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--- Yesterday ---

----- Yesterday ---- Evolution ended.

----- Today -----

--- Today --- Humanity as we know us is ending---

---Tomorrow---

---Tomorrow --- our life futures awaits ---

**Life Futures: Transhumanism and beyond: a suggested categorisation of emerging Forms Of Life**

**Life Futures: Transhumanism and beyond: a suggested taxonomy of emergent and existing Terrestrial and Non Terrestrial Forms Of Life**

## Setting the Stage

**Today** many boundaries are blurring. Boundaries between life and death, birth and life, virtual and real, truth and falsity, surface and authentic, even between natural and 'non' natural are blurring. The real, the natural, is being redefined by the web, CNN, and eugenics\* of the 'plus' kind, such as biotechnologies and of the 'minus' kind through Nazism and 'ethnic cleansing'.

Will we have eugenic cleansing or will it be genetic nirvana tomorrow?

**Today** modern eugenics with, the human genome project, human/animal/vegetable hybrids, cloning and so forth is putting a positive spin to some aspects of what the world went to war about a mere two generations ago. Indeed some authors argue that our children are living in the last generation to give birth naturally. Even of more concern is that they may well be the last mortal generation before artificial life moves the game forever beyond us. This redefinition of the natural - perhaps the extinction of the natural - is an emerging condition of postmodernity.

Where lies the natural tomorrow?<sup>1</sup>

Our world is dominated by narrow scientific rationality and operates by applying this through predatory capitalism. With the weakening of the Nation State and the rise of the next stage corporate nations or 'corpor'n'ations', including media, oil and drug conglomerates that patent life. The essential capitalist ethos of individual autonomy, private ownership, personal enterprise and freedom of choice is ensuring the biotechnological revolution plays out according to market forces.

As these two forces of capitalism, science are combined we begin to see the blurring boundaries between natural and non-natural, biotechnologies and predatory capitalism all herald the new millennium with the death of the natural. Reality, once considered objective and even concrete, now is blurred fleeting and local.

Transhumanism and Posthumanism are all the rage yet they are but two of the many forms of life emerging at this time in our collective history. A descriptor would be 'the capacity of human life for technological improvement so as to remove or eliminate disability, deformity and to increase strength, intelligence and life span' in short techno-eugenics.

This article will seek to identify and categorise some of these. There are many other, and better, taxonomies and these are agreed indeed idiosyncratic, I would say though that what we have below will, given present techno-trajectories and with 95% probability, mean that Transhumans will be extant, say in under 360months, with or without help from outside our planet. This anticipation is based on my application of the Futures methodology of Emerging Issues Analysis over a 20 year period to 2013. <sup>1a, b</sup>

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<sup>1</sup> <http://www.sentientdevelopments.com/2013/03/10-of-weirdest-futurist-scenarios-for.html>

‘The death of God, the end of history, and the last man were the concerns of Hegel, Nietzsche and German Romanticism. Crossing this abyss into the eternal day with its flip side our animal night, the emergent crypto-conservative techno-overman id something that modernism is attempting in the Twentieth and Twenty-first Centuries. And now? Is this project over? Will we live in a postmodern simulation: a matrix of corporate capitalism and media-ated social networks, a self-referential fantastic mirror of nature with us disconnected recursively, disconnected a little more at each iteration from inner psychic depth and outer reality, our incarnational anchor?’

In short –

**Yesterday** evolution ended

**Today** we end

**Tomorrow** our life futures await.

For

**Today** we make our children’s **tomorrow**.

### **An initial taxonomy of Emergent Forms of Life (FOL)**

This article is in effect Social Science Fiction and I anticipate that after around 2040-2050 all of the following artificial terrestrial life forms will have emerged to seek to interact with our grand-children. Today we tend to think in terms of two life forms animal and vegetable. Vegetable and animal life has open to ‘open slather’ genetic manipulation and since ‘dolly and co(w)’ animals has now been with us for over a generation. Though not us - not yet that is! By 2050, while our grand-children will still be alive, most of these forms of life will exist and will incorporate Artificial Intelligence (AI) and nano technology (NT) and be co-existent with ‘natural humans’.

**Please note:** the concept ‘borg’ is used in its historical sense to identify a ‘bionic’ i.e. hu’man made **organism** referred to in his article as a Form Of Life (FOL). So it is possible to have say a bioborgs that is a biological borg and a technological borg as FOL – as explained below.

The Life forms include:

#### ***Ia Terrestrial/Planetary - tangible***

(a) **Natural** Historico-natural **existing animal, vegetable life forms** land, air and sea which is subject to biological evolution.\*\* Increasingly the natural and artificial life forms are interacting in that, in many regards, the latter is causing mass extinctions of the former. More so though the latter are genetically modifying the former to the point where the two can no longer be defined separately. In a sense transhumanism can also be seen as meaning the transitional zone in the one thing we hold, above all else, as crucial to our humanity, our consciousness across species. We now know that other species such as some others of the primate family, some dolphin species, and some elephants are ‘conscious’. **So in this sense there is already biogenetically and memetically a transhumanism in, with, and between our species and its neighbours.** Although this is acknowledgeable anthropocentric it does demonstrate that for instance ‘dolphins could be students’ or ‘elephants could vote’ or we could to an extent become involved in their

cultures. Further Transhumanism means human is no longer the locus of intelligent authenticity.

(b) **Artificial**

. **Orgoborg** - organic FOL - animal, vegetable, cellular lifeforms eg. bacteria etc. on planet earth inc.:

. **Humborgs** (organic conscious FOL commonly called **humans**). These FOL's can be replicated 'naturally', or 'artificially' by cloning (see GEborgs and bioart<sup>2</sup>). Ultimately I anticipate humborgs will be implanted with bioborgs. As these chips combined with nano technology 'nanobots' are used to operate mechanical arms, or negate brain or nerve damage, the issue of human-robots integration i.e. cyborgs, will arise.

. **Bioborg** (**h+ augmented human**). This is the standard understanding of Transhumanism (H+) to Artificial Humans (AH) to Post humanism (H1) bionic humans. The development of living biochips will further blur the definition of a living machine. By synthesising living bacteria, scientists have found a way to program the bacteria's genetic development to mimic the on and off switching of electronic circuitry. See also<sup>3</sup>. Many scientists presently feel silicon miniaturisation has reached its limit. The evolution of the silicon-chip→bio-chip→nano-chip is then expected to greatly expand the capabilities of computerisation by reaching the ultimate in miniaturisation. Biochips, when combined with nano technology will also have the unique ability to correct 'design flaws' and 'disabilities' and because proteins have the ability to assemble themselves the bioborg computer could also assemble itself.

. **Cyborg** (a human/machine composite FOL **for example 6million dollar man/woman, Frankenstein**). Cyborg can be seen as *a bionic human being comprising a human body or other organism whose functions are taken over in part by various electronic or electromechanical devices*. One Science Fiction version of the Cyborg has a stationary human brain with several autonomous servo-machines e.g. Neurochip as in the introduction to this article, who fill the brains limited physical needs and act on its commands, starts to sound like a distributed nano bot system doesn't it?

