

Art Practice and The Will to Technology

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Introduction: Questions and a Starting Point

In his book *Information Arts*, Stephen Wilson (2001), catalogs the work of more than 200 artists who have performed work in 82 scientific and technological research areas. He states that scientific and technological research now influences every corner of everyday life. He concludes that these disciplines have cultural effects which can benefit from the critical perspective and traditions held by the arts.

The question I would like to pose is: What is this relationship between art and technology? On what basis can art be critical of technology? This question is being practically answered, in the intersection of art and particularly "high" technology by an abundance of multidisciplinary and cross-disciplinary studies and at new schools and programs¹. I would like to take a step back and examine the Will to Technology in Art. Why are artists attracted to technology? Is this just an extension of technological fetishism, a seduction of chrome and glass or association with the high status that science and technology studies enjoy in our modern society?

Now that technological euphoria of the 1990s has burst with the market "correction" of the high technology speculative bubble and as scientists and technologists turn their trade away from the venture capitalists to other sources of financial backing, such as thinly veiled military projects², we may need more than ever find the values of this intersection between technology and art. We are looking at the philosophical ground beneath the art-technology symbiosis.

The question of technology is marginal; from both the dais of philosophy as well the dais of the art world, where technology is seen as a matter of means and not ends. The painter's brush technique is hardly the topic of proper art conversation, and technology is

¹Simon Fraser University School of Interactive Arts and Technology, MIT Media Laboratory Aesthetics + Computation Group, Concordia University Digital Technologies in Design Art Practice Program, etc.

²see the Darpa Grand Challenge, <http://www.darpa.mil/grandchallenge/>

not high on the agenda at the philosophy conventions. Except if one considers Heidegger, who introduced the question of technology into philosophy most fundamentally. This is where we will start, and this is where artists involved with technology turn to first, because Heidegger up ended the notion deceptively slipped into the beginning of this paragraph: technology as a matter of means and not ends.

Before we start with Heidegger, let us first clarify the scope of our discussion. I would like to speak broadly of the nature of technicity and more specifically on the current and potentials of avenues for an art practice which is engaged with technology. Along the way we will highlight what I have found to be potential theoretical frames for developing an alternative view technological rationality. It is my desire to test these conceptions in a range new digital art works.

Lastly, the reason we focus on technology rather than science in general is not that science presents a wholly truthful³ account of nature but that the production of fact (science) is a less socially constructed the production of artifacts (technology). This is similar to the reason Foucault pursued a study of what called he called a more dubious science -- psychiatry, rather than a so called hard science such as physics, where the relationship between science and it's power structure where easier to reveal (Foucault, 2000).

The traditional idea that technology is an applied science has been destabilized by empirical investigations (Pinch & Bijker, 1989 p. 20) which show that technological innovation stems more reality from mission-oriented projects and engineering R&D than from an application of pure scientific research. This means we have already dislodge an opening for critique of technology by blurring its association with hard sciences.

³ Science may be correct but not true, in the Khunian view that it's models of nature are never a complete account of nature, in that they are constantly being refined at best and overhauled at worst.

Heidegger and The Danger

Martin Heidegger's, classic text *The Will to Technology*, presents a unfolding inquiry into the essence of technology. This text is widely quoted and widely interpreted. It has been picked up as a rallying for call all manner of groups to support their views.

Environmentalists, technological dystopians and artists all interpret Heidegger differently and it is against this sea of opinion that I present a modest summary of this multifarious text.

Heidegger is not interest in technologies themselves, he is interested asking what kind of modern world we live in, and how that is related to the human project of technological exploration or the Will to Technology. This is what prompts him to say "the essence of technology is by no means anything technological" (Heidegger, 1977 p. 4). His path of questioning technology leads so deep as to construct an ontology - a way being under technicity. Heidegger places such importance to way we are under technicity as to say that it defines the way we perceive and reveal our modern world. The effects of technology on the way we see and perceive is so definitive to Heidegger because he expounds a phenomenological stance, where perception or sense-experience, is not just a surface phenomena behind which some more real unseen action is at work. The experience of phenomena is a *a priori* starting point of being. Ultimately Heidegger is interested in developing a **free relationship** to technology this is more than just having a; taking it or leave it attitude, toward technology but rather having the insight into the kind of world technological pursuit creates.

