The Language of the cybersouls

Conference or Workshop Item

the language of the cybersouls

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What`s Technology and What Shapes it?

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1. an aside

using the word 'technology' in the way we know is a recent innovation

'the systematic knowledge of the industrial arts; a discourse or treatise on the arts … an explanation of the terms used in the arts'(Macdonald 1949)

Technology, as we use the word, is a recent addition to our vocabulary. A dictionary published in 1949 advises that technology is

> 'the systematic knowledge of the industrial arts; a discourse or treatise on the arts' or 'an explanation of the terms used in the arts'[1].

The word has been around for some time. 'technologie' appears in Diderot's encylopedia of 1756 but with an unfamiliar usage, and when a book was published with the title 'Elements of technology' in 1828 a reviewer complained

> 'The word technology gives but an imperfect idea of the contents of this volume.'[2]

Only after the Second World War did the term gain currency. Since the term is relatively new then we should not expect any long standing theories on the subject.

The Greeks though did have the word *technê* and it is perhaps worthwhile seeing whether what they wrote about has any relevance.

2.hazards

politics and technology

Technology engenders 'mystification, passivity, and fatalism'. This may be a sign of its power.

In 1997, Leo Marx wrote a paper entitled 'Technology: the emergence of a hazardous concept'[3]; he felt, technology engendered 'mystification, passivity, and fatalism', which contributes to 'political impotence'.

Socrates would not have recognised Marx's picture. For Socrates, *technê*, the distant cousin of technology, was, potentially, the ideal political device.

But wait! There may not be clash; rendering the political opposition impotent is a political tactic and Marx's comment may, paradoxically, point to the potency of technology as a political weapon.

3.Collective

A technology is a collection of components

'technology' conceals laboratories, personnel, funding agencies, apparatus, buildings, publications, legends, dreams, theories, ambitions, political will and so on that collectively manipulate quanta

Marx's mysticism arises because the word technology cloaks an array of human activities. A sentence like 'A quantum technology is a technology which manipulates quantum probability amplitudes directly'[4] conceals, in the word 'technology', the laboratories, personnel, funding agencies, apparatus, buildings, publications, legends, dreams, theories, ambitions, political will and so on that collectively manipulate quanta.

Perhaps, it is because 'machines have … been associated with dehumanisation' that we hide the machinery as in the theatre which, Julian Hilton wrote, 'has rarely faced its own technological nature'[5].

Technology, then, stands for human endeavours like quantum technology and the theatre.

4.Goals

A technology requires an external goal

For example, 'biotechnology is a means of gearing the material order of living matter … to produce … 'biovalue', a surplus value of vitality and instrumental knowledge'(Waldby 2000)

Such endeavours need goals and present day conceptions expect technology to provide a means to achieve an external goal, for instance, Catherine Waldby writes

'biotechnology is a means of gearing the material order of living matter … to produce … a surplus value of vitality'[6]

And part of our linguistic confusion about technology is that this, in the Anglo-Saxon world, has also become the point of science. As Gerard Milburn wrote,

'[An] aim of modern science is to reach an understanding of the world … that it may be ordered to our purpose.'[7]

5.Politics

Political action needs a sense of direction and a clear passage

the tangled collective to express a sense of direction and it requires the displacement of other groups with conflicting ambitions

The pursuit of goals for a collective is doubly political. It requires the tangled collective to express a sense of direction and needs the displacement of conflicting ambitions. Thus the interpretation of the claim that a country is 'the world's leading … technological … power'[8] must be that actions towards meeting the goals of that nation are dominant in the world.

And on a smaller scale, the call from the people rooted in the communication industry that 'hopefully … things will start moving …allowing for new technology deployment and development'[9] must be interpreted as a yearning for their interests to predominate.