The world's first cyborg (Neil Harbisson) is now recognised by the UK government. In 2010, with Moon Ribas formed the Cyborg Foundation and in 2013 a film about this process by Rafel Duran Torrent won the prestigious Grand

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<sup>2</sup> <http://www.artnews.com/2013/03/18/biotechnology-as-art-form/>

<sup>3</sup> <http://www.youtube.com/watch?v=boYYnYSkBCU>

Jury Filmmaker Competition prize<sup>4</sup>. See:



The screenshot shows a Vimeo video player. The video content is a close-up of a British passport held by a hand. The passport is for Neil Harbisson, a British citizen born on 27 July 1982 in Mataro, UKFA. The passport photo shows a person with a glowing, multi-colored, circular device (the 'eyeborg') over their eye. The video player interface includes a search bar, navigation links (Join, Log In, Create, Watch, Upload), and a video progress bar at the bottom. The video title is 'CYBORG FOUNDATION | Rafel Duran Torrent' and it is from Focus Forward Films, posted 3 months ago. A description below the video explains that Neil Harbisson was born with achromatopsia and developed the 'eyeborg' device, which translates colors into sounds. The Cyborg Foundation was created to help others with similar conditions.

. **GEborg** (GEH – Genetically Engineered Humans). Here genetically engineered FOL for example through the modification of orgoborgs and bioborgs by bio-engineering and cloning giving us GE food, Weapons of Mass Genetic Engineering and so forth - also see Humborgs above. This may be seen as an interim life form only, which will semi-autonomously ‘technovolve’ into what I call the **Technoborg**.

. **Technoborgs** (technological FOL) Technoborgs, are also interim and include:

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[http://vimeo.com/51920182?utm\\_source=pangolin&utm\\_medium=newsletter\\_201301&utm\\_campaign=597](http://vimeo.com/51920182?utm_source=pangolin&utm_medium=newsletter_201301&utm_campaign=597)  
and <http://www.abc.net.au/news/2013-01-31/scientists-using-ai-to-advance-technology/4494732>

. **Exoskeletalborgs** as per aliens shown in movies such as ‘**Batteries Not Included**’ and intelligent **drones** with their ‘Gorgon Stare’ and AI ‘Mind’s Eye’ analysis\*\* as well as for instance exoskeletons for US soldiers in Iraq

. **Siliborgs** (**silicon based FOL** i.e. intelligent computers and computer programs viz. AI incorporating self-repairing computer programs, Rights of Robots, HAL in the 1968 movie 2001). *Silicon however is probably nearing its design limitation* as to scale and its ability to dissipate heat and is about to be replaced by organic computers using biotech nano engineering (see bio-borgs).

. **Macroborgs** – (macrostructures that provide the architecture for our own existence). This category also includes smart cars/houses/buildings/spacecraft say and other macro structures such as huge smart shopping malls and ski slopes in the desert as in Dubai where whole micro environments are enclosed and constructed as in self-regulating ‘biodomes’. Certain eco-villages could qualify here. Gaia i.e. our planet could be described as a biological Macroborg, one which we, as a species, with our over population, earth mining, cities and pollution are rapidly turning into a true Macroborg.

By 2030, I anticipate that Technoborgs will become *fused* with Cyborgs, GEborgs and Bioborgs to form the emergent **Posthuman Polyborgs** (as in the 2004 movie **iRobot** polymorphous shape shifter now robot now human now both now neither). *Humborgs i.e. humans, as we know us, will become indistinguishable from these our forecestors reaching back to us from tomorrow and beckoning.* We have already started to be replaced by these emergent evolutionary ‘technoluting’ entities\*\*. It is this *fused* polyborg life form that will start to be patented by corporations and in ‘developed’ areas of the globe will dominate the life ecology of the planet by the late this century.

### **1b Terrestrial intangible/virtual**

Alongside these forms of ‘touch and feel’ life forms where will be also virtual and intangible forms of life that comply with many of the aspects of the definition of life discussed later in this article.

. **Symorgs** - symbolical and symbological FOL are of three types:

. **Conscious/external** - culture, **computer virus**, corporations, NGO’s and the World Wide Web. The web as well offers the possibility of global symbolical intelligence

. **Unconscious/internal** - unconscious i.e. **archetypes** ie FOL that are symbolically yet not empirically real

. **Interface** – viz. a bridge/interface between consciousness’s and unconsciousness’s eg. **Internet/World Brain**<sup>5</sup>, **Dreamtime stories** the

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<sup>5</sup> For instance see <http://www.straight.com/movies/377411/doxa-2013-google-and-world-brain-considers-internet-sentient-thing> NB: Internet Sentience and World Brain are quite separate, though overlapping phenomena – please see **World Brain exhibit** in this Issue for further discussion.

Australian Cape York Rainbow Serpent Dreamtime stories/myths. Here today in our life are our ancestors dreaming and our ancestors dreaming's are our literal life today.<sup>6a</sup> Here the seven prerequisite conditions of life, outlined below, are symbolically rather than literally met. In the case of the Rainbow Serpent story, however, the influence on the physical aspects of the three aspects of tribe's life is very 'real'.

## **2 Non Terrestrial**

These FOL are the macro and micro life structures/organisms, none themselves directly related to human, which support us and remain relatively discrete from our humanoid terrestrial world. **They include:**

. **ETorgs** – FOL/aliens from other planets or 'dimensions' e.g. **the movies ET, Predator, Alien** (usually hostile to humans, in many ways they represent our own fear of the future).<sup>1b,2</sup> Indeed the Search for Extraterrestrial Intelligence is already producing a plethora of school curriculum and workshops.<sup>6</sup>

. **Macrorgs** (macrocosmic FOL) eg. the Gaia hypothesis, which sees the **world, indeed the universe as a living** organism/entity demonstrating the requisite aspects of 'life', outlined below cp. MVorgs.

. **Nanoorgs** – sub atomic particles inc. the **boson also called 'the god particle'** which links consciousness to the physical world in eastern religions such as Ananda Marga we have Micro Vita - microscopic FOL that blend or interlace mind and matter. They are also called orgones, diatoms, God particle etc. cp. Macroorgs.

[. **Psyorgs** - psychic FOL, entities originating in the non-material realm e.g. angels, spirits etc.]

With these Non Terrestrial FOL the seven prerequisite conditions of life, outlined below, are symbolically rather than literally met. At present human technology, via. SETI, is impacting the first category of these Non Terrestrial Forms of Life with cumulative impact on the second category e.g. Macroorg – the planet via. pollution, greenhouse effects and reduction in genetic diversity of food stocks. Further biochemical and particle research e.g. the Hadron collider in Europe, is impacting the third and psychic research the fourth. So in these regards homo postindustrialias is now impacting all known forms of life on or in or around this third rock from the sun.

### **Developing the contours of a definition of Life**

How can we compare these FOL? What do they have in common and how can they be defined as life at all?

#### **. Concept of life**

Life can conceptually be approached from two perspectives (a) definitional perspective and (b) a non-definitional or non-categorical perspective. The former is more empirical

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<sup>6</sup> <http://www.seti.org/>

or exoteric and Western and the latter esoteric. The latter may be seen for instance in the concept of the TAO i.e. to transcend the distinction between life and non-life and can overlap, to a certain extent, with Nanoborgs above, however this article seeks to continue the a certain Western scientific paradigm of empirical validation, thus the bracketing of [Psyoborgs].

