

Virilio, War, and Technology: Some Critical Reflections

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Paul Virilio is one of the most prolific and penetrating critics of the drama of technology in the contemporary era, especially military technology, technologies of representation, and new computer and information technologies. For Virilio, the question of technology is *the* question of our time and his life-work constitutes a sustained reflection on the origins, nature, and effects of the key technologies that have constituted the modern/postmodern world. In particular, Virilio carries out a radical critique of the ways that technology is transforming the contemporary world and even the human species.

Yet I want to argue in this study that Virilio has a flawed conception of technology that is excessively one-sided and that misses the emancipatory and democratizing aspects of new computer and media technologies. My argument is that his vision of technology is overdetermined by his intense focus on war and military technology and that this optic drives him to predominantly negative and technophobic perspectives on technology per se. However, precisely the one-sidedness and extremely critical discourse on war and military technology, as well as his reflections on war, cinema, technologies of representation and vision machines, constitute some of the most valuable aspects of his work.

Consequently, in the following pages I will follow Virilio in pursuing what he calls the "riddle of technology" and interrogate his attempts to elucidate this conundrum. Nowhere, however, does Virilio directly theorize technology in any systematic or sustained way, although reflections on it permeate his analyses. Thus, I want to probe Virilio's perspectives on technology to determine the extent of his insight and use-value, and to indicate what I see as the limitations of his perspectives. In this reading, Virilio emerges as one of the major critics of war, technology, and vision machines in our time, albeit with excessively negative and even technophobic proclivities.

Speed, Politics, and Technology

We must take hold of the riddle of technology and lay it on the table as the ancient philosophers and scientists put the riddle of Nature out in the open, the two being superimposed (Virilio and Lotringer 1983: 30).

Totalitarianism is latent in technology (Virilio 1995a).

In *Speed and Politics* (1986 [1977]), Virilio undertakes his first sustained attempt to delineate the importance of accelerated speed, of the impact of technologies of motion, of types of mobility and their effects in the contemporary era. Subtitled "Essay on Dromology," Virilio proposes what he calls a "dromomatics" which interrogates the role of speed in history and its

important functions in urban and social life, warfare, the economy, transportation and communication, and other aspects of everyday life. "Dromology" comes from the Latin term, *dromos*, signifying race, and dromology studies how innovations in speed influence social and political life. The "dromocratic revolution" for Virilio involves means of fabricating speed with the steam engine, then the combustion engine, and in our day nuclear energy and instantaneous forms of warfare and communication.

Virilio was initially an urbanist who suggests that the city is a dwelling place organized by channels of communication and transportation, penetrated by roadways, canals, coastlines, railroads, and now airports. Each crossing has its speed limits, its regulations, and its systematic enclosure and spaces within a system of societal organization. The city itself is a conglomeration of these roads, a stopover for travel, and a system of "habitable circulation" (Virilio 1986: 6). City life unfolds in the spectacle of the street with its progressions and movements, its institutions and events, mobilizing and moving flows of traffic and people. Likewise, politics unfolds in the streets and urban sites of demonstration, debate, revolt, and revolutionary insurrection.

For Virilio, the city and its institutions have military origins. In his view, the medieval cathedral and early modern fortified cities were military camps. In Virilio's words: "Before it became the throne of totality, the Christian sanctuary was a stronghold, a bunker, a fortified church for those who remained within it; all their powers and capacities were deployed and strengthened in, through and as combat" (1986: 38). Likewise, although Virilio himself does not make this point, the early Christian missions in the Americas were military fortifications used by the colonizing powers as defense and control mechanisms.

The vector is a key term for Virilio that indicates the trajectory of various technologies along a fixed length and direction, but from no fixed point. It refers to any trajectory along which goods, money, information, or military apparatuses can flow, including roadways, airwaves, and communication and military circuits. Territory is the space across which speed, technology, politics, economics, and urban and everyday life flow across vectors of transportation, commerce, war, social interaction, communication, and information. From a political and military perspective, territory is the space of human habitation, it is a space to be defended and secured, and to be invaded and colonized. Within modern societies, the nation-state was the territory that defined politics and the city, with its public spaces and institutions, serving as its privileged site. In the contemporary world, however, the city has been displaced by technologies of speed and power. In the military sphere, the city no longer serves as a break against military conquest and as a site of protection of its citizens when instantaneous military violence can assault it from hidden spaces (airplanes, nuclear submarines, and missiles). With politics occurring through media and information circuits, the time of deliberation and consensus is obliterated. Space and time are thus overwhelmed by technologies that travel at ever faster speeds and when new technologies instantaneously circulate images and information across space.

Dromology also involves analysis of the forces that brake or diminish speed as well as those forces that accelerate it. War, for instance, involves both offensive attempts to rapidly control space and territory contrasted to defensive efforts to slow down the attack, to decelerate the

offensive, just as laws and rules brake or slow down certain actions deemed destructive to the community. Virilio claims that, strictly speaking, there was no production of speed until the 19th century with the combustion engine to the electric telegraphy, in which first transportation is greatly speeded up and then communication takes place instantaneously over great distances, thus obliterating traditional barriers of time and space. Consequently, the generation of modernity involves transition from age of the brake to that of the accelerator (Virilio and Lotringer 1983: 44f), as intensification of speed generates new economic, political, social, and other forms.

Virilio argues that the role of speed had been previously overlooked in the organization of civilizations and politics and that speed is crucial to the production of wealth and power. Resolutely rejecting the forms of economic determinism associated with Marxism, Virilio's dromology focuses on those instruments that accelerate and intensify speed and that augment the wealth and power of those groups who control them. In his vision, the military comes to control speed and thus to become a dominant societal power. This situation produces an accelerating decline of the state and politics and primacy of the military, which, for Virilio, becomes a key force in politics and society whose importance he believes is usually underestimated.

From the beginning, Virilio was concerned to theorize the interconnection between speed, technology, and war. On Virilio's view, the importance of warfare in understanding human history had been grossly underestimated. Initially an urbanist and specialist in architecture, Virilio came to the view that war was at the center of civilization, that the city, for instance, was formed as a garrison for warfare, that need for defense and the preparation for war was at the origins of the foundation of cities.[1] For Virilio, war involved the organization of space, through preparing and undertaking the conquering of territory, and thus in terms of logistics, offensive tactics, strategy, and defense, there was a unique spatial organization for war. Defense required slowing down the enemies' military assault and cities provided walls, ramparts, fortresses, and enclosed areas that could repel invasion, that could protect individuals gathered within its spaces.