In Heidegger's terms the technology is mode of **revealing**, In this mode nature is challenged and rendered down to raw materials for stock piling as **bestand** or **standing reserve**. This bestand is free from it's natural context and significance, and is available to our will, to make into any product we can think of, through a technical process of production. In our current dispensation, humans are in engaged in a technical mode of

revealing which he calls **challenging-for**. Heidegger continues to point out that humans themselves become caught up in a cycle as objects of challenging-for. The **enframing** we are in is a “challenging claim which gathers man thither to order the self-revealing as standing reserve” (Heidegger, 1977 p. 19). We become the object of our own will to technology, treating people as raw materials in technical arrangements, where we can envisage people as a "labor surplus" – just another a necessary component of an economic system. Human are a means to end. The traditional relationship between machine and operator has been inverted. A purely functional relationship is observed between all parts of the machine, and in its ultimate form a totalizing mass of instrumentality emerges. This Aldous Huxley's *Brave New World*, a world without citizens, who would have rights, but rather full of instrumental people-parts, which have functional uses. Every part this dystopia is self-ordered by a prime directive, perform your function. Being part of the machine is a goal in-of-itself and is reflected in the production and consumption of machine's products whether that be men, women, leisure or soma. The possibility of an individual finding the limits of the society extending or transcending them is systematically removed. Since good is performing ones function, better is performing ones function more efficiency. Increasing efficiency is achieved through **calculative thought** – engineering the system to be more efficiency. Fundamental change is impossible. Clearly this is not a reality desired or experienced in sphere of creative innovation, which seems to draw artists to another relation to technology, what are the alternatives?

Returning to Heidegger, he sees three possible end games, the first is this despairing totalizing instrumentality which we outlined above. The danger for Heidegger is a state of human being in which calculative thinking is the only possible mode of thought. The second endgame is that a “work of art” will present a radical alternative (the **new gods**), and lastly the that the our very path towards the totalizing instrumentality, will become apparent to us upon reflection and so from the danger itself a saving power will come.

In his discussion Heidegger presents a contrasting pre-modern world example in which *poiesis* (making) of a Greek chalice occurs in a context, not free of context, i.e. without standing reserve. Here the mode of revealing is not challenging-forth but **bringing-forth**. The chalice maker develops, *techné* which describes the skills of both craft and fine art. This the origin of our word technology, and is a knowledge based on practice rather than understanding of general principles. So making by practice in any creative sphere is *poesis* and results in a high level of technical skill. It is contrasted with *praxis* which is doing which requires knowledge. The *poesis* that Heidegger describes occurs in an different enframing from before here the material, form, social place of the artifact and the practitioner's participation are highly interrelated. The Greek artist engaged in this practice would have viewed the act of making the chalice not as an exercise of his or her will, but as helping bring forth the chalice in the traditionally determined right way. Similar to the way today a midwife would not claim or have created a babe, or a gardener, a flower.

Can we return to this attractive conception of technical production? Is it possible to make art in this mode? Certainly modern society in general does not operate under this conception, the use of raw materials is ubiquitous, and Heidegger does not provide us a way toward a return to *poesis*. He dismisses the idea of reviling modern technological devices themselves.

'It would be foolish to attack technology blindly. It would be shortsighted to condemn it as the work of the devil. We depend on technical devices; they even challenge us to ever greater advances.' (Dreyfus 1995, p. 101)

But he does not distinguish between his acceptance of technological artifacts and his warning of the dangers of technicity, which are inseparable in our modern world.

