CHAPTER 1

THE PHENOMENON OF SHIFTING CENTERS: DIGITAL
ONTOLOGY AND THE POSSIBILITY OF ETHICS

In one of his later works, Norbert Wiener begins to examine the place where

religion and science interface with each other. Where does this take place? According to

Wiener, such an interface occurs where science begins to impinge upon religion, a place

he calls "the communication and control sciences."[1] Science and religion converge,

Wiener believes, in the science of control, or what he calls "cybernetics." Claude

Shannon later named this space of convergence "information theory." Oddly, the

distinction that cybernetics most radically challenges is not the difference between God

and human beings – that difference has been challenged for centuries – but the one that

exists between human beings and machines. "There are at least three points in cybernet-

ics which appear to me to be relevant to religious issues" Wiener writes. "One of these

concerns machines which learn; one concerns machines which reproduce themselves; and

one, the coordination of machine and man." Machines such as these, Wiener claimed in

1964, "are known to exist."[2]

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[1] Norbert Wiener, *God and Golem, Inc.: A Comment on Points Where Cybernetics Impinges on Religion* (Cambridge, MA: The MIT Press, 1964): 1. Hereafter cited as *God and Golem.*

[2] Ibid., 11.

While Wiener's claim concerning the existence of these machines was, and still is, controversial,[3] he nonetheless forces readers to consider a reductionistic tendency in cybernetics that is also characteristic of the age of information. According to this mode of thinking, if we examine machines and human beings at their most fundamental level – the level of information exchange – then it is apparent that there is little difference between the elemental functions of a machine, especially a computing machine, and a human being. The only difference is that of complexity. There does not seem to be any ontological difference. Once this fundamental commensurability is established and any

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[3] On the controversial nature of such claims, see Hubert L. Dreyfus, *What Computers Still Can't Do: A Critique of Artificial Reason* (Cambridge and London: The MIT Press, 1992). According to Dreyfus, the claim of Artificial Intelligence (AI) engineers that they have built machines that "think" or "reason" is based upon a very sloppy use of language. Utilizing rather superficial analogies between computers and human beings, AI advocates claim that the computing machine and the human mind function is basically identical, and even though the components are not identical, if the function is the same, then both are fundamentally equivalent.

Dreyfus argues that such claims are based upon the ability to limit "thinking" to micro-worlds that allow AI engineers to create a strictly defined syntax based upon carefully prescribed tasks. In other words, a machine can "think" only in relationship to certain tasks, playing chess for example. Because the domain of chess playing, in theory at lest, is finite, a machine may be programmed to "think" in the rules of playing chess. However, Dreyfus argues, human beings do not "think" with only their minds; they think with their bodies as well. It is their ability to think with their bodies that allow human beings to have a world so that they can know more than they think with their minds. In this sense, while their worlds may be limited, they are much more complex than the worlds generated (defined) by the databases that form the algorithmic micro-worlds of computing machines. Because computers lack bodies, they cannot think, at least they cannot think in the same way that human beings think. A computing machine, he concludes, is therefore not analogous to a human being and vice versa.

Dreyfus' argument is not without its detractors. As Michio Kaku points out in his latest book, *Visions: How Science Will Revolutionize the Twenty-First Century* (New York: Anchor Books, 1997), Dreyfus' critique may hold for what Kaku calls "top-down" AI, but it probably is not adequate to "bottom-up" AI (73ff.). On this, see also Beth Preston, "Heidegger and Artificial Intelligence," *Philosophy and Phenomenological Research* 53 (March, 1993): 43-69.

ontological difference is erased, then claims concerning intelligence and reproduction are

activities relative to a common phenomenon that encompasses both machines and human

beings, i.e., information.

From a cybernetic perspective, then, information is the common denominator that

defines intelligence, but perhaps more interestingly, it also defines the nature of reproduc-

tion as well. Beginning with the position he opposes, Wiener writes:

> On the one hand, machines are made of iron and brass, the finer chemical
> structure of which has nothing to do with their functions as parts of a machine.
> Living matter, however, is living down to the finest parts which characterize it as
> the same sort of matter – the molecules. Then, too, the multiplication of living
> matter occurs by a well-described template process, in which the nucleic acids
> determine the laying down of the chain of the amino acids, and this chain is
> double, consisting of a pair of complementary spirals. When these separate, each
> gathers to itself the molecular residues needed to reconstitute the double spiral of
> the original chain. . . .
> However, even living systems are not (in all probability) living below the
> molecular level. Furthermore, with all the differences between living systems and
> the usual mechanical ones, it is presumptuous to deny that systems of the one sort
> may throw some light upon systems of the other. One respect in which this may
> well be the case is that of the mutual convertibility of spatial and functional
> structure, on the one hand, and of messages in time, on the other. The template
> account of reproduction is manifestly not the whole story. There must be some
> communication between the molecules of genes and the residues to be found in
> the nutrient fluid, and this communication must have a dynamics. It is quite in the
> spirit of modern physics to suppose that field phenomena of a radiative nature
> mediate the dynamics of such communication. It will not do to state categorically
> that the processes of the reproduction in the machine and in the living being have
> nothing in common.[4]

The exchange or communication of information at a sub-molecular level is the fundamen-

tal ontology by which the difference between human beings and machines is erased, and

reproduction is then defined by the nature of this informational exchange. Seen in this

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[4] *God and Golem*, 45-47.

light, both machines and human beings reproduce because the existence of both is

dependent upon such reproductive processes, and it is at precisely this point that religion

and science merge. According to Weiner, God works forcefully in the midst of God's

creation to bring about both the progressive development of human beings and machines.

Both are of the same order, and it is God's divine persuasion at the point of informational

exchange, not simply the intellect of human beings, that fuels this reproductive process.

This idea, Wiener admits, is one that threatens the independence and autonomy of human

beings, but an idea is not invalidated simply because it is threatening.[5]

Because cybernetics is an informational environment of control where the process

of development for both human beings and machines is dependent upon something that is

not strictly the domain of human volition, Weiner describes a context where machines

and their development is an activity that is to some degree autonomous of the creative

activity of human beings. An environment that authors human beings is to some degree

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[5] Ibid., 47-48. It is interesting to note that Wiener's discussion of God is reminiscent of Alfred North Whitehead's understanding of God. For Whitehead, God is a principle of persuasion that moves the world forward towards ends conceived in the "primordial nature" of God. God's persuasion is God's involvement in the developmental process of all events, human and nonhuman, and takes place in what he calls the "consequent nature" of God. Because, however, God is not omnipotent, God does not force this development, but persuades it. However, as in Weiner's account, God's persuasion can be great because the process is in some sense embodied by God's persuasive presence. While to my knowledge, Whitehead did not develop the technological side of this concept, the influence of God is based upon the environment that is created by God's ubiquitous presence. If technology is part of this aim, the development of technology rests in the persuasive nature of God's omnipresence and not strictly in the will of human beings. See Alfred North Whitehead, *Science and the Modern World* (New York: The Free Press, 1925): 173ff., and *Process and Reality: An Essay in Cosmology*, corrected edition, edited by David Ray Griffin and Donald W. Sherburne (New York: The Free Press, 1978): 342ff.

an environment that also authors the creations of machines as well. Or, put differently, the environmental process that Wiener describes is elsewhere called "technological determinism."

