Emerging Technologies - Some Strategies for a Future of Design and the Formation of Somatic Experience.

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Abstract
This brief paper highlights some of the issues that have arisen in a research that emerging from the experience of attempting to extend design analysis and criticism into those student projects which engaged with 'incorporated technologies' such as nanotechnology, virtual and augmented reality, DNA computing or implant augmentation. The research itself will take the form of a number of narratives intended to explore and invite discussion of ideas drawn from philosophy and science, posited as a means to initiate discussion among designers. This paper particularly explores how this process of dialogue arose from the discussion of complex and 'uncertain' ideas with student designers and emerged from the experience of developing curricula for the undergraduate 'design futures' course at the University of Wales. It is suggested that issues emerging from this research may have some impact upon the design of future pedagogies for design education and upon the future of industrial design conceptualisation. Questions are raised of the methodology of those designers who claim to model users experiences through metaphoric or comparative allusion to antique models of mechanical processes or through social interactions conceived to bear comparison with established human rituals. The paper describes how a speculative method of dialogue is being designed in order to explore the potential of an extensionist philosophical model. The dialogic method, whilst still in the process of construction, is centred upon a process of 'story-telling'. It is anticipated that these stories will go some way towards the embodied, inclusion of emerging uncertain and unorthodox ideas of 'extension' in philosophy, biology, ecology, psychology and neuroscientific into the schema of industrial design conceptualisation.

Key words: Industrial Design, emerging technology, interaction, ontology, scenario filmmaking

Between 1997 and 2003 Design Futures was an industrial design undergraduate course at University of Wales Newport. Prioritising ideas and critical analysis above all the course was intent upon exploring the future of design as a cultural activity. Students were encouraged to engage with the design implications of 'future' technologies.

Incorporated technologies such as nanotechnology, virtual and augmented reality, DNA computing or implant augmentation presented particular problems for the course team. For whilst such technologies - of such intangibility that their presentation denied 'objective' realisation - invited design consideration it was particularly problematic to extend design analysis and criticism when the design consequence could not be easily modelled. The initial inclination was to banish such projects from the curriculum and to focus upon more orthodox inclinations of interaction design or eco-design and the course successfully developed a specialism in these fields.

The research, to which this paper can only allude briefly, is concerned to enquire of the boundaries of design conceptualisation. To date the research has surveyed a range of methodologies accounting for the phenomenological experience some forms of emerging technologies are anticipated to create. The research enquires whether such technologies can really be beyond the scope of design and has thrown up questions of the methodology of designers who seek to humanise technology and explores whether a means can be found - through story-telling - of opening a broader ontological debate among the industrial design community. If the methodology proves successful, a contribution might then be made towards the establishment of an engagement with emerging forms of technology, which are understood to deny orthodox taxonomy.

At the heart of this research lies a concern to investigate the International Council of Societies of Industrial Design, definition of industrial design:

a creative activity… the central factor of innovative humanisation of technologies... (ICSIC 2004[1])

in light of Mitchell's nascent concept of the illusory product (Mitchell 1988) and the emergence of a post-mechanistic science. The claim of the research described here, that recent direction of focusing upon the user may be interpreted as a deterministic constraint upon human creativity, is tested, in part as an intellectual consequence of the pedagogic requirement placed upon students to create short films. The intention of these films was to enable insight into the experience of proposed design

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[1] International Council of Societies of Industrial Design (ICSID). http://www.icsid.org/

