A Comparative Account of Substantive Technology Theory in the 20th Century

Daniel Bruce Hansen

Master's Thesis

Lakehead University

May 27, 2003

For my father.

I have received an excess of support from countless family and friends, yet I would like to mention a select few:

Todd Dufresne, for being in all things the very definition of a mentor.

Albert Borgmann, for his kindness, support, and generosity of time and energy that goes beyond the rational.

Richard Berg, for first drawing me into philosophy, for his example.

Kim Fedderson, for his time and enthusiasm.

Andrew Feenberg, for his direction and encouragement.

Krista Hansen, for saintly patience and strength, for a son, and for love.

Table of Contents

Preface

It would be just as easy to say what this thesis is not about as it would be to say what it is about. Indeed, some would venture to say that most of this thesis is not about technology at all, with a paragraph about keyboards here, a footnote about microchips there, but rather pages about politics, sociology, anthropology, and so on. I would respond that it is all a matter of definition, and the definition of technology I am preferring in this thesis extends well beyond keyboards and microchips into the vastness of all politics, sociology, anthropology, and further still. This position carries with it a conclusion that technology, as defined, is among the determinants of individual, cultural, and social change. Admittedly, determinism in any form is considered unpopular, yet from the beginning of this process I have been given no sufficient reason to think otherwise.

This thesis represents my own introduction to the philosophy of technology. Begun from a mere interest, every stage of research, every book, and every article provided something entirely new. I have tried to align and condense a small portion of it for this thesis, so the reader should be aware that many, many important thinkers on technology have been left out. As a result, this thesis, while still being ambitiously broad in scope for a treatment of this length, represents but a fraction of the field as whole. At any rate, it tells a story I believe is worth reading, especially in a momentous technological age such as ours.

1: Introduction

Now at the dawning of the 21st century, recent technological developments have thrust us into the digital age, where technology is claiming a totalizing role in all aspects of Western society, presenting unique problems and opportunities. In turn, many theorists are asserting the fundamentally unique nature of digital technology, claiming we need new ways to think about technology. This is true, for, as we will see, digital communication technologies are a completely new kind of technology, requiring new approaches to keep it in hand. It could be convincingly argued, however, that technology is technology no matter what form it takes – that comments made about technology two thousand years ago are still applicable. And still it could equally be argued that digital communication technology is so different a form of technology from any past version that new theory is need to adopt, adjust to, and cope with its effects – both positive and negative.

In this thesis, I will demonstrate that the solution to the digital problem requires a little from both sides of the issue. I contend that while digital technology is a radically different form of technology, its substantive character as a technology has remained the same. To this end, I will examine claims concerning the essential character and unique nature of modern industrial technology made by Jacques Ellul, Herbert Marcuse, and Martin Heidegger. All of these theorists, regarded as 'founding fathers' of contemporary philosophy of technology, asserted modern technology's substantive character as revealed by its unique nature. I will then survey, assess, and compare evaluations made by some contemporary theorists, namely Jean Baudrillard, Steven Best and Douglas Kellner, Andrew Feenberg, and Albert Borgmann. The purpose of reviewing such a

general chronology is, I think, useful in that I will be able to make comparisons between modern age theory and current theory. I believe that modern-age theorists were on to something that current theorists have generally left behind or ignored, perhaps the result of over-sensitivity to the recent unpopularity of modernist modes of thought. My approach is founded in admittedly basic and, some might complain, naïve observations; like many others, I feel the constant pressure of technology, and particularly of digital communication technology, on every aspect of my daily living.

My observations about the pervasive nature of technology are not my own, nor are they new. In fact, it has become something of a cliché to decry the pervasiveness of technology in the digital age. Internet and e-mail, public surveillance, cell phones, genetically engineered food – every aspect of our daily living is aided or augmented by or, in more cynical terms, has been made subject to digital technologies. Alan Lightman, a novelist, essayist and physicist, who is also an adjunct professor at MIT, recently ran a feature in *The Globe and Mail* entitled "Prisoners of the Wired World," in which he observed that "technology was supposed to make us free: Instead is has enslaved us. In a world driven by an unquenchable thirst for speed and profit, how can we rediscover the key to an inner life?" (2002: R1). He continues to suggest that technology has taken on a life of its own, and that we need to reclaim our own lives so that we are 'free' to actually waste our time, if we so choose, rather than continually dividing it up into blocks of efficient activity:

> If I have hours, I can work at my laptop on an article or book. If I have a few minutes, I can answer a letter. With only seconds, I can check telephone messages. Unconsciously, without thinking about

> it, I have subdivided my waking day into smaller and smaller units of 'efficient' time use, until there is no fat left on the bone, no breathing spaces remaining. I hardly ever give my mind permission to take a recess, go outdoors, and play. What have I become? A robot? A cog in a wheel? A unit of efficiency myself? (R1).

Lightmans's concerns are but an echo of generations past. Carl Mitcham and Robert Mackey, in a wonderful introduction to an edited collection entitled "Philosophy and Technology" and published in 1972, write:

> As two students coming of age in the 1960s, we found ourselves living in a decade of plastic food, landscapes that resembled the printed circuits of a portable television set, and scientific toys that were rocketed into space to take possession of the moon.... As we watched the Vietnam War become an automated battlefield with American air power, stripping both children and trees of their skin, while the evening news was punctuated with advertisements for swift cars and laxatives, our minds closed down upon our thoughts. Yet doubting, and sometimes running, we were always forced back to the same thing, more certain than ever of its dominating presence. (v)

The possibility of losing control of the very thing designed to provide more of it has been the constant contrapuntal voice to the corporate claims of increased efficiency and mobility offered through technology, and both voices have been heard ever since

technology has gained a certain level of presence in both industry and society as a whole. Yet in the current era, when technology is being thrust upon us, when we are urged to incorporate technology into every facet of our lifestyle, and when we are taking it and immersing ourselves readily in technologies, some thought about what the nature of technology actually is and how it will affect us when internalized to such a degree is not only a good idea, but is absolutely necessary. It is my hope that what I see as a useful point of view in modern theory will again be useful and even enlightening in helping to assess the social implications of digital technology.

But what is technology? What do we mean when we talk about technology? Is it complex like computers or cars, or something simple like a flint arrowhead, or a reed used to extract termites from their mound? Or is technology, in a sense, bigger than the things we use? The distinction is crucial, for how one conceives of technology determines what issues are considered relevant and important. As we will see, it is surprising to find how diverse the conceptions of technology actually are.

1.1: Technology

Reading and writing about philosophy and technology can get very complicated, very quickly. One reason the difficulty exists is because philosophy of technology, more than any other philosophical 'discipline', necessarily engages all manner of theory and practice, from history and music to engineering and business. Indeed, by virtue of the thoroughly pervasive nature of technology in Western society, philosophy of technology is inherently supra-disciplinary. By the same virtue, philosophy of technology is arguably the most important vein of philosophical investigation of the 21st century.

Yet the supra-disciplinary nature of thinking about technology is at the same time a problem. The philosophy of technology discourse seems akin to the fields of Babel after the intervention of God – nearly every theorist defines technology in his or her own way, making meaningful discourse about it very difficult and rare. Criticisms are often weak or miss the point entirely due to wildly varying conceptions of what technology actually is. Still, I believe it is possible to isolate common veins of thought and assessment from many different thinkers on technology, typically because they are extracting from the same lode. Technology, no matter how you happen to define it, still presents problems, as well as opportunities, that have real implications.

In the field of philosophy of technology – in the fields of Babel, *post deum* – no two thinkers define technology in the same way. Upon randomly picking up a book on technology, one is never sure of what one will find inside. This fact has been one the most frustrating aspects of my reading, in that, after waiting for weeks after ordering a book through inter-library loan services, I would often be frustrated by the lack of a forthright clarification of terms, causing me to cobble together an estimation of the author's intentions. Other times I would read a text which claimed to use one definition only to act upon another. Perhaps I should not have been so surprised to find such a variation in definitions, considering that the participants in the discourse involve the entire spectrum of academia and science. Frankly, it becomes a chore when one tries to find parallel or even compatible approaches among thinkers of technology.

To make matters worse, most philosophy dictionaries such as the Oxford Dictionary of Philosophy do not even provide a definition of technology. When they do, they provide no content apart from a lead to "The Frankfurt School." Of course, the

Frankfurt School was not a strictly philosophical group; rather, they drew as much from sociology and economics as they did from philosophy. Sociology dictionaries, in fact, often provide a definition of technology, such as this one from the second edition of the Oxford Dictionary of Sociology: "A term used rather loosely in sociology, to mean either machines, equipment, and possibly the productive technique associated with them; or a type of social relationship dictated by the technical organization and mechanization of work ..." (665).

It is made clear in the above quote that there are two general conceptual definitions of technology. The first is that of instrumentalism, and the second is that of substantivism. Simply put, instrumentalists generally define technology as tool, subservient to the values established in politics or culture. Substantivists declare the existence of something underlying – literally *sub stantia* – in technology, often an essence or an autonomous force to technology that overrides all traditional or competing values. It is a difference between identifying many 'technologies' or one 'Technology'. Each definition is naturally concerned with certain issues rather than others, yet I will later reveal that the two, while often positioned opposite to each other, can and do work well together. First, however, it is helpful to clarify what exactly is meant by the terms "instrumentalism" and "substantivism" in relation to technology.

1.1.1: Instrumentalism

A simple yet inclusive definition of instrumentalism identifies technology as tool or instrument. There are a variety of ways to define technology as instrument, such as: the branch of knowledge that deals with industrial arts, applied science, engineering, etc.;

the application of knowledge for practical ends, as in a particular field; the terminology of an art, science, etc.; a technological process, invention, method, or the like; the sum of the ways in which a social group provide themselves with the material objects of their civilization. Instrumental conceptions also include man-made entities such as processes or systems. These include economic systems, political systems, or even methods such as mathematics, logic, or critical methods. In short, the core of the instrumentalist definition of technology is anything that is used by humans to achieve a pre-configured end.

The 'popular' conception of technology, shared with Western governments and corporations, is a basic version of instrumentalism where technology is identified as anything mechanical or electrical. Of course, some people are aware enough to identify any tool as being a technology as well, from a stone axe to a space shuttle.

Divisions in definition among instrumentalists occur around issues such as what kinds of things actually constitute a technology. The most common definitions of technology imply some element of human design. Others restrict technologies to being material objects, where still others extend the definition to include other man-made processes or concepts, such as the alphabet. Divisions also occur around the issue of whether or not technologies are necessarily limited to tools designed and used by humans, or if they can be 'found', e.g., a sharp rock found and used for cutting meat, a log found and propped up as a ladder, and so on. Indeed, 'found' technologies could also include tools being used for a different purpose than intended, e.g., glass transformer bulbs being used as paper weights, or a bottle being used as an instrument.

Despite the varying definitions, all instrumentalists emphasize, or even take for granted, human control in the design and direction of technologies, and so technology is

deemed 'neutral' with respect to its ends. According to Andrew Feenberg (1991), the claim of the neutrality of technology implies at least four things. First and most obvious, as pure instrumentality, technology is indifferent to the variety of ends it was designed and employed to achieve. Second, technology also seems to be indifferent to politics. A hammer is a hammer, a steam turbine is a steam turbine, and such tools are useful in any social context. Feenberg makes a distinction here between the political neutrality of technologies and the apparent non-neutrality of legal or religious institutions, "which cannot be readily transferred to new social contexts because they are so intertwined with other aspects of the societies in which they originate. The transfer of technology, on the contrary, seems to be inhibited only by its cost" (Feenberg 1991: 6). The third implication, according to Feenberg, is that the socio-political neutrality of technology is usually attributed to its 'rational' character and the universality of truth it embodies. What this means is that if technology is based on verifiable causal propositions, then what works in one society or context should work just as well in another. The fourth implication of defining technology as neutral is that, due to technology's universality (point three), the same standards of measurement can be applied in different settings. Feenberg says that because of this universal application of standards, "technology is routinely said to increase the productivity of labour in different countries, different areas, and different civilizations. Technologies are neutral because they stand essentially under the very same norm of efficiency in any and every context" (6).

Feenberg is obviously using the narrow and popular instrumental conception of technology in this assessment, so it is debatable whether or not his list can be applied to all of the instrumental definitions of technology I have provided. For example,

Feenberg's definition would seem to exclude all non-mechanical kinds of technology, although one could make a case for technical methodologies to be lumped in with the machines. As seen above, however, machines and methodologies are not the possible extent of instrumental technologies.

Feenberg's second assertion that instrumental technologies are indifferent to social or political contexts is not entirely true either. Even with modern Western technologies, political and social ideologies can be challenged. For the past several years in northern India, many hydro-electric projects have been protested and ultimately stopped because of the socio-political conflict that arose when rivers – many of them sacred – were dammed and their flows impeded. The most contentious and visible example of this is the proposed damming of the Narmada river in western India, known as the Narmada Valley Development Project, which plans to install 30 large, 135 medium, and 3000 small dams on the Narmada and its tributaries, all of which are considered sacred. The potential power and water that would be made available by the project is indeed needed to aid in agricultural and industrial development, yet many are protesting the potential human rights abuses and the certain population displacements that would result, not to mention the violation of the Narmada itself, the related pilgrimage routes, and hundreds of centuries-old temple. Some of the large Narmada dams have been built, such as the Sardar Sarovar dam. Others, such as the Maheshwar dam, have been cancelled or postponed in response to public outcry. The cost/benefit ratio takes on new meanings and evaluations when modern Western technology meets with non-Western socio-politics (Roy 1999: online).

Further to this, Feenberg's third and fourth claim that a technology is universally applicable reveals a particularly Western conception of technology in his assessment. For instance, Don Ihde's example of Micronesian navigational tools describes them as being based on local constellations and landmarks – one would not be able to take that tool and use it to successfully navigate Lake Superior. A global positioning system (GPS), however, with its array of dedicated satellites can be used to accurately navigate anywhere in the world, be it on land, water, or in the air. GPS fits Feenberg's four implications, but Micronesian navigation tools do not.

On the whole, Feenberg is not entirely convincing in his assessment of neutrality. He applies qualifying remarks with respect to technology's neutrality in writing that it merely 'seems' or 'is said' to be neutral in these four ways, and he does so for a reason. Feenberg is setting up instrumentalists to represent one extreme in technological discourse; he does the same with substantivists, positioning them at the other extreme. He does this in order to position himself in the 'balanced' and thus sensible middle-ground, and he does so unfairly. Not all instrumentalists and not all substantivists necessarily stand where he places them. Of particular note is his positioning of Ellul and Heidegger at the substantive extreme, labeling them as "apocalyptic" and ultimately pessimistic in their assessments of technology. This interpretation of Ellul and Heidegger is an easy one to make based on superficial reading, and has subsequently become the popular understanding. Yet I would argue that Feenberg is ultimately guilty of misquotation and misrepresentation, especially in Heidegger's case. I will return to both Ellul and Heidegger later in the paper. However, the effect of Feenberg's assessment of

instrumentalism leaves the reader with the impression that every instrumentalist believes these things necessarily.

It is in fact quite possible for an instrumentalist to deny any or all of these points, as well as to deny technology's supposed neutrality. For instance, it would be simple for someone to claim that while technology is indeed a mere tool of human design and prescribed function, there is still an inherent bias toward domination in its design. This view makes no claims about the autonomy of technology, or of its essence, but merely contends that there is a habit in technologies imbedded in its very design in that technology is designed and applied to dominate – or to help its users to dominate – an object or idea, be it humans, nature, or whatever. A gun is designed to put its user in a dominant position over the target much in the same way that a small-pox vaccine is designed and applied to put a patient's immune system in a dominant position over a potential small-pox virus. In either case, technology allows for the emergence of asymmetrical power relationships that previously were balanced or, more likely, the reverse. Technology, then, effects change. This view, in the vein of instrumentalism, places the burden on engineers and policy makers – or corporate interests – to *conscientiously* design and apply technologies. Interestingly, Feenberg adheres to such a position himself, yet nominally distances himself from instrumentalism. Instrumentalism and substantivism, it seems, are not as clear-cut as Feenberg makes them out to be.

Yet I believe that Feenberg's narrow account of instrumentalism is useful for its accurate description of the most common public understanding of technology, which also happens to be the general understanding of political and economic authorities in the

West. As a result, the *common* view is that technology, being neutral, has no moral relationship to the ends for which it is used.

1.1.2: Substantivism

In terms of the general population, there is a minority view which invariably denies the neutrality of technology. Substantivists suggest that the tools we use shape our individual, social, and cultural lives. Extreme proponents of substantivism argue that technology in this sense is the prime determinant of social and cultural change, even more so than economic, historical, or even biological factors. As such, means and ends cannot be separated and the technical society is doomed to an ever-spiraling process of technological conflagration. But not all substantivists are so pessimistic.

Technology in the substantivist sense is often considered to embody a certain set of values. In Western societies, for example, substantivists hold the opinion that instrumental technologies are merely a partial factor and product of a grander and more comprehensive system of rationality. This system of rationality, which theorists tend to call 'technology' or 'technique', is an unique characteristic of modern industrial culture. While instrumental technology has been the material counterpart to humans for millennia, the increasingly intense application of technology in the modern industrial age seems to have revealed to many modern theorists a substantive element or essence of technology as a whole. This essence is, by definition, universal to all technologies, but only recognizable – and problematic – in such intensely technical conditions such as modern industrial society.