### . Towards a definition of Life

Life may be defined negatively as what it isn't i.e.

*the condition which distinguishes animals and plants from inorganic objects and dead organisms.*

Or Life may be defined positively as *entities, which manifest the following distinguishing manifestations of life, are:*

(1) Growth through **metabolism** (energy conversion),

(2) **Reproduction**, and

(3) The power of **adaptation** to environment through changes originating internally.

A precise definition of life is difficult, however, in a rough sense, an organism may be considered alive if these three are active. The only exceptions to the above description of life are viruses (biological and computer). They are only partly living organisms in that they adapt (criteria 3) and possess the replicating nucleic acids/source codes (criteria 3) but lack the ability to metabolise energy (criteria 1) <sup>3</sup>. In order to obtain enough energy to reproduce viruses act as parasites in host systems. □

Some definitions of life also include (4) locomotion, (5) individuality however I see these fitting into metabolism, adaptation and reproduction respectively. Still others extend this to include (6) intelligence (which can be seen as adaptation) and (7) natural/organic structure (seen as metabolism). <sup>4 a, b</sup> Clearly characteristics such as (1) consciousness, (2) language, (3) tool making, (4) agency and (5) carbon based are not required.

This standard definition of life i.e. that of metabolism, reproduction and growth works for individual organisms however it does not answer the following line --

*A rose plucked from the bush is still rose,*

*But a person [or life form] plucked from the Universe*

*Is a mere absurdity (Anon)*

Thus a standard definition does need to tell us that a solitary living thing cannot exist without (8) its supportive ecosystem web of which it is a part/holon..

Consequently to be meaningful life has to be thought of as embedded in the larger system of the biosphere – the web of life concept. The evolution of different species of life is coupled together in what may be called a ‘nested hierarchy’. This web or ‘fitness landscape’ underpins individual organisms and supports life eg, the pattern that connects. In this sense organisms or life may be seen as ‘complex adaptive entities within complex adaptive systems’ i.e. holon’s that ride the waves of energy and cycles of materials just as a surfer rides the flow of energy in waves. These waves indicate systems that are dynamic i.e. not in equilibrium. The moon or mars are in equilibrium. They are dead - they have high entropy.

For instance if our heart beats completely coherently/regularly or completely incoherently – we die. Complete stasis as in complete equilibrium or complete incoherence leads to death. In between is what has been called *spectral reserve*. This is the zone where we can live - the intertidal mud flats of life. Further each organism’s development is guided by a master program code eg. DNA/RNA in cells and the organism can reproduce this code.

In summary in terms of this paper living organisms may be seen as complex, neg-entropic, adaptive, self-organising entities that ride homeorhetic energy waves in a quantum universe with patterns of far from equilibrium thermodynamic systems equilibrium and consequently has substantial spectral reserve.

So we may add the following four components to our definition of life. That is of (4) *locomotion* inc. levitation, (5) *self-organising non-equilibrium system or organism* with significant spectral reserve, which is governed by an (6) *internal master program* such as DNA, and (7) *part of a web of life*.

In summary the criteria for life are for the purposes of this paper:

**1 Metabolism**

**2 Reproduction**

**3 Adaptation**

**4 Locomotion**

**5 Self-organising**

**6 DNA**

**7 Web**

### **Methodology used**

In selecting a methodology to underpin the research for this somewhat unusual futures subject I sought a combination of approaches that would incorporate horizontal and vertical dimensions of the subject. Called Deep Futures such a chosen approach would also need to allow identification and incorporation of the broader Futures Research theme involved in the topic while bringing future generations of Forms of Life into the discourse in ways that begin to include their voices (sic) in present discourses.

Deep Futures seeks to explore vertical and horizontal aspects of the critical issue or theme at hand. In this instance, Forms of Life horizontal considerations would include the population impact of rapidly increased human numbers, application of genetic engineering to providing a ‘safe’ food source, disease reduction, and medical enhancement for us and so forth. The vertical slice however starts to consider these entities as separate FOL with discrete awareness/consciousness not only as horizontal extensions of our human consumption patterns. In this sense Deep Futures provokes reconceptualisation of the critical issues such raised in this article i.e. ‘What is life’? It also raises ethical issues such as ‘should we create (us as) a new life form?’ And how is technology changing our relationship to these emergent FOL and thereby ourselves?’<sup>5, 6b</sup>

The above taxonomy then has been developed using a Deep Futures approach by applying a methodology derived from Critical Futures Studies called Themeing. It is crucial to note that many other forces are also pushing on Gaia today.<sup>7</sup> In this instance the theme is 'reviewing of person to person and person to nature relationships'. Themeing for Slaughter is critical in developing a social foresight capacity. In this sense critical futures studies viz. theming can provide a 'critical purchase' on our historical trajectory in a way that opens-out social foresight possibilities for present day understanding, empowerment, intervention and action. I argue that future generations of life on planet earth will include forecestor forms vastly different to our existing categories of animal, vegetable (and mineral). And to include their voice, this article maintains we need to envision a world of 2050 in a way that can start to bring their voices as our forecestors into present futures discourse.

### **Identifying some Themes common to these Forms of Life**

#### **. T1: at least five of the seven criteria met**

On the basis of this extended 'definition', interpreted literally and symbolically all of the above Terrestrial Forms Of Life are 'alive', while the extra-terrestrial forms satisfy most of the criteria.

#### **. T2: Spot/Stop the difference**

Our modern society has great difficulty in assimilating difference and imperfection. This we externalise. We treat difference, even diversity itself, as 'other' to us. Consumption patterns even life forms have to be regulated/protected/engineered to remove 'non-compliance' i.e. they have to be homogeneous. This enables us to continue consistently consume the products of capitalism whether they be coke, chook or the cloned cyborg Universal Soldier or Dreamtec warrior.

As Western law is bureaucratic it has become more about regulation and control i.e. about protecting power structures, than about facilitation and development i.e. about centralising conformity not hamonising diversity, about compliant not compliment. It noe has little to do with ethics or justice i.e. moral good. These two factors, bureaucratised law and minimisation of difference become the 'soft' even 'silent' face of modern eugenics\* today.<sup>8,9</sup>

For instance consider the Clones-R-Us Corporation. Yes it's a real web site. It didn't take long for a C-R-Us to spring up. DreamTech Corporation [ <http://www.sarahgreene.net/previous/hmsbeagle/html/content/11/webres/wreview.htm>] offers DNA licensed from celebrities in labs around the world where no anti-human cloning laws have been established -- e.g. Costa Rica, Liberia and Vanuatu. Check out the prices and availability at: [http://www.turbulence.org/Works/thacker/Clones\\_R\\_Us/clones\\_r\\_us.html](http://www.turbulence.org/Works/thacker/Clones_R_Us/clones_r_us.html) Genetic engineering, in this context becomes a form of social control, a mechanism for avoiding the appearance of difference.<sup>10</sup> We can see in this a process of 'naturalisation' of this technology for instance its internalisation by Government<sup>7</sup>.

