Kay Johns BA (Hons) Fine Art: Sculpture 2008

Posthumanity:Enhancement or Infringement?

Exploring how artists and cyberneticists portray the advantages and disadvantages towards the future of Posthumanity

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Abstract

In contemporary society most people have become extremely reliant on technology; our existence has become empowered by our discoveries. While machines were once thought of as separate human technological creations, some observers suggest that our development has since surpassed this level. Technology has become entwined with our bodies and the dawning of a new hybridization between human and machine has led to the emergence of the Posthuman. This dissertation explores some of the cultural technological developments in society that may lead to this idea. I will research how artists and cyberneticists portray the advantages and disadvantages towards these developments; along with how their work may address human rights and ethical issues, in a world merging life on earth with the machine. Formed of three main subject areas, chapter one will attempt to clarify how technology can change our identity, by generating obsolescence of the body, along with the ethical issues that it may encounter. While in chapter two interactive technologies will be explored, by looking at both surveillance and sousveillance systems, along with Orwellian concerns of human rights and privacy. The final chapter will explore direct implantation of micro chips into the body. This topic will attempt to unfold the problematic concerns generated by implantation, exploring both benefits and fears towards a future that Posthumanity may embrace. While technology can give us the freedom to redesign our bodies and enhance our abilities, it can also be used to devoid people of any rights, privacy and freedom. The issue of control and who has the power becomes a recurring concern throughout this dissertation, and one begins to realize the truth. The implantation of a micro chip so that you can be tracked wherever you go, is not about the advancement of technology to aid with our safety or enhance our abilities to become Posthuman, it is ultimately about power and control.

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Posthumanity: Enhancement or Infringement?

Exploring how artists and cyberneticists portray the advantages and disadvantages towards the future of Posthumanity

This dissertation is the outcome of research gathered from a collection of artists, cyberneticists, theorists and reporters. It explores some of the cultural technological developments in contemporary society. It focuses on the idea that some observers suggest a concept or shift in evolution has taken place. That technology has become so entwined with our bodies; where the merging of humans and machines has formed a new hybrid species know as the Posthuman. The aspirations are to research some of the technological characteristics in the work of the featured performance artists and cyberneticists. Exploring how the advantages and disadvantages of technology may be generated or portrayed in their work. Along with, how this may raise questions on human rights and ethical issues in a world merging life on Earth with the machine. This area of study was chosen in conjunction with the creative processes of my own studio practice, by exploring kinetics, whilst attempting to make remote controlled sculptures, and learn more about cultural developments of the latest technology in society. Prior to describing the work in the following three main chapters, it will be useful to first explain some background information on what constitutes a Posthuman.

In contemporary society the use of technology has become quite ubiquitous, most people today have become more and more reliant on computers, internet, mobile phones, and MP3 players. At the heart of our culture, information technology has sprung, along with scientific developments in microchips, genetic modification of plants and cloning[1]. Amongst most humans there is a constant yearning and curiosity to gain more information, from wanting the latest gadget to finding new discoveries in reproductive, genetic, and information technology. This has

[1] Graham, Elaine, L. *Representations of the Post/Human*, Manchester University Press, 2002, p.3.

all contributed to the accumulative effect of blurring the boundaries between humans and machines. For some people the merging of humans and machines is the next step in our evolutionary development, while others are cynical that we will lose our humanity and dignity. In 1985 science-fiction writer Bruce Sterling made reference to a Posthuman in his book called *Schismatrix,* this is one of the earliest citations found as a noun.

Bruce Sterling writes:

> *Lobsters were creatures of the vacuum, faceless posthumans, their eyes and ears wired to sensors woven through the suits. Pilot never ate. He never drank. The routines of his body were subsumed within the life-supporting rhythms of his suit.*[2]

One definition of a Posthuman is that, it's considered a theoretical being that will artificially evolve from human beings by either, manipulating their genetic makeup, and/or augmenting their bodies with robotics and other technology.[3] A chimera would be considered a Posthuman, as it has been artificially created by genetic manipulation of human and non human animal organisms.[4] A Cyborg is defined as part biological part machine. Posthumans and Cyborgs are often thought of as the same, because they are in one respect. If the biological component of a Cyborg has evolved from humans and is part machine it would be a Posthuman. However a Cyborg that is from a non human animal would not be considered Posthuman, because it would not have evolved from humans.[5] (For example an animal that is part horse and part machine would be a Cyborg but not a Posthuman). Transhumans are a collection of people that advocate this amalgamation of our species and believe that our next evolutionary step is to become Posthuman. There are several groups of Transhumans, for example, one extremely organised group, which the philosopher Max Moore is associated with, are called Extropians, they mainly philosophize about the development of technology and becoming

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[2] Sterling, Bruce. *Schismatrix,* Arbor House Pub Co., 1985, p.286.
[3] Reference site
www.wordspy.com March 2007
[4] Chimera
http://dictionary.reference.com/browse/chimera May 2008
[5] Gray, Chris Hables. *Cyborg Citizen: Politics in the Posthuman Age*, Routledge, 2002, p.2.

Posthuman.[6] However there are religious and secular humanists that contest these ideas, know as Bioconservatives,[7] which the social philosopher Francis Fukuyama is associated with. They are opposed to the use of technology to modify human nature as they believe this will infringe upon human rights and dignity.[8] These ideas and moral implications of the Posthuman have mainly come into light by popular culture science fiction novels, comics and films such as *Blade Runner*[9], *Johnny Mnemonic*[10], *Ghost in a Shell*[11], *Judge Dredd*[12] (more can be found within this bibliography). It appears that science-fiction, has touched upon the early stepping stones of possible futures within science fact. Simultaneously components of the cyborg have also been explored within both the arts and Science. Leading writers in this field are William Gibson, Bruce Sterling (Science fiction writers), Max Moore, Francis Fukuyama, Nick Bostrom (philosophers), along with theorists, N. Katherine Hayles, Donna Haraway, Chris Hables Gray. Interviews with the featured artists and cyberneticists will either be gathered from primary research (myself), or secondary research (external sources).

The topic of the first chapter is called the *Obsolete Body*, which explores transformation of Identity, via a contemporary art form called *Cyborg Theatre*. It addresses modification and augmentation of the body by using cybernetics as part of its method and practice. It also explores the interconnectiveness between humans and the environment, and addresses concepts of control that may raise questions of an ethical or political nature.[13] The performance artists Stelarc and Orlan feature. They both explore physical modifications of the body merged with technology. This chapter also explores artificial limb extensions for disabled people, featuring the artist Alison Lapper. This topic will attempt to clarify how

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[6] World Transhumanist Association
http://www.extropy.org/directors.htm Jan 2007
[7] Institute for Ethics and Merging Technologies
http://ieet.org/index.php/IEET/more/carrico20041222/ Jan 2008
[8] In Defense of Posthuman Dignity by Nick Bostrom
http://www.nickbostrom.com/ethics/dignity.html Jan 2008
[9] Blade Runner (Dir. Ridley Scott, Blade Runner Partnership, USA, 1982).
[10] Johnny Mnemonic (Dir.Robert Longo ,Alliance Communications Corporation, Canada / USA 1995).
[11] Kôkaku kidôtai (Ghost in the shell) (Dir. Mamoru Oshii, Bandai Visual Co. Japan / UK 1995).
[12] Judge Dredd (Dir. Danny CannJudge Dredd on Cinergi Pictures Entertainment Inc. USA, 1995).
[13] Giannachi, Gabrella. *Virtual Theatres*, Routeledge, 2004, p.43

technology can change our identity by generating obsolescence of the body, along with human rights and ethical issues that it may encounter.

Computer Wearables and Interactive Technology is the topic for the next chapter. Here surveillance systems will be discussed, along with Orwellian concerns of human rights and privacy. Featuring Steve Mann performance artist cyberneticist/engineer and inventor of computerized hybrid clothing called *WearComp*. This technology can be used as a self surveillance system that Steve Mann has invented named *sousveillance* which may be used to *fight the machine against itself*.[14] These are Steve Mann's own words in which he suggests that can people take control of their lives by recording events of misconduct and exposing them via the internet. Also featuring in this chapter will be the media artist Paula Roush, Paula also uses interactive technology in her work, by recording sounds from bleeps in underground tubes from oyster cards that register and store both identities and destinations of travel. This topic will attempt to clarify systems of control by exploring technology that can both aid and violate human rights and freedom.

In the final chapter *The Merging of Humans and Machines* via direct microchip implantation into the body will be explored. Here microchip implantation into the body will be discussed by researching the work of the cyberneticist, Professor Kevin Warwick and the multidisciplinary artist Nancy Nisbet. They both have had microchip implantation in their bodies for opposite reasons. This topic will attempt to unfold the problematic concerns generated by implantation exploring both benefits and fears towards a future that Posthumanity may embrace.

To briefly summarize, this writing investigates some of the technological cultural developments in society. Whilst looking at how artists and cyberneticists explore these technologies through their work, which may portray or generate political issues regarding areas concerning human rights and ethical issues. By analyzing both primary and secondary

[14] Surveillance and Society 1(3): 331-335
http://www.surveilance-and-society.org February 2008.

research sources, this will attempt to discuss how the advantages and disadvantages of technological development, will affect the merging of life on Earth with the machine.

Chapter One: The Obsolete Body?

Technological creations of the human species may be in the form of a simple tool, to aid our abilities. It may also be through the application of medicine, biotechnology, genetic engineering, cloning, or surgical and cosmetic enhancements. This list is quite extensive and can also be through the operation of computers, communication devices, and transportation systems, to the further specialist technologies of space travel. While these technologies can be used as a tool to either, extend, enhance, transport, or prolong our bodies. It has prompted the question if these technological developments are causing our bodies to become obsolete.

This chapter explores the obsolete body via transformation of identity by looking at the contemporary art form called *Cyborg Theatre*.[15] It addresses modification and augmentation of the body by using cybernetics as part of its method and practice.[16] The performance artists Stelarc and Orlan feature. They both address concepts of the cyborg by exploring physical modifications of the body merged with technology, using prosthetics and extensions, to the concept of rendering the body as obsolete or redundant. A prelude to this chapter will feature the artist Alison lapper. She uses her body as her medium and has displayed photographs of herself wearing artificial limb extensions. This topic will attempt to clarify how technology can change our identity by generating obsolescence of the body, by debating human rights and ethical issues that its transformation may encounter.

To primarily set this topic in motion the definitions of the words Cybernetics and Cyborg will need to be clarified. Cybernetics is the study of communication and control systems in animals, organizations and machines.[17] The term was first defined in 1948 by an American

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[15] The term Cyborg Theatre was first coined by: Dr Star-buck. Jennifer Parker. *Project Muse*, Global friends: The Builders Association at BAN in PAJ, Performance & Art, Vol. 26. No. 2, May 2004. pp. 96 – 202.

[16] Giannachi, op.cit. p. 43.

[17] Microsoft Encarta 2008, p. Cybernetics.

mathematician called Norbert Weiner.[18] Comparisons between the brain and nervous system come into light, along with computers and electronic systems, such as the analysis of the mechanisms of feedback and data processing. An air conditioning system might be compared with the body's mechanisms for temperature control and respiration. 'Cybernetics is an assortment of mathematics, neurophysiology, computer technology, information theory, and psychology'.[19]

A Cyborg is a cybernetic organism (*i.e.*, an organism that is a self-regulating integration of artificial and natural systems).[20] The first actual Cyborg was a white laboratory Rat (See Fig 1) that was housed in New York's Rockland State Hospital, during the 1950s. The rat had a tiny osmotic pump implanted into its body to inject chemicals at a controlled rate, altering its physiological parameters,[21] but the term was not coined until 1960 when Manfred Clynes and Nathan Kline used it in an article about the advantages of self-regulating human-machine systems in outer space.[22]

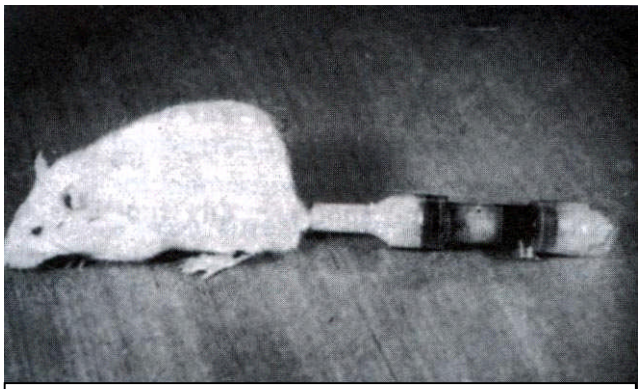

Fig 1: First Cyborg Rat (1950s), New York's Rockland State Hospital. Photograph from *The Cyborg Handbook,* Routledge, 1995, p.30.