Wiener, however, does not claim to be a philosopher even though he is interested in philosophical issues. He is first and foremost a mathematician who is interested in defining a scientific phenomenon. Because of this, the seemingly deterministic nature of technology does not bother him, for traditionally mathematics and science are concerned with causal realities defined under the conditions of necessity. However, if Weiner were to approach the issue of technology from a philosophical perspective, he may not discover the same type of necessity assumed by mathematical formulations and scientific research. Rather, he might discover that technology provides the environment against which modern and contemporary persons understand themselves and their world. Given this scenario, different philosophers have described the effect of technology upon human beings and their social arrangements in various ways. In what is to follow, I will examine a number of different ways of thinking about technology as the environment through which human beings must understand themselves. First, I will briefly examine the philosophy of Martin Heidegger and his understanding of technology as *Gestell*. For Heidegger, technology is not deterministic in the scientific and mathematical sense of the term, but represents the destiny of human beings. It is not something that they can avoid, but they must think through it if they are to live authentically in a modern context. Technology, then, must not be understood instrumentally, or as something that defines technological machines and the way they are used. Rather, technology is our destiny

because it is the environment in which human discourse is shaped, and through which our world is revealed.

A second, more deterministic, way of understanding technology is put forward by Jacques Ellul. According to Ellul, technology is our destiny, but it is a destiny that will necessarily be the demise of humanity. For Ellul, technology is a deterministic influence that necessarily leads to the end of humanity. Identifying with Ellul's deterministic emphasis but with different results, Marshall McLuhan is the third way of thinking about technology that I wish to examine. According to McLuhan, the destiny shaped for us by digital technology may hold many dangers for the future of humanity, but because its trajectory is towards greater communication and understanding, the more likely scenario is a global village in which people enjoy a greater sense of community. And finally, I want to examine the thought of people like Merrit Roe Smith who argue that technology, and especially digital technology, has become such an important part of our economy that it is virtually impossible to think of our future as human beings without it. By examining these diverse views of technology, I hope to demonstrate that technology in general, and digital technology in particular, forms a pervasive backdrop against which we must understand ourselves as contemporary persons. It is not something that can be ignored. Rather, it is something that we must embrace if we are to understand our world today, and if we hope to think meaningfully of the world of tomorrow.

For Martin Heidegger, technology is the backdrop against which he developed his philosophy, and particularly his thought that followed his *Kehre*. While it would be

inappropriate to call Heidegger a deterministic philosopher, there has always been a sense

of passivity in Heidegger that certainly determines the givenness of thinking itself.

For example, the fundamental ontology that he outlines in his *Being and Time* speaks of a

passivity of *Dasein* that underlies his phenomenological approach to being-in-the-world,

a type of letting-be. This is not, strictly speaking, a deterministic way of thinking, but

Dasein is thrown into an environment that it does not create, but which it must make the

best of by choosing to be in the context of its everydayness. *Dasein* inherits a world, but

if *Dasein* exists authentically, this is as far as *Dasein* is determined, for beyond this,

Dasein chooses to relate to its world by letting it be, by letting it come to light as it is in

its everydayness.[6]

In the later Heidegger, the Heidegger of the article on the Heraclitus' "Fragment B

50" [7] and "The Question Concerning Technology,"[8] *Dasein* begins to lose its central role

in his analysis, and Heidegger seems to pay greater attention to the environment in which

Dasein exists. For example, in his commentary on Heraclitus' "Fragment B 50,"

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[6] Martin Heidegger, *Being and Time*, translated by John Macquarrie and Edward Robinson (New York, Hagerstown, San Francisco, and London: Harper & Row, Publishers, 1962); Heidegger's fundamental ontology as I have described it above is outlined most fully in the first section of the book, see pp. 67-273.

[7] Martin Heidegger, "Logos (Heraclitus, Fragment B 50)," in *Early Greek Thinking: The Dawn of Western Philosophy*, translated by David Farrell Krell and Frank A. Capuzzi (San Francisco: Harper & Row, Publishers, 1984):59-78. Hereafter referred to as "Logos."

[8] Martin Heidegger, "The Question Concerning Technology," in *The Question Concerning Technology and Other Essays*, translated with an introduction by William Lovitt (New York: Harper & Row, Publishers, 1977):3-35. Hereafter referred to as "Concerning Technology."

Heidegger gives the *Logos* a seemingly more fundamental role in his analysis than

Dasein. According to Heidegger, philosophers have traditionally separated the process of

legein – the process of "laying-down and laying-before which gathers itself and others"–

from the ontological reality of *Logos*, or its function as a "shelter."[9] The effect of this

separation is that *legein* (saying) has little or nothing to do with the sheltering care of

Logos (Said/Being). Language, in this move, is fundamentally separated from Being, and

thought is hopelessly abstracted from history.

According to Heidegger, if we are to avoid the errors of previous philosophers,

then we must be careful not to separate *legein* from *Logos*. Saying cannot be separated

from the Said. Sheltering, in other words, is a function of the gathering itself, for in the

gathering the shelter is established, and in the shelter the gathering is given specificity or

boundaries. Through *Logos*, *legein* understands what is to be gathered. In this sense,

saying and said stand together as one. Or, to quote Heidegger:

> Proper hearing occurs essentially in *legein* and *homologein*. This is consequently a *legein* which lets lie before us whatever already lies together before us; which indeed lies there by virtue of laying which concerns everything that lies together before us of itself. This exceptional laying is the *legein* which comes to pass as the *Logos*.
> Thus is *Logos* named without qualification: *ho Logos*, the Laying: the pure letting-lie-together-before of that which of itself comes to lie before us, in its lying there. In this fashion *Logos* occurs essentially as the pure laying which gathers and assembles. *Logos* is the original assemblage of the primordial gathering from the primordial Laying. *Ho Logos* is the Laying that gathers [*die lucent Lege*], and only this.[10]

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[9] "Logos," 60.

[10] Ibid., 66.