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<sup>7</sup> <http://www.genome.gov/>

The 'other' i.e. the marginal/periphery viz. the poor, disabled, black, women, Muslim etc. are not part of any pictures we see in regard to the above. Here 'the other' represents not only a geographical place or a postmodern terrain it is also a site of power over. Along with the internet Robotics and Genetics are reshaping how we communicate and envisage society. This 'revolution' is called the GNR revolution of Genetics, Nanotechnology and Robotics and it is not all for our good! In our society, obsessed as it is with homogeneity, we can see 'the other' as different and therefore 'bad'. So 'disabled/different and proud of it' becomes more than a bumper sticker it becomes a form of civil disobedience. And indeed beyond to a form of alterity or 'otherness' within what may be called electracy<sup>17b</sup> (a reconceived form of literacy for the web-based post human era), so here to be fully human is to be disabled – differently abled – imperfect – non transhuman.

I am advocating a form of bio-anarchy where as individuals we retain power over our own bodies and do not surrender this to the medical/techno discourse of the Corporate State. A rationalist synthesis almost forces the imperative on us of struggling to prevent the genetic health of our bodies and those of our children, from passing everything over to the Corporate State to patent or regulate in life and death!

### **. T3: Disappearing peoples**

A disturbing aspect of science and technology is that it is essentially Western. Authors such as Zia Sardar argue that this essentially 'disappears' non-western technologies and the peoples who developed them.<sup>11a, b</sup>

### **. T4: Your friendly stock market catalyst**

The economic entity even life form of tomorrow may well be the *compucorporation* i.e. an IT based corporation or NGO that is of an international scale. This means trans-national corporations run increasingly by computer assisted life forms e.g. designer siliborgs 'assisted', no longer controlled, by humborgs. In a sense this is already happening in Stock Market Firms – witness the 1987 stock market crash where computers (emergent siliborgs) kept selling as the price of stocks fell. The siliborgs acted as catalysts quicker than we, as humborgs, could respond. Today over 10% of decisions on investments in managed funds, derivatives and stocks are made by neural net Artificial Intelligence networked computers. Many of these investments are out-performing conventional 'natural intelligence' brokers. Soon human judgment will be too risky in fund management or aircraft flight etc. 1987 – just such a long time ago.<sup>12</sup>

### **. T5: Y2K the first Kick Inside**

Witness the huge paranoia about **Y2K, 1987 Stock Market crash 2012** yet see it as an example of a deeper yet unrecognised angst from our slowly dawning realisation that humanity is now dependent on other forms of life, the 'siliborgs are taking over'. These Forms Of Life we birth then change us in to co-dependency and beyond. With Y2K we saw the enormous energy that was invested in correcting siliborg systems not yet design capable of technovolving without external human input. We also see the potential for enormous human dislocation that something as simple as the lack of two digits in a master program code can cause.

These are a foretaste of future anxieties as our survival depends more and more on other non-human FOL. Y2K, 2012, 1987 Stock Market Crash then is indicative of a transition trauma as we as humans begin to face our fate - we are no longer in charge – they are – the siliborgs – and their kicking their way out. And the result we see is Preppers and Survivalists abound.

### **. T6: Singularity the second Kick Inside**

This point is where artificial/computer intelligence reaches and then exceeds human intelligence on the planet. This point is expected around 2035.<sup>4b</sup> At this point Transhumanism and the Singularity will I anticipate merge.

### **. T7: Blue Hawaiian Potato**

The present consumer outburst against genetically modified food reminds me of a story a friend told me happened when he was mess officer in the Royal Australian Air Force some years ago. In order to ‘initiate’ new recruits they were regularly given challenging tasks. In this instance the new recruit was given a large pot of potatoes to mash and unbeknown to him some natural blue food dye had been placed in the bottom of the pot. After mashing for a while the blue dye started to come through the mix and caused the new recruit some alarm as he had never seen any food like this, however he followed orders and finished the job. It was billed in the mess as ‘blue Hawaiian potato’ – it was a sell out.

Already over half the American crops of soya bean, cotton and maize are **GEBorgs**, grown from GE seed stock. Increased yields, more climate tolerant plant stock and fewer applications of pesticides are some of the espoused benefits of these GEborg life forms. Total world production of GEborg life forms has gone from practically 0 in 1995 to over \$2bUS today. Clearly to ‘create’ a GEborg one doesn’t have to understand ‘life’ for instance say as making a Humborg or Bioborg all one has to do is to ‘modify’ part of the organisms DNA for instance and the organism does the rest.

### **The first Robot kill**

The legal system today is unprepared for, and in many ways unpreparable/unpreppable for, addressing robotic crimes and crimes perpetrated by other FOL such as Y2K or another Wall St crash. Some fifteen years ago now, the Morbidity and Mortality Weekly Report cited the first death caused by a robot i.e. the **first recorded Exoskeletalborg caused humborg fatality**, some 116 years after the first motor vehicle death. This accident occurred in 1985 when a machinist at a Michigan company entered a robot’s work envelope. Apparently not programmed to take human frailty into account the robot used its arm to pin the man to a safety pole killing him with the force.<sup>13</sup>

As these exoskeletalborgs emerge as life forms **who or what is guilty for death consequent death or injury**, or was it murder? The robot designer, the corporation using the life form, the Government for failing to legislate safety laws, the worker, the robot? What then are the rights of these robots?<sup>14, 15</sup> Today, as we move to driverless cars and pilotless planes such issues are being raised increasingly in ways that stretch the coping ability of our existing ways of thinking.

Already there are robot controlled pilotless planes. By 2020 the pilot will be out of the cockpit even out of the loop, witness the advent of the cruise missiles. Psychologically though pilots will remain, in name, only, for some time. Already 90% of passenger jets regularly take off and land without direct pilot input. Presently Australia is buying pilotless planes for surveillance of our northern coastline. Clearly, in the case of the drones in Pakistan attacks missiles are added to such a pilotless, intelligent 'robot' entity we know today as 'Predator Drones'.

### . Broadacre human enhancement

What I am advocating is that the **Bioborg** FOL offers the most accelerated path to 'broad acre' human enhancement. If human consciousness and culture are functions of the nervous system, then these FOL are to varying degrees conscious<sup>8</sup>. Such a path I see through artificial humans (AH's) and the most accelerated path for AH's is cloning. Once this is blended with genetic engineering and nano technology 'superior features', such as beauty, strength or intelligence and removal of design defects will mean humans as we know us will cease to exist. We cease to be limited by our genetic inheritance, for instance design your own body check out.<sup>9</sup>

Intriguingly one doesn't need artificial wombs, reproducing robots or tricky machine-nerve interfaces to replace us 'natural humans' just simple cloning, as indeed we are already doing the humble tomato and dolly and so forth. This is a hijack of organic life by organic life in favour of an ideal of say 'no disability' or 'no death' etc.

One only needs what is already in existence – self-reproducing genetically enhanced upgraded clones. Nor do we need billions of AH's marshalling against the embattled remnants of 'real' humanity. All we need is to insinuate AH's at key multiple locations into the global human breeding chain and 'bio bingo' we have accelerated technolution becoming biolution. Just as a tiny amount of yeast can make a whole loaf of bread rise so it is, I anticipate, that AH's will be to the human race this century.<sup>10</sup>

We have all seen the human ear growing on a mouse's back and fly's eyes growing on the fly's' abdomens. Not only can cloned animal parts provide test beds for new drugs and medical treatments they can also become disposable human organ growers – no more third world human organ piracy needed here.