Heidegger is unclear. An art practice formed under this conception of *poesis*, seems tantalizingly attractive. Would doing so be pre-modern? Would it render the the artist irrelevant to the reset of modern society or provide a new model of technical production?

Imagining an artist or artisan, operating as a pre-modern in modern times is difficult. Artisans or designer who's work fits a societal need, like the chalice makers, operate in a world full of raw materials, designers exercise their will in their selection of form and materials from a wild field of standing reserve. On the other end of the spectrum of art practices, expressive art communicates the subjectivity of artist and is dominated by the presence of authorship, in its form, theme and content.

Andrew Goldsworthy's practice is as close to a modern form of *poesis* I can find. His work has been described as a collaboration with nature. Goldsworthy organizes found natural materials, creating tracings of abstract forms, which are ephemeral constructions, often revealed in a negative space -- holes or absences that stand out from the natural background. After finishing a construction he photographs it, at its zenith, leaving the viewer to imagine their dissolution (See Figures 1-4). Goldsworthy works without stock piling art supplies. His will does not completely determining his materials and form:



Figure 3



Figure 4

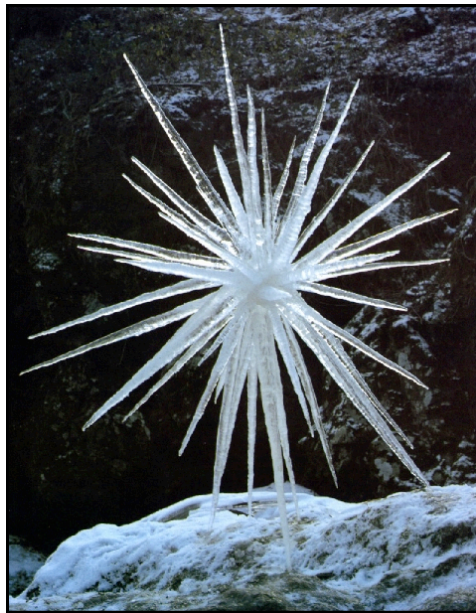


Figure 5



Figure 6

'I enjoy the freedom of just using my hands and "found" tools--a sharp stone, the quill of a feather, thorns. I take the opportunities each day offers: if it is snowing, I work with snow, at leaf-fall it will be with leaves; a blown-over tree becomes a source of twigs and branches. I stop at a place or pick up a material because I feel that there is something to be discovered. Here is where I can learn.'

(Goldsworthy, 1999)

This approach echoes *poesis*, in which Goldsworthy as with the chalice maker, relates to

nature in a highly integrated approach to form and materials and learning from his practice:

'Looking, touching, material, place and form are all inseparable from the resulting work. It is difficult to say where one stops and another begins. The energy and space around a material are as important as the energy and space within. The weather and rain, sun, snow, hail, mist, calm is that external space made visible. When I touch a rock, I am touching and working the space around it. It is not independent of its surroundings, and the way it sits tells how it came to be there.'
(Goldsworthy, 1999)

But here the similarity ends, with the click of camera and his stamp of authorship on coffee table books of these photos Goldsworthy catapults himself back into the modern age of the mechanical reproduction of art. This is not a return to pre-modern *poesies* but a bridge between the modern and the pre-modern. It is a modern display of a perennial interaction between nature and human. Goldsworthy's photographs traces his actions, in nature. James Hatley ties this action metaphorically back to a pre-modern action.

'For the very figure of the trace recalls humans traversing a terrain in search of innumerable spoor the signs and tracks and droppings left behind by a diversity of creatures, as well as climactic and geological processes.' (Hatley, 2003)

Hately (2003) goes on to define the trace as 'that mode of aesthetic contact, in which the approach and withdrawal of other creatures or the natural elements are registered in a mindfulness, a *phronesis*⁴, in regard to one's human crafting and creating, one's *techné* and *poesis*.' Thus, the practice of tracing seems to be a promising approach for revealing the interface between humans and nature, which felt so keenly in modern times. The

⁴See Glossary.

combination of modern technical action and *poesis* is possible. We can be used still tap into human intuition with materials and form to develop skill, but original pre-modern *poesis* not evident.

