 'information' as a "strategic resource", but also the NII project itself, as a means toward the end of security.

Information is defined also as having "had an equally profound effect on the way people live their everyday lives" in the areas of "creating communities of interest," "strengthening education," "improving healthcare," "increasing entertainment options," and in "enhancing participatory democracy." These categories are extremely telling for the

---

[12] The reader will note the lack of page numbers following what appear as direct quotations from these reports. This is due to the reality of downloading documents from the internet, with which one does not get page numbers. The author vainly attempted to get in touch with the Government Printing Office in order to obtain the published copies of these documents.

ways in which the NIIAC views the project of building information infrastructure, and recreating the spaces in/on/around which it exists. This definition, or more accurately, this *delineation* of information qualifies the information(s) which the NIIAC see as having important effects on the lives of US citizens; by writing these categories of information in, the NIIAC also writes non-included categories out. It will become obvious upon close analysis that the understanding of sovereignty at the heart of this vision for information infrastructure is economic, and not the military sovereignty of the Cold War.

The NIIAC defines the National Information Infrastructure in the following manner:

> It is a series of components, including the collection of public and private high-speed, interactive, narrow and broadband networks that exist today and will emerge tomorrow. It is the satellite, terrestrial, and wireless technologies that deliver content to homes, businesses, and other public and private institutions. It is the information and content that flows over the infrastructure whether in the form of databases, the written word, a film, a piece of music, a sound recording, a picture, or computer software. It is the computers, televisions, telephones, radios, and other products that people will employ to access the infrastructure. It is the people who will provide, manage, and generate new information, and those that will help others do the same. And it is the individual Americans who will use and benefit from the NII. The NII is a term that encompasses all these components and captures the vision of a nationwide, invisible, seamless, dynamic web of transmission mechanisms, information appliances, content, and people.

Understanding this definition is crucial to understanding the NII. 'Infrastructure' is redefined: instead of merely being the conduits for certain classes of flows — in the manner that the telephone infrastructure consisted of not voice data itself, but of the wires, switches, and telephones over which voice data flowed, or that the transportation infrastructure consisted of vehicles and the environments over/on/through which they traveled, but not their passengers and cargo — infrastructure becomes, in the case of the NII, everything. The capital equipment used to process and carry data, the goods used to produce data, but also the data itself, and the people who work on and with that data – these are now all seen as infrastructure. The result of this redefinition of the concept of 'infrastructure' is that the people of the United States become resources to be mobilized, and to be managed.

The NIIAC's global perspective on information infrastructure lays the groundwork for understanding the initiatives it proposed as disciplinary practices. If information infrastructure is understood in this fashion, how could it be seen as effecting the production of space? The first sort of discipline which will be examined is the economic discipline which is the raison d'être of the NIIAC; the second sort is a more

physically coercive discipline which is included in the vision of the NIIAC mainly for political purposes, so that the sectors of society in favor of police practices would continue to support information infrastructure initiatives, as well as to give the State a 'back door' should the private sector become too unruly in their pursuit of economic growth.

The Economic Discipline of Digital Spaces

The digital spaces of the NII are divided between the Private and Government sectors; they are geo-graphed. That is, following Ó Tuathail's formulation (Ó Tuathail 1996)[13], this cordoning off is meant, literally, to denote and demarcate the spheres of influence controlled by capital and those controlled by government. Operationally, the hegemon of digital space is the private sector, which "must have primary responsibility for the design, deployment, and operation of the NII." These hegemons are not to be hindered by excessive governmental regulation; instead, "all levels of government must work together to create a public policy and regulatory climate that allows the NII to thrive."

For Lefebrve, there are three components in the social construction of spaces: spatial practices, representations of space, and representational spaces. These components are conflated in digital space: at once, spatial practices are representations, and also figure spaces for representations. This is due to the fact that all of digital spaces which are currently constructed on/in the internet are ultimately rationalized in terms of TCP/IP datagrams. The act of encoding (that is, 'building') a digital space – a World Wide Web site, for example – is also an act of representing a space, and of acting in a certain way on that space. It is the fact of this conflation which makes it possible to analyze the spatial practices advocated by the NIIAC not only as practices, but as representations, as well.

_____

[13] While I am quite enthusiastic about Ó Tuathail's formulation, I am concerned about his seeming emphasis here on states as geo-graphing powers, which seems to discount on some fundamental level the geo-graphic power of private capital:

> It [Geography] was not a noun but a verb, a *geo-graphing*, an earth-writing by ambitious endocolonizing and exocolonizing states who sought to seize space and organize it to fit their cultural visions and material interests. (Ó Tuathail 1996, 2).

As the spaces of digital being expand, those corporate entities which control 1) access to these spaces, 2) the tools used to construct and connect to these spaces, as well as 3) the rules of existence in these spaces exert geo-graphic power, as they mark out 'their' spaces from others. Spaces which are "best viewed with Netscape Navigator" or are "optimized of MIE" (Microsoft Internet Explorer) are marked, geo-graphed spaces.

The six major goals offered in "Common Ground" are telling of the ways in which the NIIAC envisions its project as one of producing digital space.

First, they offer certain representations of the character of digital spaces. The spaces of the National Information Infrastructure, according to the NIIAC, are to be "affordable and ubiquitous". This focus is echoed in "A Nation of Opportunity", as the NIIAC sees as a goal the development of a national information infrastructure which is "available to all individuals" and is "affordable, easy to use, and accessible from even the most disadvantaged or remote neighborhood."[14]

That being "affordable and ubiquitous" is goal of the NIIAC assumes several things about the current state of affairs on the information superhighway. One, these spaces are high-rent districts: living there is cheap, but getting there is not. Access fees for internet services are declining, but the hardware combinations necessary to access these services, and the spaces to which they serve as gateways, are stuck at price points prohibitive to all not in the upper-middle, wealthy, or techno-classes. Thus, internet use is concentrated, as well. This concentration is not strictly class oriented, however; rural areas are also largely cut out of the circuits of infotecture right now, as well. A third, more fundamental assumption about the practice of digital spaces built into "Common Ground" is that these spaces are not to be free spaces, but instead are to be purchasable commodities. After a certain level of users, however, the marginal cost of adding another user approaches zero. The upshot of this very low marginal cost is the existence of unprecedented opportunities for profit, or unprecedented quantities of public good (if, in fact, access to the internet is deemed a public good). These notions of affordability are based within a neoliberal economic framework in which the notion of a public good worthy of public spending is as endangered as the dodo bird.