For Virilio, logistics, the preparation for war, is the beginning of the modern industrial economy, fuelling development of a system of specialized and mechanized mass production. War and logistics require increased speed and efficiency, and technology provides instruments that create more lethal and effective instruments of war. The acceleration of speed and technology, in turn, create more dynamic industry, and an industrial system that obliterates distances in time and space through the development of technologies of transportation, communication, and information. The fate of the industrial system is thus bound up with the military system which provides, in Virilio's vision, its origins and impetus.

Thus, on Virilio's optic, cities, cathedrals, the economy, politics, and other key aspects of the modern world are products of military mobilization and deployment, thus war serves as the motor of history, culminating in what Virilio calls "pure war." In Virilio's view, the system of deterrence in the Cold War nuclear stalemate created a situation in which technological development channels technology into military forms and technocratic political domination. In this situation, "Weapons and armor constantly need to be strengthened. Technological development thus lead to economic depletion. The war-machine tends toward societal non-development" (Virilio and Lotringer 1983): 5). With more and more resources going to the

military and military imperatives dominating production, government, and the evolution of science and technology, societal development is undermined and social underdevelopment becomes a defining mark of the contemporary world.

In addition, for Virilio, the acceleration of events, technological development, and speed in the current era designates "a double movement of implosion and explosion," so that "the new war machine combines a double disappearance: *the disappearance of matter in nuclear disintegration and the disappearance of places in vehicular extermination*" (Virilio 1986: 134). The increased speed of destruction in military technology is moving toward the speed of light with laser weapons and computer-controlled weapons systems constituting a novelty in warfare in which there are no longer geo-strategic strongpoints since from any given spot we can now reach any other, producing what Virilio calls "a strategy of Brownian movement through geostrategic homogenization of the globe" (Virilio 1986: 135). Thus, "*strategic spatial miniaturization* is now the order of the day," with microtechnologies transforming production and communication, shrinking the planet, and preparing the way for what Virilio calls "pure war," a situation in which military technologies and an accompanying technocratic system come to control every aspect of life.

In Virilio's view, the war machine is the demiurge of technological development and an ultimate threat to humanity, producing "a state of emergency" in which nuclear holocaust threatens the very survival of the human species. This involves a shift from a "geo-politics" to a "chronopolitics," from a politics of space to a politics of time, in which whoever controls the means of instant information, communication, and destruction is a dominant socio-political force. For Virilio, every technological system contains its specific for of accident and a nuclear accident would, of course, be catastrophic. Hence, in the contemporary nuclear era, in which weapons of mass destruction could create an instant world holocaust, we are thrust into a permanent state of emergency that enables the nuclear state to impose its imperatives on ever more domains of political and social life.

Politics too succumbs to the logic of speed and potential holocaust as increased speed in military violence, instantaneous information and communication, and the flow of events diminishes the time and space of deliberation, discussion, and the building of consensus that is the work of politics. Speed and war thus undermine politics, with technology replacing democratic participation and the complexity and rapidity of historical events rendering human understanding and control ever more problematical. Ubiquitous and instantaneous media communication in turn makes spin-control and media manipulation difficult, but essential, to political governance. Moreover, the need for fast spin control and effective media politics further diminishes the space and role of democratic political participation and interaction.

Disappearance and Loss: Virilio's Complaint

We now have the aesthetics of the disappearance of a numerical, unstable image of fleeting nature, whose persistence is exclusively retinal (Virilio 1991a: 36).

Throughout his works, Virilio describes the loss of key human capacities and powers in the

contemporary world under the influence of always accelerating technology. While from the 1970s to the present, Virilio discusses the decline of politics in a technological world in which individuals are losing control over their technology, society, and polity, *The Lost Dimension* (1991b [1984]) deals with the decline of the city, its decentering and displacement in the information and postindustrial society and, crucially, the loss of the object, of the very concreteness of lived experience in a new world of technologically-generated representations and modes of vision.

For Virilio, the city is decentered in relation to the rise of suburbs and then telecommunications and new sites of work and interaction in a postindustrial society. Virilio's "overexposed city" is penetrated by media and advertising, information technology, and what Debord called "Society of the Spectacle," overwhelming urban space and life. In Virilio's vision (1991b: 9ff.), the urban wall and gateways have given way to a plethora of openings to media channels, information and communication networks, and diverse new technologies. Each technology is a window to the outside world, obliterating urban boundaries and spaces to the geopolitical channels of the global world and the world of atopic cyberspace. Exposed to global culture and communication, the city loses its specificity and city life gives way to technological cyberlife, an aleatory, heterogeneous and fractured space, and a world-time that enables individuals to experience events simultaneously from every time zone in the world.

Henceforth, fragmentary images derived from diverse sources constitute one's "image of the city," rather than the grids of maps or personal experience. Virilio is analyzing a momentous shift in the image and imaging of the world, of what he calls a "morphological irruption," of an "iconological disruption" mutating from perception to quantitative representation and then to digitization. This shift in experience progressively volatilizes the real and obliterates the object of lived experience into technological modes of representation, that constitute a derealization and dematerialization of the object. That is, whereas the object of lived experience was once an object of perception, an object seen and handled by the bodily subject, the objects of cyberspace and virtual reality -- as well as the objects of contemporary scientific theory -- are abstract and immaterial, generating a new form of technological idealism.

For Virilio, theories of light and speed replace time and space, as a new immateriality and "new illuminism" comes to dominate contemporary scientific thinking. Virilio believes that as with the notions of critical mass or temperature, when states of affairs break up and become radically other, space too becomes "critical" (Virilio 1997b: 9ff). The notion of "critical space" refers to the breaking up and dissolution of previous configurations of space under the impact of technology. For Virilio, telecommunication that eradicates all duration and extension of time in the transmission of messages and images, as well as mass transportation and interactive computer technologies that decenter urban or lived space, all constitute threats and dissolutions of previous configurations of experience as space becomes virtual and takes on new modalities. Previous configurations of space and time are replaced by time-light (i.e. the time of the speed of light) and a new "lumiocentrism" (1997b: 5f and 14f), in which the instantaneous flow of information ruptures previous configurations of time and space, requiring new concepts to describe the parameters and processes of the new worlds of technology and technological experience.