Such is the view of most theorists of the modern age, the most prominent and influential of them being Ellul, Heidegger, and Marcuse. While each defines the essence of technology differently, the similarity of theory among these men is particularly interesting when one considers each man's socio-political position. Heidegger was at one time a Nazi supporter, perhaps reluctantly, but a Nazi nonetheless. Marcuse, a student of Heidegger's, was a Jew who fled Germany in the early 1930s for obvious reasons. And Ellul was a Christian Anarchist and a hero of the French Resistance. It is incredible, given their radically different socio-political positions, that each produced such similar evaluations of technology and of its implications for humanity, as I will demonstrate in a few moments.

It bears mentioning that there is no necessary connection between the substantive position and the essentialist position. However, it would not be a broad generalization to say, as above, that substantivists are essentialists. It would also be equally accurate to say that substantivists, as essentialists, are deterministic. But again while these connections are more than a tendency they are hardly necessary, just as there is no necessary connection between instrumentalism and the claim of the neutrality of technology.

The charge of determinism made against technological substantivists is particularly interesting. Technological determinism has been unfashionable for decades. Yet in times such as these, when it is clear that the internalization of digital technologies at every level of government, business, and of society in general is beginning to make significant changes to our culture, ascribing a determining nature to digital technology in Western society is compelling. After all, how we communicate, how we order our time,

what priorities we have, what values we hold, all seem to be mediated and in some ways determined by the technologies we use today.

The substantivist position was commonplace during the years around World War II. However, the furtherance of postmodern theory and its deconstructive project in recent decades had eclipsed modern theory and, with it, related concepts such as essence and determinism. Essentialist and determinist concepts and language are unpopular and dated even among the general public, and thus instrumentalism is favoured as if by default. Perhaps it is for this very reason that the general public disregards the idea of a substantive nature in technology, and that technology is rarely isolated as a significant factor in social change and structuring, as well as possibly threatening our humanity. Rather, technological advance is pursued and applauded.

1.2: The Historical Problem of Technology

We live in a wired world, or so the claim goes. As far back twenty years ago, arguably before the digital age, technology theorists were remarking on the pervasiveness of technology, and that we lived in culture so saturated with technology that every aspect of daily affairs from the mundane to the most intimate were increasingly technologically mediated (Ihde 1985: 22). But claim about our wired world is true; the pervasiveness of technology is not and cannot be in doubt. Indeed, it has been clear since the maturation of the industrial age when just over one hundred years ago the phenomenon of technology suddenly became an object of interest for philosophers. Yet even as recently as twenty years ago there remained a broad gap between the importance of technology to

the 'real world' and the sparse number of philosophical works dedicated to the understanding of modern technology (Durbin 1983: xiii).

The philosophical engagement with technology, however, did not begin with the modern era. While the issue of technology has become supremely important only in the past seventy years, technology has been subject to philosophical investigation since the dawn of Western philosophy. These earliest of discussions about technology in the Western tradition first occurred in ancient Greece with Plato and Aristotle. In the next few pages, I will briefly outline the technology-related discussions of Plato and Aristotle for the purposes of providing a background to modern discussions of technology. The thinking of these two men are the source waters of all theory since, and Heidegger in particular makes direct reference back to them. However, while these discussions have had a resonating effect on our own conceptions of technology, I will reveal shortly that Heidegger points out that time has allowed some confusion and misinterpretation to filter in.

1.2.1: Plato

Technology, an English word, has its roots in Greek, meaning literally 'study of an art or skill'. For this reason, Plato does not attack technology as we popularly conceive it, namely technology as machine or physical tool. Rather he attacks an aspect of *techne* (arts or branches of knowledge), the aspect that is imitative.

Plato attacks technology in a number of works, and in particular he attacks writing. He likens writing to painting, which, like other kinds of art such as poetry and rhetoric, was considered by Plato to be but a mere imitation of knowledge or *episteme*. Knowledge was, for Plato, the highest goal of human striving. It was positioned atop a

ladder of states of mind, each preceding rung being thought (*dianoia*), then confidence (*pistis*), and finally conjecture (*eikasia*). To be able speak meaningfully about a thing, one must have knowledge of it, to know what it is. But imitative art like painting and poetry was branded as conjecture, not able to add to the discourse about a thing, and so was not worthy of serious consideration. Furthermore, arts were considered to be dangerous to people in that they distracted them from what was actually worthy of their attention, specifically knowledge, as evident in this quote from Book X of The Republic:

> This is what I wished to have admitted, when I said that painting, and imitative art in general, works far away from truth in doing its own work, and joins hands and makes bosom friends with that part in us which is far away from wisdom, for no healthy and true end. (603a-b)

In the Phaedrus, written after The Republic, Plato continues his attack by including writing with the imitative arts. He invokes a parable, a meeting between the Egyptian god Theuth and the pharaoh Thamus, to illustrate his point. Theuth was a god who invented many things, including writing. Upon presenting this 'invention' of writing to Thamus, Theuth announced it as "an elixir of memory and wisdom," yet Thamus held a different opinion:

> 'Most ingenious Theuth, one man has the ability to beget arts, but the ability to judge of their usefulness or harmfulness to their users belongs to another; and now you, who are the father of letters, have been led by your affection to ascribe to them a power the opposite of that which they really possess. For this invention will produce

> forgetfulness in the minds of those who learn to use it, because they will not practice their memory. Their trust in writing, produced by external characters which are no part of themselves, will discourage the use of their own memory within them. You have invented an elixir not of memory, but of reminding; and you offer your pupils the appearance of wisdom, not true wisdom, for they will read many things without instruction and will therefore seem to know many things, when they are for the most part ignorant and hard to get along with, since they are not wise, but only appear wise'. (274e-274b)

This parable reinforces Plato's position that writing, like painting, is an imitator of knowledge, and also produces imitators of knowledge in people. Indeed, Plato continues, always in the voice of Socrates, describing writing's dangers:

> Writing, Phaedrus, has this strange quality, and is very like painting; for the creatures of painting stand like living beings, but if one asks them a question, they preserve a solemn silence. And so it is with written words; you might think they spoke as if they had intelligence, but if you question them, wishing to know about their sayings, they always say only one and the same thing. And every word, when once it is written, is bandied about, alike among those who understand and those who have no interest in it, and it knows not to whom to speak or not to speak; when ill-treated or unjustly

> reviled it always needs its father to help it; for it has no power to protect or help itself. (275d-e)

For Plato, writing, as well as any other imitative art, is effort in the wrong direction on the proper course of human striving. It leads to no good for it does not encourage learning, but rather leads to problems like laziness and a reliance of things other than the mind.[1] The question now is whether or not Plato's discussion of imitative arts can be applied to technology in general, especially as we understand it, or if his comments are applicable merely to the ancient arts he mentions.

Plato's complaint about the unreciprocal nature of writing can certainly apply to technology as we conceive it today, not merely to arts. Indeed, being inanimate, technologies are inherently unreciprocal. But unlike specific arts, they do not themselves tend to make direct statements that invite questions, replies, or other kinds of response – responses that the work itself cannot answer. Perhaps more precisely put, technologies are not constructed and intended to be used as a means of artistic expression. Washing machines are not designed and used in an act of artistic expression, and if a washing machine is indeed built for that reason, it is technological art; this is a blurring of a commonly understood dichotomy. Certainly, technologies allow for new kinds of artistic expression, but that is another distinction. As it is *generally* considered, technologies are not art.

Plato's other complaint about how writing or imitative arts invite people to rely on the art for knowledge rather than relying on the efforts of their minds or bodies, can certainly be applied to technologies today. This kind of argument has been applied to computers and calculators, as well as to earlier technologies such as chainsaws and even

the printing press. It could be argued that there is not much efficacy in applying this kind of argument to modern technologies like the chainsaw or the computer, for in most cases the application of a technology is used for the purposes of increased efficiency, as opposed to the arguably inefficient purposes of the arts. Whether or not efficiency is a worthy goal, especially in light of compromises made to the detriment of the environment and perhaps to valuable human interaction, is another issue altogether.

1.2.2: Aristotle

Aristotle does not speak of any particular kind of technology directly, but rather devotes some time discussing different kinds of knowledge, as well as the nature of science and art. This is important for us to know because it was Aristotle's writing, perhaps more than that of any other thinker, that shaped early Western scientific thinking and development, particularly because of his discussions of cause and effect, and of epistemology. How our intellectual forbearers have understood Aristotle – or misunderstood, as Heidegger insists – has determined our current understanding of science and technology, of what they are, should be, and how they should work.

In Book VI of his Nichomachean Ethics, Aristotle presents the argument that all knowledge is directed by choice. Choice itself is made available by the direction of desire and reasoning toward a particular end, such that "thought alone moves nothing; only thought which is directed to some end and concerned with action can do so" (412-413). If one does not desire to achieve some end, no choice for action will present itself.

Of five kinds of knowledge or "faculties by which the soul expresses truth by way of affirmation or denial," Aristotle names two of special importance: *episteme* and *techne*

(413). *Episteme* is pure science, or knowledge of what is necessary or universal. *Techne* is art for Aristotle, or more specifically applied science, and is concerned with bringing into existence those things which are capable both of being and of not being. Each is bound with and even defined by its productive action, either as *praxis* or *poiesis*. *Praxis*, or "action," is equivalent to rational action or conduct in response to a choice.[2] *Poiesis*, or "production," involves the rational production of a thing, just as *praxis* is rational action toward or in response to a thing. It too is governed by choice, for "whoever produces something produces it for an end... only in a particular relation and of a particular operation" (413).

Episteme (pure science) and *techne* (applied science) operate as equally useful means of attaining truth along with intelligence, practical wisdom, and theoretical wisdom. Yet, somewhere along the way to the present, likely during the Middle Ages and into the Enlightenment, some aspects of Greek *techne* were lost. Technology is indeed still considered to be applied science, yet not applied science as Aristotle considered it to be. Rather, Aristotle's categories of knowledge were confused, and eventually rational action and production became the outlets of scientific inquiry; Aristotle's applied science became a subset of pure science, rather than remaining an equal partner in intellectual excellence. Art has been considered in recent times to be the opposite of science and rationality – even an enemy – where once they were considered brothers.

This confusion and subsequent asymmetrical epistemology known as Enlightenment rationality evolved into the modern Western world-view, characterized and enhanced by efficient and industrious technologies. This asymmetrical rationality

composed a landscape that began to threaten its inhabitants, rousing equal yet opposite expressions of art and thought.

1.2.3: Anti-Enlightenment Romanticism

As Enlightenment values evolved into industrial procedures, the prevalence of technology began to rise. As if over night, the machine-infused life had become a scene of struggle and discontent, a scene vividly exposed in the works of many 19th century writers. In Notes From Underground (1864), for instance, Fyodor Dostoevsky makes the irrational man his anti-hero of 19th century industrial society. This anti-hero, this "underground man", is alienated by and from technology and the alleged advances of Western civilization. Notes From Underground is in part a polemic directed against Western utopian rationalism and materialist ideals that were becoming popular in Russia in the mid-1800s, most famously explicated in N. G. Chernyshevsky's What is to be Done? (1862). Opposed to adopting Western rationalism, Dostoevsky suggested a return to purely Russian ideals in addition to the Christian ideals of love and self-sacrifice, showing that the "liberals" miss these entirely (Kaufmann 1975: 22).

The growing effect of technology and the technical society eventually compelled Ernst Kapp to publish *Grundlinien einer Philosophie der Technik* (Foundations of a Philosophy of Technology) in 1877, which stands as the first work in the philosophy of technology. In this work, Kapp develops the idea of *Organprojektion*, or organ projection, where technologies have their analogies in the human organism in appearance, form, function, and even production. Technologies are nothing other than man exteriorizing himself and returning to himself (Huning 1985: 11). Freud echoes the

concept of *Organprojektion* clearly in a famous passage from Civilization and Its Discontents (1930):

> Man has, as it were, become a kind of prosthetic God. When he puts on all his auxiliary organs he is truly magnificent; but those organs have not grown on to him and they still give him much trouble at times. Nevertheless, he is entitled to console himself with the thought that this development will not come to an end precisely with the year 1930 A.D.. Future ages will bring with them new and probably unimaginably great advances in this field of civilization and will increase man's likeness to God still more. (Freud 1930: 39)

Marx and Engels too engaged technology, particularly in factories and assembly lines, for its role in the process of alienation. According to Marx and Engels the modern individual, and in particular the wage laborer, is deprived of fulfilled living because any sense of communal action or satisfaction has been removed from his role as a socially productive agent. Technology, including the market, has caused human beings to be subject to it, separating them from their social community and life's work, so that in the end they have no ownership over their own lives or their products.[3] Both the obvious and the more subtle effects of industrial technology on the environment, on culture, politics, economics, and on social and individual ontologies provided little room for positive assessment.

Yet Marx also saw in technology the possibility of its employment for the liberation of humanity. This line of thought, this hope, is carried through the modern age

by Marcuse. The assessment among prominent theorists in the modern age was that there was clearly much more to technology than its mere instrumentality – the consensus seemed to be that technology possessed an substantive quality which determined its boundaries. These boundaries were not always the ones intended. The most obvious and most often referenced example of unintended ends would be that of nuclear fission. Originally sought for the production of previously unimaginable amounts of power, the process was used to destroy an estimated 270,000 people in a mere two bombings over Hiroshima and Nagasaki in 1945. The day after the bombing of Hiroshima, Albert Camus wrote:

> We can sum it up in one sentence: Our technical civilization has just reached its greatest level of savagery. We will have to choose, in the more or less near future, between collective suicide and the intelligent use of our scientific conquests. (Camus 1945: 110)[4]

While this is an extreme example of how disastrous the applications of science and rationality can be – both in the device of the bomb and in the cultural landscape that would provide the means to build it – technology was at the same time securing its place in the minutiae of everyday living, from cars to vacuum cleaners to telephones to radios. The common household was becoming a showcase of gadgetry, and people's lives were becoming more and more tied to the technologies they used.

It was not until the surge of technological progress in the first half of the 20th century, culminating in many senses in the events of World War II, that theorists were compelled to recognize the fundamental difference of technology of the industrial age, or modern technology, and its totalizing effects. Philosophers such as Heidegger, Marcuse,

and Ellul, asserted this unique nature of modern technology, each in his own way. In fact, the events surrounding the Second World War, to which these men were intimately subjected, no doubt crystallized for them their thoughts on technology. For all of them, technology had revealed itself to be an autonomous and ultimate threat to humanity rather than remaining the compliant and neutral tool it had popularly been considered to be.

2: Modern Industrial Theory

It was around the time of World War II when discussions regarding the implications of technology for both the individual and society exploded. The war itself – and in particular, the ideas and practices of the National Socialist Party – could not have served as a finer example of how technology unbound could, and clearly did, have the worst effects possible. Even before the war, many academics were trying to stress that technology, and moreover the much less tangible 'essence' of technology of which mechanical technology was but a partial factor, was inherently dangerous to humanity. Not only was technology dangerous physically, but it was also ontologically threatening. By mediating experience and physical reality, technology was poised to change what it meant to be human.

For academics who were either in the midst of or subject to the Nazi regime, the importance of technology in relation to people was paramount. Martin Heidegger, whose relationship to the Nazi party is a constant source of debate and scrutiny, warned of the ontologically destructive potential of the essence of technology yet also hinted at its parallel potential for assisting in attaining authenticity. Ernst Jünger, the celebrated Nazi writer and one-time German shock trooper, more or less praised the possibilities of technology along the party line. Jacques Ellul, a hero of the French Resistance, condemned technology in all forms outright for its blind and relentless quest for the complete domination of all things. Herbert Marcuse, a Jewish student of Heidegger's who fled Nazi Germany with many of his colleagues in the early 1930's, warned of the implications of technology, particularly of technology within modern industrial society. Technology, it seemed, had become the chief concern of the time.

In what follows, I will briefly outline the theories of technology of Martin Heidegger, Herbert Marcuse and Jacques Ellul. As already mentioned, these three men are considered to be the pioneers of serious philosophical assessment of technology in the modern age, and still their theories are being applied, although not popularly, to the current situation some forty to sixty years later.

By surveying these theories, I intend to draw out certain aspects that are transferable to the present age of digital technology in Western societies. These aspects, namely technology's essential character or substantive element and the historical uniqueness of modern technology, can be applied to assess the current context of digital technology in contrast to the current and more popular postmodern technology-led theories.

2.1: Jacques Ellul

Born in Bordeaux in 1912, Jacques Ellul grew to be an outstanding student, eventually studying law at the University of Bordeaux and the University of Paris, where he earned his doctorate in 1936. He then taught at various institutions until the outbreak of World War Two, during which he participated in the French resistance while farming to support his family. After the war, he moved back to Bordeaux where he more or less stayed and taught until his retirement in 1980. He died there in 1994 after a long illness.