The digital spaces of the NII are, say the NIIAC, to "[F]ocus on users". The employment of this photographic trope is ironic, as the ubiquity of the spaces of the NII may indeed allow a more thorough focus on the users of those spaces, providing a more effective method of tracking them than is presently possible – not only in physical terms, but in financial and digital terms, as well[15].

For the NIIAC, these digital spaces, while focusing on users, and being carved into different realms of influence (digital fiefdoms?), should be spaces of societal benefit,

---

[14] This actually is one of the few explicitly geographical references contained in either report. It is one of the few times that the geographically

[15] One example of such tracking is already in the early phases of implementation. This is the interlinkage of traffic monitoring cameras with databases in order to assess tolls, as well as to assess fines for traffic violations (*Converging Infrastructures*)

particular in the areas of education and participatory democracy. These spaces too, while ostensibly 'national' spaces, must integrate within a 'global' information infrastructure, which as Tim Luke points out (Luke 1997, 3), is anything but worldwide. On one hand, the NIIAC recognizes that "[T]he global accessibility and use of information is especially critical given the increasing globalization of markets, resources, and economies"; on the other hand, "[T]he preservation of distinct cultures and national sovereignty are important for all nations".

Finally, according to the NIIAC, digital spaces demand the immediate attention of policymakers. The reason for this is that information infrastructure, as the conduit for information, is vital as a strategic resource, as "consumer goods and conventional raw materials" are displaced by "information services and the technologies that enable individuals to use, enjoy, exchange, and indeed create information and related services" as "the bedrock of economic security".

In addition to the six goals for information infrastructure offered in "Common Ground", the NIIAC offers five 'principles'[16] which are to guide the (re)construction of the national information infrastructure. These are the principles of universal access and service, privacy and security, intellectual property, education and lifelong learning, and, electronic commerce.

On the basis of the description of information and information infrastructure given in "Common Ground", it is not unreasonable to view the first four of these principles as subsidiary to the final one, electronic commerce. Indeed, each of the first four is necessary to ensure the success of the fifth. Electronic commerce would surely fail without customers, so universal access and service is necessary. If everyone is wired into the network, everyone can participate in the digital marketplace; indeed "All individuals should be able to be both consumers and producers of information on the NII". Without adequate assurances of the security of online transactions, electronic commerce has failed to take hold as an everyday method of conducting business. Without privacy, whole spheres of the economy which are of questionable morality to many citizens cannot take place on the information superhighway. The extension of intellectual property law is of perhaps paramount importance for electronic commerce, as the ability to sell is determined fundamentally by the ability to own. Information which is universally accessible is not salable; by reconstituting private property in digital spaces, the

---

[16] This is probably a misnomer. These are not so much principles (for instance, what is the principle of electronic commerce?), as they are overriding goals, or sets of issues to be addressed.

foundations for electronic commerce are laid. Finally, education and lifelong learning are necessary both for producers and consumers of the products of electronic commerce. For consumers, education is necessary in order to participate in an economy which provides disposable income to prime the economy. At the same time,

> A knowledge-based global economy will stimulate the creation of jobs that demand new information intensive workplace skills. Learning resources available on the NII should equip individuals of all ages with these skills and enable them to thrive and contribute in this new information society.

The emphasis on electronic commerce within "Common Ground" is meant to ensure that the digital spaces of the NII play their part "among the forces of production", as well as underpinning "the reproduction of production...and property relations" (Lefebrve 1995349). In "A Nation of Opportunity", these functions would be fulfilled in four areas. These five facets are electronic commerce, education and lifelong learning, health, and government information and services (NIIAC 1995).

The principles which the NIIAC espouses in "A Nation of Opportunity" to enable electronic commerce seek to establish the infrastructure which will enable the conduct of business transactions in online spaces. For those who will work on the 'information superhighway', this will mean "training, education, and adaptation to mechanisms" in order "to facilitate the transition to the new environment and to enable the maximum participation of all users." There are unmistakable echoes of a Taylorist approach to worker management here, as workers are made to adapt to the network, instead of vice versa. In this formulation, the mechanisms of information infrastructure come before the workers; the NIIAC does not speak of adapting the mechanisms to the workers. Similarly, workers are to adapt to the environment. These amount to a ratification of a technopolis in which humans serve machines. A second principle for electronic commerce is that:

> All levels of government should stimulate the development and use of the information infrastructure through electronic procurement of goods and services, offering government services to the public electronically, and thorough consumer awareness programs to promote widespread use of the information infrastructure (NIIAC 1995).

The embedding of government services in digital spaces forces use of the information infrastructure (requiring the compliance of individuals within a digital scheme of administration, even beyond what is in place currently) by those who might otherwise not participate. For those seeking government services in the information age, opting-out is not an option. Since the spaces of the information infrastructure are to be spaces of commerce; for the NIIAC, it is imperative that the government do its part to sell the

citizenry on the use of these spaces, to the point of creating public-service campaigns to preach the virtues of digital spaces. As a result of this close partnership between the Public and Private sector to 'encourage' the use of the information infrastructure, it is farcical to consider (as does the NIIAC) the provision of government information and services as a separate category. The NIIAC sums up its recommendation for government information and services as follows:

> All levels of government should use information infrastructure technologies to provide basic pointers to government information and services, thus simplifying public access to relevant government information; improving delivery of government services and the management and use of government information; and enabling the private sector to develop and provide enhanced and expanded value-added information products and services (NIIAC 1995).