For Virilio, developments in science and technology are obliterating both modern and common sense views of the world and producing new objects and spaces that cannot be explained by current conceptual schemes. The "physics of the infinitesimally small" and the cosmological speculations on outer space produce novelties and puzzles that put in question the facts of perception, the realm of experience, and that point to new, unperceived and imperceptible entities, that confound common sense and current scientific schemes (Virilio 1991b: ff). Moreover, new technologies are producing both new objects (i.e. cyberspace, virtual reality, etc.) and new modes of perception and representation (i.e. fractal geometry, computer-generated representations of external and internal realities, etc.) that themselves require new modes of thought and cognition. Such shifts in modes of perception and representation began with cinematic photography that captured motion and phenomena not visible to the naked eye, increased with developments in microscopes and telescopes, and proliferated new modes of perception and representation with computers and new virtual technology.

In short, Virilio is mourning the loss of the object of ocular perception in the emergent forms of technological perception and representation, the displacement of the dimension of direct observation and common sense (1991b 111), and thus the loss of the materiality and concreteness of the objects of perception, the realm of appearance and lived experience. In other words, Virilio mourns the loss of the phenomenological dimension that privileged lived experience. Always a phenomenologist, as he affirms in his interview with John Armitage in this issue, Virilio roots his thought in concrete experience of objects, people, and processes in the observed and experienced worlds of everyday life and the natural and social worlds. The new technological worlds, for him, constitute a break and rupture with ordinary experience and thus shift the locus of truth, meaning, and validity to, for Virilio, an abstract and enigmatic virtual realm.

Contemporary science and technology for Virilio are thus producing new forms of experience, new modes of perception and representation, and new objects of experience that decenter the human subject, that replace human cognition with technological vision, and displace human labor power in favor of automated technological production. Losing control over its world, the human subject becomes a mere recording device and the human body is reduced to functions in a technological system. Material reality is decentered and a new technological idealism generates concepts increasingly distant from common sense, the body and material world, the conceptual systems of the past, and lived experience.

In addition to the loss of the concrete object of perception, of the realm of appearance and material reality, of the body, Virilio mourns the disappearance of the city, the state, and the end of politics in the new globalized technopolis. Just as computer-aided production and a new virtual form of automation displace human labor power, so too does "flexible accumulation" (David Harvey), the new global division and organization of production, and international financial markets, data bases, and simultaneity of information transmission, communication, and video representation obliterate previous experiences and concepts of time and space, producing a grave new world of transnational global corporations, political organizations, and cities, displacing the national firm, the city, the nation-state, and previous forms and sites of modern politics.

Indeed, for Virilio part of the "lost dimension" is the end of politics in a world of increased speed and virtualities. This is most evident in the realm of military technology in which the complexity of weapon systems create ever shorter response times for humans to react to frightening computer-generated information concerning military threats and in which military technology itself can autonomously generate catastrophes ranging from "friendly fire" incidents to nuclear apocalypse. But the loss of stable referents of the political -- the city, state, nation -- in the deterritorialized and volatilized virtual and global spaces of the new information economy and polity, also render human participation in politics perplexing and perhaps futile.

This vision of technological domination, of technology displacing human beings, has echoes of the theories of "autonomous technology" (Winner) developed by Heidegger, Ellul, and other totalizing critics of contemporary technology. Virilio does positively cite Heidegger on technology, though he suggests critiques of Heidegger and totalitarianism, specifically his affiliation with German National Socialism (1986: 90, 113f, *passim*, and Virilio and Lotringer 1983: 23f). Thus, while Virilio is quasi-Heideggerian in his perspective on technology, seeing technology as the enframing demiurge of the modern world, as the matrix in which human practice unfolds, he is clearly anti-totalitarian, and might be seen perhaps as a left-Heideggerian. Further, in the light of his Christian religious beliefs, he has certain affinities with Jacques Ellul's radical critique of technology, that sees technology as an autonomous force that is coming to dominate the contemporary world, effacing human freedom and meaning. When asked if Ellul or Christian existential philosopher Gabriel Marcel influenced his thought, he affirmed the influence of Ellul while denying the impact of Marcel.[2]

Certainly, there are echoes of Ellul's technique, of a totalitarian tendency toward domination and destruction from technological development, running throughout Virilio's work, although he uses more concrete models of war machines, or vision machines, to characterize technology, is less overtly totalizing than Ellul, and is more muted in his religious perspectives. Yet there are similar themes of the demise of human autonomy and creativity in a world in which technique and technological development imposes its imperatives on human beings and both have a predominantly negative and critical take on what they see as the totalitarianism of modern technology. Like Ellul, Virilio denies the technological imperative and affirms the dignity and sovereignty of human beings over things.

Against all forms of economic determinism and idealist humanism, Virilio posits an autonomous force and power of technology and describes the ways that it constrains economic and social life. Yet in place of Marxian economic determinism, Virilio arguably substitutes a form of military-technological determinism. On his view, the military organization and deployment of people is the origin of proletarianization and predates capitalism; military mobilization is exploited by political, economic, and military forces to augment their power; and the result is the ever-more sophisticated and lethal development of a war machine, a destructive apparatus that is increasingly automated, lethal, fast, effective and removed from human control or values, producing "a state of emergency" in which the very fate of the earth and humanity is at stake.

Virilio, Baudrillard and the Present Moment

...there is a nihilistic dimension in Baudrillard's writing that I cannot accept. It is

quite clear to me that Baudrillard has totally lost faith in the social. To me, this is sheer nihilism. I have not at all lost faith in the social (Virilio 1998).

For Virilio, it is technology that accelerates speed, that intensifies war, that creates totalitarian modes of domination and so something like a technological military determinism is present in Virilio's thought. His displacement of the primacy of economics and focus on the key constituent role of technology brings his thought into dialogue with his contemporary Jean Baudrillard. In the 1970s, Baudrillard and Virilio were two of the world's most advanced theorists, both focusing on the new technologies that were creating the novum of the contemporary. Both were concerned to grasp the nature of m and the present age with Virilio theorizing m in terms of technology and speed, and its impact on war, politics, and modes of representation, with new configurations of space and time emerging in pure war. Baudrillard, by contrast, theorized the end of modernity in a postmodern turn moving toward a society of simulation, hyperreality, implosion and other postmodern technological and social novelties.