To anticipate the digital ontology that I will seek to describe in this dissertation, the oneness of *legein/Logos*, saying/said, is the formation of a center based upon the givenness of the moment in which the One (*hen panta*) comes to be. In this sense, then, *legein/Logos* describes the process of *aletheia* in which the nondescript, indistinguishable flux of Being is gathered, or made specific, through the distinctiveness of letting-be. "*Hen Panta* says what the *Logos* is. *Logos* says how *Hen Panta* essentially occurs. Both are the Same."[11]

This gathering, or centering process, however, comes with a price, for in it the self-determination of *Dasein* is limited more than it is in Heidegger's fundamental ontology of *Being and Time*. This is true because while the being of *Dasein* is still very distinct (it is still the being that asks the question of Being), it is nonetheless a part of the *legein/Logos* process. The oneness of *Dasein* with *legein/Logos* comes into focus when we examine more fully Heidegger's notion of shelter. Heidegger writes:

> However, the sheltering does not secure just any thing that happens along: the gathering which properly begins with the sheltering, i.e., the vintage, is itself from the start a selection . . . which requires sheltering. For its part, the selection is determined by whatever within the crop to be sorted shows itself as to-be-selected . . . The most important aspect of the sheltering in the essential formation of the vintage is the sorting (in Alemanic [the southwestern German dialect]; the fore-gathering [*Vor-lese*] which determines the selection, arranging everything involved in the bringing together, the bringing under shelter, and the accommodation of the vintage.[12]

Several thoughts present themselves in response to this passage. First, what Heidegger seems to be describing here is the process of coming to be for the being of beings. If

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[11] Ibid., 71.

[12] Ibid., 62.

something exists, in other words, then it exists because of the gathering/sheltering process defined by *legein/Logos*. If this ontological insight is applied to the being of *Dasein*, then it would seem that *Dasein* itself is a type of gathering whose distinctiveness is watched over by the sheltering of Logos. This, then, is the second thing that comes to mind. If the being of *Dasein* is that which is watched over by the sheltering of Logos, then the being of *Dasein* is to a large extent fore-gathered by the *legein/Logos* process. While this may describe nothing more than the "thrownness" of *Dasein* as described in *Being and Time*, Heidegger seems to have more in mind, for in the gathering that defines the boundaries of *Dasein*, the thinking of *Dasein* presents itself. When expressing itself, and this is my third point, *Dasein* expresses the gathering/sheltering distinctiveness determined in the fore-gathering, the "most important aspect of the sheltering." In this sense, the being of *Dasein* is to be one with the being of beings as determined by the gathering/sheltering of *legein/Logos*, and its expression of itself is largely determined by the fore-gathering, a world in which it is shaped, but not necessarily a world of its creation.

This notion of *Dasein* seems to be born out in Heidegger's writing on technology. In his article, "The Question Concerning Technology," Heidegger defines the relationship that people (*Dasein*) have to that which is unconcealed in the gathering/sheltering process as overseen by *legein/Logos*. The problem that modern people have in understanding or "thinking" modern technology, Heidegger believes, lies in the fact that people continually explain technology as if they have the only role in its development. The error lies in their penchant to think technology as machines and in turn understand the machines as tools that are at their disposal. "Technology is no mere means [tool]" Heidegger argues.

"Technology is a way of revealing . . . It is the realm of revealing, i.e., of truth." Modern

humanity would be more apt to understand this, Heidegger thinks, if they first understood

that technology is not something that originates in modern machines, even modern

machines that have the ability to manipulate language.[13] Rather, the origins of technology

are found in the Greek notion of *technē*. "*Technē* is a mode of *alētheuein*. It reveals

whatever does not bring itself forth and does not yet lie here before us, whatever can look

and turn out now one way and now another."[14]

It is mistake, then, to think of technology as certain types of tools. Rather,

technology is the environment in which that which is comes to be. Put differently, it is a

Gestell, a gathering together, which means that it is a function of *legein/Logos*. *Dasein*,

far from being its creator, is that which is determined in large part by the coming-to-be of

modern technology. Rather than challenging the world and itself with its creations,

Dasein is instead challenged by technology. Heidegger writes:

> The revealing that rules throughout modern technology has the character
> of a setting-upon, in the sense of a challenging-forth. That challenging happens in
> that the energy concealed in nature is unlocked, what is unlocked is transformed,
> what is transformed is stored up, what is stored up is, in turn, distributed, and
> what is distributed is switched about ever anew. Unlocking, transforming,
> storing, distributing, and switching about are ways of revealing. But the revealing
> never simply comes to an end. Neither does it run off into the indeterminate. The
> revealing reveals to itself its own manifoldly interlocking paths, through regulat-
> ing their course. This regulating itself is, for its part, everywhere secured.

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[13] Heidegger calls a computer a "language machine." See his *Hebel der Hausfreund* (Pfullingen: Neske, 1957).

[14] "Concerning Technology," 12-13.

> Regulating and securing even become the chief characteristics of the challenging revealing.[15]

Here Heidegger presents a rather deterministic picture of the environment of technology, one in which the gathering/revealing process is determined by the technological background – the *legein/Logos* – itself.

This also describes the heart of the relationship that exists between *Dasein* and Being in the later Heidegger. Technology cannot be thought instrumentally, Heidegger believes, and therefore it is not something that human beings (*Dasein*) create. Rather, technology is a gathering together as a "standing reserve," the beings of which are to be watched over by *Dasein* with care.[16] In this way, technology is the gathering of *legein/-Logos* as an ordering that is presented to *Dasein* as something that already always is. Technology is a matter of Being. It is not a matter of *Dasein's* creativity, and therefore the role of *Dasein* in the standing-reserve is the fore-gathering of *legein/Logos* as care. *Dasein* is not free to be otherwise.

However, the caring relationship fore-gathered for *Dasein* by *legein/Logos* is not merely determined in nature; I would call it dialectical. The relationship of *Dasein* to Being (*legein/Logos*) is to be understood within the context of a letting-be. Therefore, this relationship is not a matter of volition as much as it is the power of Being to be as the Being of beings. *Dasein*, then, is defined in the dialectic of care for the coming-to-be of the Being of beings, and freedom is not a freedom-to-do as much as it is the freedom-to-

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[15] Ibid., 16.

[16] Ibid., 18.

let-be. Care for the Being of beings as *Gestell* is the destiny of *Dasein* that cannot be escaped. It is "an ordaining of destining, as is every way of revealing," but while this destiny is certain, it cannot be understood as fate, and hence its dialectical nature. Heidegger explains:

> Always the unconcealment of that which is goes upon a way of revealing. Always the destining of revealing holds complete sway over man [sic]. But that destining is never a fate that compels. For man [sic] becomes truly free only insofar as he [sic] belongs to the realm of destining and so becomes one who listens and hears, and not one who is simply constrained to obey.[17]

We are not, as Dasein, determined by moral obligation, but we are destined by our relationship to Being as manifest in the *legein/Logos* of *Gestell*, the environment that is technology. In this sense, we cannot avoid the technological age that defines our world, nor is this something we would want to do. Rather, the world that we inherit and the world that we will shape is the world that is shaped by technological discourse. That is to say, a world shaped by technological discourse is a world that shapes the relational matrix out of which our relationships to everything in our world are formed. In this technological environment lie the destiny of human beings as well as their opportunity.[18]

The soft determinism of Heidegger, however, is surpassed in both scope and tone by Jacques Ellul. For Ellul technological determinism is a disastrous result of technological development. According to Ellul, technology is ultimately the destruction of human beings. Rejecting the notion that human nature is an enduring and unchanging

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[17] Ibid., 24-25.