Ellul wrote nearly one thousand articles and fifty books, mostly dealing with the maintenance of ethics and theology in a technical society; a radical form of Christianity was the central motivation in all of his activities, academic and otherwise, in that he advocated Christian libertarian/anarchistic personalism and political ecology. Although

he generally avoided political associations, he was quite active in ecological and religious concerns of his area (Chastenet 2002: online).

Ellul is recognized more than any other thinker of technology as the paradigm of the technological essentialist. He is often, and properly, characterized as being fatalistic and aggressive, despite his own claims to the contrary (Ellul 1990: vii). Technology presents for Ellul the greatest problem to humanity, so much so that the only way to deal with technology is to get rid of it – at least in its modern form. A return to a more natural and symbiotic relationship with nature is the only viable solution if man is to come to grips with himself, society and, most importantly for Ellul, God. For the purposes of this thesis, I will be neglecting a good deal of the theological aspects of Ellul's writing simply because they are not directly related to his assessment of technique, but follow from what I wish to focus upon. At the same time, I recognize that Ellul's theology and cultural analysis are entwined, and so it should be noted that this brief summary does not represent the whole of Ellul's critique.

In the last half of the 20th century, Ellul wrote a number of books and articles on the implications of technology on modern society and the individual, most notably The Technological Society in 1950 – which was discovered and promoted by Aldous Huxley, and later brought him fame in American universities in 1964 – and The Technological Bluff in 1990. It is primarily from the first of these two books that I will draw Ellul's description of modern technology and its difference from earlier forms.

It is vital to reiterate that Ellul's chief concern is not technology in its instrumental form. Rather, Ellul assesses what he calls '*la technique.*' In Ellul's first book on technique, published as *La Technique* in France, but as The Technological

Society in North America – yet should have been translated as The Technical Society (Ellul 1990: xi) – Ellul himself defines technique as "the totality of methods rationally arrived at and having absolute efficiency." In the introduction of the same American edition, Robert K. Merton curiously offers another definition: any complex of standardized means for attaining a predetermined result. Yet, the translator's definition is wrong, by Ellul's own admition: "The term *technique*, as I use it, does *not* mean machines, technology, *or this or that procedure for attaining an end*" [emphasis added] (Ellul 1950: iv). This is merely one instance of how easy it is to misunderstand Ellul, perhaps a result of his difficult style and subtleties lost in translation.

Ellul's introductory definition of technique is simple enough, but what he does not include are the several intriguing characteristics, effects, and future consequences of modern technique. I say modern technique with purpose so as to again make a distinction; the technique Ellul describes in 1950 is very different from all technique before the eighteenth century. Prior to the eighteenth century – the dawn of the technical application of science which characterizes the modern era (63) – technique had four limitations that separated it from modern technique, namely, limited application, limited technical means, limited area of effect, and limited control (i.e., freedom of human choice) (64, 67, 68, 76).

Clearly, these limitations require some explanation, yet first it bears mentioning that Ellul regards the *intrinsic* nature of modern technique to be the same as that of pre-technical society: techniques are techniques. It is the nature of the technical phenomenon that has changed, i.e., the characteristics of the relation between technical phenomenon and society (63). The new nature of technique is made known by looking at its effects on

society, not at its intrinsic qualities. Ellul uses the dramatic example of a mortar shell to make his point; any number of shells of the same caliber will produce the same results in the same environment. Yet if the environment were to change – for instance, exploding the shell in a crowd of people – the results would change; it would be a different phenomenon. "To assess this change, it is not the intrinsic character of the explosion which must be examined, but rather its relation to the environment" (63).

The first of these limitations of 'old' technique is that of narrow or limited application. What this means is that technique once played a secondary role in productive and consumptive actions to pleasure. Ellul argues that humans historically regarded work not as a virtue as it is today, but as punishment (65). The idea, Ellul says, was to work only as much as absolutely necessary in order to survive, meaning production and consumption were minimized, and so their corresponding techniques were limited. As a result, humans did not consider technique (and by inclusion, technology) to be very important, or that their fate was bound up in it in any way.

The second limitation, closely related to the first, involves technical means. Apparently, there were few means of attaining a particular end, and because of the first characteristic, virtually no attempt to perfect the means that did exist (67). Humans tended to keep tools as long as they were effective, and any deficiency was compensated by the skill of the worker. As a result, there was much variation between, say, carpenters according to each carpenter's abilities, and efforts were more directed in improving the skill of the worker rather than the tool itself. Modern technique sought to reduce or even eliminate such variation of skill. The eventual improvement of tools came about in a more pragmatic way, essentially the result of the practice of a personal art (68).

The third limitation concerned geography. Technique spread slowly from civilization to civilization, and was hindered by factors within each civilization such as climate, population, flora, political regime, etc.; a particular technique was an intrinsic part of a particular civilization, and so transmission was very difficult. The 'best way' to do something in one region wasn't necessarily the 'best way' to do it in another. As a result of technique being integrated as such, it did not evolve autonomously, as Ellul argues of modern technique (69).

The fourth limitation on technique before the eighteenth century related to control, or the existence of possibility of choice. As a result of the characteristics discussed above, humans were free, Ellul contends, to either accept a certain technique or get along without it. During the Roman Empire, for example, a man was more or less free to leave civilized life in the city for a life as a hermit in the countryside, and Roman law was powerless with regard to an individual's decision to evade military service or, surprisingly, imperial taxes and jurisdiction. Choice was a real possibility. With respect to material techniques, the possibility of an individual's freedom was even greater (76-77).

By isolating these characteristics of technique during pre-technical society, Ellul alludes to characteristics of technique in a technical society; it is characterized by broad application into all spheres, resulting in a multiplication of means, the perfection of said means, and geographical extension to practically the entire globe. However, Ellul isolates several other characteristics that serve to define modern technique more acutely: rationality, artificiality, automatism, self-augmentation, holism, universalism, and autonomy.

Ellul points out, declaring it "obvious," that present in modern technique is "a rational process which tends to bring mechanics to bear on all that is spontaneous and irrational" (78) – as seen in examples of division of labour and the creation of standards. "Every intervention of technique is, in effect, a reduction of facts, forces, phenomena, means, and instruments to the schema of logic" (78).

Artificiality is another "obvious" characteristic of the modern technical phenomenon. Ellul points out that the functional means of technique, being artefacts, are artificial means, and the world being created by the accumulation of technical means is therefore an artificial world. Although it could be replied that this in an intrinsic characteristic of technique, Ellul would answer that modern technique destroys and subordinates the natural world, not even allowing a symbiotic relationship, which is exclusive to the modern technical phenomenon. To put it simply, technique is opposed to nature.

The other characteristics of modern technique Ellul lists, such as automatism, he claims are not quite so obvious as the two just mentioned. Automatism of technical choice is summed up by the idea of "the one best way" to do a certain thing. This characteristic has two aspects: one, when a technique is rationally refined to maximum efficiency, a person effectively has no other option, for he must decide in favour of that technique. The effect of this extreme application of rationality is what Ellul calls automatism, meaning that the technical process becomes self-determining, always moving toward to the most efficient. "Man is stripped of his faculty of choice" (82). The second aspect of automatism of technical choice is seen in the relationship between technical and non-technical or spontaneous activities. Ellul argues that when these

activities collide, such as in politics, technical activity automatically and invariably eliminates the non-technical, but not with any directive will or conscious effort. Using politics as an example, Ellul says that politics was full of uncertainties resulting from qualities such as finesse, aptness, even genius. If chance is to be eliminated, politics must become a technical activity. He cites Lenin as being the first to establish a political technique, formulating rules and principles. As a result, even a mediocre politician could attain a good average policy, ensuring stability and a consistent political line. The question of what is the limit of automatistic technique is raised, and Ellul wonders if there is any at all (83).

The next obscure characteristic of modern technique concerns self-augmentation, again having two aspects. The first aspect is that technique now progresses almost entirely without human intervention. Certainly it must be that technique indeed progresses by means of minute improvements by humans, but the role of human invention has been seriously reduced. Ellul sees this characteristic in effects such as the disappearance of the one big genius, like Newton, who sets in motion a new way of thinking. Rather, invention and innovation occur on an anonymous level, where there is an army of technicians making constant adjustments and improvements to a given technique (86).

Realizing that he might be sounding self-contradictory, in that he asserts the self-augmenting nature of modern technique yet concedes to the directive role humans play in technical progression, Ellul appeals to the second aspect of self-augmentation; automatic growth. Ellul argues that modern technique grows automatically, referring even to the growth in number of those technicians who supposedly control the progression of a given

technique; Ellul refers to a statistic that says the number of scientists and technicians has doubled every decade for a century (87). The thrust here is that the nature of technique demands that more and more technicians are present to make continuous modifications and improvements, effectively in response to technique's demand to grow.

Self-augmentation, Ellul continues, can be formulated in two laws: one, that technical progress is irreversible; and two, that it grows geometrically. As for irreversibility, Ellul states that every invention calls forth other technical inventions in other domains (89). There is never any attempt to halt the process, let alone reverse it. Geometric progression occurs because of the result of irreversibility; since every invention calls forth other inventions, those inventions in turn do the same. Part of the reason for technique's self-augmentation is that technique creates problems that only technique can solve. During this augmentation, Ellul contends, humans play no real part at all; technique is involved in a new kind of spontaneous action and the evolution of technique becomes exclusively causal, "losing all finality" (93).

The next characteristic exclusive to modern technique is what Ellul calls holism (the translation uses 'monism,' yet the French is *unicité*, and so 'holism' may be a better choice). This means that as the technical phenomenon embraces all the separate techniques in the process of self-augmentation, it forms a whole. "It is useless to look for differentiations," Ellul asserts. "They do exist, but only secondarily" (94). Certainly, material techniques such as computers are different from others, like cars. The same follows for immaterial techniques, such as the construction of a building and a teaching method. Yet they all share identical features. "This identity is the primary mark of that

thoroughgoing unity which makes the technical phenomenon a single essence despite the extreme diversity of its appearances" (95).

The universalistic characteristic of the technical phenomenon unfolds geographically. The geographic aspect of technical universalism is the constant spread of technique, country by country, until it is truly universal. Technique has and does spread – mainly by commerce or war (much like Coca-Cola), presupposed by transportation and communication techniques – into hands where, unlike old technique that could only be accepted by a similar civilization, technique imposes itself (Ellul 1950: 118). This expansion also (as usual) includes technicians.

The last mentioned characteristic of modern technique is that of autonomy. Ellul isolates this characteristic as the primary and essential condition for the development of technique. What this means is that technique is a closed system where matters of use and ends are outside its design. Technique asserts its autonomy in all spheres – politics, economics, morality, spirituality – with the exceptions of physical and biological laws. These, however, it dominates and puts to work (134). Technique requires predictability, and so it must "prevail" over the human being, reducing it to "the king of the slaves of technique" (138). This opinion is shared by Heidegger.

Already some effects of the modern technical phenomenon have been seen, namely that it seeks to overcome anything that is unpredictable and spontaneous, i.e., humans and nature. The inevitable result of such domination of technique over every aspect of existence is that everything necessarily serves it (128). Everything is subject to it, from procreation to how we eat, grow, where we live, how we die. How one approaches these effects is a matter of personal position; the characteristics Ellul

describes can be viewed either positively or negatively. For instance, Walter Ong is optimistic with regards to the artificiality of technique and its internalization: "Technologies are artificial, but ...artificiality is natural to human beings. Technology, properly interiorized, does not degrade human life but on the contrary enhances it" (Ong 1988: 82-83). Ellul clearly takes the negative view: "Today the sharp knife of specialization has passed like a razor into the living flesh. It has cut the umbilical cord which linked men with each other and with nature" (Ellul 1950: 132). Again, Martin Heidegger would agree with this dark expression, but he sees hope in technology as well.

2.2: Martin Heidegger

Martin Heidegger is considered by many to be one of, if not the, most important and influential philosophers of the 20th century. Motivated by Husserl's call to bring philosophy down "to the things themselves," Heidegger developed what became known as phenomenological existentialism, influencing generations of philosophers, most notably Jean-Paul Sartre, Herbert Marcuse and Maurice Merleau-Ponty.

Heidegger was born in the town of Messkirch, in the Black Forest of Baden, on September 22, 1889. He studied Roman Catholic theology and then philosophy at the University of Freiburg where he was a student of Husserl. Heidegger began teaching at Freiburg in 1915. While teaching at Marburg, Heidegger wrote and published his hugely influential and original opus, *Sein und Zeit* (Being and Time) in 1927. A year later, he became a professor of philosophy at Freiburg, succeeding his old mentor. After 1930, Heidegger's work focused primarily on Western conceptions of Being, particularly contrasting the reverent Hellenistic conceptions with those found in modern industrial

society. After a fruitful academic career, despite the lamentable reputation of an early association with the Nazi party, he died in Freiburg on May 26, 1976 (Kaufmann 1980: iv & 11).

In 1954 he published "The Question Concerning Technology," in which he worked around the problem of modern technology and its essence. In a powerful and now famous passage at the beginning of the essay, he presents the problem:

> Everywhere we remain unfree and chained to technology, whether we passionately affirm or deny it. But we are delivered over to it in the worst possible way when we regard it as something neutral; for this conception of it, to which today we particularly like to do homage, makes us utterly blind to the essence of technology. (Heidegger 1954: 287-288)

Yet the essence of technology, Heidegger asserts, is not at all technological or equivalent to technology in any way: "When we are seeking the essence of "tree," we have to become aware that what pervades every tree, as tree, is not itself a tree that can be encountered among all other trees" (287). Indeed, Heidegger concedes that the common view of technology as means to ends and as human activity – as instrument – could not be anything but correct (288). What is more, this definition is applicable to every kind of technology, primitive as well as modern, and in being so conditions our every attempt to master it. "Everything depends on our manipulating technology in the proper manner as a means" (289). But what if technology were no mere means? How would it stand with the will to master it?

So while Heidegger admits that the instrumental definition of technology is indeed correct, it is not completely 'true'. What Heidegger means is that a merely correct understanding of technology does not go deep enough to reveal its essence; the correct understanding of technology fixes upon the surface value of technology, that being its neutral instrumentality, and stops there. By contrast, the true understanding of the essence of technology *can* be revealed through a proper understanding of its instrumentality (259).

A proper understanding of technology's instrumentality, Heidegger argues, begins with Aristotle and his concept of causality, a concept we have inherited and understand to be the principles by which technology operates. Unfortunately, philosophy has maintained a skewed interpretation of Aristotle's causal concept, and so has consequently barred a proper understanding of technology's operational principles (290).

In Physics and Metaphysics, Aristotle describes what he sees as the four 'causes' of a thing, the four explanations or characteristics that make a thing what it is. These include: the material cause (*hyle*), or the matter from which a thing is made; the formal cause (*eidos*), or the form into which the matter enters or is shaped; the efficient cause (*logos*), or that which brings about or makes the thing; and the final cause (*telos*), or the end to which the thing is directed. Since Aristotle's exposition of these principles, our understanding of what a technology is has been determined, and perhaps limited, by our interpretation of Aristotle's causality. But Heidegger suggests that since our understanding of 'cause' is faulty, so too is our understanding of technology.

What we understand as "cause," or *causa* in Latin, belongs to the verb *cadere*, to fall, or that which brings it about so that something turns out as an effect. Heidegger

argues that what the Romans called *causa* is called *aition* in Greek, and means something subtly but significantly different; *aition* is that thing to which something else is indebted. The reciprocal side of indebtedness is 'being responsible for', which is *aitia* in Greek, again from the *aition* root. Indebtedness and responsibility certainly suggest a kind of cause and effect relationship between two things, but is not exactly the same as the kind of relationship suggested by *causa* – the relationship is more fluid and intimate than being detached and mechanical as *causa* suggests. The relationship between the four causes, then, is obviously different than what we have understood so far.

Heidegger suggests that the relationship between the four causes of a thing, as Aristotle in the original Greek intended, inter-relate in this way: the final object is indebted to both the matter (*hyle*) from which it is made, and the aspect (*eidos*) in which it is shaped. Above these two lies a third cause that is responsible for the object, and that is 'that which gives bounds' or completes the meaning of what the object was made to be (*telos*). *Telos* has often been misinterpreted to mean simply "end" or "purpose," but is more precisely defined as that which "is responsible for what as matter and what as aspect are together co-responsible for the [final object]" (291). Heidegger's example is that of a silver chalice, which is indebted to the silver for its matter and to the aspect of chalice-ness for its form. Both the silver and the chalice-ness are in turn indebted to the *telos*, or that which confines the chalice within the realm of consecration and bestowal, for combining the matter and aspect together into one object and circumscribing it as a sacrificial vessel.

The fourth participant or "mode of occasioning" is the efficient cause, but here Heidegger contends that the Aristotelian doctrine neither knows the cause that is named

by this term, nor uses a Greek word that would correspond to it. Our common understanding of the efficient cause is limited with respect to the responsibility involved in the process; in the example of the chalice the efficient cause would be the silversmith, but the silversmith's relationship and responsibility is much more than merely crafting the object. Rather, the silversmith "brings forward into appearance" the chalice through "careful consideration"; the difference is one of manufacturing and direction of resources. The careful consideration and activity of bringing forth (*poiesis*) of the silversmith is the application of *logos*. The three previous causes are indebted to the silversmith for "the "that" and the "how" of their coming into appearance and into play for the production of the chalice" (292). Bringing forth is a way of revealing, which in Greek is *aletheia*; the Romans translate *aletheia* as *veritas*, which we say in English as "unrevealing," or "truth."