Baudrillard began in the field of social theory and his early and to some extent middle works provided aspects of a sociology of new media, information, and biogenetic technology, while Virilio centered on technologies of war and representation. By contrast, Virilio eschewed sociology, preferring to focus on war and politics. In his later work, Baudrillard too moved beyond conventional social theory and sociology, moving into a new type of philosophical discourse and cultural metaphysics of the present age.[3] While the post-1980s Baudrillard engaged in abstract theorizing and increasingly obscure metaphysical discourse, Virilio undertook extremely detailed empirical and historical research, albeit presented in an often cryptic and fragmentary style. Both engage in comprehensive historical analysis, though Virilio arguably develops more penetrating historical and political analysis, somewhat in the mode of Foucault who, however, he says he respects more than he likes, claiming that his own work is more fragmentary and disruptive, deploying collage methods of assembling fragments and quickly moving from one topic to another in contrast to Foucault's more classical style (see Virilio and Lotringer 1983: 38f).

There is a strong convergence on some themes with Baudrillard and his French contemporaries concerning the radical breaks and ruptures in the contemporary technological world with past modes of social organization, as well as significant differences in theorizing this rupture. For Baudrillard, postmodernity means the end of reality, the end of being able to distinguish between the real and unreal, the end of being anchored in and living in a real material world. On Baudrillard's optic, we dwell increasingly in the realms of hyperreality -- broadcast media, the cyberspace of computer interaction, video and computer games, or a range of mass-mediated worlds -- film, music, multimedia, and VR devices. Moreover, it becomes increasingly difficult to distinguish between the real and hyperreality, leading to a dissolution of the real. Thus, as Virilio notes, "The question of m and postm is superseded by that of reality and post-reality" (1994: 84).

Yet Virilio differs from Baudrillard in his theorizing of contemporary technological society. In an interview with John Armitage published in this issue, Virilio says that he disagrees with Baudrillard over the issue of simulation, seeing simulation not as an obliteration of reality, but instead as substitution, in which a technological reality replaces a human one, as photography

substitutes itself for real life, or film substitutes the static representation of the real with "moving pictures," or, in our day, when virtual reality substitutes itself for "real life." Consequently, unlike Baudrillard, Virilio believes reality does not disappear, but is rather displaced by another mode of reality, a virtual reality: "Thus, there is no simulation, but substitution. Reality has become symmetrical. The splitting of reality in two parts is a considerable event which goes beyond simulation" (Virilio 1997a: 43). Thus, whereas for Baudrillard reality disappears in hyperreality, for Virilio new technologies provide a substitute reality, a virtual reality which becomes more powerful and seductive than ordinary reality.

Virilio theorizes speed, dynamics, and the simultaneous eruption of a dialectic of implosion and explosion, while Baudrillard theorizes inertia, implosion, and the crisis of the political. Both, however, evoke the end of history and politics in the contemporary moment. More than Virilio, who often articulates political and religious passions, Baudrillard more neutrally describes, accepts, perhaps even affirms, the end of politics, history, in the "catastrophe of modernity." Virilio, by contrast, wants to preserve and expand the social and politics against pure war and the military, opposing a transpolitics which denies the continued relevance of modern politics.[4]

In terms of concrete political analysis, Baudrillard has had a particularly poor record as a social and political analyst and forecaster. As a political analyst, Baudrillard has often been superficial and off the mark. In an essay "Anorexic Ruins" published in 1989, Baudrillard read the Berlin wall as a sign of a frozen history, of an anorexic history, in which nothing more can happen, marked by a "lack of events" and thus the end of history, taking the Berlin wall as a sign of a stasis between communism and capitalism that would endure for the millennium. Shortly thereafter, rather significant events destroyed the wall that Baudrillard took as eternal and opened up a new historical era.

The Cold War stalemate was long taken by Baudrillard as establishing a frozen history in which no significant change could take place. Virilio, by contrast, perceived the beginning of the break-up of the Soviet Empire and the opening up of a new era. Already in *L'Insecurite du territoire* (1976), Virilio cited Helene Carriere de Encausse's *Decline of an Empire* and returned to this theme in *Pure War*, noting that the Soviet empire is "breaking apart" (Virilio and Lotringer 1983: 155). Of course, no one anticipated the extent and suddenness of the breakdown of the Soviet empire and collapse of the Soviet Union itself, and in the 1980s Virilio tended to exaggerate the continuing power of the Soviet military machine and operated with the Cold War model of a bipolar world as the key constituent of contemporary history, much as Baudrillard.

With the collapse of the Soviet Union and end of the Cold War, we are, as I argue below, in a new historical era which Virilio has so far not adequately theorized. He remains, in my view, trapped in a mode of technological determinism and a perspective on technology that equates technology with military technology and pure war. For Virilio, technology drives us, it impels us into new modes of speed and motion, it carries us along predetermined trajectories. He believes that:

the question, "Can we do without technology?" cannot be asked as such. We are forced to expand the question of technology not only to the substance produced, but also to the accident produced. The riddle of technology we were talking about before is also the riddle of the accident" (Virilio and Lotringer 1983: 31-32).