6.Self conception

Altering views of authority is a political tactic

Politics can attempt to remove or impose obstacles, or it can attempt to change the sense of authority of those who feel obstructed, or those who feel uninhibited

The political effect of technology is to enhance or constrain the capabilities of individuals. For instance, an editorial presents surveillance systems as 'technological tools' that supplement 'humans by providing an extended perception and reasoning capability'[10].

But politics can operate on several planes: it can attempt to remove or impose obstacles, or it can attempt to change the sense of authority of those who feel obstructed, or those who feel uninhibited.

Thus in telecommunications an industry leader claims that growth in the industry required 'changes in the mindset of the users'[11].

Additionally, our assimilation of technologies, changes the way we are organised, the way we talk and think and thus alters the way we describe ourselves and our relationships.

These changes dynamically and reflexively present new obstacles and alter political targets. Through our technology we both provoke and are provoked by change.

7.Progress

The myth of progress is commonly attached to technology

The demonstration of progress may be an attempt to show how technology portrays the ingenuity of humankind

Notable political successes or potential successes of technology are transformed into legends of optimism and pessimism by the protagonists.

For instance, there is an echo of the Promethean origin myth in Sir Leon Bagrit's Reith lecture when he said,

> 'There is a great technological explosion around us, … freeing … people from their traditional bondage to nature'[12]

And, it seems, that we can expect more since, Gerard Milburn writes, 'Like the horizon, apparent limits to progress of modern technology fade before us as we move'[13].

Technology it seems is to be created in the image of man for, Sir Leon also noted, 'the direction of modern … technology is towards the creation of … machine-systems based on man as a model'[14]. The goal then seems to be the creation of a self-image.

Critics might agree but they might be disturbed by the image that is created, for instance, by polluting technologies and technologies of war. The optimists evade these moral discomforts by setting their goals as internal to the technological enterprise, as an editorial recently claimed

> 'Progress in science and technology has led to brilliant successes. We have sent men to the moon, built the web, and are on the brink of mapping the structure of the genes'[15]

The external goal is then to provide reassuring demonstrations of the ingenuity of humankind rather than improvements in the human condition.

8.Technology

Exploits theories, generates material changes, is a collective enterprise and is political

'Today we are surrounded by technology that owes its existence … to the application of quantum mechanical processes. From the humble CD player to the marvels of modern optical fibre communications … quantum technology is a serious money making business'(Davies 1996)

Let sketch things out — using a passage on quantum technology. We expect technology to operate within the theoretical framework of science: as the extract says

'we are surrounded by technology that owes its existence … to the application of quantum mechanical processes'

The technology generates material changes, examples given are 'the humble CD player' and 'the marvels of modern optical fibre communications'

and the whole is a collective enterprise since, apparently, 'quantum technology is a serious money making business.' [16]

But overall technology is a political enterprise thus devoted to obstructing or promoting change.

9.Technê

Translated into art, or skill or science

The Greeks are blamed for using words interchangeably. It is conceivable the translators are confused.

The Greek word *technê* is translated in several ways. Translators blame the Greeks for using words interchangeably, but maybe the translators are confused.

10.Aristotle

Kinds of technê

There are a number of *technê* which form a hierarchy. Politics is at the top.

Aristotle wrote about *technê*.

His examples of *technê* included flute and lyre playing, weaving, building, bridlemaking, and navigation. He also mentions the arts of the carpenter, sculptor, tanner, geometrician, navigator, doctor, perfumer and chef.

In Aristotle's scheme there is a hierarchy of *technê* and, he adds, "the highest … is obviously politics"[17].

11.Existence

Technê has an end beyond activity

Technology brings good things into existence through skill. The skilled person is virtuous.

Aristotle declares every *technê* is to do with "coming into being"[18]. It involves studying how to bring something, which originates with a producer, into existence.