The provision of government information and services is not only about serving the clients of those services, but also about enabling the private sector to make a buck, thereby reproducing the relations of production.

It is in the section of "A Nation of Opportunity" which concerns education that the disciplinary aspects of the information infrastructure initiative most clearly reveal their roots in a transnational, informational capitalism, and where the importance of reproducing the dominant modes of production (the combination of forces and relations of production) shines through most clearly:

> A knowledge-based global economy will stimulate the creation of jobs that demand new information-intensive workplace skills. Learning resources available on the Information Superhighway should equip individuals of all ages with these skills and enable them to thrive and contribute in this new information society (NIIAC 1995).

The stimulus for this sort of education is capitalism, in its late/postmodern, transnational, informationalized variant. These skills, and their acquisition, are oriented towards making one productive within this sort of capitalist environment: this represents the dual character of discipline (nearly) perfectly. At once, individuals participating in an informational economy can "thrive and contribute", but at the cost of having to adapt to the mechanisms of this economy.

In the section of "A Nation of Opportunity" which the NIIAC devotes to the consideration of the possibilities of the information infrastructure for health care in the twenty-first century, we see another way in which the NII would reproduce the relations of production currently dominant in American society. First, the NIIAC admits that "Market pressures are forcing a top-to-bottom reexamination of health services" (NIIAC 1995); the drive to incorporate the health-care infrastructure of the United States into the

digital information infrastructure is not a product of a desire simply to improve healthcare for citizens of the United States, but is instead a way to respond to corporate pressures to be allowed to turn a profit. The imperatives of informational capitalism are clearly in operation in this section of NIIAC's report:

> The availability and use of the Information Superhighway to provide that kind of information access can support the paradigm shift in how people participate in their own wellness *as individual consumers and purchasers of health*, enabling improved quality of life and significant economic benefits (my emphasis, NIIAC 1995).

Those who are sick are no longer simply so - they lack 'wellness', and need to be empowered to purchase "health" – that is, they are potential customers. This particular issue area captures the attention of the members of the NIIAC not simply because it is a good for society to have citizens who are healthy, but because there are "significant economic benefits":

> A healthier society consumes less treatment, lowering the cost of delivery, and is also better able to *fully participate in the global economic marketplace. As the Nation faces increasing global competition, improving the ability to compete on all fronts must be a national goal* if this country is to continue to provide the high quality of life and standard of living that its people deserve (my emphasis, NIIAC 1995).

The NIIAC sees information infrastructure not only in economic terms, but also in political ones. In "Common Ground", the political importance of information infrastructure is understood very narrowly. There are two direct mentions of political benefits in "Common Ground." The first sees "an unprecedented opportunity to enhance participatory democracy in the U.S." in "one-stop shopping for government information and services" through "interactive, multi-lingual, touchscreen kiosks, located in places such as shopping malls, libraries, and supermarkets". The conclusion here is quite clear:

Participatory Democracy = Consumption of Government-related services.

The second mention of political benefits from information infrastructure is as a 'societal benefit'. According to the NIIAC:

> as people engage more directly and frequently with government representatives in new ways, participatory democracy will flourish, enabling a more responsive, efficient, and effective government.

Putting these two together, the ostensible fulfillment of political needs by the information infrastructure means the more efficient marketization of government information and services.

The discipline that is enacted by an information infrastructure which is patterned after that outline by the NIIAC is highly economized, consumer-oriented discipline, wherein what formerly were public goods (the right to assemble, the right to free speech) are privatized, and become commodities. A person has no digital presence unless she is online, and a person cannot be online unless they have access, which either comes from working at a place which provides such access, or by paying a monthly fee for the privilege of dialing in to the network. Further, by providing what services remain for the State to provide via self-service, online delivery mechanisms (as is the case in California), the state is able to ever more closely monitor the users of those services, in able to ensure their compliance with 'the appropriate regulations.'

A Digital Panopticon?

In addition to the economic operations recognized by the NIIAC as functions of information infrastructure, there remain vestiges of the coercive disciplinary force described in Foucault's *Discipline and Punish* within the vision of the NIIAC.

That there seems to be the perception of a need to re-instate a coercive model of disciplinary power is not unexpected; it is politically expedient, on at least two levels, for the NIIAC to include what amounts to a homily to law enforcement in "Common Ground" and "A Nation of Opportunity." At the first level, it is raw pandering: in order to ensure support by 'law and order' representatives for the program of the NII, offering pork to the police in digital spaces is necessary. On a second level, however, it appears that maintaining the police apparatus in digital spaces allows the State a back door to maintain control, should the private sector go too far, and decide, for example, that it no longer has any use for a state presence in digital space. For Foucault, then:

> The Panopticon, on the other hand, must be understood as a generalizable model of functioning; a way of defining power relations in terms of the everyday life of men (*ibid.,* 205).

This generalizability is what makes the concept of the panopticon useful in the analysis of the NII. Now, though, penitence is not what is sought. The consumerism which is held up as 'participatory democracy' in "Common Ground" and the docility upon which it relies:

> can be insured only if, on one hand, it can be exercised continuously in the very foundations of society, in the subtlest possible way, and if, on the other hand, it functions outside these sudden, violent, discontinuous forms that are bound up with the exercise of sovereignty.

The power of the panopticon flows from the asymmetry of perspective between

the inmates and those in charge of them; the panopticon functions by allowing those in charge complete transparency – they see *everything*, while the inmates see *nothing*: "...the major effect of the Panopticon: to induce in the inmate a state of conscious and permanent visibility that assures the automatic functioning of power" (*ibid.,* 201).