Theorist N. Katherine Hayles writes:

'Cyborgs actually do exist; about ten percent of the current U.S. population are estimated to be cyborgs in the technical sense.'[23]

While initially the cyborg maybe thought of as more in the realms of science-fiction, however the term is quite loosely defined, that a cyborg maybe seen as anyone that has a pacemaker, artificial organ or limb

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[18] http://dictionary.reference.com/browse/cybernetics
[19] World encyclopedia, Oxford University Press,2005 Jan 2008. http://www.encyclopedia.com/doc/1O142-cybernetics.html
[20] Gray, op.cit., p.2.
[21] Gray, Chris Hables. *The Cyborg Handbook,* Routledge, 1995, p. Xi.
[22] Ibid, p. XV.
[23] Ibid, p. 322.

extension.[24] For instance (see fig 2) the artist Alison Lapper, was born with a medical condition called phocomelia, which has characteristics of stunted growth of shortened arms and legs.[25] Alison also uses her body as her medium via photography, and has displayed photographs of her childhood days wearing artificial limp extensions.[26] The institution that she was in also experimented on a group of children like her, making them wear gas powered contraptions which actually hindered their abilities. The program was scrapped after a few years due to its failure,[27] but during this time Alison could have been considered a cyborg in the prosthetic sense. However because Alison did no lose any limbs to begin with this would be seen as an enhancement, but because the enhancement of the limbs would not exceed the average human ability to extend or preserve life she would not have characteristics of a Posthuman.

Fig 2: Alison Lapper, 'Struggling with her limp extensions'. Photograph from *Alison Lapper My life in my hands*, Simon & Schuster, 2005, p.120.

In an essay written by the transhuman strategic philosopher Max Moore he writes:

> *The transition from human to posthuman can be defined physically or memetically. Physically, we will have become posthuman only when we have made such fundamental and sweeping modifications to our inherited genetics, physiology, neurophysiology and neurochemistry, that we can no longer be usefully classified with Homo Sapiens.*[28]

Cyborg Theatre displays concepts of the cyborg by using technology that takes place through the performers body, the body both becomes the experiment and the theatre, and allows the viewer to be drawn directly into

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[24] Gray, Chris Hables. *Cyborg Citizen: Politics in the Posthuman Age*, Routledge, 2002, p.2.
[25] Alison Lapper http://www.alisonlapper.com
[26] Ibid, http://www.alisonlapper.com/gallery February 2008
[27] Lapper, Alison. *My Life in My Hands*, Simon & Schuster UK Ltd., 2005, pp. 35-37.
[28] http://www.maxmore.com/becoming.htm

the work of art through the visual journey of the production process to the arrival of its creation. While its main features are modification and augmentation of the human body, it also explores the interconnectiveness between humans and the environment, whether in the real world or the virtual world of the internet. It addresses notions of communication and control, expansion and conscription, freedom and imprisonment and may raise questions of ethical and political concerns.[29]

The Australian performance artist Stelarc (Stelios Arcadiou) has done several performances extending the body, along with simultaneous suspensions, while his body has been interfaced with different forms of technology and machinery. In one of his suspension performances he attaches a third prosthetic hand that he controls by electromyogram sensors via thigh and stomach muscles. The rest of his body is controlled via the internet.[30]

In his 1993 performance known as *Hollow Body, Hollow Space* or the *Stomach Sculpture* (See Fig 3). Stelarc attempts to swallow a metallic capsule, the first performance of this kind began in the 1970s. With the aid of a medical team an arthroscopic camera is inserted into his body, which

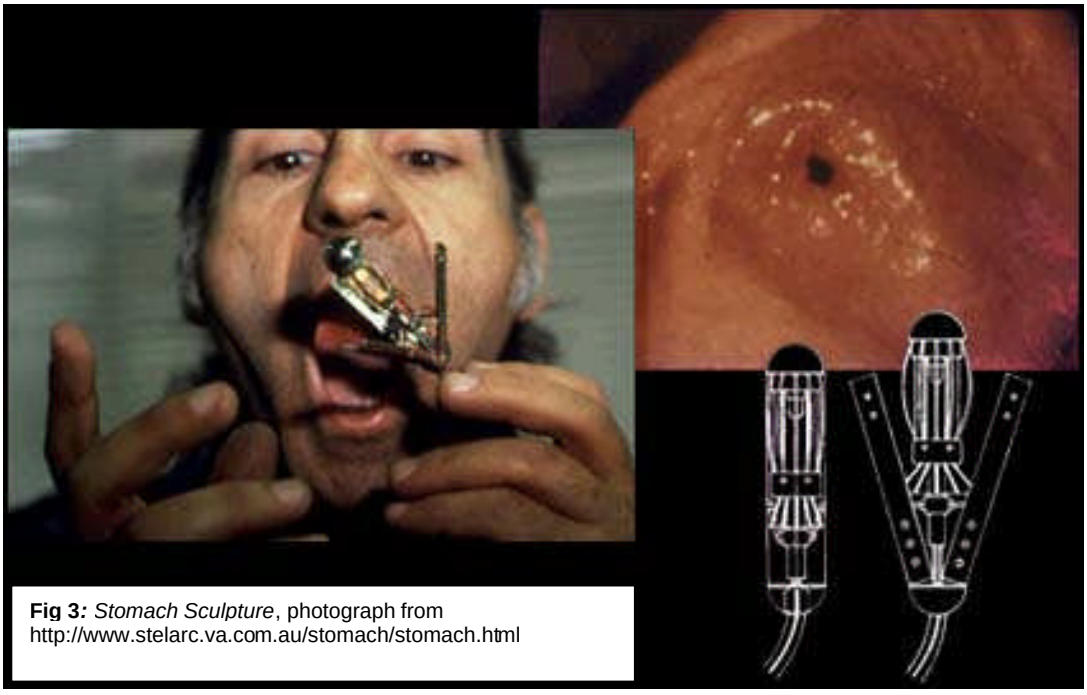

Fig 3*: Stomach Sculpture*, photograph from http://www.stelarc.va.com.au/stomach/stomach.html

[29] Ibid p. 43.
[30] Extended – body: Interview with Stelarc http://www.stanford.edu/dept/HPS/stelarc/a29-extended_body.html February 2008

would then be projected for an audience to view his insides.[31] This explores the possibilities of the body becoming hollow, expressing the idea that the body could be redesigned to absorb nutrition and oxygen through the skin, making the internal organs unnecessary.[32]

Stelarc says:

> *Hollow is an idea of thinking about the body as a space or host for a sculpture, which provokes an idea of the body serving as no function than to contain Art.[33] I was intrigued about the notion of the body being a self contained entity. [34]*

In an interview with Stelarc conducted by myself, he said that he does not deliberately set out to either portray the advantages or disadvantages towards the future of Posthumanity.

Stelarc said:

> *None of the performances are meant to be at all illustrative of a particular idea or discourse. The ideas are generated by the performances. The ideas are authenticated by the actions*
>
> *This anxious, uncertain and empty body discovers its inadequacies. The obsolescence of the body is a consequence, not experimentation with the obsolete body. In other words the performances don't illustrate the obsolete body but rather they generated the obsolescence.*
> (In an Interview with Stelarc by the author, see Appendix 1).

It appears that it's through Stelarc's performances that he has explored the notion of the body's obsolescence, which is very much like a process led experiment.

Stelarc also mentions:

> *It becomes no longer meaningful to think of systems of control, whether it's the body or the machine, it's about alternate operational systems*.
> (In an Interview with Stelarc by the author, see Appendix 1).

In an interview with Ross Farnell, Stelarc explains that the natural body as we know it would find it difficult to sustain life outside of this planet, so the idea of this new version would be to hollow, harden and dehydrate the

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[31] Smith, Marquard. *Stelarc,* MIT Press, 2005, pp.106-107.
[32] http://www.stelarc.va.com.au/stomach/stomach.html March 2007
[33] Ibid.
[34] Smith, Marquard. *Stelarc,* MIT Press, 2005, pp.106-107.

body. Stelarc holds an enticing concept that the body maybe also seen as a host allowing for more technology to be placed inside.[35] The performance called *hollow* may also be seen as a prime example of Manfred Clynes and Nathan Kline's cyborg, for self-regulating human-machine systems in outer space. The notion of the obsolescence of the body in this case has advantages to extend life outside of its natural environment. However the concept of the body as obsolete opens up questions for debate and issues of an ethical and political nature that cyborg theatre encompasses. These issues are often illustrated in futuristic books and films.

Quoted from the book called: *The ship who sang,* by Anne McCaffrey

> *The brain was perfect, the tiny, crippled body useless. So technology rescued the brain and put it in an environment that conditioned it to live in a different kind of body - a spaceship.*[36]

This describes a slave race of Posthumans called '*shellpersons*,' humans often infants or young children that had been connected to a life support system of a computer. Their duty is to serve as starship pilots, while paying off their debt to society for preserving their life. Once they have served their time and paid off their debt they can be free agents in whatever capacity they choose, but nevertheless they must buy their freedom.[37]

While these concerns are met in a science fiction novel. Francis Fukuyama the social philosopher holds a bioconservative view point of the Posthuman. In his book called *Our Posthuman Future.*

Francis Fukuyama writes:

> *In the near term, the big ethical controversies raised by biotechnology will not be threats to the dignity of normal adult human beings but rather*

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[35] Featherstone Mike., Turner Bryan S. *Body & Society*, volume 5, numbers 2-3, SAGE Publications Ltd., 1999, p. 132.
[36] McCaffrey, Anne. *The Ship Who Sang*, Corgi Adult; New Ed Edition, 1999, Back cover.
[37] Audio Book, McCaffrey, Anne. *The Ship Who Sang.* Read by Cori James, Library of Congress, 1969.

> *to those who possess something less than the full complement of capabilities that we have defined as characterizing human specificity. The largest group, are the unborn, but it could also include infants, the terminally sick, elderly people with debilitating diseases and the disabled.*[38]

Francis Fukuyama a secular humanist fears that the future of Posthumanity will become far more hierarchical and competitive than the world of today, which may result in a world of social conflict.[39] However some religious bioconservatives suggest that merging the body with technology to enhance the natural bipedal human would be against Gods will.[40]

The French performance artist Orlan has since transformed her identity by cosmetic surgery going directly against practices of Judaeo-Christian religious belief systems that overshadowed her cultural heritage. These practices promoted bodily purification and discipline, while attempting to keep the psyche bound and constricted.[41] In the photograph of Orlan (See Fig 4) she is under going cosmetic surgery. Over the last decade she has since transformed her identity through cosmetic surgery; between 1990 and 1993 she underwent nine plastic

Fig 4: November 21, 1993: Seventh Surgery-Performance, titled *Omnipresence* New York. *Oran Carnal Art*, Flammarion, p.133.

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[38] Fukuyama, Francis. *Our Posthuman Future*. Farrar Straus Giroux; 1st edition 2002, p. 174.
[39] Ibid, p.218.
[40] In Defense of Posthuman Dignity by Nick Bostrom http://www.nickbostrom.com/ethics/dignity.html December 2007
[41] Featherstone Mike., Turner Bryan S. *Body & Society*, volume 5, numbers 2-3, SAGE Publications Ltd., 1999, p. 154.

surgery operations in an operating theatre that also acts as a set.[42] The whole project is called the Reincarnation of St Orlan. The seventh operation of this series called *omnipresence*[43] was broadcast live via satellite, elaborately staged with colourful costumes and drapery which was also filmed and broadcast in institutions throughout the world. This maybe seen as a key example of Postmodern media culture, in which physical reality has been diminished by meditated reality.[44] Orlan would be redesigned to have the chin of Botticelli's Venus, the eyes of Gerome's Psyche, the forehead of Leonardo's Mona Lisa, the mouth of Boucher's Europa, and the nose of a School of Fontainebleau Diana, hence becoming an artwork of history.[45] Under local anesthetic, with a feminist plastic surgeon at her side slicing into her body,[46] she reads from a psychoanalytic text by Eugenie Lemoine Luccioni which suggests amongst other things the concept of the body's obsolescence.[47] By declaring the body as obsolete, Orlan is associating her own feminist rhetoric with Stelarc's project on generating the body's obsolescence.[48] Simultaneously she is rejecting some of the hard-core feminist critiques of Stelarc's project,[49] which are suggesting that this arrogant denigration of the body is the ultimate patriarchal fantasy.[50] By supporting Stelarc's case, she is making a consciously political gesture, which therefore raises questions on how gender plays a key role in these issues.[51]

The notion of the body as obsolete has also been explored by Donna Haraway (Professor in the History of Consciousness Board at the University of California at Santa Cruz)[52] first published 1985, called a

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[42] Durand Regis, Heartney Eleanor. *Orlan: Carnal Art*, Editions Flammarion, 2004, p. 122.
[43] Ibid, p. 133.
[44] Ince, Kate. *Orlan*. Oxford International Publishers Ltd., 2000, p. 104.
[45] Featherstone,op.cit, 159.
[46] Warr Tracey., Jones Amelia. *The Artist's Body*, Phaidon Press Ltd., 2000, p. 185.
[47] Giannachi, op.cit, p. 51.
[48] Featherstone, op.cit. 152
[49] The feminist performance artist Amelia Jones discusses Stelarc as a Cartesian, and refutes him on that basis: *The Delights of Dorkbot*, YLEM Journal, Artist's using science and Technology, vol. 26, no 2. www.ylem.org/Journal/2006Iss02vol26.pdf
[50] Featherstone, op.cit. 152
[51] Ibid, p.152.
[52] Gray, Chris Hables. *The Cyborg Handbook.* Op,cit. p. 479.