The first words in his *Ethics* are, "Every *technê* … is thought to aim at some good"[19]. Each *technê*, Aristotle proposes, creates different goods[20], and judgements about the goodness in things depend upon the particular trades: for instance we would expect the details of justifications about their actions from a carpenter and a geometrician to differ.[21]

Aristotle reckons the skilled person is worthy and their skill is virtuous. Somehow some of this virtue rubs off so that every good thing is the product of skill[22]. However, valued things can be produced by accident or imitation so, according to Aristotle, particular actions do not identify someone as skilled[23]. *Technê* is therefore more than action and its goal is to create something good above and beyond a particular activity.

12.Connections

Technê is not supposition or belief

Skill, a mixture of reason and virtue, can be taught and is open to rational explanation.

Aristotle, in discussing ethics, contrasts *technê* with supposition and belief[24] and presents skill as a mixture of reason and virtue[25] which is synonymous with wisdom in

technê that Aristotle attributes to "the most exacting practitioners".[26] He presumes virtues can either be taught or manifest themselves as habits which the virtuous person can properly justify. Since virtue must be justifiable, skills too must be open to rational explanation.

13.Deliberation

Technê requires careful deliberation about action

Deliberation is a defining feature of *technê* and of technology. A technological enterprise employs experts deliberate about the production of valued products.

Aristotle explains that people deliberate about their *technê* and because there are greater uncertainties, they are more measured than if they were involved in science[27]. This deliberation can be good or bad and cannot simply be the recall of scientific knowledge.

Good deliberation must consist of faultless inferences and contribute to the production of a worthy product. Generally, Aristotle writes, this deliberation requires inquiry and calculation.

For me, this is the heart of *technê* and of technology. Rosalind Williams, an erstwhile Dean at MIT, suggests that meetings are "a primary site of technological action today" [28], and it is clear that professionals of all kinds in enterprises spend much of their time debating the options that will influence the products of their organisation. We are also careful in assigning people roles and selecting who can join in deliberation, to ensure that the deliberation is of a suitable standard. The engineer, for example, is asked to produce considered accounts, reports and justifiable designs — internal products for the enterprise which influence production.

14.technê

Aristotle in the Ethics

A *technê* consists of an activity that produces something of value through the actions of skilled people who conceived the product and who deliberated about its production

According to Aristotle, then, a *technê* consists of an activity that produces something of value through the actions of skilled people who conceived the product and who deliberated about its production. These skilled practitioners can provide justifications of their actions that they were taught or that were reinforced through routine.

15.technê

Aristotle in the Metaphysics

Generalisation, Teachability, Precision, Explanation

'we assume that practitioners of *technê* are wiser than men of mere experience … because the former know the cause, whereas the latter do not'

In the Metaphysics, Aristotle summarises some major features of *technê*

First a *technê* categorises experience[29] to aid prediction.

Second a *technê* can be taught.[30]

Third, a *technê* should offer precision in judgement. Thus a *technê* that has established and measurable goals is favoured.

Fourthly a *technê* offers explanations of its procedures. Aristotle writes

> 'we assume that practitioners of *technê* are wiser than men of mere experience … because the former know the cause, whereas the latter do not'[31]

16.Plato

Promethean legend

Prometheus gives people the *technê* stolen from the gods. Zeus gives humankind a sense of justice and respect.

There is a legend about how Prometheus, the only clever Titan, brought the *technê* to humankind. The story, related by Protagoras, tells how two Titans distributed a pool of powers and traits among the creatures formed by the gods from earth and fire. Epimetheus asked Prometheus if he could do the job alone, saying that he would let Prometheus check the result. Prometheus agreed.

Epimetheus tried to be fair, for example, by giving swiftness to animals that did not get strength, but he blundered and ran out of powers before he had dealt with the humans. Prometheus, checking the work, discovered the omission.

Humankind was due to emerge from the Earth. To redeem humankind, in haste, Prometheus stole the secrets of the arts and crafts from Athena, and the secrets of metalworking and fire from the god Hephaestus, and distributed them amongst people. This helped humankind survive, but wild animals harried them and when people formed groups to protect themselves, they fought among themselves. Zeus was alarmed and sent Hermes to imbue humankind with a sense of justice and respect for one another.