The critical theory response here is that once again this is an iterative coming out of the neoliberal right wing corporations and their handmaiden the 'corporate state' and has nothing to do with social or ecological justice just profits. Here we see the patenting of life forms inc. seeds and genes etc.<sup>11b</sup>

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<sup>8</sup> <http://ling.ucsc.edu/~chalmers/mind.html> and <http://www.brainresearch.com/>

<sup>9</sup> <http://ieet.org/index.php/IEET/more/linzenbold20130116>

<sup>10</sup> <http://www.transhumanism.com/> .

### **. Who or What wants a Republic or Indigenous Rights?**

Can our system of Government be conducted with these emergent Forms of Life? Will we be able to develop a hybrid culture? For instance cyborgian culture will probably not need a language that is in any way recognisable to us. Who needs a face to face bla bla when an interstellar download in cyberspace will do? Will they be able to vote? Would they even care whether there is an Australian Republic or indigenous land rights? Would they prefer a Cybernation with us the hamburgs sent to cyberia? Probably!! What rights will they let us have? Will we become their Disneyesque theme park for hamburgs i.e. for us? They are already among us yet we ignore them except when they threaten to cut off our TV or change our food. To all intents and purposes such governance does not yet exist, nor is it mooted, in Western Nations.

As these FOL take hold then the Fields Of Action (FOA) for conventional social policy evaporates. For example Indigenous land rights and so forth will continue to be one such legitimate FOA however relatively it will shrink in significance compared to the technological field assertively covertly and overtly occupied by the FOL.

We could well see a kind of inverse of the recent battlebot's TV series where schools and Technical Institutes build battle robots and humans gaze at them from outside the 'ring' a sort of techno colosseum. Maybe one day this century it will be the H1's looking on as we do our gladiatorial battle again 2000 years after the first contests in Rome.

### **Renaissance Rationality**

These challenges are so profound that to understand and respond to them we need to reinvoke the renaissance concepts of rationality and extend the concept to what maybe called a new logic matrix or wisdom.<sup>15</sup> A re-invocation that is, in my opinion, long overdue. For instance Wilber imbues rationality with intent as well as extent.

Rationality in this broader sense can now include empiricism, reason, intent, pluralism, imagination, passion and a conviction towards emancipation.<sup>16</sup> In the west today through the impact of the Universities empiricism has all but usurped any broader meanings of rationality. As such today we can speak of the 'scientific dark age' where instrumental rationality, devoid of the majority of renaissance rationality, re-makes the world in its own image. The tragedy that is rationality today is it has shrunk, largely under the tutelage of the academy, to evidence and logic.

We enter the new dark ages.

Conventional systems of thinking (epistemology's) that are from what Slaughter calls 'the flatland of industrialism' and their philosophical nemesis, postmodernism, seem unable to provide the depth and wisdom needed to understand the challenges that are upon us. Challenges such as outlined in this piece inc. environmental apocalypse by the end of this century, cloning and emergent FOL's yet another lone drone clone wandering the plain with its Gorgon Stare, looking for programed meaning to blow up. For me these, like us, are part of the 'fatigue of the West' as we attempt to deal with this 'flatland imperialism' of 'kill the 'other''.

Today, more than ever, we need an inner discernment embedded in discriminative human judgment. Something that law, science and politics remain unable to provide. We need to get to the ‘heart and hand, as well as the head, of the matter’. Renaissance rationality, a logic matrix for the new millennium, removes humanity as centre of the universe and allows for other ways of knowing and being. To this end last year a colleague, Iona Miller, and I wrote a series of six articles in this vein aimed at harnessing social science methods for finding wisdom in our lives. <sup>19</sup>

### . Art

Australia’s Science-Artist Robert Pope specialises in painting future life systems that open up our future; that are counterpoints to the ubiquitous techno futures<sup>20, 21, 4a</sup>. He represents these life forms organically and technologically by using fractal geometry and chaos theory to illustrate such alternative holographic multiverses which, I submit are so important for our survival as a life form. This compels us to face the urgent need for alternative futures for human survival, such as survivalists, intentional peace communities, islands of peace, preppers, artificers and so forth.

For example three of his great works (in my opinion) demonstrate aspects of this logic matrix and illustrate several of the above Forms Of Life (FOL) identified in this article. They are:

. **Datum Markers** (using the globe - **Macrorg** to harness black holes for neg-entropic energy creation through diatoms - **MVorgs**) Fig1.

. **Aesthention Drive** (a majestic craft powered by neg-entropic implosive yin motor fueled by beauty and inspired by the Australian Landscape in the Tamworth area) – **Technoborg** Fig2 and,

. **Biosphere Energy Flow** (living organic carbon based technologies) - **Orgoborg**

All three paintings portray important aspects of this neg-entropic rational logic matrix for a New Renaissance rationality that can positively embrace other Forms Of Life, Fig3. In this painting, in my view, Pope presents a fully human neg-entropic view. This is the view that is now marginalised and yet is the motivation behind this piece.

**Fig1: Macro & MVorgs – Datum Markers**



**Fig2: Technoborg – Aesthention Drive**



**Fig3: Orgoborg – Biosphere energy flow**



In my view Pope’s work illustrates a **Renaissance Rationality** that embraces Wilber’s Vision Logic<sup>17a</sup> work which in turn reinvokes the broader rationality of our first European Renaissance and extends it to vision logic that can incorporate other forms of life. Such vision logic rationality includes (Table1) below:

**Table 1: Renaissance Rationality**

<ul style="list-style-type: none"> <li>. Intent and extent</li> <li>. Logic (yang) viz. analytics*</li> <li>. hermeneutics, critics &amp; heuretics,</li> <li>. Intuition (yin),</li> <li>. Imagination</li> <li>. Evidence*</li> <li>. Heuretics, innovation, electracy**</li> </ul>	<ul style="list-style-type: none"> <li>. Relational i.e. it is connected to other FOL,</li> <li>. Embodies multiple perspectives,</li> <li>. Passion and Conviction,</li> <li>. Symbolism (math and myth) i.e. science <b>and</b> art.</li> <li>. Pluralist</li> <li>. Moral i.e. it can embrace the good</li> <li>. Practical hope</li> </ul>
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\* Indicates the extent of rationality as instrumental rationality in late capitalism circa 2000-2020. \*\* see Ulmer 1994<sup>17b</sup>

### **Conclusion**

In this article I have sought to outline a taxonomy of life in the emerging futures field of Forms Of Life. The power of science today is producing a range of life forms that defy our existing conceptual and taxonomic ability. Presently it seems to many of us that democracies have lost the ability, religions lost it mid last century with the advent of IVF, if they ever had it, to address these deeper issues or understanding emergent issues with a lens of practical hope. The argument has been advanced that such concerns have to be located within the conflagration comprising an entropic **logic base** that is big business,

big science, our own big consumption in the context of our Western desire to dominate or eliminate ‘the other’ and minimise difference.

This conflagration generates a form of soft eugenics that now threatens to make our children’s futures what is Kosovo today.