[18] Ibid., 34-35. This is what Heidegger means when he states that the fulfillment of our care of technology is found in thinking technology as art.

phenomenon of human beings that is impervious to contextual pressures, Ellul distin-

guishes between various types of technology, but very generally, they may be divided into

technologies that form an environment for human beings, and those that he calls "human

techniques" where people "become the object of technique."[19] The former, are "eco-

nomic techniques" that range "from the organization of labor to economic planning, and

the "technique of organization" that concerns masses of people and "applies not only to

commercial or industrial affairs of magnitude . . . also to states and to administration and

police power." Organizational technique also includes the military and its weapons of

destruction as well as the legal profession.[20] On the other end of the polemic, however,

are human techniques. These include such things as education, work, vocational guid-

ance, propaganda, amusement and medicine. What distinguishes these from the environ-

mental techniques is that they tend to be related directly to the needs and desires of

individuals rather than relating to groups, organizations or political structures. The point,

however, is this: human techniques feed off the more general environmental techniques

with the result that human beings are caught up in a grandiose scheme where their desires

and needs are created by technique and it is technique that promises to fulfill and satisfy

them. Technique creates the problem and it solves it so that human beings become

completely dependent upon, and hence determined by technique.   Ellul explains:

> Human techniques have no existence except to the degree that the human individ-
> ual is subject to economic conditions and to the degree that mechanical conditions

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[19] Jacques Ellul, *The Technological Society*, translated by John Wilkinson, introduction by Robert K. Merton (New York: Vintage Books, 1964): 22.

[20] Ibid.

permit the means discovered to be exercised upon him. To neglect the technical context of these human techniques it to live in a world of dreams. To admit it is to perceive that human techniques in the real world (not in the world of philosophic abstractions where freedom is always possible) are conditioned by the economic, the political, and the mechanical. Human techniques, therefore, are never "dominants" because they can exist only in relation to all the others. They cannot be isolated in a pure state; and their means, tendencies, and results must be interpreted in relation to these others. If human techniques were ever to come into conflict with the others, they would inevitably lose out, for they would retain no substance.[21]

In an environmental context such as this, there is no possibility for a human being to exist in and of herself. The essential nature of a human being is not something unique to the human being, but is rather a "man-machine" nature, as Ellul puts it, that reflects not only the nature of people, but absolutely determines the destiny of humanity as well.[22] In this sense, "the human being becomes completely incapable of escaping from the technical order of things."[23]

Whereas Weiner and Heidegger think that technology is something that that we must think through, and Ellul understands the dominance of technology to be the demise

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[21] Ibid., 394.

[22] Ellul's determinism has been debunked by many since the time of its writing, but it is interesting to note that this is probably due to his emphasis upon humanity's destiny more than the deterministic elements of things. The new school of thought known as "the New Historicism," it seems to me, is every bit as deterministic as Ellul, but advocates of this school do not claim to define the *telos*, or destiny, of humanity. Historicism does not describe a teleologically determined environment, but a temporally determined context. Our temporality, or historicity, ultimately determines why we are the way we are. From this point of view, if we are to understand who we are, then we must examine our environment, our situation within the givenness of our historically conditioned context. If, as Ellul claims, we are situated in an environment that is predominately technological, or as I will argue, digital, then it is of no surprise that our being will be greatly determined by technology or more importantly, digital phenomena.

[23] Ibid., 397.

of modern humanity, North American popular culture analyst, Marshall McLuhan, thinks

that technological determinism promises a return to a more primitive and communal form

of life. Speaking of the collective nature of guilt that seems to accompany electronic

media, McLuhan notes:

> The new feeling that people have about guilt is not something that can be pri-
> vately assigned to some individual, but is, rather, something shared by everybody,
> in some mysterious way. This feeling seems to be returning to our midst. In tribal
> societies we are told that it is a familiar reaction, when some hideous event
> occurs, for some people to say, "How horrible it must be to feel like that," instead
> of blaming somebody for having done something horrible. This feeling is an
> aspect of the new mass culture we are moving into – a world of total involvement
> in which everybody is so profoundly involved with everybody else and in which
> nobody can really imagine what private guilt can be anymore.[24]

The reason that McLuhan understands society to be moving back to a more primitive

form is because of the effect that electronic media is having upon the world. Quite

simply, the information age is moving away from the logocentric nature of print culture,

and towards a more multimedia, multi-sensory reality that is predicated upon a very fast

form of communication. Because of the tremendous speed of electronic media, the world

has shrunk, and people that were once separated by vast expanses of space, are now

brought into electronic proximity as if they lived in one large, but at the same time, small

global village.[25]

While McLuhan argues that there is no "turning back" from this electronically

produced global village, he nonetheless is not as certain about humanity's destiny as

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[24] Marshall McLuhan and Quentin Fiore, *The Medium is the Massage: An Inventory of Effects* (San Francisco: Hardwired, 1996): 61.

[25] Ibid., 63ff.

Ellul. Whatever humanity's destiny may be, he argues, there is no escaping the effect the information age will have upon human culture. Electronic media can be a nightmare, he believes, because with the advance of military technology, the possibility of humanity's demise is greater now than it has ever been in the past. However, if we understand the military in the age of information as simply consisting of its weapons, we will have missed the point, McLuhan contends. Military weapons are nothing but a remnant of a mechanical, literary age that is quickly becoming not only obsolete, but impotent with the onslaught of a much more effective and powerful information age. "It is this trend toward more and more power with less and less hardware," McLuhan writes, "that is characteristic of the electric age of information."[26] While this trend may have a tendency to marginalize non-technological societies, he notes, it nonetheless is a very promising development in light of mass weapons of destruction. It is an affirmation of the global village and retribalization, and whereas the threat of an obsolete mechanical and logocentric age is still very real, the movement towards a more communal form of life promised by the age of information is a much brighter and more compassionate destiny for human beings, and indeed, the world.[27]

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[26] Marshall McLuhan, "Weapons: War of Icons," in *Understanding Media: The Extensions of Man* (Cambridge and London: The MIT Press, 1964, 1994): 342. Hereafter cited as "Weapons."

[27] Ibid., 344-345. For a more recent approach that is very similar to McLuhan's, but represents a more European model, see Pierre Lévy, *Collective Intelligence: Mankind's Emerging World in Cyberspace*, translated by Robert Bononno (New York and London: Plenum Trade, 1997).

McLuhan's optimism concerning electronic media and the age of information is deeply sown into the fabric of United States culture. According to Merritt Roe Smith, while technological determinism has its roots in the European Enlightenment, "it has found even more fertile ground in the newly independent United States – primarily because Americans were so taken with the idea of progress." For many Americans, progress was progress towards the good, and they believed that technology was the "means of achieving the virtuous and prosperous republican society that they associated with the goals of the American Revolution. For them, progress meant the pursuit of technology and science in the interest of human betterment (intellectual, moral, spiritual) and material prosperity."[28] The myth grounded in the newly formed United States government was a myth deeply rooted in progress driven by technology and science, and this progress was good. Indeed, it could not and should not be stopped.