17.Aeschylus and Sophocles

Types of technê

Medicine, prophesy, mining, ploughing, government are examples. But the political *technê* is the least developed and not inherited from the gods. A new political *technê* is needed.

In a play by Aeschylus, Prometheus explains that he taught humankind about calendars, astronomy, about the primary skill of number, and about the "mother of many arts" — writing. He showed people how to harness animals, exploit horses, build ships[32] and taught them about medicine, prophesy, mining, and he concludes, immodestly, "every *technê* possessed by man comes from Prometheus"[33]

In Sophocles' Antigone the chorus applauds the skills of people that protect them from the weather and baffling diseases[34], the skills of speech, thought, ploughing, taming and trapping animals[35]. People are praised for bringing order to the city[36]. Their story is of progress but the chorus is uneasy because as Sophocles shows in Antigone, people found it difficult to maintain a healthy stability within a city, or a family. The creation of humankind did not give them a *technê* for handling conflicts of interest.

Plato tackles this question.

18.Socrates

Protagoras and Socrates in conversation

Plato through his report of Socrates' conversations explores potential *technê* of politics — ways of resolving conflict and preventing irrational acts.

Protogoras, an early Socratic dialogue, recorded by Plato, opens when a friend is surprised that Socrates has not spent time with his youthful lover. Socrates explains that he has been to meet the wise Protagoras, and justifies his action by saying, 'must not the wisest appear more beautiful?'[37].

The night before, Hippocrates asked Socrates to go with him the next morning to see Protagoras, the famous teacher. Hippocrates wants to learn from Protagoras, but is not quite sure what he will learn. Socrates counsels caution because, he declares, teachers are like food retailers who say their wares are good for you, but they do not really know.[38]

This opening outlines two problems and Socrates' solution. The problems are: we often have to decide between conflicting options, and our feelings can cause us to act rashly. The solution, according to Socrates, is to express all the advantages and disadvantages in the same terms then calculate which option outweighs all others.

19.Protagoras

Protagoras' position

Protagoras claims to have a *technê* of politics that relies on clever speech and evades rather than resolves conflict.

The dialogue continues exploring two proposals for a new *technê*, which is to overcome the remaining uncertainties in human lives caused by passions and the inconsistencies between our commitments.

Socrates concludes that Protagoras' art produces clever speakers.[39] Protagoras calls it 'a *technê* of politics' and his recipe for dealing with conflict is primarily one of evasion. He provides, he claims, a *technê* because he is offering an orderly understanding. Socrates does not think Protagoras' art can be taught and challenges it as a *technê*.[40]

20.Pythagoras

Plato assumes every technê should include number and calculation

Socrates proposes scheme for measuring good and bad which can make decision-making a matter of calculation

In the Republic, Plato following Pythagoras writes that every *technê* must include number and calculation[41].

Socrates argues that numbers help to decide and compare things. He proposes that there are not different kinds of good and bad, and that like weight, good and bad are properties that everything has.

He plans 'like an expert in weighing, [to] put the pleasures together and the pains together… and say which is the greater quantity'[42].

Socrates also explains, 'the *technê* of measurement' removes controversial appearances, from the equation.

More subtly, it eliminates distinctions that cause us irrationally to cling to treasured attachments.

21.Gorgias

Socrates' scale extends from pleasure to pain.

In the Gorgias, Socrates wants individual expert judgement, the generalisation of experience and unbounded deliberation.

These are not ingredients of a practical politics.

To complete his scheme Socrates requires a satisfactory measure and in the Protagoras he adopts a scale of pleasure and pain.

In the Gorgias he elaborates and in the process dismisses certain *technê* such as cooking, music and poetry as worthy pursuits. Where practical politics requires haste, his formula requires unbounded deliberation; to gain cooperation decisions require the consent of many but Socrates wants the individual judgement of an expert; finally Socrates wants to generalise experience where, in contrast, practical politics deals with unique circumstances. Socrates solution seems ideal but impractical.