Eugenics on the other hand can offer humanity the opportunity to transcend the natural – not just manipulate it and in turn be manipulated by it. To achieve this in the next 30 years we need to develop and harness a new logic matrix, a new form of extended rationality that combines the horizontal view of the present science with one that also includes a vertical view or ethical/moral perspective with both dimensions integrated through a lens of ‘practical hope’.

In short, I argue, we need the vision logic of renaissance rationality. Too often the cyclic boom/bust momentum of history actually preserves orthodoxy. Once the pain and suffering is over, and things appear to swing back to normalcy, the straitjacket of orthodoxy returns society to conformity. Notice how quickly the financial markets have returned to bad old ways: the recession is nearly over, green shoots are appearing in many locations, and, we are told, we can return to business as usual, shaken but unstirred. Of course, we will learn from our mistakes and the future will be better and more prosperous.

Yet it never seems to work out that way well through the social changes that are being wrought from the technological ones documented in this piece, as well as the environmental challenges of global warming and economic bubbles of boom and bust. It may well be that using chaos theory we can intervene now with even small initiatives in a move to localised social sustainability. History awaits and our children’s children will judge the success or not of our humble fumbles. In any event I submit that the perturbations emergent in the world techno-eco-socio-econo today may not automatically favour the state corporatist endorsed military industrial complex – we may have a chance.

These changes will favour the status quo, however the cracks between the initiatives may well provide a gap for the emergence of truly human forms of life based on the remembering of a pro-life humanity based logic base (H!). In these post-normal times the critical ingredients for dealing with these changes are: imagination, creativity as I spell it **creativity** – enactive creativity, solidarity and systems praxis. So we have the potential process to move from  $H \infty H1 \infty H + \infty H!$  It is these types of initiatives we hope to document in this eZine – CRAFT.

It is only with a renaissance rationality that we will be able to understand the ethics of eugenics and develop the wisdom to harness the potentials of the Emerging Forms of Life on planet earth and beyond, before they apply the same **logic base** we have today to us tomorrow. So it is our best interest to take responsibility for the choices we will have to make to help ensure we can arrive at our imagined transhuman futures with our humanity and our planet in-tact.

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\* Historically, the *eugenics* movement had two general aspects: positive eugenics, concentrating on the means to increase the breeding potential of especially ‘fit’ individuals, and negative eugenics, emphasising the restriction on breeding for particularly ‘unfit’ types.

In the positive side there is active and passive. In the active we actively research e.g. through genetic manipulation to improve the human race. Note ‘improve’ needs to be broadly conceptualised and is directly relevant to our topic on Transhumanism. The passive approach to positive eugenics is the one we have taken for millennia in that through mate selection, educational processes and so forth characteristics such as intelligence, beauty, height and strength and parenthood readiness have been used generally unconsciously as selection criteria for our partners. We also see this in our pets e.g. the huge variety of dogs we have eugenically positively and proactively bred over the past several hundred years.

Transhumanism and indeed this article is advocating active positive eugenics we may call ‘soft positive eugenics’ in the paper. For a Manifesto of Speculative Post humanism please see <http://enemyindustry.net/blog/?p=422>.

The negative form is seen in the recent ethnic cleansing of Europe and Asia and the Hitlerian concepts of the pure master race. This article does **not** advocate this approach. Rather the article suggests we surface the reality that we all do eugenics passively, what I call ‘soft eugenics’ every day in every way. We just need to take this to the active level. Many spiritualities already do this say in Christianity ‘a new heaven and a new earth’ (Revelation) equals for me ‘a new humanity’ a trans human even where the technological component is replaced by a so-called spiritual one.

\*\* Including earth, land and sea under the rubric ‘terrestrial’, however strictly speaking terrestrial covers earth and 2/3rds of the planet’s surface is covered by water so our planet should logically be called ‘water’. Such ‘*natural*’ evolution is *wasteful* and *slow*. *Wasteful* e.g. the human genome project shows that most of our DNA, in fact over 95%, is not active. Of the 6 billion bit genetic code only about 23 megabytes is active. This is less than half the size of Microsoft Office 2000, which I am using to write this sentence. The **first stage** is *slow* in that it has taken some 15 million years since humanoids, and 3.4 billion since life in its simplest form, appeared on earth.

Human inspired evolution or ‘*technolution*’, called technoevolutionary algorithms, on the other hand are able to speed this evolutionary process up a billion-fold. Moreover when we hook up the species with intelligent machines, in a neural net, we can collectively speed up even this process, the **second stage**. The **third stage** is when this process is scanned on to the neural computer network itself. Here computational speed is inherently millions to times faster than mammalian neurons. So ‘evolution’ leaves the natural world, passes through human hands and onto the net by mid this century. Then a million ‘earth hours’ (basically a century) becomes one ‘neural net hour’.

Gorgon Stare is a photographic system for drones comprising 9 integrated cameras and processed by AI in the Mind's Eye project US Military, this is a step towards VI – Visual Intelligence now only found in animals and in particular humans. The system uses Complex Adaptive Systems programming to enable the algorithms and heuristics embedded in ME project to learn from experience and directly from visual inputs. Unlike well-developed machine vision, the ME approach looks to understand the meaning behind the objects it recognises.

Also I have found that the further back we go the more interesting our archaic history becomes and also the more confusing and diffuse, yet more relevant to the theme of this article and then again as Solomon said maybe 'there is nothing new under the sun'. Civilisation now predates the last ice age e.g. Gobekli Tepe (Turkey), Puma punku (Bolivia), Machu Picchu (Peru), Olmec civilisation (Mexico) etc. and ancient Indian civilisation of the Vedas some of which date to up to 15,000BP (there is also strong evidence of deeply archaic ruins in South Africa that reach back many many millennia beyond the above date, even to a 100,000year old stone calendar). Anywhere around this timeline we have numerous species of homo living contemporaneously, even in the one locale. Homo sapiens was in this league not the smartest tool in the shed by far with a smaller brain than even Neanderthal and by far the weakest physically. As I say curious-er and curious-er.

As well the many massive stone structures such as Newgrange in Ireland, and Stonehenge in England that predate the Pyramids and entire submerged civilizations around India in particular. Technical accuracy, astrological knowledge and mathematical precision in these structures utterly defy logic. They are sometimes associated with skeletons with elongated crania up to 2.5l in volume 2/3rds larger than our present volumes. Detailed discussion of this topic is outside the scope of this piece.

**So the archaic history of Forms of Life, even forms of Homo, on our planet is as intriguing as 'furstory' of Forms of Life (the latter being the focus of this paper).** Possibly the difference is that this time we are modifying ourselves.

\*\*\* Such a **logic matrix** could well be neg-entropic and derived from a rationality built on yin energy compared to explosive yang energy systems of today. That is it would generate a positive sum game i.e. it would generate more energy that it used, called **overunity**. This neg-entropic energy is also seen in Fig3 (Biosphere Energy Flow) would be introverisal and centripetal systems e.g. cold fusion and external implosive vacuum motors cp. to the current day entropic, extroversial and centrifugal yang energy e.g. the explosive internal 'combustion' engine. A motor developed from this yin technology powers the **Aesthentison** in Pope's work above, and is rumoured to power some UFO's that are to my mind terrestrial experimental craft with a yang motor drag is removed as the craft is enveloped in a vacuum and propelled by graviton quantum field type magnetic drive motors.