Progress that is motivated by the development of technology and science, however, may depict a strange picture of the good. As Smith points out, technological and scientific progress has profound political and cultural implications. Those people whom technological progress favors find it good, but for those people that it disadvantages, progress is anything but good because it may mean their demise. Examining a work of art by John Gast (1872) entitled "American Progress" (figure 1), Smith notes that while the spirit of progress is depicted in a most alluring fashion, "Indians, buffalo, wild

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[28] Merritt Roe Smith, "Technological Determinism in American Culture," in *Does Technology Drive History? The Dilemma of Technological Determinism*, edited by Merrit Roe Smith and Leo Marx (Cambridge and London: The MIT Press, 1994): 3. Hereafter cited as "Technological Determinism in American Culture."

horses, bears and other game [are] moving westward – ever westward" as if to be fleeing from it. Because of the disadvantages technological progress brings to these beings, they do not embrace it nor do they desire it. Rather, they flee from it. They realize that it may be their destruction.

Another work of art from that period, while not as dramatic in its depiction of technology's impact upon Native American culture and wildlife, illustrates the inevitability of technological progress. In Currier and Ives' 1868 lithograph entitled "Across the Continent: Westward the Course of Empire Takes Its Way" (figure 2), the central feature is the railroad with its tracks plotting a westwardly course and fading into the horizon.

Figure 1 "American Progress" by John Gast (1872). Photo in *Does Technology Drive History? and* Used with Permission from MIT Press.

On the one side of the tracks are the social structures that have developed according to the influence of technology. On the other side is the North American continent as it existed before the influence of technology. Outside the town are Conestoga wagons carrying settlers across vast, open plains of space, accompanying technological progress into the West.

On the pre-technological side of the tracks, Native Americans on horseback are

staring at the black plume of smoke created by the steam engine, and further away, Native

Americans are canoeing across a lake with mountains framing the lake and fading off into

the horizon. It is as if the railroad tracks and the train – the cutting edge of technology for
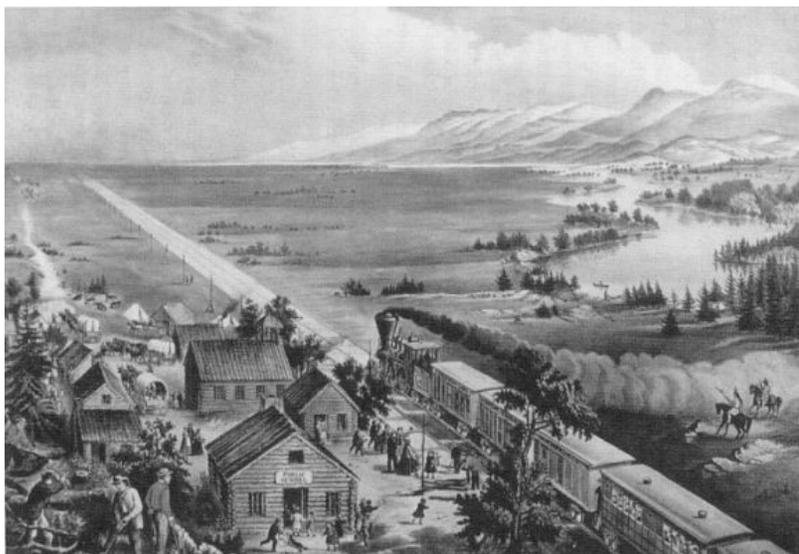

Figure 2 Currier & Ives' 1868 lithograph depicting technological progress. Photo in
Does Technology Drive History? Used with permission from MIT Press.

that period – were cutting the world into two parts. On the left is the future, and on the

right is the past. Michael Smith explains:

> The segregation of natives and settlers on the two sides of the rail line
> provided an alternative to depicting the actual relation between these two groups –
> not because Currier and Ives were reluctant to portray the extermination of Native
> Americans, but because such a scene would have distracted from the theme of the
> lithograph: the smooth, unchallenged inevitability of the train's progress across
> the terrain. Beneath its calm and uncontested surface, this vision of westerning-
> as-progress signified conquest over the land, its natural elements, and its inhabit-
> ants.[29]

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[29] Michael L. Smith, "Recourse of Empire: Landscapes of Progress in
Technological America," in *Does Technology Drive History?*, 42. Hereafter cited as
"Recourse of Empire."

Because of what was believed to be the inevitable progress of technology, the land and all who inhabited it must change. Native American culture would not survive and neither would much of the landscape. It would be transformed, and in the transformation anything that was not technological would be discarded, and whatever could serve technological progress would be deemed important and necessary. This was as true for the settlers accompanying the progress as it was for the Native Americans. All must conform to the new standard of excellence. Their survival depended upon it. As Merritt Smith points out, "In the eyes of the artist, technology had assumed a place of dominance in American culture."[30]

If the belief in technological progress was to play a dominant role in the development of American culture, its dominance was most clearly seen in advertisements that blindly condoned this progress. According to Merritt Smith,

> Advertising agencies . . . not only sold the products of industrial capitalism but also prompted a way of thinking about industrial technology. Using the psychological concepts of association and suggestion, neatly packaged in colorful and briefly worded appeals that excited mental images, advertisers encouraged people to believe that technology, broadly construed, shaped society rather than the other way around.[31]

Technology is not only inevitable, these advertisements suggested, but the transformation it brings should not be feared because technological progress will save time, allow us to spend more time with our families, and make our lives much happier and much easier. According to these avatars of technological development, only a fool would fail to

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[30] "Technological Determinism in American Culture," 13.

[31] Ibid.

embrace the promise of technology, for the destiny it promised, while bringing about the destruction of non-technological cultures, nonetheless meant that the future world would be much brighter than anything these obsolete cultures could have given us.

Technological determinism, at least from the North American perspective of progress, is the destiny of modern humanity, and this destiny is good. As mechanical technology developed, however, it was replaced by an electronic form of technology that is the manifestation of a deeper, more pervasive environment known as the information age. Electronic devices and the advance in science worked hand in hand with each other to foster an understanding of reality where machines developed by human beings were simply one aspect of what I will describe as digital ontology. As Heidegger pointed out in his article on technology, technology cannot be equated simply with machines. Rather, technology is a *Gestell*, or "Enframing," as it is often translated. This means that technology describes a fundamental environment that defines both machines and human beings, and while Heidegger would have opposed this interpretation, some have even suggested that this environment is itself a type of machine with an intelligence of its own. Building upon a mechanistic view of reality proffered by the early Greeks (e.g., Democritus), and gaining its modern formulation in Cartesian and Leibnizian philosophy, the function of reality is itself that through which technology is revealed.[32] Now, however, the machine is not a printing press or a train; it is a computer, and information defines the

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[32] For a history of the development of the mechanical view of the world, see E. J. Dijksterhuis, *The Mechanization of the World Picture: Pythagoras to Newton*, translated by C. Dikshoorn, foreword by D. J. Struik (Pinceton, NJ: Princeton University Press, 1986).

relational function of its parts. However, with the move from the realities of machines

such as the printing press and the train to the electronic and informational function of a

computer, the relational environment formed by information is not an analogical environ-

ment expressed in the imprecision of metaphor and simile. It is a digital environment

where simulation replaces metaphor, and identity displaces simile . With this change, we

move from understanding progress as technological progress to understanding progress as

digitally determined.