22.Ethics

measurement or consent

Pragmatism demands a settlement on correct standards and procedures. Evasion is the likely approach to deep conflict.

'decisions about right and wrong were engineered into the social fabric along with the fire drills and parking regulations'(Ballard 2001)

In the Protagoras the candidates for a political *technê* are in dispute. But there is no suggestion that the *technê* given by Prometheus to the proto-humans were controversial.

A conceivable explanation is that Prometheus gave the practitioners a way of quantifying and measuring everything that mattered to their *technê*, so their judgements involved incontestable calculations.

A more plausible alternative is that their rituals and habits dodged confrontation, and they disregarded highly contentious topics.

What seems likely is that the experts who practise a *technê* reach a settlement about what practices are legitimate, about what standards to apply and who can make judgements. The outcome is a tradition of practice, incorporating an unquestioned ideology of the craft. As J.G. Ballard writes, 'decisions about right and wrong [are] engineered into the social fabric along with the fire drills and parking regulations'[43].

23.Microclimate

A technê has an internal moral calmness

A *technê* is a practice that upholds largely undisputed standards supported by its practitioners.

Thus a *technê* has an internal moral calmness. This microclimate of ethics is most likely based on ideology and not calculation and is therefore messier than Socrates would have liked.

A *technê* is a practice that upholds largely undisputed standards supported by its practitioners. A skilled practitioner is then someone, who, according to the authorised judges, does a good job. It is unlikely that their standards will generate a conflict with wider views on morality, but this may only be because the practitioners evade wider moral debate.

The practitioners do need engage with the wider community to sustain the authority to practise but they may do so by baffling their public rather than rational argument.

24.Change

Changing ways of life

People and *technê* are inseparable as new *technê* emerge so people's self-image is changed.

As the traits given to the animals in the Promethean legend created new forms of life, so the development of a *technê* changes ways of life and hence what it means to be human.

Put another way, the formation of a new *technê* or the spreading of a *technê* changes the self-image of the people involved.

The *technê* and the people are, cyborg-like, bound together. The changes that people and technology undergo, alter what people value and how much they value things so that a *technê* that calms one area of dispute is liable to disturb the settlements reached within and amongst other groups of practitioners. And a changed and settled *technê* is equally vulnerable to repercussions from the changes it brought about.

Let me give an example of how deep these changes can be.

25.transformation

the example of electricity

Instead of being analogous to machines, living organisms *became* machines.

Around 1790, Galvani accidentally discovered that static electricity had an effect on nerves[44]. Afterwards the 'animal spirits' thought to be in the nerves became 'animal electric fluid', then 'animal electricity' and later simply electricity[45].

Soon, biologists were investigating the human nervous system[46], physicists were advancing electrical theories and engineers were installing the electrical telegraph. Around the mid- nineteenth century, it became commonplace to talk about the nervous system of the telegraph as an analogue or even to see one as an extension of the other. For example, in a popular science book Rev. J.G. Wood wrote 'the brain transmits its message to the limbs by means of the nerves, so does the same brain transmit its message … thousands of miles, … utilising … wires'[47]

Instead of being analogous to machines, living organisms *became* machines.

26.biology

Technological analogies changed biological conceptions

Nowadays, terms like "signal" and "information" and references to "communication" familiar to a technologist appear in biologists' books and journals.

Nowadays, terms like "signal" and "information" and references to "communication" familiar to a technologist appear in biologists' books and journals. A journal on genetics reports that 'communication between cells' is facilitated by 'signalling molecules' disturbed by 'crosstalk'[48] . DNA has become 'a program for "computing" … sequences of … acids'[49] and for some scientists the body is 'a network of informational systems'[50.]

27.cyborgs

We can see ourselves intimately bound to our technology

The linguistic connection made through analogies between biology and electrical systems translates into dreams of material connections.