The implication of this reinterpretation of Aristotle is that our approach to technology is not as intimate and even spiritual as it should be. Heidegger would say that we approach resources, technologies and the manufacturing process at face value, not properly through *logos*. If we were to carefully consider a thing in order to properly reveal it, allowing it to "come out of concealment into unconcealment," as Heidegger would say, we would be truthfully representing the thing itself. To wit, "the possibility of all productive manufacturing lies in revealing" (294).

Technology, via this reinterpretation, is no mere means but rather a method of revealing, or *poiesis*. As stated in the introduction, *poiesis* is bound up in the original meaning of *techne*, and so technology is thus properly understood to be inherently more considerate than instrumentalism suggests. "Technology is a mode of revealing.

Technology comes to presence in the realm where revealing and unconcealment take place, where *aletheia*, truth, happens" (295).

In this sense, modern technology is no different than older or primitive technologies. The essence of technology is historically consistent, in that any stage of technological development is a way of revealing. However, when one examines modern technology closely, it becomes apparent that the kind of revealing modern technology does is not of *poiesis*, but is more aggressive. "The revealing that rules in modern technology is a challenging [*Herausfordern*], which puts to nature the unreasonable demand that it supply energy which can be extracted and stored as such" (Heidegger 1954: 296). For example, agriculture was once the work of a peasant who, in sowing seed, was operating within the natural forces of growth and increase. Modern technology's relationship to the environment exposes a different character:

> Agriculture is now the mechanized food industry. Air is now set upon to yield nitrogen, the earth to yield ore, ore to yield uranium, for example; uranium is set upon to yield atomic energy, which can be released either for destruction or for peaceful use. (296).

Nature is now "set upon" by technology, challenged to provide resources rather than relating more or less equally with technology.

Heidegger demonstrates this new relationship with yet another example; the Rhine, once considered to be a great river filled with historical significance and grandeur, is now challenged to provide hydro-electric energy, apparently as something at our command. Technology is not incorporated into the great river as was the old model, but now is dammed up and viewed as a power supplier – much like the Narmada example

mentioned in the introduction. Even when not viewed as resource but as a river in the landscape, it is done so as an object "on call for inspection by a tour group ordered there by the vacation industry" (297) Modern technology, in challenging, ordering, regulating and securing nature reveals it to be but standing-reserve, something at hand to be manipulated and exploited.

To this Heidegger adds that technology is equally challenged as a resource. Objects like airliners are standing-reserve, ordered to insure the possibility of transportation. In this way, instrumental technologies are not autonomous and so are not themselves doing the challenging of nature; rather, people are challenging technology, driving it forward. However, what sounds like having a handle on technology is misleading; rather, people are already challenged themselves, belonging "more originally" than Nature within the standing-reserve (299). This means that humans allow themselves to be challenged by willingly taking part of the technological process in ordering nature, in approaching nature as an object of research and exploiting its energies, as a result of inauthentic being:

> Thus when man, investigating, observing, pursues nature as an area of his own conceiving, he has already been claimed by a way of revealing that challenges him to approach nature as an object of research, until even the object disappears into the objectlessness of standing-reserve. (300)

Modern technology, then, is no mere human achievement.

The essence of technology, as that which "gathers" or "sends" people to order all things as standing-reserve, Heidegger calls "enframing," or *Gestell* in German.

Heidegger chooses *Gestell* because for him it encompasses the radically dualistic nature of the essence of technology, namely challenging and producing or presenting (*poiesis*); the word *stellen* means "to set upon," yet also suggests *Stellen*, which implies "producing" or "presenting." This essence is the driving force behind all mathematics, physics, and thus the modern scientific world-view, and so modern technology is merely its most recent, and dangerous, product (ca. 1954). More so, the essence of technology is humanity's supreme danger (308).

This danger comes about when humanity no longer concerns itself with proper poetic manner of producing and acting, or appealing to *logos*. When truth is no longer the chief concern of humanity, but instead merely correctness, then the challenging nature of the essence of technology blocks *poiesis*. In other words, when we focus merely on the face value of objects we are thrust into a rigorous and logical world-view, and we are subsequently blinded to *poiesis*, or the way in which we can reveal truth (give Being a home).[5] When this happens, the truths and essences of everything are no longer available to us, and the possibility of knowledge is lost. Most importantly, the possibility of knowledge of humanity's essence is at stake: "The rule of enframing threatens man with the possibility that it could be denied him to enter into a more original revealing and hence to experience the call of a more primal truth" (309).

Yet all is not lost. Hope rests in what Heidegger identifies as a "saving power" within the essence of technology. If my understanding is correct, Heidegger is making reference to his claim that the essence of technology is dualistic, comprised of two radically opposed ways of revealing: challenging and *poiesis*. These two ways of revealing will never be separated or disappear – certainly, the challenging aspect will

assert itself, yet *poiesis* will always remain as a part of the essence of technology. The trick is to keep the danger of the essence of technology always in sight. This is the task of *poiesis*, or art. Art is the saving power within the essence of technology:

> Because the essence of technology is nothing technological, essential reflection upon technology and decisive confrontation with it must happen in a realm that is, on the one hand, akin to the essence of technology and, on the other, fundamentally different from it. (317)

Heidegger's comments here are extraordinary and deeply insightful. Like Ellul, he is asserting the totalizing effect of the essence of technology, particularly the "challenging" of technology which is perhaps singularly responsible for the context in which Heidegger is writing. It is also this "challenging" aspect which characterizes modern technology, separating it historically from all previous incarnations or forms of technology. That art has claim to this same essence – as *poiesis*, as the brother and opponent of "challenging" – by virtue of its roots in *techne* makes a good deal of sense, especially when considered in the context of digital technologies; not only do technologies and arts share the same essence and so are equally approachable, developments in digital technologies has made available new and more powerful kinds of art.

Don Ihde, Distinguished Professor at State University of New York at Stony Brook, responds to Heidegger's assertion of an essence in technology. In the essay "Technology and Cultural Variants" (1985), Ihde argues that Heidegger's position is ambiguous about the kind technology of which he is describing the essence, whether it is

Western technology as a historical phenomenon, or modern technology only, or the whole of Western society. In response to this ambiguity, Ihde offers an implicit critique of Heidegger by applying Husserl's claim that the way to establish an essence or invariant is through the examination of variations; Ihde argues that Heidegger does not give an adequate account of variants to establish the existence of an essence of technology (Ihde 1985: 20). For his defense, Ihde refers to cultural variations of technology that do not adhere to Heidegger's description of an autonomous and thus socially deterministic technology. One such example is that of Micronesian navigational tools. In this instance, the tool is modeled after the cultural perception that the island being sought moves toward the navigator and that the water moves past the boat as the ocean moves in relation to the boat, rather than the Western perception that the boat and navigator move through the water to the stationary island. The tool developed to aid the navigator within this perception, combined with the subtle art of wave reading, provides a sufficient means of navigation among the Micronesian islands. When compasses were introduced into this culture, the effect of its reliability in storms and constant visibility was a decline in wave reading (24).

Ihde suggests that such cultural variations in technology serve to prove four things: first, that technologies correlate with cultural outlooks; second, that technologies "incline" when embedded in cultures, meaning that introduced technologies serve to over-ride other technologies and thus alter a culture; third, that any single technology can be used in ways not intended; and fourth, that there are stages in the adaptation and use of technologies as they are learned and made familiar. For example, as a culture becomes familiar with a particular technology, they move out of a fear/fascination stage into ones

of increasing comfort and, perhaps, indifference (32). In all of these "proofs," Idhe sees a critical response to Heidegger's description of an essence of technology.

The first comment I must make in response to Ihde – and in defence of Heidegger – is that Heidegger is perfectly clear about the kind of technology whose essence he is describing. It is that of modern industrial technology, not technology at any stage in history, nor the whole of Western society – for he obviously considers technology and society to be separate "things" if *one* can have an effect on the *other*. Heidegger never hinted at making a "whole earth measurement", as Ihde would put it, for his examples are merely of modern Western – particularly German – technologies.

Secondly, Heidegger does in fact use Husserl's method of proving an essence through examples of variations. Working within the Western tradition, Heidegger provides a series of examples ranging from silver-smithing to farms, windmills, sawmills, mines, hydro-electric generators, and aircraft (Heidegger 1954: 290-297). Technology's essence is sought through the historical variations of technology in the Western tradition. What needs to be restated here is that Heidegger was describing an essence of technology that is historically consistent, even ahistorical. The essence of technology only becomes a problem when misunderstood and its challenging character is "allowed" to become predominant in a culture, as with modern industrial technology. Western technology has not always been a problem, just as Micronesia's navigational technology does not pose a problem within Micronesian culture.

Consequently, I believe that Ihde's four proofs do not address Heidegger's notion of an essence of technology. What is worth mentioning here, though, is the similarity of Idhe's description of technology to Ellul's, particularly in proofs two and three. In fact,

Ihde seems to be *proving* Heidegger's claims about technology, in that its rational character and ability to reveal a *particular* "world" – a Western world – will undoubtedly affect the user, no matter the context.

2.3: Herbert Marcuse

It would be a gross understatement to say that Heidegger's thinking influenced many people. Heidegger amassed a devoted following, including many of the students who sat before his reputedly brilliant lectures. One such student, Herbert Marcuse, became well known in his own right for his views on technology and its social implications. Like Heidegger, Marcuse is critical of technology's dominant place in Western culture, and likewise views instrumental technologies as the embodiments of a totalizing kind of rationality. This rationality shares many – perhaps uncanny – characteristics with Heidegger's *Gestell* or "essence." Yet unlike Heidegger's analysis, Marcuse's analysis and solution are economically and politically motivated.

Marcuse was born in 1898 into a prosperous Jewish-German merchant family in Berlin. After an uneventful service in the First World War, Marcuse earned a doctorate in literature from the University of Freiburg. He worked for a while as a bookseller, but after reading Heidegger's *Sein und Zeit* after its publication in 1927, went back to Freiburg to study with Heidegger, working as his assistant. In 1933, Marcuse joined the *Institut für Sozialforschung* (Institute for Social Research) at the University of Frankfurt, more commonly known as the Frankfurt School.

In 1934, Marcuse left Germany – and Heidegger. Heidegger had openly supported the Nazi party and praised Hitler to the point of "betraying philosophy," as

Marcuse put it, in that Heidegger situated the will of Hitler above any task of philosophy, and encouraged those around him, even his students, to do the same (Olafson, 1988, 98). Marcuse, a Jew and a philosopher and someone who had up until then considered himself a Heideggerian, found himself re-evaluating both his personal relationship with Heidegger as well as his academic adoration of Heidegger's theories. Even though Heidegger withdrew from any open association with the Nazi party after 1935, Marcuse felt that Heidegger's comments were in no way redeemed (Olafson 1988: 100).

Marcuse eventually ended up in New York City, working for the American government as well as teaching at a number of American universities, including Columbia and Brandeis, until his retirement in 1976 from the University of California at La Jolla. He died during a trip to Germany on July 29, 1979 (Kellner 1984: 25).

Marcuse's thinking was primarily political, charged with Marxism and later augmented by Freudianism. Although he tried to separate himself from Heidegger as much as physically, ideologically, and theoretically possible, there is no doubt that Heidegger's influence on Marcuse was permanent. He was also exposed to prominent German theorists of the time such as Max Horkheimer, Theodor Adorno and Walter Benjamin. These men, along with Marcuse, composed part of what became known as the Frankfurt School.

Drawing from the critical exercises of Kant, from the dialectics of Hegel, Marx and Lukács, as well as from Freud, Weber, Husserl and Heidegger, the Frankfurt School developed what is known as 'critical theory.' Critical theory demanded that every one-sided doctrine be subjected to criticism, including its own foundational theories, such as Marxism; for instance, they argued that the emancipating proletarian revolution was not

inevitable, and that thought or theory was more or less independent of social and economic forces. Yet they still considered themselves Marxists; Marcuse himself explained that Marxist theory left itself open to such evolutions (Olafson 1988: 97).

The school in general believed that science and positivism were riddled with non-theoretical interests and that reason had become repressive; they could not accept without qualification Max Weber's view that the sciences should be value-free and thus avoid value-judgements about the people and institutions they study (Jay 1973: 83). They argued, for example, that science already embodied value-judgements, such as the desirability of the technological domination of nature, which, though in fact questionable, seemed so self-evident that these value-judgements appeared not to be as such at all, but simply a disinterested devotion to science. For science, the suggestion of value-neutrality effectively protected such well-entrenched yet hidden value-judgements from criticism (OCP: 355). But since theory and its concepts were a product of social processes, the Frankfurt School felt that critical theory must trace its origins and not, like empiricism and positivism, accept them and thereby indirectly endorse the processes themselves.

In this section, I will briefly review Marcuse's assessment of technology and its implications for both the individual and society, referring primarily to his 1941 essay, "Some Social Implications of Modern Technology" (hereafter SSIMT) and also his later and more aggressive work from 1964, One-Dimensional Man (hereafter ODM). Marcuse, like Heidegger and Ellul, asserts a crucial difference between modern industrial technology and previous forms, yet also maintains technology's historically consistent substantive element.

Marcuse, like Heidegger, defines technology as something more than just machines; rather technology is defined as "a social process, in which technics proper (that is, the technical apparatus of industry, transportation, communication) is but a partial factor" (Marcuse 1941: 138). Additional definitions are as follows: a mode of production; the totality of instruments which characterize the machine age; a mode of organizing and perpetuating or changing social relationships; a manifestation of prevalent thought and behavior patterns; and an instrument for control and domination. Technology for Marcuse is all of these things, the perverted embodiment of rationality and standards of individualism born of Enlightenment thinking.

Machines themselves are politically neutral; they can promote authoritarianism as well as liberty, abundance as well as scarcity. National Socialism was, for Marcuse, the most striking example of how a "highly rationalized and mechanized economy with the utmost efficiency in production can operate in the interest of totalitarian oppression and continued scarcity" (139). Even now within modern democratic industrial society, there is an element of totalitarian control, though subtle, which exists due to the influence of technology and its implicit rationality. Yet the current brand of modern industrial rationalism differs greatly from the kind of rationalism from which it was derived, and Marcuse sees key differences and even oppositions between traditional rationalism and the modern brand of rationality and individualism.

According to Marcuse, the earlier or traditional rationality was marked or even guided by the principle of individualism, in that it was said that self-interest was rational and that no external authority had the right to encroach upon the individual; the individual, as a rational being, ought to be free to make rational actions. Indeed, by being

free to think for themselves, people were assumed to be capable of making rational or "best" decisions, which would in turn contribute to a just and civil society. Furthermore, in the economic setting of the time, a person's mark of individualism was made by the products that he created and sold as a part of the community's needs.

Yet as the industrial age and a freer enterprise economy emerged and evolved, it arrived at the point where, Marcuse says, "the process of commodity production undermined the economic basis on which the individualistic rationality was built" (141). As a result such conditions, particularly work environments such as mass production assembly lines, the principles of individualistic rationality were surrendered to the manufacturing process and an economic system that favoured efficiency and mechanization. What's more, the profitable use of such means of production dictates – to an extent – what kind and how much of commodities are to be produced, and "through this mode of production and distribution, the technological power of the apparatus affects the entire rationality of those whom it serves." In short, as technical rationality spread through the economic and political systems, the individual as it was once understood had become lost in the apparatus.

To be clear, Marcuse writes that individuality has not entirely disappeared; rather, "the free economic subject has developed into the object of large-scale organization and coordination, and individual achievement has been transformed into standardized efficiency" (142). This transformation is nothing like the Enlightenment ideal, but nearly its opposite: "The efficient individual is the one whose performance is an action only insofar as it is the proper reaction to the objective requirements of the apparatus, and his

liberty is confined to the selection of the most adequate means for reaching a goal which he did not set" (142).

The individual, at one time the purpose and triumph of Enlightenment rationality, had been absorbed into the apparatus, the now clichéd 'cog in the machine'. As a result of the individual becoming a part of the system, he was effectively robbed of the ability – or even motive – to critically engage the system itself. This new kind of rationality – a technological rationality – established new standards of judgment and created attitudes that caused people to accept the dictates of the new rational system. As a result, technological rationality is characterized by its stifling effect on critical thought. People, and by extension society, had become "one-dimensional."

Marcuse provides an example of this stifling effect of technological rationalism on critical thought. Marcuse refers to a person who drives through the mountains to distant place, a situation I happened to mimic while out West last spring. Like Marcuse's traveller, I used the highway map to choose the route to my destination, upon which towns, lakes, and mountains appeared merely as obstacles to my destination. There were signs all along the route with instructions, including when to stop and take note of a certain vista or a historical landmark. Even the parking spaces at these places were designed to offer the best view. All of my thinking had been done for me already. "He will fare best who follows its directions," Marcuse writes, "subordinating his spontaneity to the anonymous wisdom which ordered everything for him" (143). Indeed, my trip was a good one, free of complications – or adventure for that matter.

