Upgrading Humans – Re-grading People?
Jonathan Sawday

'Why has man not a microscopic eye?'[1]

'So long as we represent technology as an instrument we remain transfixed in the will to master it'.[2]

The purpose of this short paper is to offer a response to Professor Kevin Warwick's account of his work in the field of implant technology. As a cultural and literary historian, it would, clearly, be foolish of me (not to say presumptuous) to attempt a critique of the science behind Warwick's work. Hence, my intention is to do no more than to place his work within a wider cultural tradition.

Warwick's work is concerned with what has sometimes been termed the 'human – machine interface' but, considered in cultural terms, is more properly located within the emerging discipline of 'Transhumanism' or 'Posthumanism' – the belief that the application of new technologies will, in the course of time, work to transform the human species, to such an extent that a new, and distinctly different form of humanity will emerge.[3] Such fabricated creatures, in the words of Donna J. Haraway's immensely influential 1985 essay on this theme, would be 'a hybrid of machine and organism […]. Creatures simultaneously animal and machine, who populate worlds ambiguously natural and crafted'.[4] Usually, although not invariably, this transformation is imagined as exchanging or replacing organic body parts for a compound of the organic and the artificial, or even the replacement of the organic altogether, so that the human creature is envisioned as liberated from the bondage of biology, to enter into a new existence as a purely artefactual creature. In its more radical forms, transhumanism envisions the development of altered mental capacities, or even the 'uploading' of the human mind to a computer, to produce a sentient 'being' whose existence is purely virtual. Transhumanism thus hovers in an uneasy realm midway between scientific reality (of the kind that Warwick's own work exemplifies) and the more ambiguous arenas of myth, fiction, film, and even computer games. Its tendency, necessarily, is to look forwards to the future, by extrapolating from the past trends and possibilities which usually, though not invariably, are beyond the grasp of our present technologies. As Nick Bostrom puts

the matter: 'The rapidity of technological change in recent times leads naturally to the idea that continued technological innovation will have a large impact on humanity in the decades ahead'.[5]

Considered, however, from the literary and historical point of view, Warwick's ideas can be thought of as exemplifying much earlier dreams of human perfection and perfectibility achieved with the help of mechanical or artificial assistance. These dreams might include: the robotic fantasies of the fifteenth-century Italian clockmaker, Lorenzo della Volpaia; Leonardo do Vinci's experimental drawings for some kind of robotic knight; the fantastic automata of Arabic and (later) European craft workers in the medieval, Renaissance and Enlightenment periods; Robert Hooke's seventeenth-century speculations on an 'enhanced' human frame re-designed with the help of clockwork technology; and (even) the early calculating devices of Pascal, Leibniz, and (in England) Sir Samuel Morland, who all drew on the Cartesian conception of the body-machine, together with Hobbes's 'reduction' of human thought processes to mathematical calculation, and which would culminate in the extreme mechanism of Julian Offray De La Mettrie's *L'Homme Machine* (1748).[6]

But transhumanism has a more specifically literary set of antecedents. In Renaissance poetry, for example, we find Edmund Spenser, John Donne and Guillaume Sieur Du Bartas in the sixteenth and early seventeenth centuries conjuring with the image of human beings 're-crafted' as mechanical artefacts.[7] In Shakespeare's *Coriolanus* (1608) the central protagonist, Coriolanus himself, is imagined as a crafted 'thing', a robotic 'engine' of war oblivious (until the play's final scenes) to human feeling. Such poetic and literary texts can be thought of as the distant forerunners of Mary Shelley's *Frankenstein, or The Modern Prometheus* (1818), or the later metallic fantasies of W. B. Yeats who, in his poems 'Sailing to Byzantium' (1927) and 'Byzantium' (1933) imagined a purely artificial existence in which the complexities of organic life are exchanged for the 'glory of changeless metal'.[8] Transhumanist texts might also include Aldous Huxley's *Brave New World* (1932), as well as the science fiction writings of (*inter alia*) Arthur C. Clarke, Isaac Asimov, Robert Heinlein and Stanislaw Lem. William Gibson's foundational 'cyberpunk' novel, *Neuromancer* (1984), with its vision of humanity interconnected via the 'consensual hallucination' of the 'matrix' (an idea which, it has been

suggested, might have anticipated the idea of the internet) can also be thought of as a further manifestation of this strand of thinking.[9] Ridley Scott's equally influential dystopic *Blade Runner* (1982), based (loosely) on Philip K. Dick's novel *Do Androids Dream of Electric Sheep?* (1968), with its powerful cinematic evocation of a world in which humans and (deadly) human simulacra are only with great difficulty distinguished from one another, is yet another manifestation of transhumanist thought, though of a distinctly dark nature.