Transcendence

If we give up the idea that artists or artisan can return to the pre-modern and accept a place with in modern technological society, what role can art play? We have already seen Heidegger call for a "work of art" as exemplar of the new gods, which would bring a new understanding of reality. It is not clear if Heidegger is really talking about modern art explicitly, but rather it seems he is referring to marginal practices 'such as friendship, backpacking into the wilderness, and drinking the local wine with friends.' (Dryfus, 1995)

Heidegger's student Marcuse, names art explicitly. He calls for the transcendent powers of art to liberate us from our modern one dimensional world. Marcuse's one dimensional world is a thoroughly worked out critique the instrumentality inherent in technocratic modes of dominion and social control. Even as late as 1977 almost 10 years after the May Events of 1968 demonstrated a political will towards "self-determination" in the face of the technocratic alienation, Marcuse still saw art as import in source of transformative codes. In the *The Aesthetic Dimension* he sees radical the qualities of art as 'opening a horizon of change (liberation)' (Marcuse, 1978 p. xi), the mechanism of this art-liberation is conceived as an aesthetic transformation or sublimation, in which experience is re-represented in a form (poem, play or novel) that releases subversive powers 'which explode the given reality in the name of a truth normally denied or even unheard of (Marcuse, 1978 p. 7)'. Marcuse restricts his discussion to literature and is mainly concerned with a critique of Marxists aesthetics, which would obstruct art's role as source of liberation. The notions of subversion is first brought to light here and the transcendent potential of art is reinforced. It is an unfair demand of art be the only source of transcendent potentialities in over coming the technocratic hegemony, this is consistent

with a boarder philosophical critique of technology, which we will return to soon with the work of Andrew Feenberg.

Subversion

But what of these notions of subversion and transcendence? What evidence is there for art to open the “horizon of change”. While art is often seen as a member of the vanguard of social change, can we identify epicenters of these transcendent forces in art? Composer and sound artist John Cage is quoted instrumentally in this regard:

'I want to give up the traditional view of art as a means of self expression for the view that art is a means of self-alteration, and what it alters is *mind*, and mind is in the world and is a social fact... We will change *beautifully* if we *accept* uncertainties of change; and this should affect any planning. This is a *value*.'
(Kostelanetz, 1991)

Notice how Cage positions himself, as artist, as a link between art as a means of change in a social world, even to the mundane extent of planning. This view of art as a means of change of the self, mind and society is proposed as an **aesthetic**; the value on which his notion of beauty is constructed.

While Cage's work could not be called pre-modern *poesis*, it does contain an socially engaged process as formulated above. He seems to embody Heidegger's free relation to technology at least in his attitude: During his work with indeterminacy that explored the I Ching, Cage initially performed hundreds of manual I Ching coin throws, later he utilized a computer program (Culver) to generate the throws. At a deeper level he seemed to intuitively grasp the danger of bestand, when applied to musical experience, which can be efficiently stockpiled ready for distribution as records. When asked about the uses of turnable records, replied emphatically, 'No, they are not useful' (Greenaway, 1997). He

elaborates, telling an anecdote, by which I understand that he views the experience of listening to a musical performance being objectified in a single referable “classic performance” reduces any potential a new performance might have purely by virtue of reference to the objectification. Any interesting features of a new performance will be view not as *new* but as *aberrations* from the recoding, causing the performance to be labeled inferior to the "classic performance", The image or simulacrum of the performance (the recording) becomes more authoritative than an actual performance through the efficient repetition and distribution of the simulacrum.

Cage's aesthetic allows him to accurately and unambiguously chart this territory and to divine the stagnate one-dimensionality now in evidence in the main stream recording industry, where variety is engineered out of performances to the point where artists cannot identify themselves within the product derived from their studio performance.