The difference, then, between traditional rationalism and modern technological rationalism is that rationality, having once been a critical force, is now one of

compliance. The overall social implication of this shift is that as "the laws of technological rationality spread over the whole society, they develop a set of truth values of their own which hold good for the proper functioning of the apparatus – and for that alone" (146). In other words, Marcuse identifies a new compliant attitude in modernity that apparently did not exist in the past, i.e., not until the mid to late 1700s. Of course, it could be argued that history does not give us such an example. With the possible exception of elites, people have never been free in the senses that Marcuse employs. In Marcuse's defence, however, the modern situation presents unique problems which he has vividly and I think correctly isolated.

This new attitude, which Marcuse calls 'compliant efficiency', perfectly illustrates for Marcuse the structure of technological rationality:

> Autonomy of reason loses its meaning in the same measure as the thoughts, feelings and actions of men are shaped by the technical requirements of the apparatus which they have themselves created. Reason has found its resting place in the system of standardized control, production and consumption. There it reigns through the laws and mechanisms which insure the efficiency, expediency and coherence of this system." (146)

The result of compliant efficiency is that the pursuit of self-interest is "conditioned upon heteronomy, and autonomy is seen as an obstacle rather than stimulus for rational action" (147). What's more, Marcuse sees here a curious split of reason, of what was once, within the scope of traditional rationality, a homogeneous truth: "one assimilated to the apparatus, the other became (remained?) antagonistic to it; the one

making up the prevailing technological rationality and governing the behavior required by it, the other pertaining to a critical rationality whose values can be fulfilled only if it has itself shaped all personal and social relationships" (147). Yet this division of truth values operates and is interpreted under a single ideology of technological rationality, so that even though critical propositions are argued, e.g., that every individual is equipped with certain inalienable rights, they are frequently interpreted in favour of efficiency and concentration of power (147).

Thought, even critical thought, within a technologically rational system becomes standardized so that critical truth values are (mis)appropriated and consequently represented as truth values of the very systems that the critical proposition initially attacked. This reversal has a stultifying effect on the potency of critical thought within the established culture. This familiarity with the truth illuminates the extent to which society has become indifferent and insusceptible to the impact of critical thought. As Marcuse puts it, "for the categories of critical thought preserve their truth value only if they direct the full realization of the social potentialities which they envision, and they lose their vigor if they determine an attitude of fatalistic compliance or competitive assimilation" (148). In Canada, this kind of reversal of truth values was seen in the adoption of left-wing social programs, such as health-care and welfare, into traditionally right-wing platforms during the 1960s, 1970s, and culminating in the entrenchment of the Charter of Rights and Freedoms in the Constitution in 1982 (Jackson & Jackson 1998: 169, 171).

In Europe in particular, this tendency of critical rationality to be assimilated into the organizational and psychological pattern of the apparatus caused a change in the very

structure of the social opposition. "The critical truth values borne by an oppositional social movement," Marcuse writes, "change their significance when this movement incorporates itself into the apparatus. Ideas such as liberty, productive industry, planned economy, satisfaction of needs are then fused with the interests of control and competition. Tangible organizational success thus outweighs the exigencies of critical rationality" (149). For example, the conditions of mass commodity production eventually compelled people to organize oppositional groups to represent common interests, yet these crowds or mass groups – forming within a technologically rational environment – inevitably became mass parties and their leadership transformed into mass bureaucracies. Yet "this transformation, far from dissolving the structure of individualistic society into a new system, sustained and strengthened its basic tendencies" (150). The extent to which ideology, mass culture, and consumerism would integrate the working class into capitalist society was not quite what Marx had anticipated.

The crowd or mass is not new or unique to the modern era, yet there are peculiar characteristics of the mass within the technologically rational system. In the past, i.e., within a traditionally rational system, the realization of individuality contributed to the development of community, wherein each member contributed so as to exist in a more or less symbiotic manner. In Marcuse's analysis of modern capitalistic society, the crowd represents the anti-thesis of community. The crowd is now merely an association of individuals who have been stripped of all 'natural' and personal distinctions and reduced to, as Marcuse puts it, "the standardized subject of brute self-preservation" (150). While the crowd does indeed unite, it unites atomic subjects of self-preservation who are detached from everything beyond their selfish interests and impulses. As the opposite of

community, the crowd is the perverted realization of individuality. Masses within a technologically rational system consequently act as a conservative force that perpetuates the existence of the apparatus:

> As there is a decrease in the number of those who have the freedom on individual performance, there is an increase in the number of those whose individuality is reduced to self-preservation by standardization. They can pursue their self-interest only by developing 'dependable reaction patterns' and by performing pre-arranged functions (150-151)

As part of a mass, the uniformity among them is the competitive self-interest they all manifest. The members of the masses are individuals. Yet today, the prevailing type of individual is no longer capable of seizing the fateful moment which constitutes his freedom. His function has changed from a unit of resistance and autonomy to one of ductility and adjustment (151).

It is a nuance that defines the individual as both an autonomous figure and an impressionable conformist; yet the autonomy is false, and so both facets of the individual, if I understand Marcuse's analysis, ultimately support and contribute to the apparatus. In the end, "technological rationalization has created a common framework of experience for the various professions and occupations. Underneath the complicated web of stratified control is an array of more or less standardized techniques, tending to one general pattern, which insure the material reproduction of society" (153). By this assessment, any action taken by a group or an individual is always already technically

suited to the perpetuation of "apparatus" or the system and its values. From this standpoint, it may seem as though there is no ground for opposition.

In this particular essay, however, Marcuse offers a solution to what may have seemed by his description to be an irreversible and uncontrollable situation. Marcuse identifies one aspect that both traditional (or critical) rationalism and modern technological rationalism share: "it envisions the rational form of human association as brought about and sustained by the autonomous decision and action of free men" (152). In other words, people still have the capability of choice. In technologically rational systems, the same forces that created the modern masses as the standardized attendants and dependents of large-scale industry also created the hierarchical organization of private bureaucracies (154).

Marcuse argues that in democratic countries, the growth of the private bureaucracy can be balanced by the strengthening of the public bureaucracy, or a properly functioning democratic system: "In the age of mass society, the power of the public bureaucracy can be the weapon which protects the people from the encroachment of special interests upon the general welfare. As long as the will of the people can effectively assert itself, the public bureaucracy can be a lever of democratization" (155). By Marcuse's analysis, the rationality inherent in the specialization of functions tends to enlarge the scope and weight of bureaucracies, which, for a Marxist, isn't necessarily a bad thing.

This solution, he is clear to point out, does not necessarily lead to a kind of socialist collectivism. Marcuse argues that technological progress does not allow for the kind of collectivism that replaces the free pursuit of competing individuals with the

general social application of the traditional properties of the individual; rather, Marcuse asserts that men will always compete for a share of social wealth, that men will continue to regard society as a power of restraint and control, that they may furnish a false collectivism that maintains the domination of humans over nature and of humans over humans (160). However, Marcuse makes the clear – and Heideggerian – suggestion that technology, though being a dominating force and influence, has within it the possibility for a new kind of human (i.e., individual) development. As he puts it, "mechanization and standardization may one day help to shift the center of gravity from the necessities of material production to the arena of free human realization. The less individuality that is required to assert itself in standardized social performances, the more it could retreat to a free 'natural' ground" (160).

Eventually, technological progress could make it possible to decrease the time and energy spent in the production of the necessities of life, and a gradual reduction of scarcity and abolition of competitive pursuits could permit the self to develop from its natural roots. "The less time and energy a person has to expend in maintaining his life and that of society," Marcuse writes, "the greater the possibility that he can "individualize" the sphere of his human realization" (161). In this conclusion, clearly, Marcuse echoes Marx's own utopian impulse, yet also employs a Heideggerian phenomenological existentialism – a Marxist phenomenological existentialism.

So, in summary, SSIMT is a sketch of the historical decline of individualism from the time of the bourgeois revolutions to the rise of modern industrial society. The development of modern industry and technological rationality undermined the basis of the individual rationality and social apparatus. As capitalism and technology developed,

advanced industrial society demanded increasing adjustment to the economic and social apparatus, and submission to increasingly total domination and administration. As a result, a mechanics of conformity spread throughout society. The efficiency and power of advanced industrial society overwhelmed the individual, who gradually lost the earlier traits of critical rationality, thus producing a 'one-dimensional society' and 'one-dimensional man'.

In One Dimensional Man, Marcuse advances his critique of modern industrial society as he laid it out in SSIMT some twenty years prior, presenting some particular social effects of modern consumerism or capitalist society, namely American society – though while Marcuse states that he is critiquing modern industrial society, it is clear that his focus is advanced capitalist society. The core of his critique remains unchanged: the rise of a technological rationality has perverted individualism and has effectively closed opposition to the prevailing system, or apparatus, and so people, unable to critically engage the system, remain one-dimensional.

In ODM, Marcuse argues that vested interests, through technologies such as advertising media, impose false needs upon the public. False needs, for Marcuse, are artificial and heteronymous, as opposed to true needs, which are essential to human survival and well-being. What is false are consumer needs like money, possessions, property and security, which are repressive to the extent that they perpetuate conformity and alienated labour. They perpetuate a system whose continuation impedes the fulfillment of individual and social needs and potentials.

Further to this, Marcuse argues that in advanced capitalist society, different personality structures than the ones described by Freud are needed. The father, for

instance, is no longer a dominant economic figure, but is replaced at home by the authority of the mass media, school and sports teams, gangs and the like. The self immediately identifies with social ego-ideals and role-models, and no longer forges its identity through battling its id impulses and superego parent figures. The result is what Marcuse calls a one-dimensional static identification with the others and with the administered reality principle. In other words, the individual's very gratifications, thoughts, and behaviour are socially administered.

Marcuse's assessment, as I've mentioned, is much stronger and more radical than in earlier works such as SSIMT, and so his solution is correspondingly more radical, suggesting that democratic reform is not possible and that a radical social reconstruction is required. Marcuse argues that in order to employ technology in the interests of liberation, a radical break with current science and technology is needed as well as the development of a new science and technology (Marcuse 1964: 227).

Under capitalism, for instance, technology creates waste, planned obsolescence, superfluous luxury items and poisonous chemicals. Also, technology is used to create ever more efficient instruments of social control and domination. Since current technology is inherently dominating and oppressive, breaking with the continuum of domination would require a new technology of liberation, requiring new ends and goals for technology, and new kinds of technology, in what Marcuse calls "a turn from quantity to quality" (231).

Jürgen Habermas, however, maintains that this idea of a new technology is logically flawed for reasons that Marcuse himself has posed: the very logic of technology is that of instrumental rationality, meaning that technology is rooted in the human

organism and thus inherently follows the structure of labour. Technology cannot be fundamentally altered (Habermas 1974: 81). In other words, if Marcuse argues that technology is inherently biased toward domination by virtue of its very design, how does he propose that technology could ever be used in the interests of liberation?

The solution offered in SSIMT is slightly different from the one he offers in ODM. The difference in age between ODM, which is commonly taken as Marcuse's fully developed analysis of modern industrial society, and SSIMT is some twenty years, and it should come as no surprise that there might be some inconsistencies between the two works. Some critics, such as Morton Schoolman, have felt that Marcuse's description of technology in his earlier works, including SSIMT, contains two anomalous positions: one, the political neutrality of technique, and two, the progressive utilization of techniques through democratic reform (Arato 1998: 138).

However, this interpretation of Marcuse is a focus of constant debate. As for Marcuse's assertion of the political autonomy of technology, some critics, such as Douglas Kellner and Andrew Feenberg, reject the assertion of others that Marcuse truly characterized technology as being so deterministic. They argue that the confusion appears for a number of reasons. One reason is that Marcuse was constantly battling with and trying to rectify, at some level, essentialism and historicism, idealism and materialism – a series of dualities which, Marcuse felt, have plagued traditional and contemporary thought (Kellner 1984: 234). For this reason, Marcuse's writing often appears to be self-contradictory. This apparent self-contradiction has led to interpretations pegging Marcuse to positions ranging from essentialist to historicist, from dogmatic Marxist to anti-Marxist, from bleak pessimist to starry-eyed utopian.

Another reason for the confusion, which Feenberg picks up on, is due to Marcuse's rhetorical style. Marcuse's works – particularly those after 1950, i.e., Eros and Civilization and One-Dimensional Man – are marked by striking aphorisms and grand, sweeping statements that, if read in isolation, are potentially misleading (Feenberg 1991: 72). As a result, Marcuse appears "insensitive to clinical and empirical detail just as he is too impressed with unprovable abstraction imported, perhaps too hastily, from Hegel, Marx, Freud, Adorno, and others" (Dufresne 2000: 109).

The other remark regarding the progressive utilization of technology through democratic reform falls again within the same debate. Kellner and Feenberg, again, defend Marcuse by saying that, for the same reasons as above, he has been misinterpreted and that his theory is in fact self-consistent. However, when taking the texts as they are written, Marcuse is clearly maintaining an assessment of technological rationality yet is offering two different solutions to the problem. Of course, once again, when one considers the time span between the two works in view, it should not come as a surprise that Marcuse would come to a different conclusion than the one he came to twenty years prior. What is consistent and most important, at least to the concerns of this thesis, is his assessment of technological rationality.

Despite such minor inconsistencies, Marcuse's thinking fit remarkably well into the social milieu of the 1960s. His uncompromising critique of advanced industrial society articulated the anger and disgust felt by a generation of young people outraged by the Vietnam War, the oppression of blacks and other minorities, and the continued existence of poverty alongside the wealth of consumer society (Kellner 1984: 241). All of a sudden, Marcuse was vaulted from being a relatively unknown German-American

philosopher to a media celebrity and international hero of youth in revolt. It was "Marcusemania," and what the French called "*la drugstorisation de Marcuse*" (Dufresne 2000: 111).

2.4: Summary of Modern Theory

Despite such disparate contexts, all three of these thinkers arrive at the same crucial conclusions about modern technology and technical culture – that it is at once historically unique yet exudes an historically consistent substantive element, whether it be called *la technique*, *Gestell*, or technological rationality. Some important differences exist, such as Marcuse's techno-utopianism in contrast to Ellul's fatalistic pessimism, yet the core assessments of substantive technology among all of them are similar enough to provoke the recognition of an element of correctness at the very least. And despite the fact that all three thinkers were operating in a sense within similar geo-academic contexts, i.e., influenced by the same thinkers as well as socio-political events like the Second World War by virtue of their geographical proximity, they were different enough that I believe such similar assessments are significant.

The significance of their similarity also extends to the present, where their accounts of the character of technology in relation to Western society is only too clearly applicable to the current setting of digital technology. In the next section, I will survey a few accounts of current technology and technique by contemporary theorists. In doing so, it will be made abundantly clear that the present situation is not so different from the situation of fifty years ago.

3: Contemporary Theory

The assessments of modern theorists did not hold for long. Even by the time Marcuse was writing One Dimensional Man, radical developments in French Theory were already underway. Within mere decades, the world of theory had been rocked and turned on its side. "Post"-modern theory had emerged and was quickly undermining the foundations upon which modern theorists had laid their claims.

Nonetheless, some theorists did not throw out everything modern. Some, as we shall see, argue that modern theorists such as Heidegger and Marcuse still have something valuable to contribute in the face of postmodernism. The character of technology in the Western social system has indeed changed, as we will see, but only as a result of a shift from mechanical or industrial technologies to digital technologies. While this shift is revolutionary in itself, the system in which the shift has occurred has not completed a similar revolution. Moreover, the substantive nature of technology has not witnessed an equally fundamental change either.

3.1: The Postmoderns

Broadly conceived, postmodernism shares its deepest roots with all of philosophy and Western thought, yet the hints of its critical and ultimately deconstructive project appear in the romantic philosophies of the mid- to late-19th century, such as in the writing of Søren Kierkegaard, Karl Marx, and Friedrich Nietzsche (see Hacking 1998: 96) The phenomenological and existential projects of Husserl, Heidegger, and Sartre as well as the cultural critiques of the Frankfurt School set a firm foundation for the thoughts and

works of Guy Debord, Jacques Derrida, Michel Foucault, Jean Baudrillard, and many other prominent – and predominantly French – theorists (Best & Kellner 1997: 39).

Postmodern theory is marked by revelations of reversal, and even more so a complete deconstruction – not destruction – of modern forms of thought, which were considered to be oppressive and blindly mechanistic and dehumanizing. Postmodern theories, in an effort to debunk modernisms, are best understood not as 'after' modernism, but as subversive or even 'anti' modernism. Expressions of the "end" or "death" of history, art, politics, and even 'the real' reflect this opposite position to the categories, boundaries and grand, unifying narratives of modernistic thinking.

In its most "extreme" and purest form, postmodernism is a state of mind, not a method that can be laid out and categorized (Bauman 1992: vii). To do so would be to apply modernistic categorization and ultimately miss the point, or as Derrida put it, "I am applied Derrida" (Derrida 1995: interview).