The NIIAC emphasizes the possibilities of a digital information infrastructure for "new and expanded opportunities for communication among people, law enforcement agencies and the criminal justice system." This emphasis on "sufficient capacity and resources to collect and exchange information that promotes the protection and well-being of the people and enables the deterrence of crime" (NIIAC 1995) seems to perversely echo Foucault:

> A whole problematic then develops: that of an architecture that is no longer built simply to be seen...but to permit an internal, articulated and detailed control-to render visible those who are inside it; in more general terms, an architecture that would operate to *transform individuals*; to act on those it shelters; *to provide a hold on their conduct*.... [my emphasis] (Foucault 1979, 172)

The spaces of the information infrastructure are therefore spaces of prevention of crime through ceaseless surveillance. The construction of these spaces is oriented towards "making more effective detection, apprehension and prosecution [of criminals, one assumes], where deterrence fails" (NIIAC 1995). Digital spaces of enforcement are meant by the NIIAC in "A Nation of Opportunity" to be generalized – that is, these spaces are not simply spaces of government enforcement apparatta, but also bring in non-government community and volunteer networks:

> Community-based, in-home, and voluntary support services, done in cooperation with recognized authorities, that may help save lives and property and promote prompt and effective recovery...should be supported (NIIAC 1995).

The point of this expansion is to extend the reach of the information networks which will enable government enforcement agents to detect, prosecute, and punish criminal acts.

> The Federal Government should encourage the development of local and State emergency models that expand the involvement of duly recognized community-based organizations for more effective *public information gathering and dissemination* [emphasis added] (NIIAC 1995).

Inasmuch as the NIIAC seeks a NII which is "ubiquitous", with 'universal' service, **and** given the asymmetry assured by the functional inequality of access and quality of access to the NII resulting from its embeddedness within a neoliberal market mode of production, **and** the asymmetry in the availability of information across users

(so that some can 'see' everything, while others can 'see' very little) the NII, too, can be understood as a panopticon. Further, the emphasis placed on the use of information infrastructure for law enforcement (the harsh reality of law enforcement is softened here by the warmer and fuzzier trope of 'public safety) relies on the creation and expansion of networks of surveillance. This panoptic quality provides only part of the disciplinary power of the NII, however.

The second practices which operate in Foucault's understanding of disciplinary power are the practices of distribution and classification. As described in the introduction, distribution allows for the administration of the objects inhabiting a space, and thus of the space itself. The Taylorist understanding of the role of education in the NII project ("training, education, and adaptation to mechanisms") relies on the administration of citizens in order to ensure their correct functioning in the informational economy. For Foucault, these arts of distribution make up a "perpetual penality that traverses all points and supervises every instant in the disciplinary institutions [which] compares, differentiates, hierarchizes, homogenizes, excludes. In short, it normalizes (*ibid.,* 183).

The recommendation that governments "at all levels" embed the provision of information and services within the NII not only acts as a stimulus for use of the NII, but also serves as a method of surveillance and normalization of those seeking information or services. Logs of information and service requests can show which people are most often using particular information services, and more accurate records can be kept which mirror ever more closely the activities of citizens with regard to government services. Given this information, service provision can be normalized more effectively, as deviant cases are not allowed by 'the computer'.

The focus of the NIIAC on 'Emergency Management and Public Safety" as an essential part of the information infrastructure is doubly revealing: on one hand, the principles which are elucidated in this section outline the further articulation of the information infrastructure as a space of surveillance; on the other hand, the focus of the NIIAC on this topic illustrates the thorough-going approach of the NIIAC to construct with the information infrastructure initiative those spaces which will extend the reach of the 'sovereign' government of the United States of America into digital areas.

The space which formerly existed between the state and citizens (the private sphere) begins to disintegrate in the face of the sorts of economic and coercive discipline advocated within the documents of the NIIAC. The aggregation of *everything* the government knows, has done, and wants to do with a person in a set of interlinked databases is positively frightening, allowing as it does the complete interpolation of government into life. The commodification of existence, through the marketization of

access to digital spaces finishes the decline of the public sphere which began in the late 1960s. In spaces where existence is commodified, the private sphere evaporates, leaving only the public which, *prima faciae*, is the realm of the State. It is this effacement of distance, and ultimately, the private sphere, which is the central concern of Paul Virilio.

4

Trans-Spatial Sovereignties and Securities

A final chapter does two things: it looks back, on what has already been said; and, it looks forward, anticipating that which remains or needs to be said next. First, following this convention, I will look back at what I have already said, and offer a summary of what I think this all means. Second, I will speak of what should happen next, particularly with respect to ways of trying to exercise freedom in spaces which very obviously lend themselves to the extension of disciplinarity.

Barring the rise of an unexpected new military enemy, the battleground of an anarchic world moves from the war room to the board room, as military clashes become economic clashes. The informationalization of the world economy is forcing states to re-evaluate the ways they identify themselves; in digital space, the boundaries (arbitrary or not) which once allowed states to delimit themselves from one another terrestrially no longer exist; further, the economic organization of the world economy already precludes any cut and dried system of classifying whether or not corporations are 'American' or 'British' or 'Japanese' — making these distinctions in digital space is much harder.

As a result, the meaning of sovereignty has begun to change. Instead of the statist orientation which the International Relations of Morgenthau and Waltz which were ideally, some would argue, suited to analog spaces, we begin to find states defining their sovereignty with a spatial orientation, which is more aptly suited to digital spaces. But sovereignty has not only changed for the discipline of International Relations; it has also changed for states themselves.

In seeking to understand new perspectives on sovereignty, we need to focus not on the arbitrary terrestrial boundaries which have delimited states in the past, but instead on the even *more* arbitrary boundaries of digital spaces, which can be written and re-written infinitely. The work of Lefebrve and Foucault, with their more and less explicit understandings of the disciplinary nature of spatial constructions helps us to understand the acts of information infrastructuring advocated by the National Information Infrastructure Advisory Council as acts aimed at the extension and legitimation of analog sovereignty into and over digital spaces. These actions enact disciplinarity not only in the traditionally coercive sense that social theorists have understood for generations, but in a new economizing way, as well. The shift of the very rules of existence which occurs in

the move from analog to digital spaces is crucial to the expansion of disciplinarity which is occurring: no longer is existence itself free (as it was, at a basic level, in analog space), instead, existence in digital spaces must be bought, leased, or stolen from the private sector. As a result, the rights of free assembly and speech are history; only a quaint anachronism is the idea of 'free information'.