It is interesting and perhaps somewhat ironic to note that implied in the language

used to describe technological and digital determinism, along with its progress, an ethic

seems to be implied based upon goodness being defined as progress itself. In both of the

works of art referenced above (pp. 19-20) the Native Americans and their lifestyles are

placed at risk, and as Michael Smith argued, the dominance of technology meant the

conquest and ultimate destruction of their culture. While this is tragic, based upon the

ethic implied in technological and digital progress, it is also inevitable and necessary if

the good that oversees technological and digital progress is to be realized.

However, as McLuhan seems to suggest, to understand this as an ethic is mis-

guided because in a deterministic environment there is no "ought" or "should" implied in

the change of progress. Like primitive cultures that attribute the consequences of human

wrongdoing to a tribal feeling[33] rather than ethical responsibility, so also technological

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[33] This is in reference to McLuhan's analogy between reactions of primitive
peoples to a "hideous event" and the reaction of people who inhabit the global village of
the information age. See the quote from McLuhan and Fiore's book, *The medium Is the
Massage*, on p. 17 of this chapter.

and digital determinism is simply a matter of necessity. It is not a matter of responsibility, and while it may seem right to say that the promises of such deterministic schemes as these are good, it is more appropriate to say that they will make us feel good since there is no sense of volition or responsibility involved.

When applied to the digital reality of the information age, thinkers such as McLuhan and Merrit Roe Smith seem to suggest that while digital realities can heighten the sensibilities of human beings and make us feel better, there is very little ethical responsibility and hence, no real concept of good and bad governing what I will call digital ontology. Indeed, given the pervasiveness of digital ontology, we may want to question even the possibility of ethical discourse. The idea that there may be no ethical responsibility inherent in the fundamental ontology of the information age causes some people to respond to this age with shock and suspicion if not outright horror and disgust. Instead of an ethic, the digital reality of the information age seems to denote a feeling. That feeling is good or bad depending upon one's perspective, but because there is no normative ethical ground for evaluation, the progress or change brought about by the information age cannot be said to be good or bad, nor may anyone be held accountable for the events that it may bring about. Indeed, without an ethical ground from which to make such judgments, it is difficult to determine whether or not the environment created by the information age is abusive or not.

It is the problematic nature of ethics in an age of information that I wish to address in this dissertation. To do so, I will divide my examination into two broad parts: a descriptive part, and an ethical part. In the first part, the descriptive part, I will describe

a digital ontology by looking at it from a scientific perspective and what I will call digital

critical analysis. From the scientific point of view, I will examine digital ontology from

an Artificial Intelligence (AI) point view, and from the perspective of cybernetics. While

a cybernetic approach to the computing environment probably antedates AI, it is AI that

created the most sensational and immediate impact upon society as a whole. However, as

time has gone by and stand-alone computing has passed into networks, the Internet and

neural computing, second-order cybernetics, as defined by people such as Heinz von

Foerster and Humberto Maturana,[34] has begun to redefine the efforts of AI.

Having described digital ontology from a scientific perspective, I will then

examine it according to digital critical analysis. Drawing upon post-structuralist and

postmodern forms of thought as represented in the literary and philosophical work of

people such as Roland Barthes, Jacques Derrida, Michel Foucault and Jean-François

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[34] Although Heinz von Foerster has not written a great deal, his influence must not be understated. One of the original participants in the Macy Conferences, which more than anything else defined cognitive science, he developed the insights of Norbert Wiener into a philosophical system of computing that encompassed not just machines, but all of life. The breadth of von Foerster's thought was appealing to Humberto Maturana whose field of expertise was originally biology, but because of his interest in cybernetics, broadened his scope of concern to a philosophical explanation of reality that erased the boundaries between living and nonliving entities. As such, the thought of both of these individuals is an important element in understanding digital ontology. On the von Foerster's involvement in the Macy Conference, see Steven Joshua Heims, *The Cybernetics Group* (Cambridge and London: The MIT Press, 1991): 72ff. On the history of cognitive science's development, see Howard Gardner, *The Mind's New Science: A History of the Cognitive Revolution* (New York: Basic Books, 1985): 23ff. For a good review of von Foerster's thought, see "Ethics and Second-Order Cybernetics," *Stanford Electronic Humanities Review* 4:2 (June 1995): 2 [online journal] available at http://www.shr.stanford.edu/shreview/4-2/text/html; Internet; accessed 21 November 1997. On Maturana's thought, see Humberto R. Maturana and Francisco J. Varela, *Autopoiesis and Cognition: The Realization of the Living*, preface by Stafford Beer (Dordrecht, Boston, and London: D. Reidel Publishing Company, 1980).

Lyotard, critical theory originated as a Marxist response to modern forms of capitalism

and the challenge advanced by capitalism to more classical forms of Marxism. While not

originally concerned with a digital context, the development of the information age and

its intimacy with a capitalistic form of economy has led some to argue that the discourse

of media technology makes it impossible to critically assess capitalism. The fear is that

without a critical space from which to view the dominance and expansiveness of digital

ontology, then it will lead to abuses that threaten to erase the face of humanity from

technological development. As the dialectic between a critical perspective and digitality

develops, we are given a unique insight into the nature and work of digital ontology itself.

I will use the work of George P. Landow from a more literary approach to the phenome-

non of hypertextuality on the one hand, and the more radical approach of Jean Baudrillard

to hyperspace on the other. In between these two extremes – Landow believing that

hypertextuality is itself a critical perspective and Baudrillard who proposes a type of

hyper-fatalism, the critical response to which is silence – I will examine the work of Mark

Poster who ultimately is unable to give up a modern notion of the self in the development

of his "mode of information."[35] By describing digital ontology from a critical theory

perspective, I will be able to move away from the cold, more calculative descriptions

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[35] Landow's work is developed in his book, *Hypertext 2.0: The Convergence of Contemporary Critical Theory and Technology* (Baltimore and London: The Johns Hopkins University Press, 1997); Poster's work is contained for the most part in his three works entitled *Critical Theory and Poststructuralism: In Search of a Context* (Ithaca and London: Cornell University Press, 1989); *The Mode of Information: Poststructuralism and Social Context* (Chicago and London: The University of Chicago Press, 1990); and *The Second Media Age* (Cambridge, MA: Polity Press, 1995). Baudrillard has written prolifically, but perhaps his best known book is called *Simulations*, translated by Paul Foss, Paul Patton and Philip Beitchman (New York: Semiotext (e), Inc., 1983).

offered by cognitive science, and understand how it interfaces with, and effects, the notion of being-human.