Besides using computers during composition Cage more directly used found objects, radios and even record players as instruments, preceding turntablism, in his performances and compositions. His unique subjectivity saw the potentials of these technological devices beyond their prescribed technological design. He subverted their designs. Essentially the meaning of the same technological device has been changed from something one **reproduces** an historical performance with -- a record player, to something one **creates** an original performance with - a turntable instrument.

We can again a boarder understanding of this process of subversion by studding a generalized social, political and philosophical form of subversion dubbed *democratic rationalization* by Andrew Feenberg. His theory is worth an investigation because it brings into focus how technology can be effected by the social and cultural spheres. In this way it both undermines the technological deterministic argument and provides a solid place for a social and cultural engagement with technology.

Technological Determinism

When technocratic hegemonic forces are confronted with criticism of the system a traditional rebuttal involves an appeal to the autonomous internal logic of system. We are told "that's just the way it works" or that is the most efficient way. This view is so ubiquitous that the discomfort of new technological developments is expected and endured without protest in an "adjustment period" during which we "pay the price of progress". These attitudes follow from false idea that technology flows from the immutable natural laws of science or mathematics attempts to provide legitimacy. Under this vision, changes in cultural values have no effect on technological development. Technological determinism drives both the technocratic agenda and the dystopia visions of an autonomous net of increasingly integrated and increasingly large systems of technology invading every sphere of life.

Sociological studies of technology and also an extent science, reveals that social forces are deeply implicated in the development process of technologies. These studies crack the foundations of determinism in two places, firstly they disrupt the conception that technological development proceeds linearly and secondly that social institutions must change to suit the technological imperatives. Social constructivists Pitch and Bijker (1989) show in a case study of bicycle development that at each point in it's development a range of possible solutions to technological problems existed. It is only in retrospect that the development looks like a technologically determined linear process. The process in the bicycle's design solidifies, follows a path through a tangled network of possible bicycle concepts. Functional properties, such as speed or stability of possible bicycles form alliances with groups of possible bicycle users. Since each technical problem can be solved in a number of ways we see that the shape of a technology is underdetermined. Social groups, such as women wearing long skirts, not only selected among the possible bicycle designs, they introduce new problems, which introduces new designs, such as bikes which are easier to mount. The point is that social groups can not only engage in

determining which solution to a technical problem wins out, they can also change the design problems themselves, by being a possible user of the technology. The process in which the field of possible bicycles is narrowed to a exemplar design is term *black-boxing*. Once black-boxed a technology is more or less fixed. It is named and gains a social meaning. In this case "what a bicycle is" is a safe means of transport transportation, not a dangerous racing machine for the young. When we view a technological artifact, we are looking at a mirror of our cultural values, encode in a design. Just like codes of conduct, manners or legislation reveal the values of culture, design encodes the result of a social debate. For example cotton spinning machines that permitted only small repair access spaces between them, announces the social norm that children should for work for a living. Feenberg explains this as follows: "*Technical codes define the object in strictly technical terms in accordance with social meaning it has acquired*" (Feenberg 1999 p. 88 , original emphasis). The technical code can be broken when this meaning is questioned. What a bicycle is can be opened up for renegotiation if a new previously ignored or marginalized groups enters the debate.

Hacking the Technical Code

How can marginalized groups, or even an individual artist enter the debate, which is dominated by hegemonic forces? The power relationship is clearly unequal. Foucault introduces a useful perspective on this question; he argues that resistance to a power relation is immanent to the structure of the power relation itself. The effect of locating the dominated subjects in the margin, privileges them with a point of view where they can develop knowledge of the weak points of the power relation. This lore is termed *subjugated knowledge* is often invisible to those who hold the power because it is useless to them from their point of view. It seems possible then that the technical code can be subverted or hacked from the marginal perspective within the hegemony, where the subjugated knowledges are developed. This is grand narrative in computer technology sphere: The hacker who uses knowledge of the system to compromise the system. So