The net result of these actions, we are told by Paul Virilio, is the mutation of the war machine of the Cold War (v. 1.0, a Politico-Military complex) into war machine v.2.0 (a Politico-Military-Entertainment complex). At this point, it is worthwhile to consider for a moment Virilio's image of what is happening to the existence of the subject in the face of the informational war machine.

Virilio attempts to come to grips with the speed of communications made possible by information infrastructures, and the ways in which this 'terminal' or 'absolute' speed obliterates space. His ruminations on the instantaneity offered by computer networks provide a perspective which is somewhat different from that offered by Foucault and Lefebrve. Lefebrve speaks of 'produced space', Virilio speaks of 'obliterated [Euclidean] space'; Foucault speaks of discipline,Virilio speaks of endocolonization (Virilio 1984). For Virilio, network space, the space of information infrastructures, **is** an architecture of disciplinarity.

In his latest writings and interviews, Virilio has begun to grapple explicitly with informational networks which exist in cyberspace. In addition to the two books which have most recently appeared in English translation - *The Vision Machine* and *The Art of the Motor* - Virilio has been engaged in numerous interviews on the effects of the "absolute speed" of cyberspace.

The discussions of speed and its effects on politics and sovereignties in Virilio's newest works confront directly the problematics generated when modernist conceptions of identity crash into the speed of cyberspaces. The self-conscious situation of his most recent narratives within the sites of cyberspaces makes this subset of his work most valuable to the present study. Virilio's work is actively skeptical, even pessimistic, towards the possibility that the generalization of cyberspaces can or will serve as the liberatory force which betters the standard of living of everyone (as exponents such as Negroponte contend) within their coverage.

In *The Art of the Motor*, Virilio sites network space as the space in which obliteration of sight takes place through absolute, or Pure, Speed. Instantaneity obliterates perspective, and the notions of identity based thereon. Herein lies the qualitative difference between what Lefebrve calls "Euclidean" space, and cyberspace - within 'Euclidean' space, distance, and therefore difference, exists, albeit perhaps in ever-

decreasing measure; in cyberspace, difference does not exist, as space is reduced to the lag between the departure and arrival of electromagnetic pulses.

In his understanding of the internet and network society, Virilio cites the changing complexes which guide development in post-industrial society: the first of these, the military-industrial complex is that which began the development of the internet as ARPANET; the second of these is the military-scientific complex, which "is the Vietnam War and Star Wars" (Virilio 1995); the third and present complex is the military-informational complex, wherein war is no longer fought in a 'geosphere', but is instead fought within an 'infosphere' (Virilio 1995). This first complex began, as the reader will recall, the process of moving life from analog spaces to digital spaces, the second moved the process along more rapidly in the name of national security, and the third one, in which we are all implicated to a greater or lesser degree, will complete the task. This global implication implies, ultimately, slavery to the complex, as more and more of life becomes caught up in the consumption and production of network-salable knowledge.

One of the major themes which has arisen in his most recent work is the concept of the 'global accident' (Oleveira and Virilio, 1996):

> The information revolution which we are currently witnessing ushers in the era of the global accident. The old kind of accidents were localized in space and time: a train derailment took place, say, in Paris or in Berlin; and when a plane crashed, it did so in London or wherever in the world. The catastrophes of earlier times were situated in real space, but now, with the advent of the absolute speed of light and of electromagnetic waves, the possibility of a global accident has arisen, of an accident that would occur simultaneously to the world as a whole.

The global accident is a result of the terminal speed of networked society. The instantaneity of digital communication, occurring at the 'absolute speed' of light, effaces the distance which in the past has mitigated the effects of a disaster; earthquakes, hurricanes, even terrorist attacks - all of these, which were in the past localized, become global events. Virilio points to the stock market crash of 1987 as an example of a prototypical 'global accident'(Virilio 1995b). For Virilio, these 'global accidents' are caused by the lack of orientation which results from the "dictatorship of speed" (Virilio, 1995b). This lack of orientation is the inability to maintain the equilibrium which depends on the existence of spaces to insulate humanity from the effects of the terminal speed of communications and of the effects of communications. It may be that for Virilio, the 'global accident' is the consequence of the demise of representational logic, and the result of the panoptic, visual obscenity (Baudrillard 1983) which subsumes representational logic. The obliteration of distance — spatial or temporal — is the oblteration of

'reasoning' space. The distance of reflection which has in previous eras buffered one population from the immediate reproduction of another population's problems is replaced by immediate reaction. In such obscene spaces, the notion of meaning is value-less. Things are what they appear to be.

The discussion of the global accident continues for Virilio in his references to "informational Chernobyls" (*Terminal* 62):

> ...there are three bombs. The first has exploded, the atomic bomb. The second, this is the information bomb (he didn't say 'informatic', but one does today). The third is for the next century, the demographic bomb. The informatic bomb explodes only when one crosses multimedia and generalized digitalization of all information. The informatic Chernobyl will start [my translation].

The phrase "informatic Chernobyl" deserves closer attention. Chernobyl, in ecological discourses, is a signifier for modernity run amok, for an accident the full effects of which will not be known for decades. The meltdown at the Chernobyl nuclear station killed many of those who were to be served by it, and sterilized the surrounding environment through extravagant pollution.

This is the way in which Virilio sees the cross between 'multimedia and generalized digitalization of all information': the rampant proliferation of 'information' drowns out the narratives which help form meaning. This leaves populations barren and dependent on the never-ending stream of data bombarding them in order to survive; ultimately, perhaps, we become filter-feeders in an ocean of data.