But postmodernism persists as a project, and one of its most popular and influential representatives is Jean Baudrillard. Baudrillard's most powerful ideas are contained in the words 'simulation' and 'hyperreality', words and ideas that originally were applied by him to the general Western social condition yet resonate even more deeply in the current digital age, which is also referred to in an ironically modernist fashion as the postmodern age. Baudrillard was engaging primarily American popular culture and media, asserting that it has transformed from being a culture of spectacle to one of simulation. The spectacle that has entranced us through media and popular culture has dissolved its boundaries, to the point where the images and signs of media spectacle have not merely replaced our reality, but have become it. We do not merely imitate the

spectacle, but simulate it so thoroughly that our reality is always already simulation, our reality is hyperreal. In short, the real does not exist:

> It is no longer a question of imitation, nor of reduplication, nor even of parody. It is rather a question of substituting signs of the real for the real itself, that is, an operational double, a metastable, programmatic, perfect descriptive machine which provides all the signs of the real and short-circuits all its vicissitudes. (Baudrillard 1983: 4)

And further:

> The very definition of the real becomes: that of which it is possible to give an equivalent reproduction. This is contemporaneous with a science that postulates that process can be perfectly reproduced in a set of given conditions, and also with the industrial rationality that postulates a universal system of equivalency (classical representation is not equivalence, it is transcription, interpretation, commentary). At the limit of this process of reproducibility, the real is not only what can be reproduced, but that which is always already reproduced. The hyperreal. (146)

The death or replacement of the real causes an implosion of meaning (57), a concept he admittedly borrows from the late Canadian media theorist Marshall McLuhan. In fact, Baudrillard declares that his own entire analysis comes back to McLuhan's formula: "The Medium is the Message," the "first great formula of this new age" (123 & 54). However, McLuhan's conception of implosion is slightly different than

Baudrillard's in that McLuhan regarded "electric technology" as effectively reversing the 3000 years of specializing and alienating effects – the explosion – of fragmentary and mechanical technologies, and that the world has imploded in effect into a village – a global village (McLuhan 1964: 150). Baudrillard extends McLuhan's idea of implosion, as seen above, to mean the implosion of reality and meaning through electric or electronic technologies. As we now know, and as Albert Borgmann describes, electrical technologies seem to be even more explosive in McLuhan's sense than mechanical technologies had ever been. However, McLuhan's and Baudrillard's assertion that the medium is the message, that the medium itself structures and determines the message such that the two are indiscernible from each other, is compelling. In this regard, Baudrillard's sense of implosion has weight.

3.2: Steven Best and Douglas Kellner

Naturally, there are those who disagree with Baudrillard, and with many other postmodern theorists. Steven Best of the University of Texas at El Paso and Douglas Kellner, the George F. Kneller Philosophy of Education Chair at the University of California at Los Angeles, have written a series of books effectively denouncing the claims of some postmodernists, particularly Baudrillard, that we live in a postmodern age and that grand narrative theory is useless. However, they do regard much postmodern theory as having more contemporary relevance and insight than modern theory, and so wish to strike a compromise between the two. In this regard, they combine the Marxist critical theory of the Frankfurt School, and Marcuse in particular, with the contemporary

insights of postmodern theorists like Debord and Baudrillard. The result is what they call "critical hermeneutics" (Best & Kellner 1997: 112).

Best and Kellner are wary of postmodern claims to a new era or paradigm that is drastically different than modernism, evidenced partly by the misappropriation of postmodern concepts and even the very word "postmodern" in both popular culture and academic theory. Also, many writers have claimed to have 'nailed down' what postmodernism is exactly, often with confusing and conflicting results (20).[6] In contrast, Kellner and Best conclude that there is no one postmodern theory, but many complex and often conflicting postmodern theories. For this reason, it is important not to hastily react so that one either uncritically embraces postmodernism as if it were the key to the contemporary universe or totally reject it as if it were a fad of no real significance (22).

As for Baudrillard, Best and Kellner question his radical assessment of hyperreality and subsequent implosion. While they find his insights to be important, they feel that "our present social situation is better interpreted as an intensification of (capitalist) modernity rather than as a wholly new "postmodernity"" (105). In light of this, Best and Kellner argue that since the current 'era' is thus a generalized extension of capitalism based on new technologies, capitalism and political economy, as well as applicable technologies, cannot be separated from their effects on society (109).

Best and Kellner defer to Debord and Situationist Theory, which states that self-referentiality does not entail hyperreality:

> Signs, images, and objects are not inscrutable and hermetic simply because they no longer stand within a classical space of representation. It is not that one signifier brings us a "real" world

> and another doesn't but that one occludes a larger social context more than does another, that contextualization may be more difficult in one case than in another. However self-referential and abstract the signifiers, a critical hermeneutics can uncover their repressed or mystified social content and social relations. (112)

This means that critical hermeneutics is able to contextualize or deconstruct even Baudrillard's hyperreality, which is itself ultimately an illusion. Kellner and Best regard Baudrillardian postmodern theory as obscuring the "continued existence of the capitalist mode of production, of consumer society, of the culture industries, of the state, and of coercive violence in the repression and determination of social being." The result of postmodern theory's obscuration is that it "conjoins with capitalism to obscure the most vicious and banal aspects of a violence no less real to those being "media-tized"" (114).

Critical hermeneutics has very similar lines of thought to Frankfurt School-brand Critical Theory. Kellner, an expert of Marcusean theory, admits as much. Kellner in particular takes an arguably more theoretically appropriate direction as an heir to Marcuse's project than other Marcuseans such as Andrew Feenberg, in that Kellner seems to be actively seeking to develop a supradisciplinary critical social theory. He feels that such a theory, a totalizing meta-theory, is precisely what is needed in response to the problems and potentials offered by the totalizing effects of the present age, and in particular of digital technology. Kellner suggests that if Critical Theory wants to continue to be relevant to the theoretical and political concerns of today, it must address the issues advanced by the postmodern challenge to previous traditions of social theory. This means that critical social theory today must attempt to theorize the new social

conditions analyzed by the postmodernists, and must demonstrate that its categories and theories continue to be applicable and illuminating in theorizing the new social conditions:

> Although we may be living within a transitional space between the modern and the postmodern, and may be entering a terrain where old modes of thought and language are not always useful, it seems at this point in time that in many ways, New French Theory is itself flawed and not of much use in helping us to understand and resolve many of the crucial theoretical and political problems that we currently face (i.e., moving beyond the current age of conservative hegemony, learning to use and live with new technologies in ways that will enhance human life, and understanding and dealing with a wide range of social problems from unemployment to AIDS). (Kellner 2002: online)

3.3: Andrew Feenberg

There are others who share Marcuse's vision of a Marxist-based cultural critique with an emphasis on technological rationality. Andrew Feenberg, once a friend and student of Marcuse's and now a professor of Philosophy at San Diego State University, engages Marcuse's critique of technological rationality with a social constructivist method to form what he calls, "critical theory of technology," taking the Marxist critical project in a different direction than Kellner and Best. Feenberg argues that Marcuse does not give an adequate account of social transformation, partly as a result of his rhetorical

style, and argues that technical systems are actually fraught with internal tensions that threaten to weaken the whole, rather than being the unstoppable force Marcuse seems to make such systems out to be. Simply put, Feenberg thinks that Marcuse is being too general in his account of technological rationality, and that a certain amount of difference needs to be introduced.

Feenberg sees Marcuse describing the technologically rational society – modern industrial society – as something like a gigantic machine regimenting its members, a society in which liberation depends on reversing the power between a repressive system and individual resistance. Feenberg's question to Marcuse is 'How is this possible?' Feenberg poses this question for two reasons: one, Marcuse does not offer a course of action; and two, the possibility of effecting such a drastic power shift is unthinkable short of civil war. Marcuse's attempt to convey the possibility of resistance is unconvincing or weak, even as he appeals to us to oppose the supposed 'closed' work he describes. In other words, Marcuse cannot provide the locus of resistance to the system, and so opens no space in which opposition could emerge. Furthermore, Feenberg asserts that Marcuse is wrong to suggest that the individual and society are distinct 'things' located on the same ontological level and interacting with each other (Feenberg 1991: 67).

Rather, Feenberg saw the relationship between the individual and society operating in a different way. What Marcuse lacked was a theory of technological hegemony capable of explaining the relationship of social organizations to ideology/science and power/knowledge. Feenberg tries to accommodate such a theory by incorporating what he calls the 'technical code', a phenomenon that aligns technical

systems to the requirements of a system of domination. Any hegemony is the effect of its code, though Feenberg, like Marcuse, concentrates on capitalist hegemony (79).

The term 'code' has at least two meanings in the social context. The first meaning of code refers to laws establishing what activities are either permitted or forbidden, but not necessarily in a legal context. There are all kinds of written codes of this kind to do with all nature of activity; from traffic laws to books on how to take pictures. The second sense of the term 'code' in the sociological context is of unwritten laws that are implicit in behavior and attitudes, "which signify a broader range of values than the permitted or the forbidden" (80). A mundane example of how this kind of unwritten code becomes entrenched in narrow cultural discourses is how a kind of hierarchy of goods becomes established; in a certain segment of the population in Northwestern Ontario, a hierarchy of pickup trucks is made apparent to anyone who ventures to ask. Which truck is "better" than another is never based on wide-ranging, rigorous scrutiny but is dogmatically based on anecdotes and brand loyalty. Which truck you drive sends a message about yourself and your values to others. Such codes, it seems, have a communicative function.

Feenberg argues that the technical code contains both the 'written' and 'unwritten' aspects just described. This kind of code has ontological significance in a society where domination is based on the control of technology to the point where it serves as the principle of 'organizational' identity and survival. "To exist," Feenberg writes, "organizations must 'encode' their technical environment, not merely associating technology with certain signifiers in its very structures" (81). What this means is that technologies are more than the sum of their parts; the springs and levers that are

integrated into individual technologies are a 'context of constraints' defined by their social environment. They meet the social criterion of purpose in the very selection and arrangement of the parts from which they are made. So, when a particular technology is examined, one can find within it a combination of social determinations which "pre-construct a domain of social activity aimed at definite social goals" (81).

Feenberg gives no example of what he means, but if I understand him correctly, the same truck mentioned above could serve as an example; the parts of the truck reveal much about those who use it. For instance, the kind of seat or steering wheel, or even the temperature controls, shows what the users of the truck demand as suitable comfort. Even the design of the truck betrays what the users find either attractive or its purpose. What's more, the parts not found in a the truck reveal what that particular user group does not value. The social codes of truck buyers/users become embodied in the technology (i.e., truck) they use.

Another example that could work is the design of the basic personal computer. The keyboard in particular sets very definite limitations as to the nature of the user. First, the keyboard employs a certain set and number of keys which restrict the number of functions a user has available to him, as well as limiting the number of functions a program designer works into a given program. The standard QWERTY key arrangement requires training to be used effectively (and, as a curious bit of trivia, it isn't even the most efficient arrangement).[7] The use of keys in itself restricts access to those with digits of some kind, yet the most able users are those with all ten fingers. All of these factors then affect how programs are designed and thus used. Something as 'simple' as the keyboard betrays a specific domain of social activity with definite goals.

Feenberg argues that capitalism as a whole has an over-riding technical code, clearly revealed in the example of the assembly line:

> Its design fulfills the strategic objectives of an influential network of management scientists and business leaders because it is more than a tool: a strategy of technologically enforced labor discipline forms the glue that holds together the neutral elements from which it is composed. This asymmetrical effect on power is characteristic of a strategically encoded technology. (Feenberg 1991: 82)

In the end, it seems that Feenberg is saying something quite similar to Marcuse; that within a technologically rational system, domination of men over men and men over nature is inherent because of the bias inherent within technology itself. Yet Feenberg claims that Marcuse's account is unclear with respect to how technical knowledge and society relate to one another, mostly because Marcuse does not have the vocabulary or terminology to express what Feenberg recognizes as an inherent or implicit "double-aspect" theory of technology in Marcuse. Feenberg sees Marcuse trying to suggest a pre-established harmony of technique and hegemony without reducing one to the other.

Feenberg manages to clarify what he sees Marcuse taking for granted. Feenberg explains that technical advance threatens the hegemony of the ruling groups until it – the technology – has been strategically encoded. Applications become bound to particular hegemonic purposes. So, Feenberg sees two things happening: first, there seems to be a connection being made as a result of the similarities between the technical principles employed by techniques and hegemonies; second, there is another connection occurring in the code which insures that they are coordinated in the application (83). This 'double-

aspect' of technology with respect to hegemonies is how Feenberg sees technology and social systems relating to one another.

I immediately see problems with some aspects of Feenberg's assessment of Marcuse. I question Feenberg's assertion that Marcuse implies a double-aspect theory of technology. If I understand Marcuse correctly, he describes technology or technical rationality as the germinating factor of the current hegemonies, such that technical rationality in effect created the current system; technical rationality is not something that is introduced from outside. Technology, as the physical embodiment of this rationality which has formed the system, is inherently applicable to that system. Hegemonies would then have no reason to "systematically encode" a particular technology, because it would inherently be encoded already. Yet Feenberg describes technology as being separate from the hegemony, the latter relating to the other asymmetrically, not taking 'control' by virtue of its nature, but rather being "systematically employed" by the system.

We have, then, two very big differences between Marcuse's and Feenberg's perception of technology: one, that Marcuse regards technological rationality to be both creator and part of a system, while Feenberg describes it as alien; two, Marcuse views technology as biased toward domination within a system and also as having a dominating effect over a system, while Feenberg says technology, while being biased toward domination, still seems to be within the control of the 'powers that be' to be systematically employed. I must in turn question the practical wherewithal of a hegemony to actually 'strategically' encode and employ technology. How, exactly, does an organization or hegemony do such a thing? What does it mean to do so? Strategy implies wisdom with regards to the effects of technology within a given system. We

know that this is impossible, for the greatest problems of technology with relation to man and nature do not lie with their intended ends, but always with the unintended ones.

The discrepancies between Marcuse and Feenberg may be arising from what usually reduces down to a techno-social version of the "chicken or egg" discussion. Substantivists or "total theory" advocates such as Marcuse order effective processes in a "top-down" manner, where constructivists like Feenberg order the process as "bottom-up" as a matter of method and perspective. Feenberg's claim that constructivist sociology of technology has introduced difference into the question is, to me, awry; it is an entirely new method and so no such introduction is possible.

Despite his attempts to deny it, Feenberg's account of technology belies a deep substantive root. He draws heavily from Marcuse whose critique of technological rationality borders on deterministic. Feenberg goes to great lengths to distance himself from such totalizing concepts, yet to assert a bias – good or bad – in technology as Feenberg does is indeed to assert a substance.

3.4: Albert Borgmann

The effects of technology in the digital age are manifold, a result of the proliferation of digital technologies available, and used, in nearly every area of our daily busy-ness – recall Lightman's comments in the introduction about technology enslaving us instead of freeing us. Indeed, a synonymous identification of the digital age is 'the information age'. For what is the purpose of all digital technologies but the relay of information? Albert Borgmann, professor of philosophy at the University of Montana at Missoula, sees digital information technology as both a supreme blessing and curse in

terms of the information it makes available and how that information threatens to displace reality.

Borgmann's thinking seems to tie together elements of all the thinkers mentioned in this thesis; he certainly draws from Heidegger and other moderns, but also from Baudrillard and other postmoderns. As a result, he echoes much of Kellner and Best's critique of the claims of postmodernism and also suggests solutions similar to those of Feenberg. Yet in all of it his position is uniquely his own, particularly because he is a proponent of both Catholicism and free market economy.

In 1992, Borgmann published Crossing the Postmodern Divide, in which he, like Kellner and Best, criticizes the postmodern project as not sufficiently dealing with the problems that new technologies pose to humans and their communities: "If we agree to call this distinctive approach to the reordering of the world 'modern technology', we should put the challenge to postmodernism by asking whether postmodernism will be more than technology by other means" (Borgmann 1992: 80). There is a distinction here that is worth mentioning: Borgmann is speaking about postmodernism as a social phenomenon, whereas Kellner and Best are attacking postmodernism's theoretical foundations.

So, unlike Kellner and Best, Borgmann argues that we do in fact live in a time that is something other than modernism, a time that has postmodern elements reflected in the political, economic and social structures.[8] We often hear of our 'era' as postmodern, as resting upon a "postmodern economy" or what has many other names: computer economy, information economy, postindustrial, service or electronic economies. Yet Borgmann sticks with 'postmodern economy' for he recognizes many aspects in it which

are indeed postmodern, meaning that there has been a relatively quick and radical shift from the realism, universalism and individualism that marked modern economy to information processing, flexible specialization and informed cooperation. This for Borgmann marks a departure from the rather brash and heedless practices of modern economics and toward diversification, niche marketing, and a growing dependency on services rather than goods. Banks, for instance, were at one time just a place where cautious individuals could put their money for safekeeping, but now customers are offered a slew of services ranging from insurance to RRSPs.

Borgmann suggests that despite these 'postmodern' characteristics, what is seen as a progression from modernism to postmodernism is more like (as Best and Kellner echo) an intensification of modernism – a hypermodernism. Hypermodernism is characterized by the problematic characteristics of hyperrealism, hyperactivity, and hyperintelligence.