Virilio claims that every technology involves its accompanying accident: with the invention of the ship, you get the ship wreck; the plane brings on plane crashes; the automobile, car accidents, and so on. For Virilio, the technocratic vision is thus one-sided and flawed in that it postulates a perfect technological system, a seamless cybernetic realm of instrumentality and control in which all processes are determined by and follow technological laws (Baudrillard also, to some extent, reproduces this cybernetic and technological imaginary in his writings; see Kellner 1989b). In the real world, however, accidents are part and parcel of technological systems, they expose its limitations, they subvert idealistic visions of technology. Accidents are consequently, in Virilio's view, an integral part of all modes of transportation, industrial production, war and military organization, and other technological systems. He suggests that in science a Hall of Accidents should be put next to each Hall of Machines: "Every technology, every science should choose its specific accident, and reveal it as a product--not in a moralistic, protectionist way (safety first), but rather as a product to be 'epistemo-technically' questioned. At the end of the nineteenth century, museums exhibited machines: at the end of the twentieth century, I think we must grant the formative dimensions of the accident its rightful place in a new museum" (Virilio and Lotringer 1983).[5]

Virilio is fascinated as well by interruptions ranging from sleep to day dreams to maladies like picrolepsy or epilepsy to death itself (1991a and Virilio and Lotringer 1983: 33ff). Interruption is also a properly cinematic vision in which time and space are artificially parcelled and is close to the microscopic and fragmented vision that Lyotard identifies with "the postmodern condition" (Virilio and Lotringer 1983: 35). For Virilio, the cinema shows us that "consciousness is an effect of montage" (Virilio and Lotringer 1983: 35), that perception itself organizes experience into discontinuous fragments, that we are aware of objects and events in a highly discontinuous and fragmented mode.

Virilio further argues that new technologies alter our mode of perception and experience, change the way we see and experience the world, and that in particular technologies of speed have produced an increasingly fragmented, discontinuous, and transhistorical mode of experience that grasps instances and partial relations rather than whole fields. In his view, technological time has thus invaded the time and space of the city and other sites of habitation, creating new rhythms, experiences, and modes of interaction that dramatically transform social and everyday life. Virilio describes what he calls "endo-colonization" in which the state colonizes its own urban spaces and then global institutions colonize the entire world. Concretizing this vision, Mike Davis writes: "No wonder that the contemporary American inner city resembles nothing so much as the classical colonial city, with the towers of the white rulers and colons militarily set off from the casbah or indigenous city (1985: 111). But more striking, as we shall see in the following sections, is the eruption of new "vision machines" that create autonomous realms of experience and perception.

War, Cinema, and Representation: Vision Machines

These new technologies try to make virtual reality more powerful than actual reality, which is the true accident. The day when virtual reality becomes more powerful than reality will be the day of the big accident. Mankind never

experienced such an extraordinary accident (Virilio 1997a: 43).

With *_War and Cinema_* (1989 [1984]) and his subsequent writings such as *_The Vision Machine_* (1994 [1988]) and *_Open Sky_* (1997b [1995]), Virilio focuses more on the relation between war, speed, technology, and the means of representation, particularly vision machines and the logistics of perception embodied in that pre-eminent vision machine -- cinema. War, Virilio suggests, has long been dependent on the logistics of representation, on providing accurate representations of the enemy's troop and weapon deployment. As military surveillance progressed, cinematic representation became more and more salient to military strategy, although, more recently, informatics, computer simulation, and satellite imaging has become more central.

From approximately 1904, accelerating in the First World War, and until the recent high tech explosion, the apparatus of cinema was deployed as part of military strategy, involving lighting the terrain of battle and enemy forces, accurately representing their strength and movement, and instantaneously perceiving the actual battlefield itself as a dynamic field of motion, all of which was crucial to military strategy. Cinema too followed a certain military logic with great directors serving as dictators and authoritarian orchestrators of cinematic illusion spectacle, leading Virilio to conclude that: "War is cinema, and cinema is war" (1989: 26).

Cinema has long been part of Virilio's imaginary and his reflections on cinema and war cover a vast expanse of modern history, providing a unique take on the history of cinema and the ways that modes of cinematic representation are also crucial to war. Virilio's theme is the progressive dematerialization of warfare in high tech and virtual war, in which technologies progressively replace human beings:

What the video artist Nam June Paik calls the triumph of the electronic image over universal gravity has carried this [dematerialization] still further. The sense of weightlessness and suspension of ordinary sensations indicates the growing confusion between 'ocular reality' and its instantaneous, mediated representation. The intensity of automatic weaponry and the new capacities of photographic equipment combine to project a final image of the world, a world in the throes of dematerialization and eventual total disintegration, one in which the cinema of the Lumiere brothers becomes more reliable than Junger's melancholy look-out who can no longer believe his eyes (1989: 73).

This passage refers to the tendency of technology to displace modes of human perception and representation in military planning and execution, as computer programs replace military planners and computer simulations replace charts and map of the territory. On the level of the battlefield itself, human power is replaced by machines, reducing the soldier to a cog in a servomechanism. Virilio comments:

The disintegration of the warrior's personality is at a very advanced stage. Looking up, he sees the digital display (opto-electronic or holographic) of the windscreen collimator; looking down, the radar screen, the onboard computer, the radio and the video screen, which enables him to follow the terrain with its four or

five simultaneous targets; and to monitor his self-navigating Sidewinder missiles fitted with a camera of infra-red guidance system (1989: 84).

With *The Vision Machine* (1994 [1988]) and Virilio's subsequent reflections on information and computer technologies, the epistemological turn to focus on modes of representation and the logistics of perception decenter to some extent Virilio's intense focus on war, though his interconnection of the themes of war, technology, and representation produce a unity and coherence to his otherwise highly fragmentary and elusive thought.

In the concluding chapter of *The Vision Machine* (1994), Virilio distinguishes between painting as the age of the image's *formal logic*, photography and film as the age of the image's *dialectical logic*, and video recording, holography, and computer graphics as the beginning of an age of *paradoxical logic*: the latter emerges "when the real-time image dominates the thing represented, real time subsequently prevailing over real space, virtuality dominating actuality and turning the very concept of reality on its head" (1994: 63). In this situation, images and representations replace the real, the object of representation declines in importance, and a domain of images and digital representation replaces reality. Culturally, this involves the proliferation of new vision machines that proliferate an artificial realm of data, images, and information that constitute a novel realm of experience. In war, it involves new modes of weapons based on the annihilation of time (just as nuclear technology involved the disintegration of matter and space). Just as computers and new image machines dramatically transform the nature of culture, so too do new laser technologies, modes of surveillance, and new modes of image warfare, disinformation, and high tech military spectacle change the nature of war (1994: 66f), such as was evident in the Gulf war.

The Vision Machine did not, however, explore in any great detail the new forms of information technology, multimedia, or high tech warfare, providing instead an introduction to the ways that new vision machines influence perception and representation. It is in *Open Sky* (1997b [1995]) and many interviews and articles of the 1990s that Virilio interrogates the new information technology. His central insight is that new information, communication, and transportation technology is taking us out of this world, beyond the limits of space and time, outside of nature and the material world into a new dimension with its own temporality, spatiality, and modes of being. Virilio fears that this journey will take us out of our bodies, minds, nature, and world as we have experienced and known it into a terrifying new sphere that will cause disastrous, possibly fatal, mutations of mind, body, and experience.