subverting a technology can change its meaning. For example the MINTEL system was originally conceived as distribution system for public information and was subverted by French hackers and re-engineered into a communication system for private messages is documented in *Alternative Modernity* (Feenberg, 1995 Chap 7). A more viral formulation is also possible. Take for example the GNU(GNU is Not Unix)/Linux operating system, is an alternative computing environment to the majority Microsoft Windows platform. In terms of it's features and capabilities it is comparable, even similar. What distinguishes it from Microsoft Windows is the mode under which it is developed. The open source development model, provides free access to the source code that constructs the computing environment. Access to this code is granted to anyone who would use it under a recursive license, the GNU Public License (GPL). The license is encoded in the language and rules copyright law, but grants freedom of use to anyone and includes use that creates derivative works, but with a number of special restrictions. The foremost is that any derivative works must be licensed under this same GNU Public License. The whole genealogical line of works then remain free as each user is obligated by their use to make each succeeding derivative works freely available too. The perfect reflexivity of this hack is that it creates a self perpetuating viral system, encoded precisely in the fabric of that which it is critiquing -- the use of copyright law to construct "intellectual property" and thus threatening precisely that which is most fundamentally based on intellectual property, Microsoft.

Eduardo Kac's transgenic art work *GFP(Green Fluorescent Protein) Bunny*, is similarly reflexive. *GFP Bunny* is a genetically engineered rabbit, named Alba, who glows green under specific lighting conditions. With this transgenic work Kac opens up a forum for critique of biotechnology. This critique opens the space ensnaring as many actors as possible in to a 'ongoing dialogue between professionals of several disciplines (art, science, philosophy, law, communications, literature, social sciences) and the public on cultural and ethical implications of genetic engineering' (Kac, 2000)

In this work Kac mounts a challenge to a purely technical definition of life-creation, based on the supremacy of DNA. This is achieved by moving the the site of life-creation of the transgenic subject from the technological lab, into the social private/public sphere - the home and family, a forum which subverts the power of technological experts and place everyone in the role as expert. In his words:

'...what is important is the completely integrated process of creating the bunny, bringing her to society at large, and providing her with a loving, caring, and nurturing environment in which she can grow safe and healthy. This integrated process is important because it places genetic engineering in a social context in which the relationship between the private and the public spheres are negotiated. In other words, biotechnology, the private realm of family life, and the social domain of public opinion are discussed in relation to one another. Transgenic art is not about the crafting of genetic object d'art, either inert or imbued with vitality.'

(Kac, 2000)

The subversion is make all the more clear through Alba's nature: Alba is not green all the time, she is a white albino rabbit without pigment, only under blue light will her additional florescent synthetic gene derived from a jellyfish gene glow. Since Alba's transgenic nature, is not normally visible she is not seen a green glowing monster of Kac's creation, but her other qualities are highlighted in the absence of her green glow. She can then be seen as a regular fuzzy lovable creature whose meaning and very life is created in a context of the loving, caring environment Alba needs to grow as do all animals.

Again in a manner similar to Cage, Kac finds a new definition of aesthetics:

'The word "aesthetics" in the context of transgenic art must be understood to mean

that creation, socialization, and domestic integration are a single process. The question is not to make the bunny meet specific requirements or whims, but to enjoy her company as an individual (all bunnies are different), appreciated for her own intrinsic virtues, in dialogical interaction.' (Kac, 2000)

Kac is quick to point out that the biotechnology used in the creation of Alba is not new or dangerous, but are well-known tool in this field. The project also does not upset any social rule in that humans have been steering the evolution of rabbits for more than 1440 years using traditional breeding techniques. By working with-in and crossing with-out the biotechnology domain Kac, as is preemptively bridging the social and technical spheres, before the black-boxing of this technology occurs.