Hyperrealism refers, in a *mildly* Baudrillardian way, to the way in which digital communication technologies and the information they relay are, by Borgmann's assessment, 'more real' than reality itself. They're brighter, more interesting, and less consequential than real life: "It conforms more fully to the technological promise of liberation from the recalcitrance of things, the confusion of circumstances, and foibles of human beings" (82). Digital information technologies specifically take experiences out of any contextual framework, making them pliable and rich in content. Ultimately, if the technology progresses far enough, all of our senses will be roused, offering a 'better' version of reality. But since it provides experiences outside of any context, hyperrealities

like virtual reality will ultimately fail in delivering a complete, meaningful experience (87).

Hyperactivity is a result of the flexible specialization available in the postmodern age. Flexible specialization allows for a much higher level of communication that ever before imagined, to the point where people can begin their work day before they even get to the office by using such devices as cellular phones or personal digital assistants (PDAs). Even more, the work day does not even really have to end, provided there are people and methods of getting work done at all hours of the day (97).

Hyperintelligence is the effect of the connectedness of digital communication technologies, in that every parcel of knowledge can be stored, accessed and shared at will. Yet this complete access puts the traditional American rights of personal privacy, security and liberty at risk, while at the same time ironically producing disconnectness – hyperintelligence puts technological barriers between the individual, society and other individuals, and the so very human activity of face-to-face communication and communal celebration is being robbed of social resonance (Borgmann, 1992, 102 & 106).

As well, Borgmann argues that this hyperintelligence threatens our own intelligence for memory and engagement, much like Plato had Socrates argue of writing in the Phaedrus, in that it disburdens us from having to remember either the immediacies of schedules and tasks to the expanses of history and science, languages and whatever else. "[Hyperintelligence]," Borgmann writes, "is obviously growing and thickening, suffocating reality and rendering humanity less mindful and intelligent" (108-109). As an example, Borgmann refers to a story about Nicholas Negroponte, the MIT professor who wrote Being Digital and is regarded as a champion of digital communication

technologies. Negroponte apparently stored all of his vital information in his wristwatch, yet naturally the batteries died and all of his information was lost. Negroponte's life was turned completely upside-down for about two weeks (107).

The way which we appropriate our world is being direly affected by the ubiquitous senses of hyperintelligence:

> There is a symmetry between the depth of the world and our bodily incursion into it. In the real world, humans have a natural inclination to satisfy that symmetry daily through bodily intimacy with the world, walking about, feeling the weather, going on errands, handling things, and carrying burdens.... The hyperintelligent sensorium, just because it is so acute and wide-ranging, presents the entire world to our eyes and ears and renders the remainder of the human body immobile and irrelevant. The symmetry of world and body falls to the level of a shallow if glamorous world and a hyperinformed yet disembodied person. (106)

This effect of digital information technologies on people and society was the primary focus of Borgmann's most recent book, Holding onto Reality, published in 1999. In it, Borgmann writes about information and information technology specifically, yet makes some interesting accounts of different kinds of information. For instance, Borgmann distinguishes between and gives an historical account of natural information, cultural information, and technological information. Throughout, information is

information: what is gained when a person with the requisite intelligence is informed by a sign about a thing in a certain context.

"Natural" information, briefly, is information that is gathered from natural signs, such as clouds, smoke, animal tracks, or landmarks. People are either informed about reality by or are able to construct reality from these kinds of signs, ultimately discern meaning and thus act. Once present and read, natural information retreats from presence until called back again. An example of this would be the use of natural landmarks to aid navigation. Coming from the west down the Kaministiqua River, for example, the sight of the massive formation known as Mt. McKay once indicated to the voyageurs of the North West Company of their proximity to the mouth of the river, of Fort William at the mountain's foot, and of Lake Superior to the other side. The mountain, having been read, returns to being merely a mountain once again. The mountain no longer serves this purpose, but remains a part of the landscape nonetheless to be read and provide information in new ways.

"Cultural" information differs in that it results from artefactual or conventional signs which are made and remain separate from their natural kin. Cultural information is contained in things such as letters, texts, maps, music scores, or architectural plans. Where natural information is about reality, cultural information is about as well as for reality, or for the shaping of reality. The kind of information gathered by artefactual signs then has the effect of transforming reality, where the information contained and conveyed by cultural signs provides the details to construct, usually in a physical sense, reality. Architectural plans can be read to construct a building – which conveys meaning itself – in the same way that scores can be read to construct music, which also conveys

meaning. Cultural information does not eclipse natural information, but rather enriches it.

"Technological" information is something more, and thus different. Like natural and cultural information, technological (or digital) information is about and for reality; yet it does these things with such force that it may one day threaten to in effect displace reality altogether:

> The paradigms of report and recipe are succeeded by the paradigm of the recording. The technological information on a compact disc is so detailed and controlled that it addresses us virtually *as* reality. What comes from a recording of a Bach cantata on a CD is not a report about the cantata nor a recipe – the score – for performing the cantata, it is in the common understanding of music itself. Information through the power of technology steps forward as a rival of reality [author's emphasis] . (Borgmann 1999: 2)

Digital technologies introduce such a nearly perfect level of "permanence, perspicuity, and pliability" to information that no previous kind of technology could achieve, to the point where the sign becomes (mis)taken for the thing itself, that "the structure of the sign is as detailed as the structure of the thing the sign refers to" (167 & 181). Music CDs offer a supreme example of Borgmann's statement; the music itself, being played, has its only permanence in the memory of the listener, and the listener can only provide you with vague information about the music itself. The sheet music for the piece has much more permanence, but its clarity and usefulness depends on the musical intelligence of person who is reading it. The CD of the music and the supportive technology has the

ability to recreate the music in its intended clarity – Borgmann's example is that of J. S. Bach's Cantata no. 10 – yet also allows for one to listen to the music on demand today, tomorrow, or two years from now. Yet, "you no longer say that you have information about or for Cantata no. 10, you have the cantata; what your CD player, amplifier and speakers produce is not something that is about or for Bach's music. It is the music itself" (181). Information eventually becomes so detached from reality that it eventually becomes its rival.

Yet for all of the promises that digital technology makes, its effect of displacing reality removes intelligence, things, and context from the normal semantic process. As a result, signs are self-sufficient and uniquely ambiguous. Ambiguity is always a possibility with any sign, if the reader is unable for intellectual or contextual reasons to gain sufficiently clear meaning; Mt. McKay is just another big rock to the casual observer, the end result of tectonic, volcanic, and glacial forces. The ambiguity that technological information introduces is new, in that it provides no information about the world out there; it is virtual ambiguity (186).

This ambiguity is clearly evident in "multi-user dungeons," in online communities like The Well, chat-rooms, and online games such as EverQuest or Anarchy Online. In these cyberspaces, an individual can and invariably does construct an entirely new identity, an "avatar," perhaps the one (or two) he had always wanted in real life. Walls are erected that, as Sherry Turkle puts it, "create a sense of being in a place apart" (Turkle 1984: 251). This capability blurs lines of truth and fiction, and the result is a mixture of a new level of freedom as well as confusion. On one hand, hopes can be realized; physical handicaps can be overcome, the meek can be eloquent superheroes,

sexual orientations can be realized. But with equal ease, jokes can be played. The seriousness of the user is never entirely apparent, nor is any other detail. In all of this, the users recognize that ambiguity is part of the experience (see Turkle 1995: 12).

Still, many hundreds, if not thousands of people have met and married through online communities as well as in online communities. Online marriages are becoming more frequent in games such as EverQuest. The ceremony takes place in a vibrant 3D virtual world with a virtual celebrant and congregation. Each participant virtually dresses in his or her most extravagant armor and gives gifts to the couple, usually virtual money which is part of a working virtual economy. Yet the emotions involved are real. There are real people behind the avatars, and so the lines between reality and virtuality remain blurred. Borgmann calls this effect of blurring and confusion "virtual fog." When the user removes himself from the community, even if for a moment, the fog lifts and the physical, biological reality resumes; the runner is a double amputee again, the superhero is meek and clumsy again, the man is a woman again.

In response to what he sees as the development of hypermodernism, Borgmann offers a "genuine alternative" of what he calls "postmodern realism"; he argues that we should not be afraid of technology and turn away from it. Besides, the possibility that the current technological progress would be abandoned is unlikely, if not impossible. Rather, Borgmann suggests that technologies can be positively appropriated, much like Feenberg's suggestion of "systematic employment" but without the politically radical implications, through broad education of the public in order to produce "the existence of a literate community and the presence of an eloquent reality" (Borgmann 1992: 116). Although the postmodern condition, or hypermodernism, eclipses the natural or

traditional reality, eloquent reality can occur in a technological sphere as "focal" reality – encounters each of us has with things that of themselves have engaged mind and body and centered our lives. "Commanding presence, community with the world, and centering power," Borgmann writes, "are signs of focal things" (119).

In short, Borgmann calls for community and substance informed procedure as the basis for the development and employment of technology. This is postmodern realism. Borgmann suggests that Christian models of love and community offers one foundation for postmodern realism, for they aim to incorporate contemplation and worship into the individual and corporate – as in community – levels of living (142). In this regard, he echoes Ellul and, moreover, the great Canadian social thinker George Grant. Grant, in his important work Technology and Empire, attacks in a broad sweep the modern and New Left critiques of Western technical society, particularly Marcuse's, in the end arguing that the solution Marcuse proposes does nothing to change man's relation to technology or capitalism, for Marcuse's utopia presumes the same, or better, standard of living only made available by the very system Marcuse opposes. Grant suggests, in a similar fashion as both Heidegger and Borgmann, that the West's abandonment of "contemplation" has seriously hindered its ability to understand and manage itself.

There is one critical comment that I must make in reference to Borgmann's suggestion of a reality that is being threatened by technological information. A reality that can be fogged by technology's velocity, but can also be returned to when the fog is lifted, could be argued to be but a mirage of the real. As Baudrillard and the constructivists suggest, what we consider to be a basic reality is still always already a construction. When the virtual fog lifts and, for instance, the man becomes a woman

again, the sexual categories implied are specifically Western. Many cultures do not restrict sexuality to merely two distinctions. Despite this modest complaint, Borgmann's assessment of digital communication technology and its effects on us as individuals and as a culture echoes in many ways the concerns of modern theorists, giving us reason to pause and consider the relationship between modern and contemporary technologies.

3.5: Summary of Contemporary Theory

At this point, it is possible to go in a few directions. If what we consider to be reality is in effect just as constructed as the virtual reality offered by digital communication technology, if it is all simulation anyway, then we cannot say one reality is preferable to another, and so any consequences that may arise are moot. This kind of nihilism allows for a full embrace of virtual existence via digital communication technology without any sense of consequence. What we can take from Borgmann is the idea that one reality is indeed preferable to the other, that one is indeed less a simulation than the other, and that the experiences offered by what is commonly understood to be reality – constructed, simulated, or whatever – are ontologically more significant than any experience mediated by technologically. In a word, they are most real.

This conclusion is arguably Heideggerian, and Borgmann is not alone among contemporary theorists to maintain Heidegger's line of thought. Hubert Dreyfus presents a Kierkegaardian/Heideggerian perspective in his book On the Internet, in which he repeats much of what Borgmann presents in Holding onto Reality. For Dreyfus, digital communication technologies like the internet threaten to erode or displace the more physically direct – and thus better – relationships through their increased mediation in

such practices as distance education. It likewise threatens to produce possessors of false knowledge, or even false possessors of knowledge – again, as Plato argued – by allowing uneducated voices to make claims about something with which they have no "true" knowledge, claims that will have an influence on an equally uneducated public.[9] For both Dreyfus and Borgmann – as for Heidegger – being "present" in a situation, whether with nature or another person, offers individuals and societies the most direct interpersonal experience their senses can allow.

In the end, we cannot ignore or make light of the postmodernist arguments, including those of Baudrillard, which demystify constructed realities. But, at the same time, it is naïve to follow this project if it degenerates into a *reductio ad absurdum*, to the point where there is no basis for rational action and ethic, to a nihilism; skepticism is healthy, but with moderation. The result must be a compromise; postmodernism as a state is a myth, but modernism is history.

4: Thesis Summation

What we find in all of these theorists, from Ellul through Borgmann, is a thread; a thread woven among thoroughly different political and religious ideologies, as well as through different conceptions of technology and reality. This thread is the recognition that instrumental technology is the effect of something larger that has many names and faces, be it *la technique*, *Gestell*, or capitalist technological rationality. Contemporary theorists are reluctant to name such potentially "essentialist" concepts, yet they continue to hint at them. I would argue that they have no choice. Despite the efforts of many contemporary theorists to avoid loaded modernist terms such as "essence," we have not yet completed the turn to postmodernism; we still fall prey to modernist ways of thought. Of course, this turn can only truthfully said to be 'in motion' since the late 1960s, and thirty years is only a moment in the life of a revolution.

The charge of essentialism is one to avoid, if only to escape association with the construction of often injurious or oppressive – and always exclusive or elitist – categories such as gender, race, ethnicity, class, value, history, and canon to name just a few. I believe, however, that technology does not belong with these other categories. There is nothing oppressive about claiming the essence of technology, for the sense of essence in relation to technology is, dare I say, more "true" in the Heideggerian sense, and not merely a social construction that supposes a direct opposite. As we have seen in the modernist account, and particularly in Heidegger's, technology as essence transcends and traverses constructed realities.

For this reason, it is difficult to talk about technology and not talk about its essence, even – especially – if you are appealing to any sort of political or other kind of

ideology. Indeed, my purpose in this thesis has been to reinforce the essentialist position in a contemporary context. This has been done with full awareness of the theoretical oppositions as well as the general unpopularity of this stance. But I believe that the question of the essence of technology is something that cannot be disregarded – no matter how much one might try. For instance, both Kellner and Feenberg are flavoured by a Marxist agenda, and so carry Marx's substantive baggage that they cannot drop, even if Feenberg claims otherwise. Borgmann's arguably conservative democratic politico-economics is also able to recognize a substantiveness in technology that has only *intensified* with the emergence of digital communication/information technologies.

Whether Kellner's neo-Marxist solution is right or Borgmann's Christian-conservative solution is right is not really at issue. For the political, economic, and cultural aspects of a hegemony, to use Feenberg's language, are more or less determined by the technologies upon which they depend. Again, the relationships between politics, economics, society, and technology are very much intertwined, and discerning the separations between them and thus the influence one has on another requires decades of research and analysis, only to made obsolete by the rapid progression of technological development. Rather, I believe we must deal with technology's essence, its ahistorical character, in order to be able to provide a meaningful solution. This is not to say that Kellner's and Borgmann's solutions are not meaningful; they are indeed meaningful within the systems they address, namely the hypermodern digital era, but only there. Technology has always been and will continue to be humankind's assistant for dealing with the world, and as such has no allegiance to a particular polity, economy, theology, or culture. However, it should be noted that Western society and all of its associated

systems are structured in a robustly technical manner. For this reason, contemporary Western society must, more than any other society, deal with technology itself – as something that must be dealt with as opposed to something it merely uses neutrally to deal with the world.

4.1: Intensification

The effects of a technical or technological system are brought about by the technologies used in that system, i.e., by the instrumental technologies, the political and economic techniques, and so on. Feenberg's double-aspect theory of technology is useful in describing what I see as the relationship between technology and the technical system. They are not entirely distinct things, but intimate and intrinsic to one another. Technologies are a contributing factor in the development of technical systems, and systems are a contributive factor in the development of technologies.[10] What qualities each component has will be imbued in the other, and so Feenberg's claim that hegemonies – which are in my opinion products of a technical system – can strategically employ technologies is a typical constructivist claim in that it gives more credit to agency than the situation would seem to allow. Digital communication technologies especially have an extensive impact on the structuring of social relationships as well as our own appropriation of the 'natural' world. For this reason, I had wondered if digital communication technologies were somehow fundamentally – substantively – different than any other kind of technology, and if it would in turn facilitate a new kind of technical system different in all respects to the modern technical system and its technology.

But after examining the assessments of Heidegger, Ellul, Marcuse, and other modern theorists, it became clear that the problems and opportunities presented by modern technology are very similar to the ones presented by current digital communication technologies. Granted, some of the problems and opportunities presented by digital communication technologies are indeed new and in many ways unique, but at its core, its substantive character remains the same as it has always been, from the times of the ancient Greek philosophers such as Plato and Aristotle, and the technologies which gave them pause to reflect. The current technical system is indeed different, but only in that it is more intense. While only mentioned by each, this language of intensity with regard to the digital era is confirmed by Kellner and Best, and by Borgmann.

The language of intensity in relation to both modern and digital technology and technical societies has been used or suggested by thinkers ranging from Alvin Toffler in Future Shock (1970) to Paul Virilio in Speed and Politics (1977). The digital world in particular is marked by exponentially increasing processing power and speed combined with already massive and continuously growing amounts of information.[11] The result is radically increasing amounts of information velocity, and thus increasing intensity. But for Kellner, Best, and Borgmann, the term intensity is used only in relation to the velocity of information, or the intensity of technology's effect on us due to its ever-increasing power and integration. Intensity as I employ it is larger in scope. It includes Borgmann and Kellner's sense of intensity, but more broadly refers to the shift in technology's *overall* power and integration, and thus effect; with the advent of digital technology, and in particular digital communication technology, the effect of the essence of technology has intensified in its relation to humans and Western society. Just as the modern

technical system was the intensification of technology from whatever system preceded it, for instance the Industrial Revolution, the current technical system is likewise a further intensification. But digital communication technology and the digital age is intense in all referents, including the ones mentioned above. As a result, the implications of digital technology and its essence are both more evident and more pressing.