Given the trajectory of Warwick's work, and the futuristic tone of much transhumanist writing, it might be thought that the essentially scientific features of this area of exploration are a phenomenon of the twentieth and twenty-first centuries. This is not, however, the case. Indeed, it might be argued that a more truly foundational work of transhumanism is Darwin's *Origin of Species* (1859), with its exploration of patterns of change and replacement as different species secure (or fail to secure) their different environmental niches. Seen from an evolutionary perspective (which is also, I sense, Warwick's one position) the present state of humanity might be considered as 'transitional' with the next stage involving some movement towards a fusion of the biological and technological. In the nineteenth century, this idea was already in circulation, prompted not only by the enormous growth in industrial and domestic technologies together with burgeoning interest in magnetism and electricity, but also by the beginnings of work on the forerunner of the computer, Charles Babbage's incomplete 'Difference Engine'. In his famous letter of 1822 to Sir Humphry Davy, Babbage first sketched his idea for a machine which, operating 'by the aid of gravity or any other moving power' would relieve human beings from 'the intolerable labour and fatiguing monotony of a continued repetition of similar arithmetical calculations' and would thus 'become a substitute for one of the lowest operations of human intellect'.[10] Though Babbage could have had no idea of a mechanical replacement of the human intellect within individuals (of the kind which, in its electronic form, Warwick's work seems to gesture towards), yet his idea of substituting mechanism for the 'lowest operation' of the mind strikes a distinctly transhumanist note. And certainly, nineteenth-century responses to evolutionary theory and the enormous power that seemed to be unleashed upon the world via the agency of mechanism, resulted in works such as Samuel Butler's *Erewhon* (1872) in which machines (which Butler presciently

imagined 'will greatly diminish in size') are abandoned out of fear of their evolutionary (and even replicative) capacities. As a philosopher of Erewhon explains in Butler's novel: 'I fear none of the existing machines; what I fear is the extraordinary rapidity with which they are becoming something very different to what they are at present'.[11] Warwick's own concluding vision of '[biological] humans […] left behind as some kind of sub-species', with its uncomfortable eugenicist undertones, can be thought of as a twenty-first-century articulation of the fictional fear of Butler's nineteenth-century philosopher.

Turning from the nineteenth-century precursors of Warwick's work, what is the wider theoretical foundation, within cultural theory, to which his ideas can be imagined as offering parallels? Since at least the European Renaissance, one of the dominant structures of western thought is concerned with that antithesis between 'art' (which encompasses artefacts as well as literary and artistic works) and 'nature', an idea that can be traced back to Plato, Aristotle and Augustine.[12] But in the late-twentieth and twenty-first century, so it has been argued, this distinction between the organic and the manufactured, has all but collapsed: 'the overlap of the mechanical and the lifelike increases year after year […]. The meanings of "mechanical" and "life" are being stretched until all complicated things can be perceived as machines, and all self-sustaining machines can be perceived as alive'.[13] Not only is it at least possible to imagine machines that are capable of replication, or even reproduction, but machines may even be said to possess the beginnings of that mimetic facility which had once seen as the preserve only of human beings. So, too, microbiologists have begun to conceive of the 'natural' form of the body as a complex sequence of mechanical activities, operating at the molecular level. 'Molecular machines', composed out of protein, are understood as 'the main engineering material of living cells':

> Just as today's engineers build machinery as complex as piano players and robot arms from ordinary motors, bearings, and moving parts, so tomorrow's biochemists will be able to use protein molecules as motors, bearings, and moving parts to build robot arms which will themselves be able to handle individual molecules.[14]

But are these reproductive fantasies of artificial life anything more than metaphors? Writing in the early 1950s, Norbert Wiener pointed out that 'the nervous system and the automatic machine are fundamentally alike in that they are devices which make

decisions on the basis of decisions they have made in the past'.[15] For Wiener, however, the fact that the machine and the body might be 'fundamentally alike' did not mean that machines should be understood as being 'alive' in any sense. Such a confusion of the organic and the inorganic was a semantic rather than a scientific issue:

> Now that certain analogies of behaviour are being observed between the machine and the living organism, the problem as to whether the machine is alive or not is, for our purposes, semantic and we are at liberty to answer it one way or the other as best suits our convenience. As Humpty Dumpty says about some of his more remarkable words, 'I pay them extra, and make them do what I want'.[16]

However, under the pressure of new, digital, technologies, the world about us has been re-mapped. A regime of artificiality or (to appropriate a phrase coined by the French 'urbanist' and theorist, Paul Virilio) 'total […] motorization' has come into being, at least in theory.[17] In the post-modern world inhabited by Jean Baudrillard, the distinctions between the natural and the artificial simply no longer apply. Thus, Baudrillard can describe the 1991 conflict in the Arabian Gulf as 'war stripped bare by its technicians, and then re-clothed by them with all the artifices of electronics, as though with a second skin'.[18] Even the categories of 'real' and 'unreal' have buckled, as Baudrillard urges us to contemplate 'models of a real without origin or reality: a hyperreal'.[19] This new reality is a product of the reproductive or 'replicative' capacities of systems, programmes, machines, mechanisms, or even games, whereby an artificial order has come into being. This order is the product of 'miniaturized cells, matrices, and memory banks, models of control – and it can be reproduced an infinite number of times from these'.[20]

Herbert A. Simon, a computer scientist, psychologist and (in 1978) Nobel Laureate in Economics agrees with the philosophers of machine-made reality that: 'The world we live in today is much more a man-made, or artificial, world than it is a natural world'.[21] For Simon, the world, which has been understood since the late-seventeenth century via the agency of 'natural science' is now in need of what he terms 'artificial science'. Such a science would be devoted to the study of the world of artefacts and artificial systems, rather than natural forms and phenomena. Yet, for all the celebration of artificiality above nature on the part of modern theorists of the real and the simulated, Simon recognises that the project of 'artificial science' has to

overcome a deeply engrained human prejudice, which is betrayed at the level of language. So, Simon remarks upon the many synonyms which exist for the very word 'artificial': 'affected, factitious, manufactured, pretended, sham, simulated, spurious, trumped up, unnatural', together with antonyms such as 'actual, genuine, honest, natural, real, truthful, unaffected'. Surveying this vocabulary of artifice, Simon argues that 'our language seems to reflect man's deep distrust of his own products'.[22] And yet, as Mary Tiles and Hans Oberdiek observe:

> Once we start to think about it, it is not easy to see how to draw the line between natural and artificial […]. It may be easy enough to distinguish between imitation pearls and real ones, but how much more difficult to classify domesticated animals (Siamese cats, Jersey cows, Swaledale sheep) or f1-hybrid tomatoes.[23]

Will it, I wonder, be similarly difficult to distinguish between the 'purely' human and the hybridised human of the future? Or, just like Charles Darwin, who, in the final sentences of *The Descent of Man* (1871) described shrinking in horror on confronting the 'primitive' indigenous peoples of Tierra del Fuego in the course of the Beagle voyage, will our distant transhuman descendents turn away in disgust on encountering the last survivors of their organic forbears?[24]

If taxonomy itself appears to be on the point of collapse, then Warwick's exploration of implant technology ends on a similar apocalyptic note of finality. But, then, human beings and their relationship to the technology that has come to surround them, sustain them, and sometimes almost overwhelm them, has often had a melancholic aura. So, for Sigmund Freud, writing in the 1920s with the horrors of the first industrial war still fresh in the memory, the history of the development of *all* technology was (as it was, ultimately, for Karl Marx) a story of prosthesis – a history of enhancing the human form by artificial supplements. In his *Civilization and Its Discontents* (1930) Freud understood all the manifold devices that had come to inhabit modernity as, essentially, attempts to enhance not only the human frame, but also the sensory and intellectual organs of the human being, and hence to escape the limitations imposed upon the body and the mind by nature. Surveying the technology that surrounded him in the first quarter of the twentieth century, Freud saw, everywhere, examples of precisely that cybernetic future which has come to entrance Kevin Warwick. 'With every tool', Freud wrote, 'man is perfecting his own

organs, whether motor or sensory, or is removing the limits to their functioning'.[25] He continued:

> Motor power places gigantic forces at his disposal, which, like his muscles, he can employ in any direction; thanks to ships and aircraft neither water nor air can hinder his movements; by means of spectacles he corrects defects in the lens of his own eye; by means of telescopes he sees into the far distance; and by means of the microscope he overcomes the limits of visibility set by the structure of his retina. In the photographic camera he has created an instrument which retains the fleeting visual impressions, just as the gramophone disc retains the equally fleeting auditory ones; both are at bottom materializations of the power he possesses of recollection, his memory. With the help of the telephone he can hear at distances which would be respected as unattainable even in a fairy tale. Writing was in its origin the voice of an absent person; and the dwelling house was a substitute for the mother's womb, the first lodging, for which in all likelihood man still longs, and in which he was safe and felt at ease.[26]

Thus, for Freud, the human creature was already hybridised – fused – with the works of his own creation. In Freud's catalogue of hybrid artificiality, the human form and intellect require different kinds of artifice to act as supplements or (in some cases) substitutions for the imperfect operation of those organs bestowed upon us by nature. In the case of writing, for example, Freud understood the acquisition of this art as an attempt at substituting an absent voice, a description which finds an echo in the twentieth-century biological idea of writing as 'an extra-somatic information store […] an artificial substitute for a function that was previously performed in the body'.[27] Writing is thus a purely artificial 'device' by which the imperfect operation of human memory is aided and assisted. In such a model, the wax or clay writing tablet, the parchment, the printed book, and the computer are no more than a prosthetic supplement to those changes in neuronal synapses by which our memory appears to function. Yet, for all the triumphant cataloguing of humanity's technological accomplishments, the story of the development of this prosthetic body, in which tools and devices may be considered as grafts on the human frame, extending our sensory and physical capacities, was also for Freud a narrative of disappointment: 'We do not feel comfortable in our present-day civilization' Freud observed, as though the graft of technology had not fully taken on to its human stock.[28] 'Man has, as it were, become a kind of prosthetic God. When he puts on all

his auxiliary organs he is truly magnificent; but those organs have not grown on to him and they still give him much trouble at times'.[29]

Conclusion

That technology, conceived of as prosthesis, gives us much trouble at times is, now, no more than a commonplace. Whether or not we shall struggle into the 'auxiliary organs' that Warwick's work promises us, or slip into them as easily as putting on a pair of shoes, only time will tell. Warwick himself, however, envisages a state of Hobbesian struggle between two belligerent and mutually uncomprehending states of being. Towards the end of his survey of our artificial future, *March of the Machines* (1997), sub-titled 'Why the New Race of Robots will Rule the World', Kevin Warwick poses the following, apocalyptic, question: 'We can try and reason and bargain with the machines which take over, but why should they listen when they are far more intelligent than we are?'[30] Intelligence, it seems, is no guarantor of empathy in this futuristic world. But Warwick's question is, of course, the wrong question. For, as Freud long ago understood the matter, it is not a question of two degrees of intelligence – one mainly 'organic' and the other mainly 'artificial' – battling for supremacy. This is no more than a psuedo-Darwinian fantasy. From the first moment in which our Neolithic ancestor fashioned a more effective means of scraping the earth or an animal bone with a crudely fashioned flint implement, we have *always* been fused with our devices and implements, as they have with us. Our devices have helped to fashion us, in a social and intellectual sense, in much the same way that we have fashioned them. But Kevin Warwick's work also promises, if not perfection, then at least alleviation from the limited functionality of the organic carapace in which (hitherto) we have been forced to live out our days. His account of intelligent deep brain stimulators capable of monitoring the normal functioning of the human brain such that it can accurately predict a spurious event, such as a Parkinson's tremor is, surely, a benign application of technology in the service of suffering humanity. But there is, I sense, another way of looking at the complex question of the relationship between humans and technology.

In his famous (and famously elliptical) 1953 essay, 'The Question Concerning Technology', Martin Heidegger addressed precisely this question.