For Virilio, the astronauts are harbingers of a new experience beyond the familiar space and time coordinates of material existence. Shot into outer space beyond the laws of gravity and earth's spatial and temporal coordinates, the astronauts found themselves in a no place and no time continuum without fixed coordinates or dimensions. In this new dimension, some experienced the vertigo of disorientation and collapsed into madness after their return, or into strange metaphysical musings. Virilio's comments here, however, are somewhat anecdotal and serve more as metaphorical and rhetorical devices to dramatize the strangeness of outer space travel and the displacement of our scientific and conceptual schemes in this new dimension than a serious scrutiny of the effects of space flight on human beings.

Cyberspace, Virilio claims, supplies another space without the usual coordinates of space and time that also produces a disorienting and disembodied form of experience in which communication and interaction takes place instantaneously in a new global time, overcoming boundaries of time and space. It is a disembodied space with no fixed coordinates in which one loses anchorage in one's body, nature, and social community. It is thus for Virilio a dematerialized and abstract realm in which cybnauts can become lost in space and divorced from their bodies and social world.

In addition, Virilio analyzes and denounces what he calls "a pernicious industrialization of vision" (1997b: 89) and what he fears is a displacement of vision by machines. Virilio is afraid that increasingly visions machines are seeing for us, ranging from cameras to video to satellite surveillance to nanotechnology which probes the body (and next the mind?). For Virilio, we are increasingly subjected to bombardment by images and information and thus by "a discreet pollution of our vision of the world through the sundry tools of communication" (1997b: 96). Moreover, he fears, media like cinema and television train and constrain vision, leading to degradation of vision and experience: "If, according to Kafka, cinema means pulling a uniform over your eyes, television means pulling on a straitjacket, stepping up an eye training regime that leads to eye disease, just as the acoustic intensity of the walkman ends in irreversible lesions in the inner ear" (1997b: 97).

Shrilly technophobic and consistently hysterical, Virilio demonizes modern information and communication technologies, suggesting that they are do irreparable damage to the human being. Sometimes over-the-top rhetorical, as in the passage just cited, Virilio's 1990's comments on new information technology suggest that he is deploying the same model and methods to analyze the new technologies that he used for war technology. He speaks regularly of an "information bomb" that is set to explode (1995a, 1995b, 1995c, 1997a, and 1997b), evoking the specter of "a choking of the senses, a loss of control of reason of sorts" in a flood of information and attendant disinformation.

Deploying his earlier argument concerning technology and the accident, Virilio argues that the information superhighway is just waiting for a major accident to happen (1995a and 1995b; 1997a and 1997b), which will be a new kind of global accident, effecting the whole globe, "the accidents of accidents" (Epicurus): "The stock market collapse is merely a slight prefiguration of it. Nobody has seen this generalized accident yet. But then watch out as you hear talk about the 'financial bubble' in the economy: a very significant metaphor is used here, and it conjures up visions of some kind of cloud, reminding us of other clouds just as frightening as those of Chernobyl..." (1995b).

In a 1995 interview with German media theorist Friedrich Kittler (1995c), titled "The information Bomb," Virilio draws an analogy between the nuclear bomb and the "information bomb," talking about the dangers of "fallout" and "radiation" from both. In contrast to the more dialectical Kittler, Virilio comes off as exceedingly technophobic in this exchange and illicitly, in my view, deploys an amalgam of military and religious metaphors to characterize the world of the new technologies. In one exchange, Virilio claims that "a caste of technology-monks is coming up in our times," and "there exist monasteries (of sorts whose goal it is to pave the way for a (kind of) 'civilization' that has nothing to do with civilization as we remember it." These

monks are avatars of a "technological fundamentalism" and "information monotheism," a world-view that replaces previous humanist and religious worldviews, displacing man and god in favor of technology.

[This world-view] comes into being in a totally independent manner from any controversy. It is the outcome of an intelligence without reflection or past. And with it goes what I think as the greatest danger (of all), the derailment, the sliding down into the utopian, into a future without humanity. And that is what worries me. I believe that violence, nay hyperviolence, springs out of this fundamentalism.

Virilio goes on to claim that fallout from the "information bomb" will be as lethal for the socius as nuclear bombs, destroying social memory, relations, traditions, and community with an instantaneous overload of information. Thus, the technological "monks" who promote the information revolution are guilty of "sins in technical fundamentalism, of which we witness the consequences, the evil effects, today." One wonders, however, if the discourse of "sin," "evil," and "fundamentalism" is appropriate to characterize the effects and uses of new technologies which are, contrary to Virilio, hotly and widely debated, hardly monolithic, and, in my view, highly ambiguous, mixing what might be appraised as positive and negative features and effects.

Yet Virilio is probably correct that the dominant discourse is largely positive and uncritical and that we should be aware of negative aspects and costs of the new technologies and debate their construction, structure, uses, and effects. Virilio is also right that they constitute at least a threat to community and social relations, as previously established, though one could argue that the new communities and social relations generated by use of the new technologies have positive dimensions as well as potentially negative ones.

Virilio notes as well the ways that new technologies are penetrating the human body and psyche, taking over previous biological, perceptual, and creative functions of human beings, making humans appendages of a technological apparatus. He writes: "I am a materialist of the body which means that the body is the basis of all my work" (Virilio 1997a: 47). In his early work, Virilio spoke of the body as "a vector of speed" and "metabolic vehicle" in which increased speed and velocity overwhelmed the human sensorium and empowered controllers of technologies of speed over other humans (1986).

In more recent work, he has described the body as a planet, as a unique center around which objects gravitate, and criticizes increasing derealization of the body in cyberspace and virtual technologies (1997a and 1997b). Virilio is thus in part a materialist humanist and phenomenologist who is disturbed by the invasion of the human body by technology and the substitution of the technological for the human and lived experience. We noted above Virilio's disagreement with Baudrillard over the issue of simulation which Virilio prefers to interpret in terms of substitution of one mode of experience or representation for another. Virilio's project is to describe the losses, the disappearances, of the substitution, describing how technology displaces human faculties and experience, subjecting individuals to ever more powerful modes of technological domination and control.