solutions. Although we make no particular claim to the invention this pedagogic approach, Design Futures was rather unique in the experimental approach it took to this process. Over time, these films evolved from the rather simplistic infomercials into artworks in themselves, bearing comparison to experimental film or video art. These films became not so much 'explanations' of design experiences, but forms of ontological insight into experiences of being, enabled or enhanced by incorporated technological systems. Questions were invited; whether the orchestration of being might be thought a legitimate design process of humanisation? Does this not extend the role of industrial design in processes of enabling 'poetic' experiences of being in the mechanical or industrial condition into a new territory? As the investigation of the ontological gained fluency, it seemed as if the recent inclination by industrial design to focus upon attempts to fit such experiences into an existing pattern of living might bear some comparison with late nineteenth century attempts to deny industrialisation. (Dunne 1999) Just as industrial design emerged as a formation of being in the industrial condition then might not another form of design emerge in the twenty first century? A posthuman, transhuman, transsexual Joe or Josephine maybe? (Dreyfuss, 1955) Such a form of design will surely go beyond methodology of establishing criteria for the 'usability' or 'user friendliness' of technologies by modelling 'users' experiences through metaphoric or comparative allusion to antique models of mechanical processes or human rituals from another era? Design philosophies focusing upon artifice, simulacra and the virtual have struggled to find rationality in taxonomies of the 'experience' of technological artifice and to include its 'deception' into post-modern philosophical 'grounding' of being. As new technologies emerge formed of flesh and enacted by the quanta, so they can be interpreted to bring with them new riddles for those who seek 'metaphorical' taxonomy.

In another age Kapp wrote of the 'intrinsic relationship that arises between tools and organs' (Kapp 1877: 23) although such ideas were posited in a mechanical construct. 'Since the organ whose utility and power is to be increased is the controlling factor, the appropriate form of a tool can be derived only from that organ.' When Kapp suggests that 'in the tool the human continually produces itself' (Kapp 1877: 23) he opens an intriguing new theoretical territory of the extended body. In more recent psychotechnological thought, (McLuhan 1997, Mazlish 1993 , DeKerchhove 1997 and Levy 1997 for example) extension appears not as a limited metaphor, but more directly as an integrative approach to the formation of technological species. If

industrial design is interpreted to have taken the idea of technology as extension into its conceptualisation at all, it has chosen to draw attention to the visible, cultural 'body' and to extend this outward. If industrial design interprets the body to both be something of the imagination and to act directly in the world in intimate relation to the mind, then it becomes possible to interpret theoretical focus upon the 'erotic' potential of technology as an 'imaginary body'. By including psychoanalysis and ideas of identity formation into theorisations of desire, industrial design conceptualisation can be shown to associate technology as a form of 'beautiful' body, forming an extension of the identity of the self – as body – as fixation – in a form of technonarcissism. Cyborg (mankind in the image of machine) or Android (machine in the image of mankind) can be interpreted to appear in industrial design conception as bodies of complex analysis with ideas of power and gender and desire and almost any other particular, local, cultural phenomena one may care to include. If the inhuman Lyotard (Lyotard 1991) argument is founded upon the certainty of technology as something other than human, then its rhetoric can be accused of overly accounting for imagining 'sexy' dynamic recent technologies at the expense of what is known of human anthropology. We might enquire when 'we' if ever, were not a species, formed in a condition of technology?

If emerging technologies are in phylum at once biological and synthetic, material and immaterial, organic and inorganic then critical interpretations of theories of the inhuman relying upon biological distinction are thrown into question. (See particularly Deleuze and Guattari 1988) If no humanity can be found 'without' technology, then is technology better conceptualised as an extension of humanity itself? If technology can be considered human then what of Lyotard's fears? Do we 'feel' less human when technology is included into our phylum? If such a consideration is made then what can industrial design mean when it seeks to 'humanise' technology? Should we leave the challenge of unravelling such complexity to philosophers alone? Or is it possible to find in its experience of bringing together, science and philosophy into intimate and imaginative space in the conception of what it is to be a person, how industrial design might contribute to this kind of debate?