This has encouraged people to see information technology as a means to amplify their individual capabilities. Such technology is absorbed into individual human lives until

'the boundary between the "natural" and the "artificial" partner is no longer evident.'[51] People then become just one kind of device for information processing [52].

Mechanical substitutes for other human functions have also been proposed, for example, 'Electronic noses'[53]. A 'retinal implant' to replace 'visual-processing circuits of the brain' is under development and 'cochlear implants …restore hearing'[54]. People also become intimately engaged by embedding their technology in clothing[55]. Well-established technologies are redescribed as extensions of human capabilities. Thus Katherine Hayles writes, '[w]riting … functions as a technological aid so intimately bound up with … thinking …that it acts like a prosthesis'[56].

Technologies offer prosthetic extensions. But human cells also provide materials for 'tissue based biosensors'.

28.Outcome

The uniting of biological and electrical language created the cyborg

As the Universe becomes populated with varied combinations of body parts and machines 'we have to radically rethink what we mean by 'body''(Bell 2001)and self and human.

The trafficking in ways of describing and explaining things has been accompanied by a transformation of attitudes towards living things, which become either objects to be engineered or potential components of engineered systems. Biological, mechanical and electronic systems have lost their distinctiveness and the language of cybernetics and communication technology has created the cyborg.

In this melee of language and technology we find we have transformed 'what we mean by 'body'[57] and self and human and technology.

29.Theory

A technology of technology

To be of real value a theory should guide individuals in what they should do.

One point of having a theory is to deploy it and presumably to construct a technology. Thus we seem to be asking for a technology of technology. If technology is a powerful tool, then a technology that allows us to reliably align technology towards our own goals would be of value. To be of real value a theory should guide

individuals in what they should do. I need therefore to look at things in a microscopic scale.

30.Games

Children's games offer an allegory

Some games are competitive and others cooperative or simply pastimes. The point of some games seems to be to disrupt other games. There are no written rules or goals.

One of Pieter Bruegel the elder's paintings painted in 1560, shows children playing games in the street, doorways and fields. Artefacts — sticks and hoops, knucklebones, barrels — are an integral part of the games. Thirty years earlier Jan van Doesborch of Antwerp published a poem that compared humanity to children at play, so maybe the picture was painted to depict a contemporary allegory of adults and their ways of life.

Games in the painting are have different numbers of players. In some games, everyone has a similar role; in other games there is a clear division of roles. Some players are skilled; others are clumsy. Some children drift from one game to another. Some games are competitive and others cooperative or simply pastimes. The point of some games seems to be to disrupt other games.

It is likely that there are no written rules, and children either know how to play the games or learn by watching or imitating others. Books describe the rules for such games[58], but these rules are merely an account of what the children have been seen to do. And where the apparent goal of a game is given, it is just an observation about the trend of play. Each game is recognisable because of the combinations of individual actions, the size of the group, the artefacts used and the way in which they are used.

31.Distinction

Haraway and Wittgenstein

Haraway removed distinctions.

Wittgenstein introduced language games.

Language, according to Wittgenstein, is a bundle of related techniques. He famously likened the similarities between the phenomena of language with the similarities between games, and treated the rules merely as observations about the way a game is played.

Donna Haraway's Cyborg Manifesto removed distinctions and rendered certain uses of language ineffectual and created new possibilities. Haraway's tactic might be turned on the distinctions made between language and technology.

If the barriers can be dismantled then there is scope for technology theorists to capitalise on the extensive work of philosophers of language.

My interest in doing this is in transforming language games into *technology games* in which the use of an artefact is a move in a technology game, and utility means having a place in a game.

32.Words

Words are artefacts

Words like other artefacts are products and producers

Words, like crafted pots, are bodily products, but words can also be produced by speech synthesisers, radios or scoreboards at sports grounds. Words, like machine tools, are productive. They affect people, can generate electrical signals or fill pages in a book. Words can demonstrate aggression, carelessness and caring—but so can objects like cars, litter and birthday cakes. Words are just one of many kinds of artefact.