Thus, Virilio describes the effects of new technologies in terms of an explosion of information

as lethal as nuclear explosion and warns of the ubiquity of new types of accident that will require new modes of deterrence and dissuasion. He also envisages progressive derealization and dematerialization of human beings in the realm of virtual reality which may come to rule every realm of life from war to sex. From this perspective, technology emerges as the major problem and threat of the contemporary era, as a demonic force that threatens to erase the human. Much as his predecessors, Heidegger and Ellul, Virilio warns of the totalitarian threat in technology and calls for a critical discourse on technology, recognition of its possible negative effects, and regulation of technological development, subjecting technology to human and political control.

Yet Virilio has never really theorized technology per se, and uses the same model and categories to analyze war technology to characterize new information technology. Thus, he has not really unravelled the riddle of technology which would have to interrogate its fascination, power, and complexity, and not just its negativity. Virilio criticizes the discourses of technophilia, that would celebrate technology as salvation, that are totally positive without critical reservations, but he himself is equally one-sided, developing a highly technophobic and negative discourse that fails to articulate any positive aspects or uses for new technologies, claiming that negative and critical discourses like his own are necessary to counter the overly optimistic and positive discourses. In a sense, this is true and justifies Virilio's predominantly technophobic discourse, but raises questions concerning the adequacy of Virilio's perspectives on technology as a whole and the extent to which his work is of use in theorizing the new technologies with their momentous and dramatic transformation of every aspect of our social and everyday life.

Summing Up: Virilio, War, and Technology

I don't claim to define the situation, I try to reveal tendencies. And I think I've revealed a number of important ones: the question of speed; speed as the essence of war; technology as producer of speed war as logistics, not strategy; war as preparation of means and no longer as battles, declaration of hostilities (Virilio and Lotringer 1983: 157).

This seems like a fair summary of Virilio's lasting contributions and I would suggest that the power of his work resides in his sustained interrogation of the virulence and power of military technology, but his works' limitation in turn results from using the model of military technology to interrogate technology as such and particularly the new information technologies. Virilio was justly distressed by the specter of total war, by the forces of military-technological domination, by the inexorable growth of power and the danger of the military-industrial complex during the Cold War and in particular the era between the Vietnamese and Gulf wars. During the era of the Cold War, the propagation and growth of the military-industrial complex and military state capitalism was the fundamental project and the organizing force behind the development of science, technology, and the allocation of public resources. More money was spent on this project than any other domain of existence and military priorities helped determine the mode of science, technology, and industry that developed in the Cold War period.

Military capitalism helped produce Big Government, Big Corporations, and a Big Military that deployed a tremendous array of manpower, weapons, and resources. Computers were largely

developed from military imperatives, producing large, centralized calculating machines and information machines, including the so-called "information superhighway" which had its origins in the defense industry (see Edwards 1996). The military, big government, and giant corporations also controlled scientific and technological research and development, with the military-industrial complex dominating the post-World War Two Cold War economies (see Melman 1965 and 1974).

But while there are still threats to world peace and even human survival from the dark forces of military capitalism, one of the surprising events of the past decade is the emergence of a new form of Microsoft capitalism, of less lethal and more decentralized new technologies, of new modes of peaceful connection and communication. The project of this new form of technocapitalism is the development of an information-entertainment society that we might call the infotainment society and which is sometimes described as the "information superhighway." This form of capitalism is a softer capitalism, a less violent and destructive one, a more ecological mode of social organization, based on more flexible, smaller-scale, and more ludic technologies.[6]

The differences between hard military capitalism and a softer Microsoft capitalism are evident in the transformation of the computer from a top-down, highly centralized, specialized machine controlled by big organizations to the smaller scale, more flexible, and more ludic personal computer (see Turkle 1996 for elaboration of this distinction). Moreover, the surprising development of the Internet opens up new public spheres and the possibility of political intervention by groups and individuals excluded from political dialogue during the era of Big Media, controlled by the state and giant corporations (for elaboration of this argument see Kellner 1995, 1996, and forthcoming).

Of course, Microsoft capitalism has its own dangers ranging from economic worries about near-monopoly control of economic development through software domination to the dangers of individuals getting lost in the proliferating terrains of cyberspace and the attendant decline of individual autonomy and initiative, social relations and interaction, and community. Yet the infotainment society promises more connections, interactions, communication, and new forms of community. The project is in far too early stages to be able to appropriately evaluate so for now we should rest content to avoid the extremes of technophobia which would reject the new technologies out of hand as new forms of alienation or domination contrasted to technophilic celebrations of the information superhighway as the road to a computopia of information, entertainment, affluence, and democracy.

Virilio misses a key component of the drama of technology in the present age and that is the titanic struggle between national and international governments and corporations to control the structure, flows, and content of the new technologies in contrast to the struggle of individuals and social groups to use the new technologies for their own purposes and projects. This optic posits technology as a contested terrain, as a field of struggle between competing social groups and individuals trying to use the new technologies for their own projects. Despite his humanism, there is little agency or politics in Virilio's conceptual universe and he does not delineate the struggles between various social groups for the control of the new technologies and the new politics that they will produce. Simply by damning, demonizing and condemning new

technologies, Virilio substitutes moralistic critique for social analysis and political action, reducing his analysis to a lament and jeremiad rather than an ethical and political critique à la Ellul and his tradition of Catholic critique of contemporary civilization, or critical social theory. Virilio has no theory of justice, no politics to counter, reconstruct, reappropriate, or transform technology, no counterforces that can oppose technology. Thus, the increasing shrillness of his lament, the rising hysteria, and sense of futile impotence.

While Virilio's take on technology is excessively negative and technophobic, his work is still of importance in understanding the great transformation currently underway. Clearly, speed and the instantaneity and simultaneity of information are more important to the new economy and military than ever before, so Virilio's reflections on speed, technology, politics, and culture are extremely relevant. Yet he seems so far to have inadequately conceptualized the enormous changes wrought by an infotainment society and the advent of a new kind of multimedia information-entertainment technology. If my hunch is correct, his view of technology and speed is integrally structured by his intense focus on war and the military, while his entire mode of thought is a form of military-technological determinism which forces him not only to overlook the important role of capital, but also the complex ambiguities, the mixture of positive and negative features, of the new technologies now proliferating and changing every aspect of society and culture in the present era.