**About the Author**

Paul Wildman is an independent scholar and Fellow in the Kalgrove Institute [www.kal.net.au](http://www.kal.net.au). He has published some 100 articles, contributed chapters, and two books and CD-ROMs in these areas. He is a member of Robot Rights Australia. **Contacts:** [paul@kalgrove.com](mailto:paul@kalgrove.com) Ph/fax/msg +61 7 32667570 PO Box 73 Northgate 4013 Brisbane Q Australia.

### Acknowledgment

1. **This article is a reprised one based on:** Wildman, P. (2000). Life Futures: An Initial Taxonomy of Emergent and Extant Terrestrial and Non-Terrestrial Forms of Life. *Journal of Futures Studies*, 4(2), pgs93-108.

2. The **frontispiece** is a computer painting by Iona Miller (2013) used with permission.

### References (all websites accessed 02-2013)

1. (a) Wildman, P. (2001). Anticipating Emerging Issues: Reflections from a futurist. *Journal of Futures Studies* 6(1): pgs137-152.

(b) Tough, A. Positive Consequences of SETI Before Detection. *Conference Paper for International Astronautical Congress. Oslow, Norway. October. Paper no IAA-95-IAA.9.2.06*, pgs10. 1995

2. Judge, A. Communicating with Aliens: the <http://www.uia.be> Psychological Dimension of Dialogue. *Union of International Associations publications*, 2000 See <http://www.laetusinpraesens.org/docs/alien1.php#introd>

I have left out of this piece discussion of ‘G’od for instance such ‘supernatural’ or ‘spiritual considerations come in in relation to these Non Terrestrial Forms Of Life. Personally I do believe in a ‘mysterium’ whatever that may be that there is something that is beyond our own experience. This can be described as ‘transcendent’ in that it doesn’t apply to the ‘mysterium’ but rather to a certain human awareness that there is something real beyond our ability to know or even perceive. Discussion of this topic, esp. the ‘mysterium’ is beyond the scope of this article.

3. Wildman, P. Blood Sweat and Gears: Some present implications of cloning and other life futures. *Australian Rationalist*, 1999 Autumn. **49**. 33-37.

Terrestrially, **life is classified** among four biological families: (1) **archaea (extremophiles)**, (2) **bacteria**, (3) **eukaryotes**, and (4) **viruses**. Archaea are the recently defined branch that often survives in extreme environments, often aquatic, possibly even an asteroid, as single cells, and they share traits with both bacteria and eukaryotes. Bacteria, often referred to as prokaryotes, generally lack chlorophyll (except for cyanobacteria) and a cell nucleus, and they ferment and respire to produce energy. The eukaryotes include all organisms whose cells have a nucleus - **so humans and all other animals are eukaryotes**, as are plants, protists, and fungi. The final grouping includes the viruses, which don’t have cells at all, but fragments of DNA and RNA that parasitically reproduce when they infect a compatible host cell. These

classifications clarify the grand puzzle of existing life, but do little to provide a final definition.

**Life is defined** as living things tend to be (1) complex and (2) highly organized. They have (3) the ability for energy transmutation i.e. to take in energy from the environment and transform it for (4) growth, (5) reproduction and (6) death. Organisms tend toward (7) homeostasis: a dynamic equilibrium of parameters that define their internal environment. (8) Life learns inc. living creatures that respond, and their stimulation fosters a reaction-like motion, recoil, and in advanced forms, learning. Life is reproductive, as some kind of copying is needed for evolution to take hold through a population's mutation and natural selection. As an expansion of the above to grow and develop, living creatures need foremost to be consumers, since growth includes changing biomass, creating new individuals, and the shedding of waste.

There are no absolutely hard and fast rules to the classification or definition of life. NASA has had to go further than most researchers as interplanetary exploration is now scheduled – Mars explorer. See also: <http://mars.jpl.nasa.gov/> and [http://en.wikipedia.org/wiki/Mars\\_Exploration\\_Program](http://en.wikipedia.org/wiki/Mars_Exploration_Program) .

See: NASA's definition of life:

[http://www.nasa.gov/vision/universe/starsgalaxies/life%27s\\_working\\_definition.html](http://www.nasa.gov/vision/universe/starsgalaxies/life%27s_working_definition.html)

4. (a) Inayatullah, S., & Wildman, P. *Futures Studies: Methods, Emerging Issues and Civilisational Visions*. Multi Media CDRom Brisbane: Prosperity Press. 1998

(b) The issue of whether intelligence is important in the world/definition is an intriguing one as up to now intelligence, in the big picture of interstellar birth and death has not meant much if anything. As the intelligence of our machines accelerates then machine intelligence and human intelligence will become indistinguishable. This is the so called '**singularity**' anticipated slightly before mid this century. See: <http://singularityu.org/> .

From this point human intelligence becomes in effect increasingly submerged in AI. And we may well ask what is the logic base uploaded into AI into the 'borgs' I discuss in this piece? Will it be the 'entropic monotonic' logic base we see destroying the world around us Terminator and Clone Wars style? Will it be 'the market' or some other corporate state type system of say 'skynet logic' again in the terminator series? Humans use non monotonic, abductive and adductive reasons where heuristics and heuretics play a hugely important role yet are largely overlooked in humanities and sadly even in science.

In contrast, thru **heuretics** the innovation process requires the creation of highly plausible hypotheses and solutions that are not readily observed or experienced - at least not in the current context. The thought processes most applicable in these circumstances are abductive and adductive reasoning. These types of reasoning

require that intuition and creativity are applied to observed and experienced facts.

**Abductive reasoning** determines plausible hypotheses. For example, abductive reasoning would be used to determine hypotheses for why ice would be cold. Further investigation beyond external observation would be required to prove or disprove each hypothesis proposed. **Adductive reasoning** determines plausible solutions. For example, depending upon why ice is cold, we may develop new solutions for how to make ice. Each solution would need to be tested through experimentation. Both of these types of reasoning also work hand-in-hand. See:

<http://www.ellendiresta.com/post/2009/10/26/Abductive-and-Adductive-Reasoning.aspx>

Consequently ‘We’ (H, H+, H1, + post-biological Lifeforms as discussed here) will have an accelerating potential impact on, and in, the Universe. Consider the case of an asteroid that slammed into the earth 65 million years ago and almost extinguished life as we would know it on the planet. Should an asteroid come our way today a very different fate awaits it. And yet possibly we can see techno-evolution as a form of internecine techno-asteroid we are aiming at ourselves and our planet. See:

<http://hplusmagazine.com/2013/02/01/welcome-to-postnormal-times/> esp. the introduction by Zia Sadar. *Welcome to Postnormal Times*. Feb 2013, also the Occupy, Hacker, P2P, Opensource, and DIY movements see <http://www.kalgrove.com/adultlearning/> - see Bush Mechanic section.

Detailed discussion of this theme is outside the scope of this article yet warrants separate consideration.