Cyborg Manifesto, which established the cyborg, or cybernetic organism, as fundamental to both feminist history and contemporary culture.[53]

Donna Haraway writes:

> *An ironic dream of a common language for women in the integrated circuit. By the late 20th Century, our time, a mythic time, we are all chimeras, theorized and fabricated hybrids of machine and organism; in short we are cyborgs.*[54]

In this writing she also explains how issues of the cyborg have broken down borders of Western traditions of racist, male dominant Capitalism that has led to imagining a utopian world without gender. Furthermore she mentions that the major problem with cyborgs is that they are the illegitimate progeny of militarism and patriarchal capitalism.[55] This is very much a turnaround, where the cyborg has gone beyond it origins, and so to speak, has transgressed from the patriarchal system, to imagining a utopian world without gender. She also insists that there is a need for a political unity, which may take the form of a political myth inspired by socialist feminism.[56]

In the sphere of *cyborg theatre* both Stelarc and Orlan's performances express free will and the right to redesign oneself. Orlan appears to be rendering her body as obsolete by recreating identities, whilst Stelarc's work appears to be very much about connectivity and recreating a new body filled with technology that can supersede identity as we know it. Both artists also provoke issues of apprehension by the transformation of identity to the body. By generating obsolescence of the body, these issues conjure up a political ballgame of concerns. Whilst people should have the right to merge with technology and render their bodies obsolete if they choose, they should also have the right not to have religion dominating their lives or embodiment. The fact that the first cyborg was a rat, and forced to become a cyborg, is an ethical concern, along with the disabled children's institution that Alison Lapper was in, which also forced her to become a cyborg. The imagined utopian world, a world without gender that

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[53] Ince, op.cit, p. 90.
[54] Warr, op.cit., p.286.
[55] Ibid, p. 286.
[56] Ince, op.cit., p. 90.

Donna Haraway refers to, suggests a very optimistic out look of the future. Whereas Francis Fukuyama is more realistic regarding the ethical controversies raised by biotechnology that needs to be addressed, such as, *the rights of infants, the terminally sick, elderly people with debilitating diseases and the disabled'*.[57] These groups mentioned by Francis Fukuyama are extremely vulnerable as they are often reliant on other people, and they could easily be exploited by biotechnology due to issues of consent.

Whilst similar in nature to the concerns of Francis Fukuyama, but also in contrast, the performance artist Steve Mann has also suffered prejudice for having a disability (though not as severe as Alison Lappers), but instead he has chosen to use technology to fight the machine against itself. He does this by his inventions of computer wearables and interactive technology which is also the subject of the next chapter.

[57] Fukuyama, op.cit., p174.
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Chapter Two: Computer Wearables and Interactive Technology.

This section of writing will investigate Computer Wearables and Interactive technology by looking at surveillance systems that can both aid and violate human rights, privacy and freedom. Featuring Steve Mann performance artist cyberneticist/engineer and inventor of computerized hybrid clothing called *WearComp*. This specialized wearable computer system can also be used as a self surveillance system, or sousveillance, which Steve Mann has named and employs in his performances. Also featuring in this chapter will be the media artist Paula Roush, Paula also uses interactive technology in her work, by recording sounds from bleeps in underground tubes from oyster cards that register and store both identities and destinations of travel. Orwellian concerns of surveillance will be explored by looking at both surveillance and sousveillance systems.

Mass surveillance systems have grown immensely in today's society, with Global Positioning System *(GPS)* and accompanying Closed Circuit Television *(CCTV)* materializing practically everywhere. Radio Frequency Identification *(RFID)* technology, and the more recently proposed identity cards in the *UK* have become a more prominent concern regarding human rights and privacy.[58] Yet the fear about surveillance control systems were expressed years before any of this happened by the author George Orwell, with his notorious science fiction book called *1984*[59], written in the year 1949.[60] While the book *1984* dealt with issues regarding '*Big Brother'*, which was partly thought to be dystopian critique[61] of Jeremy Bentham's panopticon prison plan published in 1791.[62] Ironically this was originally meant to be a utopian scheme for social reform.[63] Nevertheless Orwell envisioned a controlling police state that used cameras to spy, scare and

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[58] Lyon, David. *The Electronic Eye: The Rise Of Surveillance Society*, Polity Press, 1994, p.12.
[59] Orwell, George. *1984, Nineteen eighty-four*, Penguin Books Ltd., 1970.
[60] Historical Fiqures: George Orwell http://www.bbc.co.uk/history/historic_figures/orwell_george.shtml April 2007.
[61] Lyon. Op.cit.p 58.
[62] Lyon, op.cit, p. 62.
[63] Ibid, p. 58.

indoctrinate society.[64] However the technology in *1984* was based on surveillance systems only, the word surveillance is taken from the French language, surveiller meaning to watch over,[65] 'sur' means 'from above' and 'veiller' means 'to watch'. (In an interview with Steve Mann by the author, see Appendix 2). However technology in society of today has far superseded the surveillance technology in the fictional book *1984*.[66] The wide spread use of the internet, web cams, and mobile phones, which maybe used in the form of sousveillance a term that the performance artist Steve Mann has named.

(In an interview with Steve Mann by the author, see Appendix 2).

Steve says:

> *Sousveillance from French 'sous' meaning from below, can be thought of, in part, as a reciprocal, in this way, it can become performance art in the sense that an ordinary person can collect evidence of wrong doing by security guards and officials. .*
> (In an interview with Steve Mann by the author, see Appendix 2).

Steve also explains how his art performances developed. From a young age he began making devices; one particular invention was an electronic seeing aid, to assist with his vision. Due to this disability the electronic seeing aid made him look different, and because he looked different, he constantly received harassment from people like security guards in shopping malls and art galleries. They were afraid his seeing aid may also be a recording device. In turn because of this discrimination and physical abuse he encountered, Steve developed his invention into more than just a seeing aid. (In an interview with Steve Mann by the author, see Appendix 2).

Steve says:

> *I decided that electric seeing aids should also make live recordings and transmission to remote secure sites, as evidence that could be used to prosecute criminal activity.*
> (In an interview with Steve Mann by the author, see Appendix 2).

By transmission to remote sites Steve is talking about the internet where the video evidence can be viewed and used as evidence. The photograph (See Fig 5) shows Steve wearing this system, which evolved into

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[64] Ibid, p. 59.
[65] Surveillance: http://www.merriam-webster.com/dictionary/surveillance April 2007.
[66] Lyon, Op.cit, p.58.

performance art. Over the years the wearable eye piece has reduced in size quite dramatically, to what now looks like ordinary sunglasses. It consists of a little monitor worn in front of the eye, with a small video camera that gives him a recordable, real time view of his whereabouts.

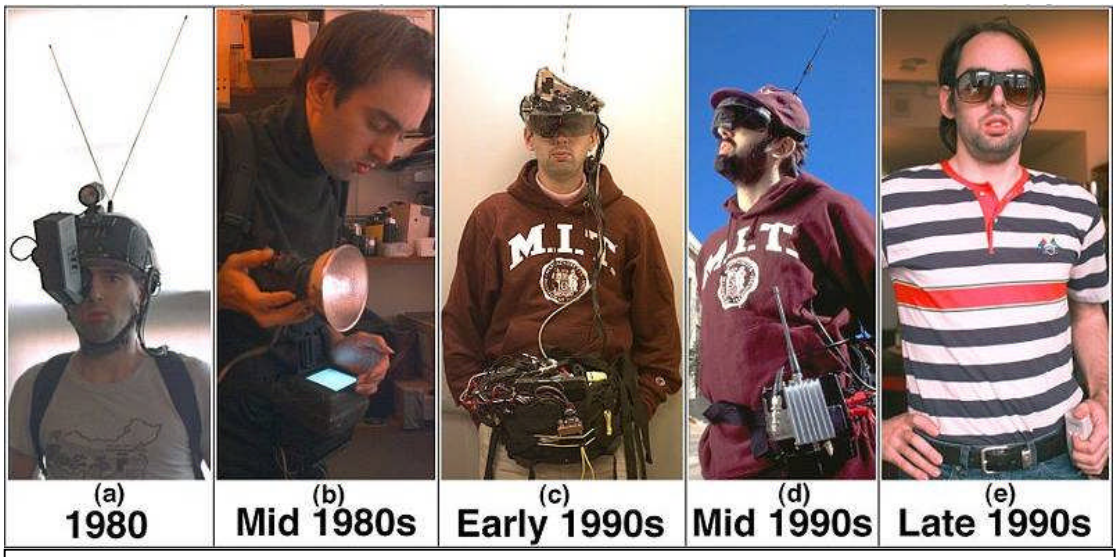

Fig 5: *Evolution of Steve Mann's Wearable Computer Invention (WearComp)* http://wearcam.org/steve5.htm

Mediating reality is what he calls this experience, which may be similar to viewing icons from a computer screen merged with regular vision. The device has allowed him to be a computer, *camera, telephone, videophone and himself all in one single entity*[67] that he has named *Wearcomp.*

Steve says:

> *Thus a person discriminated against or physically assaulted for wearing a seeing aid can now use the evidence captured by the seeing aid to prosecute the perpetrators. In some sense the alleged fears of the perpetrators have become a self-fulfilling prophecy.*
> (In an interview with Steve Mann by the author, see Appendix 2).

One of Steve's ongoing performances called *Shooting Back*, occurred whenever he found himself in shopping stores or somewhere that had surveillance cameras. He would find the manager and ask them why they were recording him without his permission. They would usually reply by saying that only criminals need to be afraid of cameras, or they may be totally perplexed to why he was so being so paranoid. Of course Steve had been video recording throughout this conversation using his *WearComp* system that was transmitting wirelessly to his own website. Yet

[67] Mann Steve., Niedzvieck Hal. *Cyborg: Digital Destiny and Human Possibility in the Age of the Wearable Computer,* Anchor Canada, 2002, p. 5.

it was only when he pulled out a video camera that was really just a prop, as had no film in, that he found similar yet strange reactions, occurring in these performances. Often the managers were totally against him filming, they were paranoid, feared the camera and would demand to have the film. On one occasion attendants at a petrol station demanded the film and physically prevented Steve from leaving.[68]

Steve Says:

> *What did the group have to hide? Probably nothing, theirs was simply just an extreme reaction to the idea that they agents of the corporate should have to undergo the same scrutiny as the customer. Who was I to take pictures of them?*[69]

While interviewing Steve, we also talked about the fear of terrorism and how governments employ this strategy to gain public support to press for more control using surveillance systems. Steve mentioned that the origin of the word terrorism came from the French revolution, by actions by the government against its own people.

Steve says:

> *So surveillance will never stop terrorism. To stop terrorism we need equiveillance (the balance between surveillance and sousveillance).* (In an interview with Steve Mann by the author, see Appendix 2).

In an article written by Stephen Strauss for the CBC News called: *Little Brother is Watching You*, he writes:

> *I don't want to be sousveilled and revealed on the internet at will. I want to have my own Garbo-esque space where I can be alone. I want there to be laws that keep a snoop dog technology out of my face.*[70]

However at the beginning of his article he mentioned how New Orleans police officers were eventually suspended and charged in 1992 with battery. The assault was on a man named Rodney King, a man that was beaten up so badly by the police that left his face bloodied and virtually skinless. Yet the assault was recorded on video by an onlooker which was thought to have sparked the Los Angeles riots of 1992. While he writes

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[68] Mann, op.cit, p.172.
[69] Mann, Ibid, p.172.
[70] Strauss, Stepen: *Little Brother is Watching You*. http://www.cbc.ca/news/viewpoint/vp_strauss/20051019.html April 2007

that it was good that the assault was captured on video, he also writes that he hates what Steve Mann declares about sousveillance: '*There is no secrecy, get used to it*.'[71]

An article in the Guardian by Duncan Campbell titled, *Could it happen again*? Duncan Campbell recapped on the riots sparked by the assault on Rodney King, he writes:

> *The image of white officers whacking a defenceless black man burned itself into the public consciousness, and lit a fuse that exploded more than a year later when the four officers were acquitted of the assault by a mainly white jury who chose to ignore the evidence before their eyes.*[72]

While Steve Mann has experienced justice from sousveillance first-hand, Rodney King has experienced justice from public outcry that was thought to have been sparked by sousveillance. Though Steve Man invented the term sousveillance, he also mentioned earlier that we need equiveillance, the balance between sousveillance and surveillance.