Kac has not gained any technical skill through his practice, as Goldsworthy does but what it lack it lacks in *techné*, it makes up in a transcendent dimension: Biotechnology can not the view life in the isolated dimension of DNA, because an enlarged field of actors is aware of that the home is as much the site of life-creation as the lab.

Digital Anti-Codes

If hacking the technical code can mean a revision of a technology's future through the introduction of a new set values or a new aesthetic, mandated by a nomadic subject -- the artist. Where are the holes in the boat of the artificial computer science? Everybody knows the captain lied. We were promised a clean glossy future, a virtual wonderland free from the harsh weight of reality. What did we get; cluttered virtual desktops, fragmented file systems, browser incompatibilities, crashing software and mountains of obsolete hardware -- digital dirt.

Again we can find the irony of reflexivity. Digital detritus is just what is missing in virtual reality to make it an authoritative representation of fictional reality. *Final*

Fantasy: The Spirit Within the first feature length fully computer generated digital "film" constantly breaks my suspension of disbelief. Not because I am unwilling, but because the characters image is too perfect (see Figure 5:No Dirt on page 24). **Digital Dirt** is the 1st Anti-code in what Arthur Kroker outlines as a art of electronic theory, or "an art of excess for a time of moderation" (Kroker 2004, p. 171), which doubles up the promises and failure of the digital age as the codes and anti-code which fold over on each other. Again this is another instance of ironic, reflexive subversion. Kroker's text entitled *The Will to Technology & The Culture of Nihilism*, would seem to be the positioned precisely the intersection art and technology we are interested. He reads Heidegger's texts as mystic koans, meditating on the Heidegger himself as a prophet. This is the way forward for Kroker, who's own text blends questioning, a partially fictional travelogue anecdotes and poetic tangents, in a kind of hypertext scrapbook.



Figure 5: No Dirt

Another potential anti-code, I see forms in doubling of virtual reality back onto reality. **Augmented Reality**, actualizes virtual events into the real world space. Proving an tracing of the unnatural in the natural. Data represented in the world, as apposed to a world represented as data. This idea was demonstrated at the 2001 International Conference on Auditory Display. The project *Babble Online* sonifies, in real-time, the web browsing behavior of visitors to the www.lucent.com website (Hansen, et al. 2001). This art-technology project was designed to convey qualitative information to the website

content providers, designers and visitors. It shows how the reflection of virtual processes (web traffic) can give listeners a sense of the activity in their immanent virtual surroundings. A sample of the sonification can be heard online. (Hansen, et al. 1999). My own work takes on from this idea, but rather than producing a sonification based on western musical notions, it is formulated on the more general notion of the *soundscape*.

Lastly I see the use of **Obsolete Technology**, as an anti-code, in which the meaning of completely closed and back-boxed technology can be reopened. Renowned Canadian artist Rodney Graham in a recent radio interview (Graham, 2004) described obsolete technology as having more potential for reflection. The current image of progress for digital technology is reproduced as a shiny box with flames sprouting from it; faster, bigger, brighter, lighter and recently smaller, but most of all newer is the axiom of progress from the industry that pronounced "The Future is Now". Building a *techné* of obsolete technology, questions this myopic forward gaze. It casts a lateral "what if" glance to the side conjuring an image of an alternate abandoned future. These technologies are often plentiful and nostalgic, and are thus rich with symbolic overtones. It is their very uselessness, defined by their planned obsolescence, that renders them open to being filling with new meaning.

Actor Networks

Bruno Latour's theory of technology provides an alternative formulation to subversion based on a *symmetry of humans and non-humans*. He points out how human and non-humans (things) are enrolled as components of systems. For Latour there is no difference in principle between these human and non-human in the system. The system or network is held together by *delegations* of norms to human and non-human actors. For example the societal norm of flushing the toilet after its use, can be delegated to humans in the usual case at home, when we must remember to flush, or to a machine in the case in newer public washrooms, in special cases the norm is explicitly scribed, as in the sign; "If it's

yellow let it mellow". But in the other cases the norm is embodied in either the human or technological body.