33.Rules

Games have implicit rules

Examples of technology games are Max Weber's iron cage of bureaucracy or Hutchin's navigational calculations using navigational instruments.

Accepting this breach of the distinction between words and other artefacts allows me to talk of technology games. Games can be competitive, convivial, disquieting, ceremonial, aggressive or sociable. The rules of technology games are manifest in the customary restrained practices people engage in, in concert with artefacts — including words. Examples of technology games are Max Weber's iron cage of bureaucracy or Hutchin's navigational calculations using navigational instruments. Warfare, science, conferences and commerce are large-scale candidates. Having a meal, taking a ride on a tram, growing a flower, creating a corpse are smaller-scale examples.

34.Artefacts

Artefacts are animated by people

Artefacts, including words, are all simply parts of the world modulated by people.

The barriers are flimsy and easily dismantled. Words, like other artefacts, are simultaneously products and producers, and artefacts, including words, are all simply parts of the world modulated by people.

Karel Capek, the playwright, opened the play that brought us the word "robot", by cataloguing a collection of artefacts: "Windows overlook the factory compound, …. To the left, … managerial offices … a reclining chair before a vast American desk with a lamp, In and Out trays, telephone and paperweight. On the left … hang large maps …, a big calendar, a clock …. On the right … are big posters …. On the floor is a beautiful Turkish carpet, a low, round table, a sofa, leather armchairs and a bookcase containing cash, bottles of wine and spirits …. Beside [the] desk is a table with a typewriter"

Alone the artefacts do nothing of significance. It is action and dialogue that animates and unites these artefacts. They need actors and an audience.

35.Glue

Humans and non-humans bind each other

the military establishment is '… full of terrifying weapons and other artifacts [but the] … glue that holds the artifacts together … is human activity'(Hutchins 1995)

Similarly, Hutchins explains that the military establishment is "… full of terrifying weapons and other artifacts [but the] … glue that holds the artifacts together … is human activity"

You could equally well say, in the theatre or the military arena, 'The hardware is the glue that bonds the people together'.

The distinction between, as Bruno Latour has written, humans and non-humans is hazy.

36.Cyborgs

Political repercussions

politics is about creating and maintaining distinctions. Removing the distinctions between technology, the body and language has inevitable political repercussions.

Donna Haraway's Cyborg Manifesto erased the boundary between people and machines. Articulated tools and prosthetics, like the telephone, blur bodily boundaries, and drugs, medical imaging, texts, films and recorded sound penetrate, invade and colonise the body. In commerce and medicine the database, and not flesh, is becoming the point of interaction with the individual.

These technologies give credence to the cyborg, the manifestation of a dissolved distinction between people and technology. This is significant because, politics is about creating and maintaining distinctions. Removing the distinctions between technology, the body and language has inevitable political repercussions. For instance, it challenges the precedence given to linguistic expressions in, for example, the technology games of academia.

37.Metaphor

Metaphor and technology are vehicles for change.

Metaphor parades its falsehood. Metaphor is an evocative, grammatical blunder. Some metaphors catch on and others fail.

Having removed the distinction between words and artefacts, let me exploit a little of what philosophers have written about language.

Both technology and metaphor are vehicles for change.

Donald Davidson regarded metaphors as common words tangled in language games in which “a sentence used metaphorically” is “usually false”. Metaphor, unlike lying, parades its falsehood and encourages us to seek an inexpressible implication. Metaphor is, then, an evocative, grammatical blunder. Some metaphors catch on and others fail.

38.Innovation

Technology is dead innovation.

innovation — the deliberate, apparently improper deployment of an artefact that may give us insight

Translated to technology, metaphor is an innovation — the deliberate, apparently improper deployment of an artefact that may give us insight. An innovation may be useless and discarded, but if it is adopted, it propagates, and becomes commonplace, conventional and ultimately part of the backdrop that reveals the novelty in subsequent innovations. Technology is dead innovation.