Equiveillance is also a feature in the performances by Paula Roush, a London based media artist, exploring the sonic properties of Radio Frequency Identification *(RFID).* She has recorded sounds from bleeps in underground tubes from oyster cards that register and store both identities and destinations of travel (See Fig 6). Paula began this by inviting friends to join in for a semi-choregraphed oyster card sound jam. Whilst sound

Fig 6 *Oaainanimateohnh*: New Brave World Workshop: RFID and Art, 24th March 2008. http://www.worldchanging.com/archives/007915.html

[71] Ibid.
[72] Campbell, Duncan: *Could It Happen Again* http://www.guardian.co.uk/world/2002/apr/24/usa.duncancampbell April 2008.

sampling *RFID* cards and readers to explore sousveillance and gain an understanding of Radio Frequency Identification and surveillance/equiveillance of public space and transport. The first sound jams took place as a one day event at various tube stations in London during March 2006. The second was a memorial sound/jam for Jean Charles Menezes that took place at Stockwell tube station in 2006. (In correspondence with Paula Roush by the author, see Appendix 3). In an article that Paula sent me, she talks about the murder of Jean Charles Menezes who was killed by police officers following the tube bombings on the 7th July 2005, also known as 7/7. It had been disputed whether he had jumped over the barrier onto the train while being pursued by police officers. Eyewitnesses saw a man jumping over the barrier, which was suggested, could have been one of the police officers. Also the Closed Circuit Television *(CCTV)* footage was not released since the police initially refused to release the video while the Independent Police Complaints Commission *(IPCC)* investigation was ongoing. (In correspondence with Paula Roush by the author, see Appendix 3). Paula says:

> *According to the leaked Independent Police Complaints Commission (IPCC) documents, Menezes passed through the barrier normally using his pre-paid Oyster card.*
>
> *Even more chilling than this slippage, is the fact that such technology is already in place that allows for the tracing of public transport users throughout the city as a centralised database to which its subjects cannot themselves have access.*
> (In correspondence with Paula Roush by the author, see Appendix 3).

Even with all this technology in place a totally innocent man was killed, and one wonders what the overshadowing surveillance systems of the anti-terrorism laws are exactly good for?

In an article by Fred Attewill, headlining the front page of the free newspaper called the Metro, it reads:
Terrorism laws used to spy on dirty dogs. Fred Attewill writes:

> *Thousands of people suspected of petty offences such as dropping litter have been spied on by councils under the new anti-terrorism laws.*

> *The widespread use of the new Regulation of Investigatory Powers Act was revealed in a survey, in which 46 councils admitted they had invoked the law 1,343 times*.[73]

The article also mentions that some local authorities have already admitted using the law to spy on a family to make sure that they lived in the right school catchment area, and have also spied on dog owners to see if they let their dogs foul in the park.[74]

The fictional book *1984* by George Orwell appears alarmingly prescient; we now live in a society where surveillance has really taken hold. Both Steve Mann and Paula Roush have employed interactive technologies to explore and express technological awareness of a political nature. They also both talk about equiveillance to balance the equation between surveillance and sousveillance. Yet while this should be the logical answer, it still comes down to who has the power to control this information. As shown by the sousveillance video of Rodney King in which the jury totally ignored the video evidence, and it was only through public outcry of the Los Angeles riots that justice was eventually done. Whilst in the case of Jean Charles Menezes, all the surveillance technology of the underground system didn't help, stop him from being killed. Yet surveillance is practically everywhere, and has already reached ridiculously high levels where local authorities can use the anti-terrorism laws to spy on anyone for ludicrous, petty, dog fouling crimes! Nevertheless can surveillance systems really be more ubiquitous? The next chapter explores the use of implantation of micro chips into the body, which could be used in the future, to track you wherever you are!

[73] Attewill,Fred. Metro Newspaper: *Terrorism laws used to spy on dirty dogs*, 28th April 2008, p.1.
[74] Ibid, p.1.

Chapter Three: The Merging of Humans and Machines

This chapter will explore the merging of humans and machines via direct microchip implantation into the body. *Radio Frequency Identification (RFID)* and the *Multiply Micro Electrode Array (MMEA)* will be discussed. This section of writing will attempt to unfold the problematic concerns generated by these technologies. Exploring both benefits and fears that Posthumanity may embrace. Featuring the cyberneticist professor Kevin Warwick, pioneer of the *Multiple Micro Electrode Array*. This is a micro chip that connects directly to the nervous system. Also featuring in this chapter will be the artist Nancy Nisbet, who has implants of *Radio Frequency Identification* chips in both hands. Nancy is also the author of *Resisting Surveillance: identity and implantable microchips.*

Radio Frequency Identification has evolved as a major technology that can be used worldwide as a tracking device,[75] by identifying tagged objects or people via a form of wireless communication technology.[76] For instance *RFID* has been used in ski resort lift passes, security badges for access into buildings, and the *London Oyster card*.[77] It is also being used as a form of payment system in certain night clubs, where people can have implants into their bodies, to give them special *VIP* treatment while at the club. The chips known as *Verichip*, are produced by a US company called *Applied Digital Solutions*, the chip could be compared to a grain of rice in size that is encased with glass, and injected under the skin.[78] This company have said that the idea for *Verichip* was due to the aftermath of 9/11,[79] where the Twin Towers of the World Trade Centre, in New York were hit by suicide bombers in a terrorist attack.[80] *Verichips* were

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[75] RFID Centre
http://www.rfidc.com May 2007
[76] Hunt V. Daniel, Puglia Albert, Puglia Mike. RFID: *A Guide to Radio Frequency Identification*, Wiley Blackwell, 2007, p. 1.
[77] RFID Centre
http://www.rfidc.com/docs/introductiontorfid.htm May 2007
[78] New Scientist
http://www.newscientist.com/article/dn5022-clubbers-choose-chip-implants-to-jump-queues.html December 2007
[79] Verichip.com
http://www.verichip.com/contentcompany/corporatefaq#g1q&a May 2008
[80] BBC News
http://news.bbc.co.uk/hi/english/static/in_depth/americas/2001/day_of_terror/ June 2008

developed for a number of reasons regarding safety,[81] such as: *infant protection*, *wander prevention*, *asset tracking*, and *patient identification*.[82] Their logo on their website states: *Identify + Locate + Protect.*[83]

Cyberneticist Professor Kevin Warwick began experimenting augmenting his body with *RFID* technology since August 1998, when he had a micro chip implanted into his body that allowed him to be identified by a computer at Reading University. It was programmed to open doors and turn on lights depending on where he was in the building.[84] He has since become the pioneer of the *Multiply Micro Electrode Array*, a more advanced micro chip that was implanted into his arm for three months in 2002.[85] In the IT Wales interview by Sali Earls posted on 13th December 2006, Kevin talks about the implant. Initially the implant linked his nervous system to a computer and onto the internet. His wife Irena also had electrodes placed into her nervous system to do the same (see fig 7). They then linked both their nervous systems together via the computer and internet, so that when she moved her hand the neural signals went form her brain and nervous system to Kevin's

Fig 7: Kevin Warwick and his wife Irena display their Implants. http://www.itwales.com/997730.htm

[81] Verichip.com http://www.verichip.com/contentcompany/corporatefaq#g1q&a May 2008
[82] http://www.verichipcorp.com/company.html May 2008
[83] Ibid.
[84] The University of Reading: Kevin Warwick http://www.kevinwarwick.com/faq.htm march 2007
[85] It Wales: Interview with Kevin Warwick http://www.itwales.com/997730.htm January 2008

nervous system then to his brain.[86]

Kevin says:

> *… It was the world's first purely electronic communication from brain to brain, and therefore the basis for thought communication[87].*

In an interview with Kevin I asked him if he could explain how the *Multiply Micro Electro Array (MMEA)* connects to the nervous system. Kevin explains that the array is very similar to an electrical plug, only instead of three pins, it has one hundred pins. The ends are pointed, and the dimensions of the array, are approximately four millimetres by four millimetres. Each electrode is one and a half millimetres long, or each spike is one and a half millimetres long**.** The nerve fibres in total in the median nerve are roughly four millimetres in diameter. Therefore pushing one and a half into four millimetres is nearly half way into the nerve fibres. (In conversation with Kevin Warwick by the author, see Appendix 4).

Kevin says:

> *It's not really possible to actually make direct contact with individual nerve fibres as it's like pushing a pin in, or if you like the nerve fibres are like a bunch of wires, so this was like pushing one hundred pins into a bunch of wires. You can then pick up signals, and if you push electrical current in you can send currant along the wires and so on.*
> (In conversation with Kevin Warwick by the author, see Appendix 4).

In an article by Will Tizard for The Prague Post, dated 29th June 2005, he writes:

> *Besides working on extra-sensory ultrasonic inputs for human beings and the first purely electronic communication between two human nervous systems, Warwick has inspired a Boca Raton, Florida, family to volunteer to be the first to be implanted with microchips[88].*

The article also explains that the microchips will contain the family's identification and medical history and, if there were an accident, the

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[86] Ibid.
[87] Ibid.
[88] The Prague Post
http://www.praguepost.com/articles/2005/06/29/i-golem.php 26 May 2008

information on the chips, could save a life as this can be read by special scanners [89]

While talking with Kevin, I mentioned that I had read on some websites that the *Department of Defense in America* which has a section called the *Defense Advanced Research Projects Agency (DARPA)* have been doing *MMEA* implant experiments on soldiers. The idea is to change their emotions, so if they where in a scary situation, their emotions may be changed using software applications that could be downloaded into their nervous system to change their mood. I asked Kevin if he knew if this was true?

Kevin Says:

> *It is possible with electrodes yes, but maybe not with this type of electrode, whether they in the military would put more serious electrodes into soldiers, is doubtful at this time, but they could be researching it clearly.*
> (In conversation with Kevin Warwick by the author, see Appendix 4).

In an article by Gareth Cook for the Boston Globe dated 5th August 2003, Titled *Defense Department funding brain-machine work,* he writes:

> *The 24 million enterprise called Brain Machine Interfaces is developing technology that promises to directly read thoughts from a living brain and even instil thoughts as well*.[90]

While the experiments of the *MMEA* between Kevin and his wife are extremely fascinating, it is quite a scary thought knowing that the military are researching brain control interfaces to upload thoughts into a living brain.

I also asked Kevin if he thought there should be any safeguards in the future to protect humans if they don't want to become Posthuman?
Kevin says:

> *…I think that with getting employment will assume you will have this technology as part of you, but also the abilities that it gives you, will give you an advantage, but anybody that didn't have it would really be at a*

[89] Ibid.
[90] The Boston globe, reprinted in The Post and Charleston.net http://www.charleston.net Feb 2008

> *disadvantage. Whether it does become more of an evolutionary thing that you do become ultimately a type of a subspecies, I don't know…* (In conversation with Kevin Warwick by the author, see Appendix 4).

The film called *America: Freedom to Fascism,* is a documentary directed by Aaron Russon, investigating issues of social control over society, such as the *Real ID Act* in America, which plans to connect a person's driver's license, social security number, retinal scan, and/or finger print, and possibly other information. If people don't carry this card they will not be permitted to board an Airplane, Amtrak train, open a bank account or enter a Federal building. The film also investigates implantation of people and mentions the *Personal Locating Device (PLD),* which is an implantable Global Positioning System. The *PLD* is a hybrid of *Verichip* and *Digital Angel*, made by *Applied Digital Solutions* that people are having implanted. Some companies are already demanding that their workers have chip implants. The film predicts that unless people stop this from happening by refusing to be implanted, the implantation of such chips will become compulsory in the future, and people could be tracked wherever they go.[91]

Nancy Nisbet is Canadian multidisciplinary artist, and the author of *Resisting Surveillance: Identity and Implantable microchips.*[92] Nancy mentions in her article how dystopian futures of much science fiction appear prescient, where the tracking and controlling of humans is now looming out of shadows.[93]

In an interview with Wired by Julia Scheeres Nancy says:

> *I am expecting the merger between humans and machines to proceed whether we want it or not*.