Digital ontology, I will demonstrate, is an ontology of shifting centers whose function is defined teleologically. That is to say, a center is an informational response to an otherwise chaotic environment based upon a particular purpose. Because the telos of the center is identified relative to an environment that is constantly changing, however, its usefulness is outlived as soon as its purpose is fulfilled. When this happens, the center dissolves, it is deconstructed by the shift in its environment, and other centers are formed to replace it.

Centers are the building blocks upon which all aspects of reality are formed. If something is a machine, it is so because it is formed out of numerous centers, the purpose of which is to fulfill the needs of that particular environment. In terms of systems theory, the machine is an environment that defines a system, and the system is comprised of numerous centers. Because both the system and the centers are interrelated, and because the system is interrelated with its wider environment, both are prone to continual redefinition. This redefinition is the cause of what I am calling a shift. The shift, in shifting centers, is the deconstruction, reconstruction of systems and centers by the erasure and redrawing of the borders that embody them.

The life of a system is based upon what I will later call its porosity, or its contin-ued sensitivity to its environment. When a system tries to ignore or deny its shifting nature by attempting to transcend its environment, it creates a situation in which it attempts to define its purpose as if it were absolute, or universal. Put differently, it

becomes an ideology that denies its teleological nature and the teleological nature of its centers. From a digital ontological perspective, ideology defines a totalizing condition that opposes the natural function of both centers and systems.

From an anthropological and sociological perspective, people and their social environments are very complex systems comprised of an exponentially large number of centers that are shifting very rapidly. If human and social systems are attentive to their interrelated natures, their life will be much more meaningful and pleasing because it will be in keeping with the continuously shifting teleological function demanded by their environment. If, however, these systems attempt to transcend their environments by developing an ideological immunity to the shift, then they risk becoming irrelevant abstractions denoted by their intolerance to change.

It is possible to represent this ideological immunity from purely a descriptive point of view, but a description is not necessarily an ethical judgment. My question, however, is this: Does it make sense to speak of a digital ethic, or does the teleological shift of centers and systems define a deterministic *Gestell* that renders discourse about ethical agency, volition, freedom, responsibility, and accountability meaningless?

The second broad part of my dissertation (chapters 4-5) is a response to this question. Like Heidegger, Ellul, McLuhan and Merritt Smith, I too believe that digital ontology and computing phenomena are not just passing fads. They are here to stay.[36]

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[36] An interesting book that also bears this out is Peter J. Denning and Robert M. Metcalfe, eds., *Beyond Calculation: The Next Fifty Years of Computing,* foreword by James Burke (New York: Copernicus, 1997). March 1997 marked the fiftieth anniversary of modern computing, and this book is a response to the remarkable impact that modern computing has had, and will continue to have on every aspect of culture and human life.

However, because of the quickly shifting and changing nature of digital ontology, ethical concerns are often difficult to define, and more traditional approaches to ethics seem to be woefully inadequate in addressing these changing needs. The result is that some people such as Stephen Talbott,[37] Clifford Stoll,[38] M. Christine Boyer,[39] and Ziauddin Sardar[40] think that digital ontology is demonic and threatens not only women, racial and ethnic autonomy, but portends the complete erasure of human beings and nature. If, as Heidegger, et. al., have argued, digital ontology is not only here to stay, but is our destiny that to a great degree determines the course of history, then one wonders if the warnings offered by those worried about the abuses of digital ontology are not just the worrisome remnants of a dying print culture. Is digital ontology a reality that advances in control of itself and is immune to human critique? Or is William J. Mitchell correct when he cautions against accepting the advance of digital ontology without some type of controlling influence upon it? Mitchell writes:

> Massive and unstoppable changes are under way, but we are not passive subjects powerless to shape our fates. If we understand what is happening, and if we can

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[37] Stephen L. Talbott, *The Future Does Not Compute: Transcending Machines in Our Midst* (Sebastopol, CA: O'Reily & Associates, Inc., 1995).

[38] Clifford Stoll, *Silicon Snake Oil: Second Thoughts on the Information Highway* (New York, London, Toronto, Sydney, and Auckland: Anchor Books, 1995).

[39] M. Christine Boyer, *Cybercities: Visual Perception in the Age of Electronic Communication* (New York: Princeton Architectural Press, 1996).

[40] Ziauddin Sardar, "alt.civilizations.faq: Cyberspace as the Darker Side of the West," in *Cyberfutures: Culture and Politics on the Information Superhighway*, edited by Ziauddin Sardar and Jerome R. Ravetz (Washington Square, NY: New York University Press, 1996).

conceive and explore alternative futures, we can find opportunities to intervene, sometimes to resist, to organize, to legislate, to plan, and to design.[41]

If Mitchell's hope is warranted, that is, if we are going to be able to influence the progress of digital ontology, then we must define a space in which ethical discourse may be understood meaningfully in a digital environment. The question is, is such a space possible in this highly determined understanding of reality?

Ethics, from a digital perspective, is discovered in the dialectical ground of shifting centers, the playfulness of which forms the basis of ethical alternatives, or what Mitchell calls "alternative futures."[42] Here, ethics is defined not so much by the active agent who is free to make choices – an alternative that our study of digital ontology and digital critical analysis will demonstrate is really no alternative at all – as it is a context that demands a responsible response to differing alternatives that arise out of the context of shifting centers. In this sense, ethics does not define a situation where a free agent chooses to do good, as much as it is the ground that defines the dialectical play of digital ontology. Ethics is not defined relative to a center or even a system. Rather, ethics is a matter of non-totalizing discourse, the space of which is always outside the center or the system. So while digital ontology is noted for its emphasis upon the interrelated nature of centers and systems, it is not simply that. If it is to be the space of a digital ethic, it must also be an ontology that is other than systems and centers themselves.

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[41] William J. Mitchell, *City of Bits: Space, Place, and the Infobahn* (Cambridge and London: The MIT Press, 1995): 5. Hereafter cited as *City of Bits*.

[42] Ibid.

To understand how this can be the case, I will turn to the thought of Emmanuel Levinas. Admittedly, Levinas did not spend a great deal of his philosophical and ethical acumen on the problem of technology, much less the problems presented by digital ontology.[43] However, his thought contains several factors that will be helpful in defining the space of ethical concern within a digital ontology. First, Levinas is extremely suspicious of a phenomenon he calls "totality," or "totalizing forms of discourse." Totality is meaningful on two interrelated levels, the level of the individual and the more abstract level of idealism. From the perspective of the individual, totality is an exclusion of anything other than the individual's self-consciousness by making all awareness a function of self-consciousness itself. On the other hand, totality may also be defined as idealism. Idealism is the totality of the ego writ large. That is, idealism is the egoism of culture that cannibalizes all difference so that anything exterior to a culture's ideological framework is redefined and consumed by the culture itself. This is as true of the exteriority of other cultures as it is of nature. In both the totality of the individual and idealism, totality nullifies any difference that could call it into question or evoke any significant change. In this sense, totalizing discourse cannot be ethical discourse from a Levinasian perspective. Indeed, Levinas thinks that ideology is the end of ethics, and the ego (the self as a totality) is simply unethical.[44]

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[43] Indeed, Levinas did not write, except indirectly, about technology at all, and I know of only one article written about Levinas and Technology. See Adriaan Theodoor Peperzak, "Technology and Nature," in *Beyond: The Philosophy of Emmanuel Levinas* (Evanston: Northwestern University Press, 1997): 131-144.