39.Function

There is no such thing as technology

Innovation implies that artefacts do not have fixed functions.

Innovation implies that artefacts do not have fixed functions; paving slabs can become missiles; tyres can become toys, so, in a way, there is no universal thing called technology. Anything can be part of a technology game; anything can become an artefact; any behaviour can be judged a skill; artefacts do not have natural functions. But this is not a recipe for anarchy. Skills, artefacts, faith and hence institutions are remarkably and stubbornly durable.

40.Obsolescence

Innovation alters the ecology

Artefacts and skills are liable to be transferred to a parallel technology game that sustains the myth of progress.

Innovation changes the game

Innovation changes the game, renders some actions, skills and artefacts obsolescent and thus alters the ecology.

Over time, some games become less compelling because the changing technological ecology renders contingencies invisible or undermines the legitimate existence of artefacts and skills, and the changed repertoire of proper actions consequently alters the self-image of the actors.

In the altered circumstances some skills and artefacts will seem quaint or anachronistic. Artefacts will become redundant and their accompanying skills incongruous. They are then liable to be transferred to a parallel technology game that sustains the myth of progress.

41.Judgement

Existence requires judgement

Judgements are made as to whether an artefact or skill is adequate for a game and what or who is eligible for participation.

Institutions form around groups that use the artefacts and judge the skills employed in technology games.

Judgements are made as to whether an artefact or skill is adequate for a game and what or who is eligible for participation.

For an institution, an artefact comes into existence when it is judged to have a place in a technology game. Descriptions of these judgements frame criteria; tolerant institutions have soft criteria; others are hard. Innovations start out as idiosyncratic uses of skills or artefacts, and their existence is relative to institutional criteria. While one institution may recognise an innovation, another may not.

Each institutions' judgements are constrained by its faith in particular ghosts of futures and pasts. For example, engineering companies root their faith in a collage of prototypes, experiments, surveys, meetings and documents. Governments have sufficient faith to trade in chunks of radio spectra and commerce continuously demonstrates faith in monetary artefacts.

Artefacts are thus primarily objects of faith, sustained by utopian myths and histories.

42.Selfhood

Gender, nationality and professions are constituted from technology games

The self is a collection of artefacts attached to a changing variety of technology games

As the boundaries between body, technology and language are dismantled, the institution of the self becomes a collection of artefacts attached to a changing variety of technology games that constitute nations, genders, professions and so on.

It is often easy to construct or damage institutions such as a personal identity, the past or the future using the well-rehearsed skills of language. Computer simulations, prototypes, films, photographs and architectural models also offer similar institutional elasticity.

The assertion by an erstwhile dean at MIT that, technology 'simply means computers'[59], implies a dominance of linguistic and simulation technologies, and hence political institutions, including selfhood, of a worryingly flimsy construction.

43.Conclusion

Technology games constitute the community.

Technology is not a medium. It is integral with being human.

Technology represents an array of overlapping institutions embarking on political missions. Within each enterprise we expect to see settlements that establish standards of judgement and allocate roles. The enterprise will have, at least the appearance of an external goal and much of the activity will be deliberation over how to achieve the anticipated ends. The deliberation will be presented as rational and will be formalised to a degree, though those outside the enterprise will may question the rationality; in part because the institutions and enterprises will overlook criteria, valued practices and objects valued by other groups.

Characteristically, these technological enterprises do not restrict their political devices to words but add material goods to their vocabulary.

For an individual, technology is a faith in an amalgam of skills and artefacts that coalesce within an array of technology games. This pageant of technology promotes tribal practices, orchestrates idiosyncratic behaviour and sustains institutions.

The technology games we play give us a sense of who we are, what contingencies we face and how we respond to them. Technology games thus constitute the community.

In all this artefacts are not media, which shape themselves more closely around human needs, but are active participants in games which are generating and destroying hopes.

Technology is not a medium.

As the Promethean legend illustrates, it is integral with being human.

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