In October 2001 Nancy had a *RFID* microchip implanted into her left hand, and then in February 2002, had her right hand implanted.[94] Surveillance and tracking systems are usually associated with one particular person or thing to minimize confusion.

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[91] *America: Freedom to Fascism* (Dir. Aaron Russon, Aaron Russo Productions. USA, 2006).
[92] Nisbet, Nancy, *Resisting Surveillance: Identity and Implantable Microchips,* Leonardo. Vol.37, pt. 3, 2004, pp. 210
[93] Ibid. p. 212.
[94] Ibid. p. 211.

Nancy Says:

> *I hand two chips implanted into my body because of the assumption that each surveyed person has one unique ID number not two: one person one number and one unique code.*[95]

In an installation by Nancy called *Pop! Goes the weasel,* she staged an interactive installation using *Radio Frequency Identification (RFID)* to track its visitors/viewers. This installation was set in Japan which consisted of four main components: access gates, photographs, video projection, and the *RFID* scanning system. To enter the viewer can pass through two *RFID* controlled gates. If a viewer chooses to wear a *RFID* badge, this will unlock the gates so they can pass through. However viewers that do not wish to wear a badge will be locked out. Once inside, the data badges are tracked by sensors. There are pedestals with transparent backlit photographs of hands from five different people. Projected on one wall, is a video loop of the surgical procedure of the micro chip into Nancy's hands. The photograph (see fig 8), is an x-ray still from the video. The audio sound of the video is a warped version of the nursery rhyme *Pop goes the Weasel,* which also consists of an alternating medical beeping sound. The main part of this installation focuses on eight *RFID* antennae, which are hidden around the installation. When someone wearing a badge enters or walks past they will be scanned and recognized by that particular number on the badge. Different visitors end up using the same data badges throughout the duration of the exhibition so that the data entered into the computer becomes

Fig 8: Video still, x-ray of Nancy Nisbet's hands. http://www.finearts.ubc.ca/nisbet/previous_work.htm

[95] Ibid. p. 212.

meaningless.[96] Visitors are also given the opportunity to chose resistance and avoid *RFID* surveillance if desired.[97]

In an interview with Nancy I asked her if there were many participants that tried to resist surveillance?

Nancy Says:

> *It was interesting to observe peoples' reactions to the installation. In one sense, the cultural context of the installation (set in Japan) seemed to play a rather significant role. Japan is a fairly rule-based society and active 'resistance' is often downplayed. It is definitely notable that people eventually did resist and avoid the surveillance of this installation.* (Interview with Nancy Nisbet by the Author see appendix 5).

Whilst the surveillance of *RFID* systems are a concern that Nancy expresses in her installation, she also says in her article:

> *For all the benefit that may emerge from the digital angels being developed, there is the very real risk of their becoming the 21st century's all too watchful Big Brothers*.[98]

It appears that both Kevin Warwick and Nancy Nisbet have had micro chip implants for totally opposite reasons. Whilst Kevin is very excited about this technology, he believes that the merging of humans with the machine is the way forward to aid our abilities. However it is a very scary thought, thinking about the military researching mind control using similar technology. The *Personal Locating device* that the company called *Applied Digital Solutions* have also developed is a concern. While they say it has been developed to aid with safety issues, it could also be used to violate, freedom and privacy by its tracking abilities. The artist Nancy Nisbet is very concerned about the implications of *RFID*, she expresses political awareness to mock these ideas and render them useless by having two chips implanted to confuse the issue. Her installation called *Pop Goes the Weasel*, addresses concerns about identity, surveillance, and implantation, by encouraging people to learn more about this technology that is creeping into society at an uncontrolled rate.

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[96] Ibid. p 212.
[97] Nancy Nisbet http://www.finearts.ubc.ca/nisbet/previous_work.htm May 2008.
[98] Nisbet. Op.cit. p 214.

Conclusion

This conclusion is based on the information gathered from artists, cyberneticists, theorists, reporters, and all the sources herein, which have all assisted towards answering this question - Posthumanity: Enhancement or Infringement?

The emergence of the Posthuman has become apparent while researching this dissertation. It can be seen in its early stages through the application of medicine, biotechnology, genetic engineering, cloning, or surgical and cosmetic enhancements. It could be, through the implantation of a micro chip into the body, but it must be a direct enhancement to exceed the average human ability.[99] For instance in chapter one, Posthuman characteristics can be seen in Stelarc's performance called *hollow.* This may also be seen as a prime example of Manfred Clynes and Nathan Kline's cyborg, for self-regulating human-machine systems in outer space.[100] The notion of the obsolescence of the body in this case has advantages to extend life outside of its natural environment, yet the performances by Orlan appear to be rendering her body as obsolete by recreating identities. Whilst both artists' express freewill and the right to design oneself, they also provoke issues of apprehension by the transformation of identity to the body. By generating obsolescence of the body, these issues conjure up a political ballgame of concerns. For instance it would be a very different matter if this form of technology were forced on someone. Abuse of power and control can be seen from the animal experimentation of the first cyborg rat[101] and also Alison Lapper in her infant years. Alison suffered prejudice for being born with shortened arms and legs and was forced to wear prosthetic contraptions that hindered her abilities.[102] This issue of control is also an example of the ethical controversies of power and exploitation raised by biotechnology that Francis Fukuyama mentions regarding issues of consent. However in the second chapter the performance artist Steve Mann has also suffered prejudice for

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[99] Reference site www.wordspy.com March 2007.
[100] Gray, *The Cyborg Handbook,* op.cit. p. Xi.
[101] ibid, p. Xi.
[102] Lapper, pp. 35-37.

having a disability (though not as severe as Alison Lappers), but instead he has chosen to use technology to fight the machine against itself by using sousveillance. He is suggesting that people can take control of their lives by recording events of misconduct and exposing them via the internet.[103] In this chapter both Steve Mann and Paula Roush have employed interactive technologies to explore and express technological awareness of a political nature where surveillance is a prime concern. They both talk about equiveillance to balance the equation between surveillance and sousveillance. Yet while sousveillance has aided Steve Mann to prosecute the perpetrators of wrong doings,[104] it ultimately comes down to who has the power to control this information. As shown by both the sousveillance video of Rodney King and the surveillance intelligence on Jean Charles Menezes. There is no point gathering video evidence from sousveillance where a judge and jury can choose to ignore sousveillance evidence of police brutality. While in the case of Jean Charles Menezes, police killed an innocent man because the surveillance intelligence gathered on him was totally wrong, but they should not have the power to take someone's life, regardless of whether this information was correct or not. Equiviellance will only work if a balance can be drawn between the powerless and the powerful, which is a social issue of control and needs to be addressed. While surveillance cameras appear to be a major threat to human rights and privacy, micro chip implantation into the body could become the ultimate violation to these rights, which is explored in the final chapter. This chapter looks at the work of Professor Kevin Warwick who appears very excited about the implantation of micro chip technology. While the experiments of the *MMEA* between Kevin and his wife are extremely fascinating, it is quite a scary thought that the military maybe researching brain control interfaces to upload thoughts into a living brain using similar technology.[105] However if people want to have micro chip implants for whatever reason, such as containing medical records for safety reasons, then that is their choice. However, it is a different matter if people are forced to be micro chipped, or that it becomes very difficult not to

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[103] See Appendix 2.
[104] Ibid.
[105] The Boston globe, reprinted in The Post and Charleston.net http://www.charleston.net Feb 2008

be. Some companies are already demanding that their workers have micro chip implants.[106] Kevin thinks that in the future it may become very difficult for people to find employment or exist in society without becoming Posthuman and being micro chipped.[107] However it does appear that people are being convinced to have micro chip implants for safety reasons. The motivation for the company, called *Applied Digital Solutions*, to develop the *Verichip* was due to safety issues regarding the aftermath from terrorist attacks of 9/11.[108] Governments have also pressed for more security measures since this time, such as identity cards and passports containing *RFID* and retinal scans.[109] Yet even if all these safety measures were in place, how could this technology have stopped 9/11? The terrorists were suicide bombers and it would not matter whether they carried the new *ID* cards or not. Even if they had *RFID* or the *PLD* micro chips implants, it would still not stop this kind of terrorism, because you would not expect people to blow themselves up. However this issue seems to be an excuse for Governments to press for more power and control, by glossing over this fact. However Nancy Nisbet has had micro chip implants for opposite reasons to Kevin Warwick. Nancy exposes her concerns by actually having *RFID* implants into her body. By doing this she expresses political awareness to mock these ideas and render them useless by having two chips to confuse the issue.[110] Her installation called *Pop Goes the Weasel*, addresses concerns about identity, surveillance, and implantation, by encouraging people to learn more about this technology that is creeping into society at an uncontrolled rate.[111]

While technology can give us the freedom to redesign our bodies and enhance our abilities, it can also be used to devoid people of any rights, privacy and freedom. Having an implantation of a micro chip into the body, such as the *PLD* that can track people wherever they go, appears to be not about the advancement of technology to become Posthuman and aid our abilities. This is the ultimate spying device, and if George Orwell were alive

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[106] Russon, op.cit, *America: Freedom to Fascism* (Film)
[107] See Appendix 4
[108] Verichip.com
http://www.verichip.com/contentcompany/corporatefaq#g1q&a May 2008
[109] Russon, op.cit, *America: Freedom to Fascism* (Film)
[110] Nisbet, op.cit, pp. 210-16
[111] Ibid. pp. 210-16.

today he may be extremely shocked by how his book *1984* has become alarming prescient in the sense of control and surveillance on people. Yet even he didn't visualize an age where direct implantation into the body would be a possibility to track people wherever they go. This is not an upgrade, it is a downgrade and until people actually realize this, the future of Posthumanity will be an infringement of people's rights and not an enhancement to aid our abilities.

> *Those who would give up essential liberty to purchase a little temporary safety deserve neither liberty or safety*
>
> Benjamin Franklin, US author, diplomat, inventor and printer. (1706-1790).[112]

[112] Franklin, Benjamin quote:
http:www Bartle.com/73/1056.html. June 2008.

Appendix 1

An interview by email with performance Artist Stelarc by Kay Johns

Wednesday 2nd January 2008

Stelarc (Stelios Arcadiou) is an Australian based performance artist. His work explores physical modifications of the body merged with technology, using prosthetics and extensions, to the concept of rendering the body as obsolete or redundant. Today I asked Stelarc some questions about his art performances, and the concept of the obsolete body.

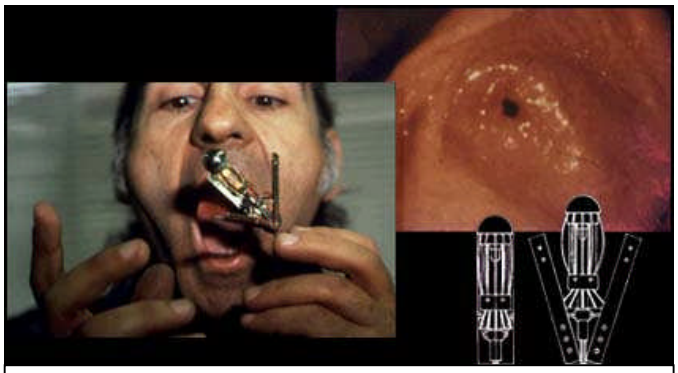

Fig 9: *Stomach Sculpture*, photograph from http://www.stelarc.va.com.au/stomach/stomach.html

Kay Johns: Are there any performances that you deliberately set out to either portray the advantages or disadvantages towards the future of Posthumanity?

Stelarc: *None of the performances are meant to be at all illustrative of a particular idea or discourse. The ideas are generated by the performances. The ideas are authenticated by the actions.*

Kay Johns: How did your work as a performance artist lead to experimenting with the concept of the obsolete body?

Stelarc:

1. *Being a bad painter at art school, I decided to be a performance artist.*

2. *I was always envious of dancers, singers and gymnasts who used their own bodies as their means of expression.*

3. *Having an interest in the body meant trying to understand how our anatomical, sensory and cerebral architectures evolved.*

4. *The early projects explored the psychological and physiological parameters of the body. The suspension performances were a strategy of exhausting the body and as a consequence exposing its obsolescence.*
5. *This anxious, uncertain and empty body discovers its inadequacies. The obsolescence of the body is a consequence, not an experimentation with the obsolete body. In other words the performances don't illustrate the obsolete body but rather they generated the obsolescence....*

Kay Johns: Do you consider yourself to be Posthuman when you are not doing performances or is it just an avenue that you wish to explore through your art, for instance your extra ear that has been attached to your arm, do you consider the ear to be a change in identity for you personally within daily life, or only as a performance piece, or both?