Much recent science and philosophy, in endeavouring to investigate the phenomena of consciousness, throws doubt upon humanistic schema:

There are strong indications that among the loose federation of sciences dealing with knowledge, and cognition - the cognitive sciences - there is a slowly

growing conviction that [the Cartesian picture of formal, logical, well defined units of knowledge] is upside down, that a radical paradigmatic or epistemological shift is rapidly developing. At the very center of this emerging view is the belief that the proper units of knowledge are primary concrete, embodied, incorporated, lived. (Varela 1992: 320)

In theorisations of deep ecologies which include chaos mathematics, Cartesian schema is similarly challenged in that it is identified as an inhibition to the development of a sustainable ecological apprehension of interconnectivity:

My thesis has been that a theory of living systems consistent with the philosophical framework of deep ecology, including an appropriate mathematical language, and implying a non-mechanistic, post Cartesian understanding of life, is now emerging. (Capra 1997: 153)

Similarity with Capra can be claimed in Idhe's (Idhe 2002) analysis of technology as the media of reality or with Varela, Thompson and Rosch's (Verla et al 1993) rather more problematic interpretations of the role of the corporeality of experience or Mazlish's (Mazlish 1993) claims for a future synthesis of technology and humanity. Even the 'situated actions' of Suchman (Suchman 1987) can reasonably be interpreted to place experience in an embodied context. In any case these challenges to the ideology of technology as an extrinsic object of the world seeking resolution might reasonably be regarded as a challenge to the hegemony of industrial design conceptualisation. Pepperell (Pepperell 2003 and Pepperell and Punt 2000) has sought to develop an extensionist mode of creative philosophy, finding no distinction in objects or between the mind, body and world. Pepperell defines extensionism thus:

…rather than regarding identifiable objects of the world as coherent and discrete, Extensionism holds that all objects and events extend indefinitely through time and space. However, we normally acknowledge only a fractional part of the real extent of any object because of constraints inherent in our perceptual apparatus…' (Pepperell 2003:188)

An extensionist schema holds that no useful border can be found in objects or phenomena in so much as all 'objects' and 'properties' are considered formed as universal states of energy, evident as excitation or density. Any claimed distinction is relative to human perspective as it appears to human conception. Such a philosophical view is supported by emerging physics in which space and time are interpreted as human conceptions without universal foundation. An extensionist philosophy suggests that such knowledge accepted as a facet of physics should be applied to the philosophical interpretation of being. The upshot of such a schema is that phenomena which can appear in cognition as beyond rational reduction or as fractures of states of reality only do so in so much as limited human conception is unable to accommodate their appearance in existing taxonomies. Emerging technologies utilising energy exchange at a sub-atomic level are bound to resist limiting human taxonomy founded in the human schema.

Deleule has pursued the 'indelible mark left upon the modern era' (Deleule 1992:203). by the Cartesian separation of mind from the body. Deleule cites Merleau-Ponty, (Merleau-Ponty 2003), among others finding the separation of the objective and subjective knowledge of the world to be similarly problematic in consideration of the experience of perception through the body, itself being of the world:

We live in an age of telepresence and virtual reality. The sciences of the mind are finally paying heed to the centrality of the body and world. Everything around us drives home the intimacy of perception, action and thought? (Clarke, 2003:1)

Whilst remaining something of a mystery to science, for many of those engaged in consciousness research question the established idea of an outside world brought to the mind through the senses, challenging the everyday sense of a world is outside the body and conceptions of images formed somehow independently of substance. Advanced neuroscience and neurophysics (see particularly Hameroff 1999), in developments in psychopharmacology - particularly in relation to research in the field of entheogens[2] - and in the emerging 'scientific' fields of quantum consciousness, researchers have found it useful to include artists, designers and theologians into their enquiries. (See particularly CAIIA[3] and Fagg 1999) Similar issues can be found in advanced research in developing biomolecular computation (Sometimes referred to as DNA computing) (Calude and Päun 2002), and quantum transistorisation[4]. (Shapiro et al 2002) Research with the direct connection of biological material has similarly moved from fiction

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[2] Entheogens. Psychoactive chemicals associated with Shamanic or religious uses.
[3] Centre for the Advanced Enquiry Into Interactive Arts: www.caiia-star.net
[4] Emerging technologies which utilise the complimentarity of DNA - its double-strandedness - and its molecular scale make it both an exceptional structure for computation and create the potential for massively arrayed biological computing technologies and data storage. In such computers, all possible answers are computed simultaneously with very low error rates.