Virilio sees the movement of cultural, economic, and governmental structures into digital spaces (exemplified in the present work by the US National Information Infrastructure) as a quantum leap in the articulation of disciplinary surveillance and in the obliteration of meaning:

> From the 90s onwards, or to be more precise, since the Gulf War and the emergence of the information (super)highways, we have emerged into a world that has nothing anymore in common with the world of history as we knew it....History is simply smashing into the wall of time....On the one hand, it is a very positive thing because it enables humanity to be brought together. But at the same time, it represents a totalitarian experience of the prime order! (Oliveira and Virilio 1996).

Here, Virilio allows for the posibility of a more dialectical understanding of digital existences. The form of the dialectic is seductive for this sort of undertaking, as it is based on a binary which immediately coexists. It may, in fact, be that technology has finally caught up to theory in this regard. A dialectical understanding of digital existences must therefore posit, along with the obvious potential for increased disciplinarity, the existence

of a potential for liberatory moments.

The Ethics(?) of Digital Existence

In his *Ctheory* article "Speed and Information: Cyberspace Alarm", Virilio sums up succinctly his position on the future of political life in digital spaces[17]:

> We have to acknowledge that the new communication technologies will only further democracy if, and only if, we oppose from the beginning the caricature of global society being hatched for us by big multinational corporations throwing themselves at a breakneck pace on the information superhighways.

Virilio's position is, at times, an extreme one. His critique of the informationalization of society provides a useful corrective to the cyber-boosterism to which we are exposed daily. Virilio's take on the existence of the Subject in digital spaces is an apocalyptic one in its emphasis on the domination which he sees as "latent in technology". Yet, he does not offer, other than the ethic of 'opposition', any greater understanding of what it means to be a Subject and Object in digital space.

Virilio offers no hope for a digitized future — the effacement of distance, it seems, can only lead to an effacement of meaning, as cause becomes effect, and image becomes meaning. Except for the most reactionary Luddites, living without technology (or more accurately, digital technology) is probably not an option. Even the most radical academics do their work (or have it done) on computerized word processors, so as Lenin put it (in another context) "What is to be done?"

The ethics of existence in digital spaces are tied up with the question of Subjectivity in such spaces. Lefebrve privileges the Subject, re-inscribing a Subject/Object binary which has its roots in Marx's historical materialism. Foucault, at the time of *Discipline and Punish*, seemed to be working toward a reworking of this binary into an effect of self-practice[18]. That is, the process of self-subjectification (of making oneself a Subject — of gaining Subject-hood), required a process of self-objectification, in order that a being would be able to realize the practices necessary to ensure Subjectivity.

The ethics of self-practice, of 'care of the self' (*souci de soi*), realizes the importance of dialectical existence. In digital space, as has already been noted, the process

---

[17] It seems to me clear that existences, insomuch as they are concerned with carving one's identity(s) in digital spaces, is political to the extreme; this does not mean that existence is *only* political, but that the political dimension looms quite large.

[18] This reworking comes to fruition in *The History of Sexuality*. In this series, Foucault considers how Subjectivity is not a given characteristic of humans, but is instead an end which is arrived at through practices of self-creation.

of the construction of spaces (for commerce, expression, governance) is caught up intensely with the content to be provided in those spaces. This presents an interesting framework for the articulation of digital subjectivities: no longer can the Subject be seen as the 'content' which exists within a corporeal form; in digital spaces 'content' conflates with 'form'. As a result, the ethic of self-practice offered by Foucault seems to be a likely beginning for the theorization of digital subjectivities. It would seem that there is an alternative path between the complete abandonment of technology, or the total acceptance of a surveilled, mapped life. Kroker and Weinstein, in their book *Data Trash*, argue for an existence quite close to Levi-Strauss's notion of the *bricoleur*, in which inhabitants of cyber-society practice their subjectivities through the acquisition of skills which enable them to effect spatial productions in digital realms: by learning to code spaces, one is able to carve out a space one's own. In essence, one subjectifies oneself by writing space.

A more nuanced understanding of digital subjectivities would embrace a dialectical understanding of the nature of digital discipline. Without such an understanding, it is far too easy to recline into a position of utter apathy, which not only allows for the faster spread of domination (through architectures of digital discipline), but a more thorough-going penetration of discipline. By recognizing that there are inherent possibilities of domination within digital infotectures, the inhabitants of those spaces are more able to make judgements as to what shape they would like the spaces they inhabit to take. If digital denizens refuse to use a certain facility or service, the drive for profit will immediately mark that service for extinction.

As a greater portion of life activity takes place in digital spaces, those who are able to 'speak' in binary have a greater opportunity (and indeed a greater responsibility) to effect liberating change. One of the ways that this occurs is through digital spaces which provide visitors futher instruction in speaking in digital spaces — these take the form (currently) of sites dedicated to HTML instruction, or sites dealing with how to program in PERL[19]. The provision of instruction for free online can be seen as an analog to efforts at free public education. A second, and far more newsworthy, way of effecting liberating change through one's online voice is in the area of encryption. Strong encryption is a key to maintaining confidentiality in online existence. Phil Zimmerman's PGP (Pretty Good Privacy) is a product, available free of charge, which allows users to

---

[19] HTML (HyperText Markup Language) is the *lingua franca* of the WWW; PERL (Practical Extraction and Reporting Language) is the language which automates most of the WWW's dynamic content.

keep their email confidential. Until a recent court decision, such strong-crypto programs were classified by the US Department of State as 'munitions', and were subject to the same export controls as landmines. Although the court has ruled against the control of strong crypto as inhibiting free speech, the FBI maintains that it is necessary for Federal law enforcement authorities to have access to the keys in order to maintain public safety. In each of these two cases, having access to knowledge and tools allows users to speak more fluently and freely, and thus be able to more easily construct their own digital spaces online.

The seeds for this sort of digital self-wrighting are already in the initiatives of the NIIAC. What must occur is that the initiatives aimed at making digital life 'affordable and ubiquitous' must be seized for purposes other than the neoliberal economic growth which seems to have driven the vision of the NIIAC.