To emphasize and also summarize, digital communication technology is *historically unique*; it is drastically different in its design and effects than any other kind of technology so far. This point is clear and irrefutable. The substantive element of digital communication technology and of technology as a whole is, on the other hand, *historically consistent*; the characteristics of technology, either as system or as instrument, are the same as modern technology. The intense nature of digital communication technology is the result of an intensification of the substantive nature of technique or the essence of technology – through the effects of digital communication technology. That this conclusion may be unfashionable in some circles means nothing. Declaring the essence of anything, as mentioned above, is seen by some as being tantamount to intellectual suicide. However, I cannot conscientiously ignore what I see as a substantive element in technology and technical systems having a determinant effect on Western culture, at both the personal and social levels.

Intensification is a key term for understanding the digital era. The term can be applied to describe every aspect of technology – both instrumental and essential – in relation to humans and societies. But the sense of the term intensity that concerns this thesis most is in reference to the idea that the digital era and its digital technology represent an intensification of the effect of technology's essence on humans by way of

the intensification of both the technical systems – technique or technological rationality – and the instrumental technologies. Kellner, Best, and Borgmann, I believe, are right to rebuke some postmodernist claims that we live in a new era, a postmodern era, and I think that Borgmann's term hypermodernism is right on the mark. The digital era is intense modernism, and is intensely modern.

Afterword

Digital communication technology is unlike any other technology in history. Able to process information at a level never before imagined, it has opened up entirely new worlds that rival our own in many ways, including the freedom it gives to anyone who wishes to unleash their imaginations and desires. It has not stopped growing, and there does not seem to be any indication that it will any time soon. What is more, the digital technologies of tomorrow will be more powerful, more flexible, and more ubiquitous than ever.

The technologies that reach our hands today have been in development for years. Sometimes, radical technologies are developed and do not reach the public for a decade or more. The efforts of the Xerox Palo Alto Research Center (PARC) over the past thirty-three years have given birth to laser printing, Ethernet technologies, the graphical user interface (GUI), and ubiquitous computing among other accomplishments. Even now, PARC and other corporately funded Silicon Valley research groups are researching and developing nano-technologies, gene-chips, micro-sensors or "smart dust," flexible electronics, all of which are intended to make information technologies more powerful, cheaper, and ultimately more pervasive and ubiquitous.

The question for the average consumer or citizen is, "How should I react to digital technologies?" Of the contemporary theorists mentioned in this thesis, the solutions vary. Ellul suggests we pack up and retreat to a more "natural" setting. Heidegger appeals to increased artistic expression as a means of balancing off the potentially negative effects of technology. Marcuse hopes for a reorganization of thought and technology in order to set technology on its proper course of disburdening people of labour. Feenberg hopes for

a reinterpretation of technology for similar reasons to Marcuse's, but expands his concerns beyond humanity's needs into those of the environment. Borgmann suggests that we realign our thinking to include spiritual practice, from worship to servitude, to balance technology's effects, a suggestion much like Grant's.

Will these suggestions continue to be viable as technology continues to develop? Will the era of ubiquitous technology that the research laboratories are placing on our horizon invite a fundamentally different system of thought and action, or is it going to be still more intensification? If so, how much intensity can humans withstand? Many people have already opted to reject the digital era in favour of a less intense lifestyle, as Ellul has suggested. Throwing out the television is one reaction. At least one local couple has opted to forgo urban living and have isolated themselves as much as they can in direct opposition to the intensity of a technical society. They have constructed a house out of wood, mud and hay, have tilled a garden and have been living comfortably – with children – for a few years, and they are by no means the first to do so. Ellul himself was an advocate of rejecting the modern level of intensity, and even he was not the first. As mentioned in the introduction, such sentiments date at least as far back as the Romantic era, and possibly as far back as Ancient Rome.

I believe that if we choose to embrace technology, Heidegger is right in stating that we must always keep the essence of technology – even if just the nature of technology to change us – always in view. This will be particularly important as advances in areas such as biotechnology are poised to change our very conceptions of what is means to be human, forever altering our political and ethical landscape. As Francis Fukuyama states in Our Posthuman Future:

> Neuropharmacology has already produced not just Prozac for depression and Ritalin to control the unruly behavior of young children. As we discover not just correlations but actual molecular pathways between genes and traits like intelligence, aggression, sexual identity, criminality, alcoholism, and the like, it will inevitably occur to people that they can make use of this knowledge for particular social ends. This will play itself out as a series of ethical questions facing individual parents, and also as a political issue that may someday come to dominate politics. If wealthy parents suddenly have open to them the opportunity to increase the intelligence of their children as well as that of their subsequent descendants, then we have the makings of not just a moral dilemma but a full-scale class war. (Fukuyama 2002: 16)[12]

Biotechnology is merely one of many current developments made available by digital technologies.

The consequences of a completely digital realm are unknowable. As Borgmann demonstrates, digital communication technologies have the clear potential to progress to the point of offering as near a perfect simulation of an event or activity, one that is possibly better than reality. The consequences of such a completely virtual reality are much too complex and dependent on variables that we cannot predict from our present situation. But if we can learn anything from the thinkers featured in this thesis, it is that prediction is not the aim, as entertaining as it might be. Assessment based on a solid

understanding of history combined with a grasp of the character of technology in relation to us and society can keep any amount technological intensity in focus.

[1] See "Plato's Pharmacy" in Derrida's Disseminations for a critical appraisal of this scene.

[2] Rational action, for Aristotle, is equivalent to moral action or conduct. To act rationally is to conduct oneself in a moral and ethical way. See Book VI of the Nichomachean Ethics, section 5(c) (1140a-25 – 1140b-30).

[3] For some, like Jacques Ellul and Herbert Marcuse, the market is a kind of technology as well, or more so a product of a uniquely modern technological kind of rationality.

[4] Hiroshima was bombed with 'Little Boy' on August 6th, 1945. Camus wrote the article on August 7th, and it was published in the French Resistance newspaper 'Combat' on the 8th. Nagasaki was bombed with the larger 'Fat Man' on the 9th.

[5] I borrowed the language in these parentheses from a wonderful glossary of Heideggerian terms compiled by Richard Rorty, which was on some photocopied pages folded into the Heidegger text I borrowed from Dufresne.

[6] One of the academic writers they attack for laying down many shifting and conflicting conceptions of postmodernism is Zygmunt Bauman, whom I have referenced earlier, and they refer to the very book I have referenced. I was amused first because Bauman is not as frenetic as Best and Kellner make him out to be. I was then amused to find that Best and Kellner arrive at the same conclusion that ultimately Bauman does, that there are many different postmodernisms. See (Best & Kellner, 1997, 22) and (Bauman, 1992, vii). As for my reference to Bauman, it is both suitable and accurate.

[7] QWERTY, or the Universal key set was developed by the original patent winner of the typewriter, Christopher Latham Sholes, some years after the typewriter was developed in

1868. One theory is that Sholes designed QWERTY to actually slow down typists who were jamming the key bars as the result of being too quick, as well as a problem in the physical design of the typewriter itself. Sholes' intent was to arrange the keys so that the most likely to be struck in close succession were approaching the type point from opposite sides of the machine.

The most theoretically efficient key set was patented by August Dvorak as the Dvorak Simplified Keyboard (DSK) in 1936. By this time, improvements in typewriters allowed for a more efficient key set, and DSK was designed more for the benefit of the typist. All of the vowels and the most recurrent consonants were arranged on the home row, and the result was that around 75% of English words were typeable without having to vertically move your fingers. As well the design aimed to optimize key stroke alternation between hands, increasing speed while reducing fatigue and stress.

DSK was a commercial failure, perhaps due to the standardization of QWERTY and the consequential reluctance of typewriter manufacturers to change production, or of businessmen to invest time and money to retrain their typists. After a brief interest, DSK faded into obscurity and QWERTY remains the industry standard to this day. Studies still have not conclusively determined whether or not DSK is actually faster, since it seems that QWERTY typists manage about the same speed.

However, there are a few who still advocate the implementation and wide-spread use of DSK. It is possible to download keyboard re-mapping software for nearly every kind of operating system, and DSK keyboards are available to purchase if one looks hard enough. Microsoft Windows operating systems have always included DSK as a key-set option, listed as "Dvorak."

[8] Like Feenberg, Kellner, and Best, Borgmann is referring to American systems specifically and thus not necessarily to others, like Canada's. Yet much of what these men say about technological society can be generally applied to sufficiently 'progressed' Western states, such as Canada and most European and Asian countries.

[9] As an aside, Dreyfus falls prey to his own reasoning. Dreyfus effectively confesses in the introduction to On The Internet that he had to learn how to use the internet to lend some credibility to his writing. He is by no means a master or 'fully apprenticed' student of the internet, its uses, or its effects on individuals or groups. As a result, he fails to meet his own standards as a valid commentator on internet technology. This is made even more clear by his misunderstanding of how the technology works. For instance, much of Dreyfus' commentary rests upon the notion that one 'surfs' the internet, moving from one place to another on the now clichéd 'information superhighway.' Unfortunately, Dreyfus has been misled. Perhaps the Micronesian conception of marine travel given by Don Ihde in the essay referenced above would help; just as Micronesians apparently do not think that one 'moves through' water to destinations but rather that the destinations come to him, one does not 'move through' the internet from one site to another, but rather the sites come to the navigator. One's navigator does not upload itself to a site; sites are downloaded by the navigator. "Navigator" itself is a misleading term, as is nearly all popular internet terms, and it is unfortunate that someone as thorough and exceptional as Dreyfus could be so careless in this regard.

[10] This phenomenon of integration and "double effect," where each participant effects the other, is commonly known among biologists as "co-adaptation" or "co-evolution," where

it is recognised that two or more organisms can have evolutionary 'effects' on each other. This kind of phenomenon is usually found in semi-closed biological systems like islands.

[11] Moore's Law states that digital processing power doubles roughly every eighteen months. Dr. Gordon Moore, co-founder of Intel, had observed in a now famous paper published in 1965 that the number of transistors per integrated circuit had doubled every year in the four previous years since such circuits had been introduced. He then predicted that the trend would continue. According to Intel, the trend has indeed continued. Their first chip made in 1971, the 4004, contained 2,250 transistors. The Pentium 4, the latest chip, contains 42 million, twice as many as the Pentium 3 which was introduced a year before. See http://www.intel.com/research/silicon/mooreslaw.htm.

[12] This scenario is investigated in the film Gattaca, in which the main character, Vincent, poses as a genetically enhanced person (Jerome) in order to qualify for being sent into space, fulfilling a childhood dream. In a classic subversion, he employs technology to illegally hide his genetically inherited chance of heart disease and his less-than-perfect eyesight from his employer and the authorities. His character is juxtaposed with that of Eugene, a genetically perfect specimen who lacks any motivation to achieve. This is a good example of the classical role of science-fiction as an important means of holding the essence of technology up before us.

Bibliography

Aristotle. Nichomachean Ethics. Trans. Martin Ostwald. Ancient Philosophy. 2nd ed. v. 1. Eds. Forrest E. Baird and Walter Kaufmann. New Jersery: Prentice Hall. 1997. 376-447.

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

Bauman, Zygmunt. Intimations of Postmodernity. London: Routledge. 1992.

Best, Steven and Douglas Kellner. The Postmodern Turn. New York: The Guilford Press. 1997.

Borgmann, Albert. Holding on to Reality: The Nature of Information at the Turn of the Millennium. Chicago: University of Chicago Press. 1999.

---. Crossing the Postmodern Divide. Chicago: University of Chicago Press. 1992

Camus, Albert (1945). "On the bombing of Hiroshima." Between Hell and Reason: Essays from the Resistance Newspaper Combat, 1944-1947. Trans. Alexandre de Gramont. London: Wesleyan UP. 1991.

Chastenet, Patrick. A Short Biography of Jacques Ellul (1912-1994) Trans. Lesley Graham. http://www.ellul.org/bio_e.htm. January 25, 2002.

Derrida, Jacques. Applied Derrida Conference. University of Luton, England. July 20-23. 1995.

---. Dissemination. Trans. Barbara Johnson. Chicago: University of Chicago Press. 1981.

Dostoevsky, Fyodor. Notes from the Underground and The Double. London: Penguin Classics. 1973.

Dreyfus, Hubert. On The Internet. New York: Routledge. 2001.

Dufresne, Todd. Tales From the Freudian Crypt: The Death Drive in Text and Context. Stanford: Stanford UP. 2000.

Durbin, Paul T. "Introduction: Some Questions for Philosophy of Technology." Philosophy and Technology. Eds. Paul T. Durbin, and F. Rapp. Boston: D. Reidel Publishing Company. 1983. 1-14.

Ellul, Jacques. The Technological Bluff. Trans. G. Bromiley. Grand Rapids: William B. Eerdmans. 1990.

--- (1950). The Technological Society. Trans. J. Wilkinson. New York: Knopf. 1965.

Feenberg, Andrew. Critical Theory of Technology. New York: Oxford UP. 1991.

---. Questioning Technology. New York: Routeldge. 1999.

"Frankfurt School." The Oxford Companion to Philosophy. New York: Oxford UP. 1993. 355.

Freud, Sigmund (1930). Civilization and its Discontents. Trans. & Ed. James Strachey. New York: WW Norton. 1961.

Grant, George Parkin. Technology and Empire: Perspectives on North America. Toronto: House of Anansi. 1969.

Habermas, Jurgen. Theory and Practice. Boston: Beacon Press. 1974.

Hacking, Ian. Mad Travelers: Reflections on the Reality of Transient Mental Illnesses. Charlottesville: UP of Virginia. 1998.

Heidegger, Martin (1954). "The Question Concerning Technology." Trans. William Lovitt. Martin Heidegger: Basic Writings. Ed. David Farrell Krell. New York: Harper & Row. 1977. 287-317.

Huning, Alois. "*Homo Mensura*: Human Beings are Their Technology – Technology is Human." Research in Philosophy and Technology. Vol. 8. Ed. Paul Durbin. London: JAI Press. 1985. 9-16.

Idhe, Don. "Technology and Cultural Variations." Research in Philosophy and Technology. Vol. 8. Ed. Paul Durbin. London: JAI Press. 1985. 17-33.

Jay, Martin. The Dialectical Imagination: A History of the Frankfurt School and the Institute of Social Research, 1923-1950. Boston: Little, Brown and Co. 1973.

Kaufmann, Walter Arnold. Existentialism from Dostoevsky to Sartre. New York: New American Library. 1975.

---. Nietzche, Heidegger, and Buber. New York: McGraw-Hill. 1980.

Kellner, Douglas. Herbert Marcuse and the Crisis of Marxism. Los Angeles: Berkeley. 1984.

---. Boundaries and Borderlines: Reflections on Jean Baudrillard and Critical Theory. http://www.gseis.ucla.edu/faculty/kellner/Illumina%20Folder/kell2.htm. Accessed 25 November 2002.

Lightman, Alan. "Prisoners of a Wired World." Globe and Mail [Toronto] 16 Mar. 2002: R1+

Marcuse, Herbert (1941). "Some Social Implications of Modern Technology." The Essential Frankfurt School Reader. Eds. A. Arato & E. Gebhardt. New York: Continuum. 1998. 138-162.

---. One-Dimensional Man. Boston: Beacon Press. 1964.

McLuhan, Marshall (1964). "Understanding Media." Essential McLuhan. Eds. Eric McLuhan and Frank Zingrone. Concord: House of Anansi. 1995. 149-179.

Mitcham, Carl and Robert Mackey. "Introduction: Technology as a Philosophical Problem." Philosophy and Technology. Eds. Carl Mitcham and Robert Mackey. New York: The Free Press. 1972. v-vi.

Olafson, Frederick. "Heidegger's Politics: An Interview with Herbert Marcuse." Marcuse: Critical Theory and the Promise of Utopia. Eds. Robert Pippin, Andrew Feenberg and Charles P. Webel. South Hadley: Bergin & Garvey Publishers, Inc. 1988. 95-104.

Ong, Walter. Orality and Literacy: The Technologizing of the Word. London: Routledge. 1988.

Plato. Phaedrus. Trans. Harold North Fowler. 17th ed. Cambridge: Loeb Classical Library. 1990.

---. The Republic Trans. W. H. D. Rouse. Great Dialogues of Plato. Eds. Eric H. Warmington and Philip G. Rouse. New York: Signet Classic. 1999.

Roy, Arundhati. The Greater Common Good. 1999. http://www.narmada.org/gcg/gcg.html. Accessed 21 April 2002.

"Technology." Oxford Dictionary of Sociology, 2nd. Ed. Oxford: Oxford UP. 1998. 665.

Toffler, Alvin. Future Shock. New York: Random House. 1970.

Turkle, Sherry. Life on the Screen: Identity in the Age of the Internet. New York: Simon & Schuster. 1995.

---. The Second Self: Computers and the Human Spirit. New York: Simon & Schuster. 1984.

Veblen, Thorstein. The Engineers and the Price System. New York: Viking. 1921.

Virilio, Paul (1977). Speed and Politics. New York: Semiotext(e). 1986.