Stelarc: *Well, there's no rupture between art and life. But what a performance or an installation does is provide the space and structure where it becomes possible to intensely express or experience bodily interfaces that explore alternate body constructs.*

Kay Johns: When I first saw a photograph of your performance '*Counter Balance*' my initial thought was wow what a beautiful sculpture. I really didn't consider the pain that you must have been going through. I suppose this was partly because you looked so calm and relaxed. My question is did you feel totally in control because you could overcome your pain, or was it the thought of being out of control, and controlled by an external force that you had to deal with in this experience?

Stelarc: *The Rock Suspension performance was one of the more sculptural installations. The body was always considered as a sculptural object inserted within other objects and spaces. Coping with the physical difficulty was never easy. Because you can't erase the painful experience. The performances were done with a posture of indifference (as opposed to expectation). When you do something with expectation, the possibilities quickly collapse and the performance becomes predictable. Performing*

with indifference allows the performance to unfold. You allow it to happen to you.

Kay Johns: Depending on your thoughts of the above question, do you think there is a similar situation of control through the merging of humans and machines. For instance you choose to interface with machines but they also restrict you physically too. To myself as a viewer there seems to be a similarity but how do you perceive this?

Stelarc: *It's never really about a situation of control. When a body is plugged into interactive technologies what is constructed is an extended operational system that allows the body to perform beyond its skin and the local space it inhabits. It's no longer meaningful to speak of issues of control nor whether it's the body or its machines that are in control. It's about alternate operational systems.*

Kay Johns: In your performance called '*Hollow Body', 'Hollow space'*, or '*Stomach Sculpture'*, can you describe your expectations before you experienced this, and was it similar or drastically different to how you thought it would be?

Stelarc: *The Stomach Sculpture turned out to be the most difficult project to realize up till now. The suspensions might appear to be the most painful, but inserting a sculpture inside your body was more difficult. You can manage surface pain, but it's difficult to cope with involuntary reflexes like gagging, feeling queasy and feeling ill. As well as the control cable there was also the endoscope tube that was simultaneously inserted down the trachea into the stomach cavity.*

Kay Johns: Did you feel that there was a particular place/ time in the performance of *stomach sculpture* that the transformation of identity took place from body to obsolete body?

Stelarc: *Oh, exhausting the body in the 13 years of body suspensions exposed its obsolescence well before the Stomach Sculpture. The realization was that the body was not the site of the pysche nor social inscription. The body was not the site for a self but simply for a sculpture.*

Kay Johns: I have noticed that you and Orlan are often compared because of performances requiring surgery and prosthetic implants, but your work is also very different. Orlan appears to be rendering her body as obsolete in a different way by recreating identities, while your work appears to be very much about connectivity and recreating a new body filled with technology that can supersede identity as we know it. What is your view on this?

Stelarc: *I find the work of Orlan particularly interesting. She is certainly the Post-Modern Performer. Her work though is in the realms of cosmetic surgery. The Ear on Arm project requires reconstructive surgical techniques. It's not about modifying present features but rather in the construction of an additional one. The ear is replicated, relocated and rewired for additional capabilities.*

Kay Johns: Do you think for anyone to truly appreciate your work they need to experience these performances physically for themselves:-)

Stelarc: *It's not that you want to separate the roles of artist and audience. Rather artists have individual motivations, aesthetic concerns and theoretical outcomes that are presented in the public domain. Others can experience indirectly, analyze and interpret in their own ways. Artists also become an audience for other art. Art generates alternate art.*

Stelarc,
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Appendix 2

An interview by email with artist Steve Mann, by Kay Johns
Thursday 10th January 2008

Steve Mann is a Canadian based performance artist cyberneticist/engineer and inventor of computerized hybrid clothing called *WearComp*. His specialized wearable computer system can also be used as a self surveillance system, or sousveillance, which Steve Mann has named.

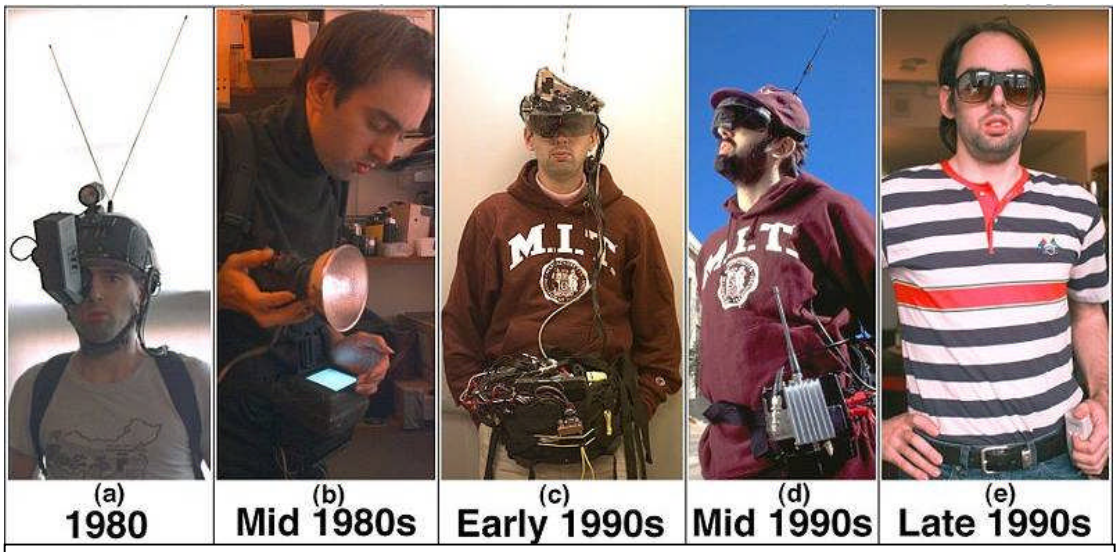

Fig 10: *Evolution of Steve Mann's Wearable Computer Invention (WearComp)* http://wearcam.org/steve5.htm

Today I asked Steve about his inventions, and his performance art.

Kay Johns: Since, you invented wearable computers and have been wearing these inventions to create a more personalized connectivity with technology, do you feel that you have achieved another identity?

Steve Mann: *Yes, I think the concept of self is inextricably intertwined with cyborgspace.*

Kay Johns: When did you first start doing performance art using wearable computers and where did your inspiration come from?

Steve Mann: *I began as an inventor, inventing various forms of devices like electric seeing aids to help me see better, and this evolved also into a form of visual art, by way of something I call the "visual filter" (computer-*

mediated reality), as was later to be outlined in chapters 2 and 3 of my textbook ,http://wearcam.org/textbook.htm. The notion of cyborgspace as performance art began when I found myself being harassed simply for wearing an electric seeing aid. I distinguish this form of harassment from the misunderstanding that comes with technology, e.g. the way that early wearers of eyeglasses were harassed just because their "four eyes" looked kind of strange, to isolate and understand a particular form of harassment beyond mere peer harassment. In particular I was most disturbed by the institutionalized harassment by security guards or officials of large organizations, because they ought to know better than to harass someone merely because of a visual impairment or because of a seeing aid. The most common form of harassment, was rooted in a concern that the apparatus might be taking pictures. This has been ongoing for example, I was assaulted by officials at places like museums simply because they were afraid that I might be recording and violating the copyright of their paintings in their gallery, or the like. Ironically, because of this harassment, I decided that electric seeing aids should also make live recordings and transmission to remote secure sites, as evidence that could be used to prosecute criminal activity. Thus a person discriminated against or physically assaulted for wearing a seeing aid can now use the evidence captured by the seeing aid to prosecute the perpetrators. In some sense the alleged fears of the perpetrators have become a self-fulfilling prophecy. Where as originally a seeing aid that did not record now records because of the harassment of the wearer based on a fear that the apparatus might be recording. The same would be true of surveillance imagine, for example, if there were a surveillance camera as closed-circuit TV that was not recording, but merely installed to monitor remotely. Now suppose someone went in and smashed up the surveillance camera because they were afraid it might be recording. What would likely happen is that the people who installed the camera would now replace it with a new camera and also install a recording device to catch the perpetrator in case he or she came back to smash up the camera again. Surveillance is watching from above. "sur" means "from above" and "veiller" means "to watch" in French, so the word denotes the god's eye view of the "eye in

the sky" (watching from above). Sousveillance from French "sous" meaning "from below", can be thought of, in part, as a reciprocal, in this way, it can become performance art in the sense that an ordinary person can collect evidence of wrong doing by security guards and officials. Typically sousveillance leads guards into a consultation with their top management, and therefore as a form of accidentally-discovered performance art, it brings the wearer face-to-face with top-level management and decision makers. For example, I've retained Canada's former Human Rights Commissioner (who is now a lawyer) to address matters of discrimination directly with top-level officials. I am not an activist, but, rather, simply through invention and what some have termed "inventing the future" find myself in a situation in which I find high level officials breaking the law. I call this "contactivism" i.e. action research at the point of contact with an organization. It occurs when a person conducts their ordinary day-to-day life but in so-doing changes the world at their point of contact with the world. If I were an activist I would be lobbying congress, or going after the top officials, but because I'm not an activist, just contactivist, I just live my life in friction with low-level clerks, yet give rise to a new form of philosophical discourse in reflectionism. Namely one might ask "can humans being clerks make clerks be human"?
(See "please wait" below) you can read about this in:
http://wearcam.org/leonardo/award2004.htm

Kay Johns: I really like the humour involved in your reflectionists performances such as *'Please Wait'*. Have you ever received any comments saying that these performances had an impact helping people think about their role and the changes that they can make within society?

Steve Mann: *This form of what I call "contactivism" has grabbed the attention of various philosophers and scholars, such as Ian Kerr, who used my popular culture book as the textbook for a new course he created on the topic of "cyborg law". See* http://wearcam.org/glaw.htm *since then it's also taken root in various other universities, etc.*

Kay Johns*:* In your book '*Cyborg, Digital Destiny and Human Possibility In The Age Of The Wearable Computer*,' you mentioned that when Timothy Leary a long-time *LSD* exponent turned his attention to technology, he made comments saying that "Computers are the most subversive thing I've ever done…. People need some way to activate, boot up, and change disks in their minds". Have you found there to be a similarity between with your inventions to alter or escape reality compared with the *LSD* culture?

Steve Mann: *I think a more direct connection can be made between mainstream advertising and LSD culture, for example, many of the beer commercials show a distorted reality. Large organizations spend huge sums of money making mind-altering TV commercials to lure people into a product that's addictive. Another analogy is Microsoft, closed source is worse than addictive; it's what I would call "collectively addictive". Let me give you an analogy, somebody sends you an MS-word document with latest version of MS that doesn't work with open office, to read it you need to buy MS-word, so their addiction to anti-science (closed source) spreads to you. Then you start using MS when you buy it, and you start sending it to others. This is worse than LSD in the sense that at least LSD only messes up one person but MS messes up the whole society of potential scientists. That's why some countries like France are trying to make MS (closed source in general) illegal.*

Kay Johns: I also read in your book '*Cyborg, Digital Destiny and Human Possibility In The Age Of The Wearable Computer*,' that The United States Department of Defense has a section called the *Defense Advanced Research Projects Agency (DARPA)* which has been integrating the use of wearable computers to create cyborg soldiers. How do you feel about the further experiments using soldiers to test the *Multiple Micro Electrode Array (MMEA)?*

Steve Mann: *I recall getting a huge number of invites from various defense people to speak at their events, etc., but as I mention in my book,*

I think the real value of wearcomp is its universality for all citizens not just defense. Like wristwatches --- everyone not just railroad workers have them now.

Kay Johns: In a suffocating world of surveillance it has practically gone unnoticed that issues of our rights to privacy have been violated. Everyday we see more surveillance devices appearing, all for the greater good of protection to citizens in the latest reasoning, of the so called war against terrorism, or something similar. You mentioned that in many ways you are in a world that horrifies you, and that by your inventions you can regain control of technology within society by using the machine against itself by using sousveillance a form of surveillance, that can be used by everyone, instead of just the powers that be, or corporate structures. The saying that springs to mind, is does two wrongs make a right?, but since surveillance is already here and would take a lot to get rid of, can you explain more about how we can use sousveillance to balance the equation?