This is obviously no simple matter — the act of seizure of these initiatives also immediately imbricates those who would seize them within the very system they seek to change. That a group plans to exhibit anti-State art online should not obscure the fact that someone, somewhere, is forced to pay for the bandwidth which carries such an exhibition. What may well be needed are provisions for 'Public Spaces' in digital realms. The precedent for State intervention to this end exists in the legislation governing local cable television monopolies, but the construction of a digital, quasi-public sphere could come at the behest of various interest groups who might purchase chunks of bandwidth to disperse piecemeal to those authors/creators/performers who have something worthwhile to say. The state intervention which was just mentioned could come either in the form of subsidies for 'non-profit internet providers', or through legislative mandates that a certain percentage of a carriers bandwidth be set aside for giving away to non-profit or public interest groups.

The digitalization of information infrastructure offers a crucial opportunity, and a critical choice: digitized spaces can either become incrementally (and infinitely) privatized spaces the existence of which is driven purely by a profit motive, or these can be spaces where the low marginal cost of adding a user can result in the creation of public spaces online.

Bibliography

Richard K. Ashley, 1986. "The Poverty of Neorealism" in *Neorealism and Its Critics*, Robert O. Keohane, ed. Columbia U. Press, New York.

Jean Baudrillard, 1983. *Simulations*, trans. Paul Foss, Paul Patton, and Philip Beitchman. Semiotext(e), New York.

David Campbell and Michael Dillon, eds., 1993. *The political subject of violence*. Manchester University Press: Manchester.

Manuel Castells, 1996. *The Rise of Network Society*. Blackwell Publishers, New York.

Lynne Cherney and Elizabeth R. Weise, eds. 1996. *wired women: Gender and New Realities in Cyberspace*. Seal Press, Seattle.

Simon Dalby, 1991. "Critical geopolitics: discourse, difference, and dissent" in *Environment and Planning D: Society and Space*, volume 9, pp. 261-283.

Simon Dalby, 1990. *Writing the Second Cold War*. Pinter Publishers, London.

Michel Foucault, 1991. "Governmentality" in *The Foucault Effect: Studies in Governmentality*, Graham Burchell, Colin Gordon, and Peter Miller, eds. U. of Chicago Press, Chicago.

Michel Foucault, 1986. "Of Other Spaces" in *Diacritics*, spring 1986, pp. 22-27.

Michel Foucault, 1984. *The History of Sexuality, vol. I*. Vintage Books, New York.

Michel Foucault, 1980. "Questions on Geography" in *Power/Knowledge: Selected Interviews and Other Writings 1972 - 1977*, Colin Gordon, ed. Pantheon Books, New York.

Michel Foucault, 1979. *Discipline and Punish: The Birth of the Prison*. Vintage Books, New York.

Jim George, 1994. *Discourses of Global Politics: A Critical (Re)Introduction to International Relations*. Lynne Reinner Publishers, Boulder.

Donna Haraway, 1993. *Simians, Cyborgs, and Women*. Routledge Press, New York.

Michael Joyce, 1995. *Of Two Minds: Hypertext, Pedagogy, and Poetics*. Michigan U. Press, Ann Arbor.

Robert O. Keohane, 1986. "Theory of World Politics: Structural Realism and Beyond" in *Neorealism and Its Critics*, Robert O. Keohane, ed. Columbia U. Press, New York.

John W. Kingdon, 1984. *Agendas, Alternatives, and Public Policies*. Harper Collins, New York.

Arthur Kroker and Michael Weinstein, 1994. *Data Trash: The Theory of the Virtual Class*. St. Martin's Press, New York.

Henri Lefebrve, 1995. *The Production of Space*. Basil Blackwell, London.

Sylvère Lotringer and Paul Virilio, 1994. *Pure War*. Semiotext(e), New York.

Timothy W. Luke, 1996a. "The Politics of Cyberschooling at the Virtual University." Presented at "The Virtual University?" Symposium, University of Melbourne: 21-22 November, 1996.

Timothy W. Luke, 1996b. "On Politics in Network Environments: Nineteen Theses on Cybersubjectivity in Hyperreal Infostructures" unpublished research paper.

Timothy W. Luke, 1995. "Fixing Identity, Fabricating Space: Sovereignty and Territoriality After the Cold War" in *Political Geography*, 15, no. 6/7 (1996), 491 - 507.

Hans J. Morgenthau, 1985. *Politics Among Nations*, 6th ed. McGraw Hill, New York.

Steven Miller, 1996. *Civilizing Cyberspace: Policy, Power, and the Information Superhighway*. Addison-Wesley, New York.

Stuart Moulthrop, 1995. "No War Machine" Work in Progress. INTERNET: http://www.ubalt.edu/www/ygcla/sam/essays/war_machine.html

Nicholas Negroponte, 1995. *Being Digital*. Vintage Books, New York.

Gearoid Ó Tuathail, 1997. *Critical Geopolitics*. University of Minnesota, Minneapolis.

Carlos Oliveira and Paul Virilio, 1996. "Global Algorithm 1.7: The Silence of the Lambs: Paul Virilio in Conversation" trans. Patrice Riemens. in *Ctheory* 6.12.96, at http://www.ctheory.com/ga1.7-silence.html.

Mark Poster, 1990. *The Mode of Information: Poststructuralism and Social Context*. University of Chicago Press, Chicago.

Juan Rogers, 1996. *Implementation of a National Information Infrastructure: Science and the Building of Society*. Unpublished Ph.D. dissertation, Virginia Polytechnic Institute and State University, Blacksburg, VA.

Michael Storper and Richard Walker, 1989. *The Capitalist Imperative: Territory, Technology, and Industrial Growth*. Blackwell Publishers, London.

Paul Virilio, 1995a. *Art of the Motor*. University of Minnesota Press, Minneapolis.

Paul Virilio, 1995b. "La guerre de l'information: Paul Virilio au micro de Frédéric Burnand" trans. Christopher Couples in *Telecom Observer*, 11 October, 1995.

Paul Virilio, 1995c. "Speed and Information: Cyberspace Alarm!" in *Ctheory*, 27 Aug. 95 at http://www.ctheory.com/a30-cyberspace_alarm.html.