5. Pentti Malaska’s outlines on Forms Of Life in his ‘Inventing Futures’ opening address to the *World Futures Studies Federation XV World Conference*, Brisbane, Australia, 28 September – 3 October. 1997, *Global Conversations -What You And I Can Do for Future Generations*.
6. (a) Wildman, P. and B. Blomeley. 1998. *Dreamtime Myth: Exploring History as Future through the Dreamtime Stories of the Magani Whirlpools of Torres Strait and Gooriala the Rainbow Serpent of Cape York*. In *Futures Studies: Methods, Emerging Issues and Civilisational Visions*. S. Inayatullah and P. Wildman. Brisbane, Prosperity Press [Multimedia CDRom]. 500 pgs equiv [on CDRom].  
  
(b) Wildman, P. *The Litany of Death: a Deep Futures critique of the Australian Royal Commission into Aboriginal Deaths in Custody*. *Futures*, (forthcoming) 2000.
7. (a) Overpopulation, Global War(m)ing, Ecological catastrophe and so forth. These are outside the scope of this article however it is possible that as Gaia drifts towards planetary collapse say around 2075 more of the exoskeletalborgs, a subset of Technoborg and their descendants, will be used for ‘crowd control’.  
  
(b) Slaughter, R. *Implementing Critical Futures Studies*. In Z. Sardar (Ed.), *Rescuing All Our Futures: The Future of Futures Studies* Westport: Praeger, 1999. pp. 83-97

8. Broderick, D. *The Last Mortal Generation: How Science will Alter Our Lives in the 21st Century*. Sydney: New Holland. 1999
9. Junker, K. How the Future is Cloned. In Z. Sardar (Ed.), *Rescuing All Our Futures: The Future of Futures Studies* (pp. 19-35). Westport: Praeger. 1999
10. Inayatullah, S., & Fitzgerald, J. Gene Discourses: Politics, Culture, Law, and Futures. *Technological Forecasting and Social Change*, **52**, 161-183. 1996
11. (a) Sardar, Z. The Problem of Futures Studies. In Z. Sardar (Ed.), *Rescuing All Our Futures: The Future of Futures Studies* (pp. 9-18). Westport: Praeger. 1999

(b) One ‘humane’ outcome of the **human genome project**, I saw a decade or so ago, that on an email list serve I subscribe to, was the realisation during our email exchanges that there is no ‘one’ human genome rather ‘human genomes’. This was triggered by acknowledgement of the scientists recording the human genome who were compelled by this realisation to seek to identify the genetic make up of these ‘other’, ‘different’, ‘disappearing’ peoples of the world.

The list provided covered about 50 groups of genetically distinct humans and included small tribes in Australia, Borneo and the Amazon. Some had remaining populations of less than 100 most less than 5000. Importantly some of these ‘tribes’ had genetic susceptibility and immunity to certain diseases. Clearly worth documenting before it is all too late. Indeed every two weeks a language disappears from planet earth. Somewhat autonomously the scientists had commenced mapping these various genomes.

Reading this email one cannot help but realise the devastatingly predatory nature of our Western culture which is ‘extincting’ our own genetic diversity and their associated cultures – extinct species (thousands per year), extinct tongues/languages (twenty-five or so every year), extinct peoples (several each year).

Also see the Chris Hedges take on the link with modern neoliberal capitalism which can be applied, I argue to transhumanism as an extension thereof, @ <http://www.youtube.com/watch?v=7zotYU21qcU> Section 2:17.40 to 2:20.10 in question is directly relevant to TH. Also: <http://transhumanity.net/articles/entry/our-vampire-future-wireheading-and-hi-tech-psychopaths>

12. Kurzweil, R. *The Age of Spiritual Machines: When Computers Exceed Human Intelligence*. New York: Viking. 1999. [www.penguinputman.com/kurzweil](http://www.penguinputman.com/kurzweil)  
For a history of computing try:  
Mind-Machine Web Museum: a virtual computer history gallery  
<http://userwww.sfsu.edu/~hl/mmm.html> 25 Years of Computer History (1971-1996)  
<http://www.compros.com/timeline.html> ; History Museum History Centre  
<http://www.mos.org/museum-online>

13. Drawn from McNally, P., & Inayatullah, S. Rights of Robots. *Futures*, **20**(2), 119-136.1988 who reference Death by Robot *Science Digest* (Aug, 1985) pg 67.
14. Moravec, H. (1998) *Robot: Mere Machine to Transcendent Mind*. Oxford University Press. 227 pgs.
15. One such new logic matrix would be the Artificer or Bush Mechanic a matrix that uses techne cp. techni where technology is an extension of us as humans rather than vice versa. In this regards I submit RRA – *Robot Rights Australia* would be a worthy consideration, say a private not-for-profit organisation committed to advocating in public and private domains for robot rights much the same as human, and animal rights have been advocated a generation ago. Please see [www.kal.net.au](http://www.kal.net.au) top right under ‘Adult Learning’
16. Slaughter, R. *The Foresight Principle: Cultural Recovery in the 21st Century*. London: Adamantine. 1995
17. (a) Wilber, K. *Sex, Ecology, Spirituality: The Spirit of Evolution*. Boston: Shambhala. 1995.  
  
(b) Ulmer, G. *Heuretics: The Logic of Invention*. Baltimore: The John Hopkins University Press. 265pgs. 1994. Electracy is a subset of heuretics which is in turn a subset of hermeneutics. Where hermeneutics asks what does this text mean heuretics asks what can be done with this text today. In broad terms, to my mind, heuristic is an out-working/extension of the meaning of the text whereas hermeneutics is an in-working/intention of meaning from within the text. Heuristic can be seen as a subset of heuretics which in turn can be seen as a separate to hermeneutics. Ulmer (1994:3,9) though argues that hermeneutics and heuretics are equal and discrete.
18. Slaughter, R. Futures Beyond Dystopia. *Futures*, 30(10), 993-1002. 1998
19. This six article series are in the Scientific God Journal and are available from the author on request. See: <http://scigod.com/> and <http://tech.groups.yahoo.com/group/scigod/> . Three of these titles are as follows:  
(1) Miller, I. and P. Wildman (2012). The Demiurgic Field: It's Patterning Role in Chaos, Creation, and Creativity. *Scientific GOD Journal* <http://scigod.com> ; <http://www.scribd.com/doc/98802448/Scientific-GOD-Journal-Volume-3-Issue-5-Toward-the-Unification-of-Science-Spirituality> . 3(5): pgs. 43-70.  
(2) Miller, I. and P. Wildman (2012). Ancient wisdom in the Modern Age: An Archaic Renaissance. *SGJ (Scientific GOD Journal)*. 3(6): pgs. 578-592.  
(3) Wildman, P. and I. Miller (2012). God’s Fingerprints: Using Reflexive praxis to identify underlying social neg-entropic patterns in our Wriggling Universe. *Scientific God Journal (SGJ)*. 3(10), pgs. 936-954.

20. Pope, R. and R. Todonai (1988). *Two Bob's Worth*. Loxton, South Australia. Science-Art Research Centre. 130pgs. The artists permission to use these three artworks is gratefully acknowledged. See <http://www.science-art.com.au/>
21. Pope, R. and C. Degenhardt. (2012). *21st Century Renaissance*. Uki, Science Art Research Centre of Australia: Uki. 180pgs.