Steve Mann: *Remember that the original definition of the word "terrorism" was from the French revolution and described actions taken by a government against its own citizens, thus the original terrorists were governments. Terrorism and surveillance originate as top-down, so surveillance will never stop terrorism. To stop terrorism we need equiveillance (the balance between surveillance and sousveillance). See http://en.wikipedia.org/wiki/Equiveillance and the articles linked therein, e.g. you might want to reference Surveillance-and-Society: Sousveillance: Inventing and Using Wearable Computing Devices for ..., Volume 1, Issue 3; et. al. Barry Wellman, sociologist., and* http://wearcam.org/anonequity.htm

Kay Johns: I realize that we don't really know who is watching us behind the surveillance cameras already in place, they could turn out to be murderers, paedophiles, rapists etc, but if everybody knew what everyone was up to using sousveillance, could this also aid people to know who was watching them if they were being stalked etc?

Steve Mann: *Yes, you raise an interesting point, namely that locking only some of the doors but not all of them, makes a risk.(See* http://wearcam.org/terrometer*/) If you lock only the front door but leave the back door unlocked, it's not good enough. Surveillance leaves the door to top-level misconduct open. If you put surveillance cameras only on even numbered streets, crime moves to odd numbers. If you put surveillance only, crime moves upstairs to high-places, sousveillance is necessary, therefore for more, see* http://www.eyetap.org *and* http://glogger.mobi *my glog is in* http://glogger.mobi/mann/ *along with a community of more than 20,000 other cyborgs.*

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Appendix 3

In Correspondence with Paula Roush **by Kay Johns**

Wednesday April 16, 2008

Paula Roush is a London-based media artist, and one of the first people to explore the sonic properties of *Radio Frequency Identification*. Paula uses interactive technology in her work, by recording sounds from bleeps in underground tubes from *oyster cards* that register and store both identities and destinations of travel. Below is my correspondence with Paula:

Kay Johns:

Dear Paula,

I hope that you don't mind me contacting you. I'm a student at Northbrook College, Worthing. I'm studying Fine Art and currently writing a dissertation about Posthumanity, including *RFID* technology, and was wondering if you could help me. In an interview that I read about you, with Regine Debatty from the *New Brave World project*, it said that your second arphid sound jam recording was a memorial at Stockwell tube station on 10th June 2006. The question that I would like to ask is: was this a memorial for Jean Charles Menezes? Only I wasn't sure because it just said memorial and obviously the dates don't match up with his murder, so just wondered that you may have done this on a different date, or that it may be for something else! If you could let me know it would be much appreciated.

Cheers Best Wishes Kay.

Paula Roush: Thursday 17th April 2008

Hi Kay

Thanks for your email, yes, it was. I have sent you an attachment of text I wrote on the subject, it may be helpful. I am now organizing w/kisss, an exhibition on surveillance for the Castlefield Gallery in Manchester. We would like to see your dissertation; can you send us more info?

Thanks, Paula.

Paula Roush:

Arphield Recordings is a project documenting impromptu arphid sound performance produced by people scanning their oysters cards in the daily routine of access control to the London tube stations. The methodology of field recordings (documentation of site-specific soundscapes through audio recording equipment) is, in this case, focused on the sampling of sounds produced by the use of arphid (rfid) technology (cards and readers) complemented by digital processing involving sampling and synthesis from the source, speculating on the ad infinitum convergence of arphid tags and readers into an endless symphony of sound surveillance and compliance.

The project started with the idea for an arphid mob, inviting friends to join me at a designated tube station for a semi-choreographed sound jam using our oyster cards. The main question was 'when and where' as a major obstacle would always be the heavy security at all gates. It was decided I would do some observation and this would eventually indicate the best timing and location for our arphid mob. Observing the familiar tube's access control gates, initially with no equipment and later with a camcorder, I realised that people were already engaging in impromptu sound performance. My documentation led me to discern varied patterns and even participatory scores, with mass arphid soundscapes punctuated by silences, glitches and cracks in the system, all warped up in a circadian rhythm of work-rush hours.

The first arphield recordings – documenting the impromptu sound performance of people moving through the London tube access control gates were done in Brixton, Kings Cross and Caledonian Road tube stations during march 2006 for the TAGGED one day event at SPACE Media Arts (Node London March 2006), when Cds with the tracks and locational tags were distributed. The second arphield recordings- the Stockwell sound jam memorial happened on Saturday 10th of June 2006 when people in London were invited to gather in the Stockwell tube station

and scan their oyster card for 30second sync periods accompanied by a pod cast of pre-recorded oyster beep tracks.

The third arphield recordings –the old street arphield gatecrash- took place on Saturday 7th of October, with instructions to download oldstreet.mp3 to a portable music player and turn up at the tube station, and at the signal start the jam moving arms up and down touching in and touching out in synch following the soundtrack.

The project remains open to contributions. One way of doing this is downloading the arphield recordings and visiting the station gates with the sounds on a portable music player to experience a mix of live and pre-recorded oyster beeps. Another way of participating is by contributing arphield recordings from a tube station's access control gate. You can do this by opening an odeo.com account and uploading your recordings , tagging them as arphield recording followed by the number unique to your oyster card (as in arphieldRecordings-0503266130-03)

Arphield Recordings was conceived as a probe into the practice of sousveillance and a more general understanding of the the arphid surveillance/equiveillance of public space and transport. It also foregrounds itself into the field of networked performance and possible notions of community, interaction, and connectedness among participants. The emerging field of personal sousveillance - the capture, processing, storage, retrieval, and transmission of an activity from the perspective of a participant in the activity (i.e. personal experience capture) using camera phones, and wearables has been mainly focused on the visual. See the dominance of weblogs as photo- and video-blogs as an evidence of this. Surveillance studies as well have given a pre-eminence to the visual. However, "The history of surveillance is as much about a sound history as a history of vision" / "we need a sound history of surveillance" / "the polyphony of sounds increasingly regulates and is regulated by us" as Michael Bull and Les Black write in the intro to the Auditory culture reader (2003) 'Eavesdropping, censorship, recording, and surveillance are

weapons of power' writes Jacques Attali (1985) 'The technology of listening is on, ordering, transmitting, and recording noise is at the heart of this apparatus…who among us is free of the feeling that this process, taken to an extreme, is turning the modern state into a gigantic, monopolising noise emitter, and at the same time, a generalised eavesdropping device'.

Heritage: back to the initiator of urban field recordings Pierre Shaeffer's 'Etude aux chemins de ferre' (1948), first example of musique concrete, who also employed a variety of manipulation techniques as the sounds remained too recognisable which led him to define it as sound-works but eventually reject as music; And back into the present where collage and field recordings in the electronic age include dial tones (golan levin) or data noise (ryoji ikeda)

In 'Sync or swarm–improvising music in a complex age', David Borgo (2005) positions music-sound as an excellent site for the study of sync in performance and in the dynamics that shape a musical community. 'Coordinated rhythmic activity ' crucial to social life "muscular unison" collective bonding" are as much at play in improvised musicking as when people are moving through the arphid gates, sharing a sonic experience where there is a group interactional synchronicity, an underlying modulation between sync and swarm, order and chaos mediated by the network.

Several studies have described the ordinary experience of moving through the city with mobile sound devices: walkmans, car radios, ipods and how new sonic territories are created in the course of these journeys. Similarly, the experience of public space is transformed as users move through with their oyster cards: the daily regulation of city walking/journeying sounding through the beeping of several electronic devices as oyster card users engage with sound technology.

The oyster card has an added layer due to the arphid's identity features. The processes involved include: (1) the registration of the card with one's id and a product identifier unlike the barcode the unique ID number inserts one into a traceable network that can map one in space/time). Id technologies, such as passports, national id cards, have been designed to facilitate identification by binding identity to the body, by associating with other identifiers such as the name, address, signature, but crucially arphids bind the body to a unique identification number, that will be associated with a database allowing for all sorts of correlations between data and other personal/social identifiers to be made.

The second step (2) is connected to 'topophonic knots' (Paul Thibauld term), the interference point between media listening (in this case also sound-producing) and architectural space is the one of access which leads us to think of the travelling space as one of doors (bus), gates (tube/trains), with the transition from the motion of walking into the one of being transported; the gates of the tube station or the readers inside the bus are sonic doors or outposts, intermediary between two ways of travelling the city in the case of the tube even more accentuated by the shift in verticality from the underground space into the street level. Also the space where regulation is more visible and the identification of the body becomes audible and thus public and de/re/territorialized.

Currently, arphid became almost synonymous with the internet of things and with ubiquitous computing, with its tendencies to use centralised proprietary systems, sharing information between authoritarian structures of commerce, policing and control but creating a form of segregation that excludes the surveilled from access to this data. A position one can take now is to expand or enlarge on current studies of surveillance. On one hand, metaphors that describe our current state of surveillance as panopticon are well established and there is also an acknowledgment that people are starting to use panopticist tools for playful, entertainment and tactical purposes. On the other hand, unlike surveillance that isolates and disconnects, there is a feeling that today's personal sousveillance

technologies like camera phones and weblogs might help to connect and build networks or a sense of community. Crucially, equiveillance -the balance between surveillance and sousveillance- which allows the individual to construct their own case from evidence they gather themselves, rather than being subjected to surveillance data that could possibly incriminate them, remains a viable road.

For example, one of the most disputed events following the 7/7 attack, related to the murder of Jean Charles de Menezes in the Stockwell tube station is the narrative surrounding the use of oyster card by Jean Charles and whether he jumped over the ticket barrier running down the escalator to jump onto the train. This was registered in the post-mortem report but later the police briefed the family that he had actually used the travel card to pass through. According to the leaked IPCC documents, Menezes passed through the barrier normally using his pre-paid Oyster card. Police initially refused to release CCTV footage while the IPCC investigation was ongoing, even to the family. It had been suggested that the man reported by eyewitnesses as jumping over the barrier, may have been one of the police officers in pursuit. Even more chilling than this slippage, is the fact that such technology is already in place that allows for the tracing of public transport users throughout the city as a centralised database to which its subjects cannot themselves have access.

http://odeo.com/channel/85358

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Appendix 4

A Conversation with Professor Kevin Warwick **by Kay Johns**

Thursday 10th January 2008 11am.

Kevin Warwick is a professor of cybernetics at the University of Reading, England. He has carried out a series of pioneering experiments involving microchips implantation into his body. Kevin's latest experiment on himself involved a neuro-surgical implant of a device into the median nerves of his left arm, in order to link his nervous system directly to a computer. Today I spoke to Kevin on the telephone to find out more about his work.

Fig 11: Kevin Warwick: *Controlling robot-arm over the net.* Photograph from: http://www.itwales.com/997730.htm

Kay Johns: Can you describe how and why your interests in cybernetics led to these quite dangerous experiments on yourself, with microchip implants put directly into your own body*?*

Kevin Warwick: *Yes I guess it's really because this technology has become available and working with surgeons it has been possible to have gone this far. I wanted to push things a little bit further, and then after the first implant in 1998, I looked for the communication aspect and wanted to take that a little bit further, trying to get signals from the brain to the computer and back the other way. We looked initially at muscular connections, to put something in the way and to find that technically we could actually go for connecting the nervous system to the computer, and this was very exciting, and the fact that we had surgeons willing to come onboard, perhaps for the more therapeutic reasons, but nevertheless they were happy to experiment with us, and this was tremendously exciting I guess.*

Kay Johns: Yes, could you explain more about how you put a Multiply Micro Electro Array inside your body to connect with the nervous system?

Kevin Warwick: *Yes, what it is, if you think of an electrical plug with two or three pins on it, typically in England three pins. What I use in the array, is something the same as that, but has one hundred pins not three, with pointed ends. If you think of a hair brush type thing, but with pointed ends, with electrodes in them to make electrical contact, but instead of an electrical plug that you would push into a socket, these one hundred pins were pushed into my nervous system. The size of it has to be clearly appropriate to the nervous system, which it is, and the over all size, the dimensions of the array, are something like four millimetres by four millimetres. Each of the electrodes is one and a half millimetres long or each of the spikes is one and a half millimetres long. The nerve fibres in the arm, in total function of nerve fibres in the median nerve is about four millimetres in diameter, so pushing one and a half into four millimetres goes in about half way into the nerve fibres. It's not really possible to actually make direct contact with individual nerve fibres as it's like pushing a pin in, or if you like the nerve fibres are like a bunch of wires, so this was like pushing one hundred pins into a bunch of wires. You can then pick up signals, and if you push electrical current in you can send currant along the wires and so on. It's about the best we can do at the moment, but we are getting a pretty good connection with the nerve fibres*

Kay Johns: I have read that the Department of Defense in America has a section called the Defense Advanced Research Projects Agency (DARPA) , that are further developing the Multiply Micro Electrode Array (MMEA) to make a cyborg soldier, do you know anything about that?