Paul Virilio, 1990. *Popular Defense and Ecological Struggles*. trans. Mark Polizzotti. Semiotext(e), New York.

Paul Virilio, 1986. *Speed and Politics*. trans. Mark Polizzotti. Semiotext(e), New York.

R.B.J. Walker, 1993a. *Inside/Outside: International Relations as Political Theory*. Cambridge U. Press, Cambridge.

R.B.J. Walker, 1993b. "Violence, modernity, silence: from Max Weber to international relations" in *The political subject of violence*, David Campbell and Michael Dillon, eds. 1993: Manchester University Press: Manchester.

Kenneth Waltz, 1986. "Reductionist and Systemic Theories" in *Neorealism and its Critics*, Robert O. Keohane, ed. Columbia U. Press, New York.

Cynthia Weber, 1995. Simulating Sovereignty: Intervention, the State and Symbolic Exchange. Cambridge University Press, Cambridge.

Puay Yang, 1995. "Institutional instability, governance and telematics." Review of International Political Economy 2:4 (Autumn 1995).

Christopher Couples

Curriculum Vitae

Degrees Awarded:

M.A. in Political Science, Virginia Polytechnic Institute and State University, December 1997

B.A. in Political Science, Virginia Polytechnic Institute and State University, May 1994

Current Position:

Social Sciences Computing Coordinator, Swarthmore College.

Teaching Experience:

Spring 1997:

Teaching Assistant, Department of Political Science, Virginia Polytechnic Institute and State University. Served as departmental computing resource, as well as teaching assistant for Dr. Ilja A. Luciak.

Fall 1996:

Teaching Assistant, Department of Political Science, Virginia Polytechnic Institute and State University. Assisted Dr. Glenn W. Richardson in teaching Political Communications. Was responsible for grading and quizzing. Aided in development of online content for the class.

Computer Consultant and Webmaster, Department of Political Science, Virginia

Polytechnic Institute and State University. Responsible for software and hardware installation, maintenance, and troubleshooting. Aided in development and implementation of online materials by faculty. Maintained departmental website, with major face-lift executed in October, 1996.

Summer 1996:

Computer Consultant and Webmaster, Department of Political Science, Virginia Polytechnic Institute and State University. Responsible for software and hardware installation, maintenance, and troubleshooting. Developed university prelaw website. Served as technical support for Dr. Timothy W. Luke's online Introduction to Political Theory classes.

Spring 1996:

Teaching Assistant, Department of Political Science, Virginia Polytechnic Institute and State University. Assisted Dr. Timothy W. Luke in preparing online content for Introduction to Political Theory (CyberTheory) classes to be taught in Summer, 1996. Was responsible for HTML coding and design execution for the CyberTheory classes.

Computer Consultant and Webmaster, Department of Political Science, Virginia Polytechnic Institute and State University. Responsible for software and hardware installation, maintenance, and troubleshooting. Developed departmental website, and laid groundwork for increased use of online materials by faculty.

Fall 1995:

Teaching Assistant, Department of Political Science, Virginia Polytechnic Institute and State University. Assisted Dr. Ilja A. Luciak in teaching Introduction to Comparative Government and Politics. Was responsible for grading and video presentations.

Spring 1995:

Teaching Assistant, Department of Political Science, Virginia Polytechnic Institute and State University. Assisted Dr. Ilja A. Luciak in teaching Introduction to Comparative Government and Politics. Was responsible for grading and video presentations.

Fall 1994:

Teaching Assistant, Department of Political Science, Virginia Polytechnic Institute and State University. Served as departmental generalist, filling in when needed to lecture for professors, as well as handling miscellaneous duties. Aided Dr. Ilja A. Luciak in the preparation of his book, *The Sandinista Legacy: Lessons From a Political Economy in Transition* (University of Florida Press, 1995) for publication.

Research Interests:

The politics and political economy of informational society; political economy, international relations, as well as the politics of development.

Conference Papers:

"Digital (Dupli)cities: Techniques of the Self(s) in Online Spaces." Paper to be presented at the annual meetings of the Southern Political Science Association, Norfolk, VA, November 5-8, 1997.

"Net Sovereignty? International Relations in the Age of the Internet." Paper presented at the annual meetings of the Midwest Political Science Association, Chicago, IL, April 10-12, 1997.

"Academic Infotecture: Course Design for Cyberschool" with Timothy W. Luke. Paper presented at the annual meetings of the Southern Political Science Association, Atlanta, GA, November 7 - 9, 1996.

"The Internet as War Machine: Deleuzian and Virilian Approaches." Paper presented at the annual meetings of the International Studies Association - South, Roanoke, VA, October 25 - 27, 1996.

Conference Presentations:

"Teaching Political Theory on the Internet" with Timothy W. Luke. Presented at Mid-Atlantic Alliance for Computers and Writing Conference, Blacksburg, VA, October 4 - 5, 1996.

Grants and Awards:

Travel Grant, Fall 1996. Graduate Student Association, Virginia Polytechnic Institute and State University.

Travel Grant, Fall 1996. Department of Political Science, Virginia Polytechnic Institute and State University.

Research Experience:

Fall 1996:

Worked with Dr. Ilja Luciak to code and analyze data from surveys conducted in Nicaragua concerning the role of women in the revolutionary movement there. My responsibilities included devising a coding scheme from pre-existing surveys, coding the data, supervising the entry of the data into an SPSS datafile, and then the analysis of the data using SPSS. I then consulted with Dr. Luciak on the significance of the data for the project at hand.

University Service:

Representative — 1996 - 1997, Department of Political Science to the Graduate Student Association of Virginia Polytechnic Institute and State University.
Member — 1996 - 1997, University Council of Virginia Polytechnic Institute and State University, representing Graduate Student Association.
Graduate Representative to the Department of Political Science — 1996 - 1997, Virginia Polytechnic Institute and State University.

References available upon request.