into reality with the fusing of the neuron to silicon array. (Straub, Meyer and Fromherz 2001) Such computers which until recently utilised farmed and 'extracted' bacterial DNA have recently taken a divergent turn with developments demonstrating incorporation, directly intervening into the higher functionality of the body. Whilst it may seem somewhat premature to claim such technologies as likely to appear in everyday life in the near term, their emergence can be understood to invite questions of the likely emergence of precognitive activity of the body as a experiential concern:

Computers will continue to miniaturise themselves, though, eventually disappearing into a microverse where their ever-vaster calculations and mathematical models will become one with the quarks and the charms. (Ballard 1992: 273)

Norretranders (Norretranders 1998) and Wegner (Wegner 2002) particularly point to the extent of the processing of the body which remains outside of consciousness, drawing attention to the manner in which hitherto 'paranormal' phenomena might be explained in terms of such nonconscious or preconscious processing (Baars 1994). Wegner describes experiments with the planchette, automatic writing, pendulum and divining rods and draws upon phenomena such as blind-sight and phantom limbs in order to demonstrate nonconscious processes interpreted to give rise to consciousness. Prescience' is employed as a terminology, ring-fencing certain 'functionalistic', processes of the body giving rise to later cognitive interpretation. Care is taken to recognise the blurred borders of the non-conscious and the unconscious, automatic or 'tacit' (Polyani 1966) in the integrative processes of 'knowledge' in non-conscious actions of the body and appearing as reflex actions of the body. Such a term can then usefully include phenomena such as automatism, unattended processing, subliminal processing, implicit processing and pre-perceptual processing (Baars 1994) or proprioceptive (Sherrington 1906) activity. As Ascott has stated, 'if the interaction is not evident to us we are no more users [of technology] than we are the "users of our eyes, ears, nerves and hormones.' (Ascott 1995: 22-24)

If a form of extensionism is found to be effective as a means to 're-find coexistence' in virtuality and reality, humanity and technology in the body as location, then it makes it possible to reject Lyotard, the Cyborg and the Android conception from industrial design. By placing attention upon the phenomena of being in an extended world – accepting phenomena as they arrive in consciousness not as acts of deception but as

extensions of the creative potential of human memory and imagination, industrial design conceptualisation may be able to go far beyond ideas of future iterations of technological application such as that envisioned by corporate capitalism:

Long term, the PC and workstation will wither because computing access will be everywhere in the walls, on wrists, and in scrap computers (like scrap paper) lying about to be grabbed as needed. (Weiser 1998: 23)

This research is concerned to explore the effect of such a dynamic shift in thinking upon industrial design. Focusing upon the extended 'body' as the intimate place in which 'consciousness' is made 'person' and by drawing upon scientific and philosophical ideas as they challenge the hegemonic schema, the research enquires whether ideas of 'humanisation' and 'interaction' can continue to have meaning. If no useful distinction is drawn between the human and technology, and the manner in which we identify them is posited as limiting taxonomy. (Wittgenstein 1958) then, can industrial design really focus upon the activities technologies afford (Norman 1990, 1993 and also Biocca 1997) without being at risk of damaging a poetry of being.

Given how likely the advanced scientific knowledge implied by many of the technologies cited in the research is to be beyond the scope of the research, care must be taken to engage with ideas at an 'operative' level for industrial design conceptualisation. That is at a level that has meaning and 'validity' in everyday life, commensurate with the 'everydayness of encounters with industrial design. The intention of this research is not to add fuel to the philosophical fields it encounters nor to add anything significant to scientific knowledge, except in so much as an exploration of the validity of these ideas in a discussion of industrial design conceptualisation. The aim of the research is to enquire how these ideas can be explored in such a manner as to have resonance in the industrial design community.

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