Kevin Warwick: *Yes, I have spoken to them, but I have not done any work with them directly, but I am clearly aware of the technology, for them the potential is enormous. I wouldn't guess that there are any soldiers actually connected up at the moment, but I would speculate that it's more of a research thing for them. It is something that they have to look at very seriously because it does offer enormous positives. By extending your capabilities via a network means that the soldier doesn't actually have to*

be at the battlefield they can be remote, so there are distinct advantages to it, and some of them are very politically good advantages, as you don't lose you personnel. So it wouldn't surprise me that they are researching into the use of this, but it would surprise me at this time if anybody has actually tried it directly, or it would just surprise me, but because the technology is there from a surgical point of view they wouldn't be the first doing it, but I just find it a bit bizarre. But clearly in the military area there is a lot to gain by using this technology.

Kay Johns: I read about the possibilities that the MMEA implant could also be used in soldiers to change their emotions, so if they are in scary situation their emotions can be changed using software applications that would be downloaded into their nervous system to change their mood. Do you know if this is true?

Kevin Warwick: *I wouldn't say so, but we don't know, I don't know, but I wouldn't have thought with this type of implant that it would be that easy, but that's not to say… With the deep brain implant, this is the sort of implant with electrodes into the central area of the brain, these are the sort of electrodes used for Parkinsons Disease and Epilepsy, but clearly you can change the mood of a person just by putting signals into the appropriate place with standard signals nothing special. You can make somebody feel very depressed, or you could make them feel very happy, or like somebody has just won loads of money, so pleased about everything purely in response to an electronic signal. So that thing is possible yes, but the type of electrode is a lot more serious, it's a full implant into a different area of the brain altogether. Whether such a response can be brought about by this particular type of array, where you're looking at relatively speaking near the surface of the brain, or into the nervous system it's unlikely, but I'm giving you a fuzzy answer there. It is possible with electrodes yes, but maybe not with this type of electrode, whether they in the military would put more serious electrodes into soldiers is doubtful at this time, but they could be researching it clearly.*

Kay Johns: In an interview with IT Wales in 2006, you said that you've been working on culturing neural networks. So instead of controlling a robot by a computer brain, you plan to grow an artificial brain from biological tissue and put inside a robot to control it instead. Have you been successful in doing this yet?

Kevin Warwick: *Yes you're timing it very nicely, we're actually starting now just to tell people about what we are doing, yes, at the moment the cultured neurons are able to drive the robot around. This is just a little robot in the lab I have to say, it's not an enormous thing outside, but it's a pretty awful driver, it's not particular good. It's taking the signals out of the cultured brain and using them to drive the robot, but the cultured brain doesn't really have much idea what it's doing. The research over the next few years will allow me to get it to learn to be a better driver. In a simple way at first, by allowing the robot to drive forwards without bumping into anything, but yeah it's taken us since you spotted that report, a year or so to get everything in place. We have cultures that are three months or so old, they have been linked up to the robot for sometime and it's all looking very very good. We are just at the stage where we have started to get results, and we are starting to really have the fun side of the research, and seeing how we can get it to learn. It's an exciting area and I think it is allowing us to learn a lot more about how neurons can bond together, and how we can teach brain cells as it were. So, I think the typical numbers of cells that are being used is something like 50,000 neurons, which is more than we were hoping for, so it's really quite good.*

Kay Johns: Could you explain more about how they grow?

Kevin Warwick: *Yes I can, most of the ones we use are actually defrosted, some of them are from cancer tissues, the neurons are separated initially in a solution, a particular liquid we use, and simply squirted down onto a slide and on the slide is a different type of electrode array. It's an electrical connection that's flat, not like the spiking ones that we were talking about earlier. These are just flat electrodes with*

connections to the outside world. Within about two days of being laid down onto the slide, the neuron will reach out, it's something they do, they will try and reach out and make connections with other neurons, and when they make connections, those connections are electro chemical. Subsequently, after about one week if they make a connection we apply electrical pulses via some of the electrodes and then elsewhere in the network, we start to get electrical pulses back off other electrodes. It starts to work like a type of brain, so it's quite simply more electro chemical growth of the network, just as a baby's brain would grow or whatever. The neurons start connecting up with each other; the research is that we will be trying to get the connection to be for a purpose. At the moment they just connect up almost in a random way, but that's what they do connect up. We want them to be connecting up and strengthen them in order to drive the robot around so they have a purpose a goal in life.

Kay Johns: So are these cancer cells taken from human bodies?

Kevin Warwick: *Well the cancer cells that we got are taken from rats brains about thirty years ago and are frozen. So they are rat tumours originally, which is most of what we are doing, but they have been frozen for about thirty years and we have defrosted them. They are quite amazing really, quite strong cells, it all sounds a bit strange, but we are learning a lot about how neurons connect up and how we can stimulate something. So, you're just at a nice time, I think in about a months time or so we might well release out to the news how far we have got with it, we are just at that stage where we are looking to put a package together that people can understand generally.*

Kay Johns: When you use these cancer cells from rats, were they made to get cancer or was it genuine cancer?

Kevin Warwick: *To be honest I'm not completely sure, we purchase them and they just come to us in a package, but from what I understand it was originally from brain tumours in rats, though how those brain tumours got*

in the rats, if they were rats with brain tumours or if somebody somewhere in the past brought that about, I honestly don't know. It's just something you can order a bit like a book like off Amazon or something, you can just phone up and place the order and they come in a package.

Kay Johns: On the internet there are quite a few conspiracy sites about you, saying that you are the damned because your first implant in 98 had a number, and that number is the mark of the beast☺ In your book 'I Cyborg', you mentioned that the number 666 actually did cause problems when used as a code at Reading University, instead of allowing your implant to activate doors, it brought the whole system to a standstill and no could figure out why? The question that I want to ask is, was this actually true, or was it just to up the book?

Kevin Warwick: *No, it was true everything in there was true, and I didn't make up the story. I'm very much a Scientist; I'm very much a practical person. I don't believe in voodoo or strange things like that so for me this was funny. Darren the guy, the main researcher put 666 in, he just did it for a laugh, but all that I described there was true, the number 666 couldn't go off, it wouldn't work, the system crashed just before we were doing it.*

Kay Johns: That's very strange isn't it!

Kevin Warwick: *I'm sure that there must be some technical reason behind it, but it's one of those things, it's all a bit weird and it's all a bit funny but that's exactly how it happened and I was 161, as boring as it was that it worked on, again once we got it working right we stuck with it and thought don't change it, use that as it is, as it's fine (laughs).*

Kay Johns: Do you think there should be any safeguards in the future to protect humans if they don't want to become Posthuman?

Kevin Warwick: *Well that's difficult for me to say, clearly at the moment the technology is really coming about, it's really going to be giving us*

abilities or potentially giving us abilities that really will change things. I mean you can see in other spheres the potential with beauty products or even with technology externally that a lot of people will want that. If there is a swing socially to having certain pieces of technology then it will become very difficult for people not to go with it. I mean now you do get people that do not have a television, or do not have a radio, or do not have a telephone because they don't believe in it somehow. You can get by, you can still live in society without that, but it is difficult at times because society will be like, what you haven't got have a telephone, no television, how can you live with it! Sometimes a conversation would be what was on television last week, but you can still get by in society, but it does put you at a disadvantage though. Not only with this but internally you would have that disadvantage, but a lot more. I think that with getting employment will assume you will have this technology as part of you, but also the abilities that it gives you will give you an advantage, but anybody that didn't have it would really be at a disadvantage. Whether it does become more of an evolutionary thing that you do become ultimately a type of a subspecies, I don't know, it's perhaps pushing the philosophical side of things at the moment, and saying that this could be a possibility, but really it could be a possibility as far as I see, but whether that would definitely happen I don't know. So thinking in the early stages, clearly it would be possible for someone to not go with the flow but it would be very difficult.

Kay Johns: Yes because I've read about nightclubs in Scotland and other places that are already implanting their customers with a micro chip so that they don't need to carry money around and can pay for their drinks using the implanted chip.

Kevin Warwick: *Yes Sure.*

Kay Johns: But I'm just thinking of the future, and if people don't want to have this chip, do you think there should be any safeguards so they can pay by other means if they choose instead?

Kevin Warwick: *Well there probably will be initially, but you got the trade off, there will be lots of advantages doing it the new way, the technical way and even trivial things at the moment with money. If you have direct debit you pay less with direct debit, well fine because the system works best to pay for your bills, ok it's not an enormous advantage but it is generally better to do that. Then I guess if you have a credit card you have more advantages, and the use of cash becomes far less important. At the moment you can still get by, you don't have to have a credit card and you don't have to pay by direct debit at the moment, but the way society goes is before too long you do, because if you don't have that you will be really missing out on a part of life, you almost have to go and live on a remote Scottish Island or somewhere, otherwise you are not taking part in normal everyday life.*

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Appendix 5

An interview by email with artist Nancy Nisbet by Kay Johns

Tuesday 18th December 2007

Nancy Nisbet is a Canadian multidisciplinary artist, and the author of *Resisting Surveillance: Identity and Implantable microchips*[113]. Nancy has had two Radio Frequency Identification micro chips implanted into the backs of both her hands. Nancy plans to modify her computer mouse to incorporate a scanner to pick up the chip's signal and monitor her internet use. One hand will be used to surf while she's working, and the other for recreation, allowing her to track and compare both identities. Today I asked Nancy some questions regarding the micro chip implants, along with her installation called *Pop Goes the Weasel* and her project called *Exchange.*

Fig 12*: Nancy Nisbet* (Portrait) Photograph from: www.finearts.ubc.ca

Kay Johns: Since 2002 when you had *Radio Frequency Identification (RFID)* Microchips implanted into the back of both hands how much information have you gathered about your virtual identities of work and recreation. Also how many identities have you been able to expand upon and track?

Nancy Nisbet: *Well, although I did implant the 2 chips in 2002, I did not receive funding at that time to complete the project. I subsequently moved on with other projects and am only now returning to the one you mention. I am hoping to actually start the virtual tracking project this summer.*

Kay Johns: Reading your article 'Resisting Surveillance: Identity and Implantable Microchips[114] the concern about the future use of *RFID* microchips became apparent. The further development of the Multiple

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[114] Leonardo. Vol.37, pt. 3, 2004, pp. 210-16

Micro Electrode Array *(MMEA)* that the Defense Advanced Research Projects Agency *DARPA* (anti-terrorist organization) are researching is also a concern. What are your views on the MMEA?

Nancy Nisbet: *I have not done enough research into MMEA to comment on this with any expertise. I do still maintain my concern over the use of RFID for identifying people - whether implanted or not. It is certainly no surprise that the military (and research companies) are investigating the feasibility and potential uses of technology such as MMEA and as a general response I am concerned over HOW technologies are used and what motivates the implementation or extended uses of such technologies.*

Kay Johns: In your installation, '*Pop! Goes the Weasel*,' did many participants try and resist surveillance, also what comments did you received about the installation?

Nancy Nisbet: *It was interesting to observe peoples' reactions to the installation. In one sense, the cultural context of the installation (set in Japan), seemed to play a rather significant role. Japan is a fairly rule-based society and active 'resistance' is often downplayed. It is definitely notable that people eventually did resist and avoid the surveillance of this installation. I noticed that people did walk around the entrance and exit gates for example, and some people went through the gate with another*.

Kay Johns: In your artwork *'Exchange'* you freely traded your own personal belongings with other peoples possessions, have you still kept all of their belongings or did their possessions also get exchanged later too? Also do you know if the other people have kept your belongings or exchanged them?

Nancy Nisbet: *The things that were traded were/are always available for trade - so the items may come in to me, and then leave again. In the cases that I am aware of, many have kept the items that they received from the trade. I do expect that some have continued trading them*.

Kay Johns: In a growing world of technology and surveillance the separation between physical communication is becoming less, we have internet shopping and banking, and machines in shops instead of cashiers, do you think ‘Exchange’ made people think about how our lives are physically changing along with the technology that is becoming integrated within our societies?

Nancy Nisbet: *I'm not entirely sure what you mean by "the separation between physical communications is becoming less". If you mean that our human to human interactions in everyday consumer life are becoming less, I would agree. As for the effect of Exchange on peoples' sense of change - I'm not sure if their impressions went to the area of separation between physical communication or not. What I perceived is that many responded to the RFID technology quite strongly. Some became suspicious of it as they learned about it through Exchange - and would not trade, others were happy to trade and play a role in the spread of knowledge about the positive and negative impacts of technologies such as RFID. Mostly people seemed to become very engaged in the stories of the objects and trades themselves – actually bypassing the commercial sector and having a sense of relationship with another human being who had some emotional and narrative connection to the object. In a way it was community building on a personal yet virtual level - using the technology to build stronger bonds between people through a physical object and personal narrative.*

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