[44] On idealism, see Emmanuel Levinas, "Ideology as Idealism," in *The Levinas Reader*, edited by Seán Hand (Cambridge and Oxford: Basil Blackwell, 1989): 238, and

When applied to digital ontology as I will describe it, this means that any attempt to reify a center so as to preclude the shift that inevitably arises out of the dialectical play of its environment is in opposition to an ethical perspective. Thus, the ethical ground that Levinas sought to define in his earlier writings, and the ethical nature of pre-theoretical realities that he describes in his later writings, have basically the same function as the dialectical play of chaos in digital ontology. Both are opposed to the isolation of a center (totality) so that it appears to be immune to the necessity of change. In this sense, the dialectical play of chaos is essentially the metaphysical ground of ethics as defined by Levinas.

Second, while the ground for digital ontology may be ethical, the ontology in and of itself is not necessarily good. Ethical realities, as traditionally understood, have to do with human activities and the realities such actions create. Because of this, ethical agents must be free to make choices between good and bad, and because they are free, are therefore held accountable for the choices they make. According to Levinas, however, to construe ethics in this fashion is to make ontology the ground for ethical behavior, and in so doing, ethics loses its transcendence and is caught up in the ideology of totality. The good is then interpreted as an ideal defined by idealistic schools of thought. It then becomes a function of ontology.

Emmanuel Levinas, *Entre Nous: On Thinking-of-the-Other*, translated by Michael B. Smith and Barbara Harshav (New York: Columbia University Press, 1998): 179ff.; on totality and the individual, see Emmanuel Levinas, "The Ego and Totality," in *Collected Philosophical Papers*, translated by Alphonso Lingis (Dordrecht, Boston and Lancaster: Martinus Nijhoff Publishers, 1987): 25ff; *Totality and Infinity: An Essay on Exteriority*, translated by Alphonso Lingis (Pittsburgh: Duquesne University Press, 1969): 37-39.

To avoid this unfortunate way of thinking, Levinas develops several different concepts which he employs to define ethics. First, freedom is not the condition that defines the ethical responsibility of the subject (ego, *psyche*). Rather, while the subject is held responsible for his or her environment, he or she is not free to choose how such responsibility is assigned. Acting from a position of freedom and the assignation of responsibility is the role of what Levinas calls the Other. Levinas states:

> The responsibility for the other can not [sic.] have begun in my commitment, in my decision. The unlimited responsibility in which I find myself comes from the hither side of my freedom, from a "prior to every memory," an "ulterior to every accomplishment," from the non-present par excellence, the non-original, the anarchical, prior to or beyond essence. The responsibility for the other is the focus in which is situated the null-site of subjectivity, where the privilege of the question "Where?" no longer holds.[45]

The responsibility that is assigned to the subject is assigned by the Other, but more than that, it is responsibility to the Other. When it comes to ethics, the subject is not initially an active agent, but is a passive system, and his or her passivity takes place before the subject is defined as a volitional agent. That is, it originates before the subject thinks about, or reflects upon its relationship to the Other.

Levinas helps us understand the nature of the self and responsibility in a non-agential way, and indeed, his passive construal of these concepts is fundamental to his form of ethical discourse. However, these are not the only ways, nor are they the most important ways that Levinas aids us in understanding how ethical discourse can be a part of digital ontology. In his later work, *Otherwise than Being*, Levinas builds upon his

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[45] Emmanuel Levinas, *Otherwise than Being or Beyond Essence*, translated by Alphonso Lingis (Pittsburgh: Duquesne University Press, 1981, 1997): 10. Hereafter cited as *Otherwise than Being*.

notion of totality as simply one type of reduction. Totalizing reduction is the reduction of all difference to the same. Or, in the language of digital ontology, totalizing reduction is a systemic reduction in which all differences between, for example, human beings and machines are defined away in terms of a common denominator, the sameness of the system itself.[46] It is this reduction that has defined the work of Artificial Intelligence engineers who define away the difference between human beings and machines based upon the common feature of function. Likewise, cyberneticians, who develop their thought based upon Norbert Weiner's feedback loops suffer the same shortcomings. They reduce all aspects of reality to a common denominator known as a system. Difference between systems is really no difference at all because whether a human being, an animal, a machine or the Amazon rainforests, they are all fundamentally the same, they are systems and function as systems.

However Levinas argues that if we stop with the reduction defined by totalizing discourse, we will have not only misunderstood the nature of reality, but we will never be able to define a space in which we can engage in ethical discourse. If ethics is to be a part of ontology, then a second different type of reduction is required, and that reduction Levinas calls the reduction of the Same to the Saying.[47] This reduction means that all totalizing discourse is ultimately grounded in something that is more fundamental than itself, a space that Levinas calls the space of the Saying, or the hither side of being. To be grounded in the Saying, he believes, is to be under the condition of responsibility defined

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[46] Ibid., 68ff.

[47] Ibid., 47ff.

by the Other. Or, in the language of digital ontology, if a human being, or a social structure, as a system is to overcome its totalizing and ideological tendencies, then it must recognize that it is grounded in something other than itself so that it can be otherwise than what it is. Put differently, the recognition of otherness within the space of its systemic discourse liberates a human being or society to be otherwise, it frees them to shift. Based upon Levinas' reductive scheme, then, a digital ethic is an ethic that places before all systems the responsibility of becoming something they are not, thereby liberating them to fulfill their function, and then to be otherwise. It is a call to be different.

An ethic such as this one is a powerful challenge to ideological factors within the culture of computing and the scientific community that often tend to reduce humanity to digits. It is also a powerful challenge to those who wish to equate human knowledge with the function of computers. While both computing machines and human beings are highly abstract and complex realities of shifting centers, and therefore ontologically commensurate, they are nonetheless different centers focused upon differing themes. Both computing and human centers can become demonic when placed in the service of that which is opposed to the porosity necessary to the shift of digital ontology. However, Levinas' philosophy helps to understand that if digital ontology is to be an ethical environment, personness cannot be restricted to the strictly human, but must be something held in common by all centers, regardless of whether they may be computing centers or human centers. If this is the case, then a highly determined environment like digital ontology may also be understood as having the potential of becoming an ethical environment, or at least that is what I will demonstrate in this dissertation.