Latour's analysis leads to a kind of textual or narrative formulation, which is echoed in the language he uses. Actors act out scripts in a scene. *Prescribed* norms are moral and ethical imperatives of mechanisms, which are imposed on people, such as rotating doors or security locks. Human actors *subscribe* to norms when they willfully take up roles in the network, or delegate a norm to a device. The range of choices in a scene is limited to a set of *circumscribed* actions. And so on.

Latour notes that modern societies are distinct in that are able to build large actor networks. The forces that build and maintain these network is termed a *program*. While *anti-programs*, act to disassemble the network. De Certeau adds an additional tactical dimension to the theory, proposing that a network may be recodified around a new anti-program.

Once De Certeau's addition is admitted, a principle weakness emerges in Latour theory: He cannot distinguish between programs and recodifying anti-programs. He has no transcendent authority to appeal to. This is not a specific issue for art making but a general ethical issue.

In Latour's ontology, the distinction between non-human (nature) and human (culture) is not fundamental, but only a constitution under which Moderns see the world. What is fundamental for him are networked hybrids. The hybrids are make up of quasi-objects having both natural and cultural aspects.

This actor network formulation allows us to conceive of a linguistic or narrative manipulation of technology. Firstly we can follow Baudrillard's adaption of *Connotative*

and *Denotative* distinctions to devices. For example a car, has a denotative aspect, that of providing transportation, but also a connotative aspect, of success and status. Taking this linguistic metaphor further we can say that technology is open for us to use as material for poetic constructions. Secondly Umberto Eco's notion of the open work, applied to technology, begs the question: What are the recombinant assemblages for inter-technological references. We are looking here for an analogy of intertextuality. A open technology, like an open text should be to receptive to being reconfigured, cut up, pasted, or folded. This is an inviting speculation. **Software**⁵ can be treated as a material for this kind of manipulation. **Lo-Tech**⁶ is also appropriate for this for this poetic reconstruction. The results are **novel hybrids** of previous black-boxes, devices ripe with both the connotative and denotative meanings of their hereditary origins.

Concluding Remarks

As we have surveyed the philosophy of technology we have been looking for key features of the terrain and points of origin for art marking. We have seen that involving technology in an art practice, essentially opens up the meaning of these artifacts and techniques for reflection, casting the question of their function and role in society back on themselves.

Specifically we uncovered the following is a list of partially overlapping fruitful avenues of subversion:

- _ tracing human/nature boundaries
- _ modern *techné* and *poesis*
- _ radial aesthetics: development of unique subjectivities and knowledge
- _ hacking the technical code: enrollment of new actors, shifting the site of debate

⁵I am thinking specifically of the MAX/MSP software development environment and more generally of open source software.

⁶Low here is not a value judgment but refers to technology which is not highly integrated or is constructed from commodity components such as pedal technology.

and generative critiques.

- _ aniti-codes: digital dirt, reality augmentation and obsolete technology
- _ recombinant poetics

We have supported our initial assertion that technology is a social and cultural world. So then art can and should enter its discourse as a full citizen. Furthermore if artists who are engaged with technology want to maintain a critical stance they must do more than work with technology they must work within technology. As members of the vanguard of cultural change they are uniquely positioned to not only bring a broader socially sensitive agenda into the formulation of technological solutions, but also to define the problems. Art involving technology is thus engaged in answering the question; what does and can technology mean?

Glossary

phronesis: Greek term for practical wisdom or prudence, the application of good judgment to human conduct, in contrast with the more theoretical inquiry leading to *sophi/a*, or wisdom generally. (FOLDOC)

intellectual property: intangible property that is the result of creativity (such as patents or trademarks or copyrights) (WordNet)

soundscape: An environment of sound with emphasis on the way it is perceived and understood by the individual, or by a society (Truax, 1999).

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