Virilio thus emerges as a highly useful theorist of the post-World War Two and Cold War era of the military with the domination of military technology and military capitalism, but he never analyses the complicity of capitalism and those economic forces that deploy technology for power and profit, instead putting all blame for contemporary problems on technology and its deployment by the military and perhaps the state. But against Virilio, it should be recognized that new technologies are part of the capitalist project, that capital recognizes, along with Marx, that surplus value is gained by productive deployment of new technologies, and that technology provides powerful weapons of profit and social control.

By eschewing critical social theory, Virilio does not have the resources to theorize the complex relations between capital, technology, the state, and military in the present age, substituting a highly elusive and evocative method for systematic theoretical analysis and critique. Virilio himself acknowledges his elusive and suggestive approach to writing, noting: "I don't believe in explanations. I believe in suggestions, in the obvious quality of the implicit. Being an urbanist and architect, I am too used to constructing clear systems, machines that work well. I don't believe it's writing's job to do the same thing. I don't like two-and-two-is-four-type writing. That's why, finally, I respect Foucault more than I like him" (Virilio and Lotringer 1983: 38-39). Indeed, Virilio's style is extremely telescopic, leaping from topic to topic with alacrity, juxtaposing diffuse elements and themes, proliferating images, quotes, and ideas which rapidly follow each other, often overwhelming the reader and making it difficult to grasp the thrust of Virilio's argument.

One could argue, in fact, that the speed which Virilio so well theorizes enters into the very fabric and substance of his writings. Virilio's texts move along quickly, they catch their topics on the run, they overwhelm with detail, but rarely develop a topic in systematic and sustained fashion. His style thus reflects his themes with speed, fragmentation, and complexity the warp and woof

of his work. One wonders, however, whether a critic of speed, war, and technology should not occasionally slow down and more carefully and patiently delineate his theoretical position.

To some extent, Virilio exemplifies Walter Benjamin's theory of illuminations and fragments, that constellations of ideas and images could illuminate specific phenomena and events. Like Benjamin, Virilio circles his prey with images, quotes, often startling and original ideas, and then quickly moves on to his next topic. Virilio believes in the virtue of breaks and interruptions, of gaps and absences, eschewing systematic theorizing. But although Virilio pursues some of the same themes as Benjamin, deploys a similar method, and cites him frequently, there are major differences. Whereas Benjamin (1969), in the spirit of Brecht, wanted to "refunction" new technologies to make them instruments of progressive social change and developed political strategies to exploit the potentially progressive features of new technologies, Virilio is relentless critical, eschews developing a technopolitics, and nowhere speaks of using or refunctioning technology to serve positive ends.

Thus, Virilio is highly one-sided and does not develop a dialectical conception of technology or a progressive technopolitics. So far, Virilio has produced no master oeuvre that will pull together his ideas and perspectives, that will provide a synthetic overview. His long interviews with Sylvere Lotringer (1983) and John Armitrage (in this issue) contain the best overview of what I take to be his most valuable work, but it remains to be seen whether he will attempt to develop a critical theory of technology for the present age. In addition, as a critical philosopher, Virilio is quite ascetic, never articulating his normative position from which he carries on such a sustained and ferocious critique of technology. He seems to assume something like a religious humanism, that human beings are significant by virtue of their capacity for speech, reason, morality, political deliberation and participation, and creative activity, while technology is seen as undermining these human capacities, taking over human functions and rendering humans subservient to technological rationality. But Virilio himself does not adequately articulate the humanist or religious dimension of his critique and, as noted, describes himself as a materialist and abstains from developing the normative perspective from which he carries out his critique.

Virilio's reflections on technology, speed and war, recall Walter Benjamin who pointed out that the human body could simply not absorb the speed and lethality of modern war. But first and foremost his critique of technology has echoes of Heidegger's and Ellul's complaints concerning the totalitarian ethos of modern, and we would now add postmodern, technology, the ways that its instruments and instrumentality dominate human beings and create a novel world in which things and objects increasingly come to rule human beings. To the extent that Virilio's works illuminate the great transformation that we are currently undergoing and warn us of its dangers, too often ignored by the boosters and digiterati of the new technologies, he provides a useful antidote to the uncritical celebrations of the coming computopia. But to the extent that he fails to provide critical perspectives which delineate how new technologies can be used for democratization, human empowerment, and to create a better world he remains a one-sided critic rather than a philosopher of technology who grasps the full range and import of the dramatic developments of the contemporary era.

Notes

1. His early text *_Bunker Archeology_* (1975) explores this theme; see also Virilio 1986: 3ff. and Virilio and Lotringer 1983: 2f.
2. See Virilio's interview with John Armitrage published in this issue and Virilio 1997b: 139f.
3. For the twists and turns of Baudrillard's tortured theoretical trajectory, see Kellner 1989b, Best and Kellner 1991, Kellner 1994 and 1995, Best and Kellner 1997; and Kellner, forthcoming.
4. In an interview with Sylvere Lotringer, Virilio states that: "For me, trans-politics is the beginning of the end. That's where my understanding of it radically differs from Jean Baudrillard's; for him it's positive. For me, it's totally negative. I fight against the disappearance of politics. I'm not saying that we should revert to ancient democracy, stop the clock and all that. I'm saying that there's work to be done... in order to re-establish politics" (Virilio and Lotringer 1983: 28). One might argue, however, that Baudrillard does not see the end of politics, or "trans-politics," as "positive," but rather as inevitable in an era in which politics, aesthetics, sexuality, and culture implode; see Baudrillard 1992 and 1994.
5. Of course, the English novelist J.G. Ballard actually staged an exhibition of wrecked cars in London in 1966, described in his 1970 novel *_The Atrocity Exhibition_*, and the apocalyptic vision of western civilizations systems of control and circulation erupting in proliferations of car wrecks informed Ballard's 1973 novel *Crash* and the 1996 film directed by David Cronenberg based on the novel.
6. For my earlier analysis of technocapitalism, see Kellner 1989a and for more detailed analysis of its current forms see Kellner 1998.