Heidegger's essay emerged from a series of lectures that he had been invited to give in the bomb-ravaged city of Bremen, shortly after the end of the Second World War. Given this context, the core of Heidegger's thesis may well have surprised the prosperous Hanseatic upper middle-classes who had invited the philosopher to lecture at their city's philosophical club, and who must have had an acute sense of the potentially devastating effects of modern technology.[31] For Heidegger's central argument was not that it had become impossible to stand aloof from technology, and neither was it that technology is, in any way, 'demonic'. Rather, he claimed that the 'essence' of modern technology, was that, in the very moment of appearing to operate as a 'saving power', it reveals itself to be at its most threatening, and at its most unbiddable. He illustrated this claim not by recourse to any philosophical text or scientific or technological work, but with a quotation from a poem by the German romantic poet, Friedrich Hölderlin. In his 'Patmos' (1802), Hölderlin wrote:

> But where danger is, grows
> The Saving power also.[32]

These lines Heidegger glossed in the following way. 'The threat to man' he argues 'does not come in the first instance from the potentially lethal machines and apparatus of technology'.[33] This is to misunderstand the essence of the technological. Instead, he suggests that 'the closer we come to the danger, the more brightly do the ways into the saving power become'. The paradox of technology, in other words, is that it is at its most beguiling and its most devastating when it is pursued in the hope of alleviating the human condition. This contention is, I think, amply demonstrated by Kevin Warwick's work.

Endnotes:

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[1] Alexander Pope, *Essay on Man* (1733), in *The Poems of Alexander Pope*, ed. by John Butt (London: Methuen, 1968), p. 511.

[2] Martin Heidegger, 'The Question Concerning Technology' (1953), in *Martin Heidegger: Basic Writings*, ed. by David Farrell Krell (London: Routledge, 2002), p. 337.

[3] For an overview of the history of transhumanist thought, see Nick Bostrom, 'A History of Transhumanist Thought', *Journal of Evolution and Technology*, 14 (2005), 1-25. Online version: <http://jetpress.org/volume14/bostrom.pdf>.

[4] Donna J. Haraway, 'A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century' in *Simians, Cyborgs, and Women: The Reinvention of Nature* (London: Free Association Books, 1991), pp. 149-181 (p. 149). Responses to this essay sometimes forget that Haraway offered it as 'an effort to build an *ironic* political *myth* faithful to feminism, socialism, and materialism' (p. 149, my emphasis).

[5] Bostrom, p. 7.

[6] For an exploration of these ideas, see Jonathan Sawday, *Engines of the Imagination: Renaissance Culture and the Rise of the Machine* (London and New York; Routledge, 2007), pp. 185-198, 221-256.

[7] See Sawday, *Engines of the Imagination*, pp. 166-207.

[8] W. B. Yeats, 'Byzantium', in *W. B. Yeats: Selected Poetry*, ed. by Norman Jeffares (London: Macmillan, 1969), p. 105.

[9] William Gibson, *Neuromancer* (1984; rpt. London: Harper Collins, 1995), p. 67. On Gibson's anticipation of the internet, see Jonathan Sawday, 'Towards the Renaissance Computer', in *The Renaissance Computer: Knowledge Technology in the First Age of Print*, ed. by Neil Rhodes and Jonathan Sawday (London and New York: Routledge, 2000), p. 32.

[10] *Science and Reform: Selected Works of Charles Babbage*, ed. by Anthony Hayman (Cambridge: Cambridge University Press, 1989), p. 44.

[11] Samuel Butler, *Erewhon* (1872), ed. by Peter Mudford (London: Penguin Books, 1985), pp. 205, 203.

[12] See Lorraine Daston and Katherine Park, *Wonders and the Order of Nature* (New York: Zone Books, 2001), p. 64.

[13] Kevin Kelly, *Out of Control: The New Biology of Machines* (London: Fourth Estate, 1994), p. 3.

[14] K. Eric Drexler, *Engines of Creation: The Coming Era of Nanotechnology* (New York: Anchor Books, 1990), pp. 5, 9.

[15] Norbert Wiener, *The Human Use of Human Beings: Cybernetics and Society* (1954; rpt. Cambridge, MA: Da Capo Press, 1988), p. 33.

[16] Wiener, p. 32.

[17] Paul Virilio, *The Art of the Motor*, trans. by Julie Rose (London and Minneapolis: University of Minnesota Press, 1995), p. 133.

[18] Jean Baudrillard, *The Gulf War Did Not Take Place*, trans. by Paul Patton (Sydney: Power Publications, 2004), p. 64.

[19] Jean Baudrillard, *Simulacra and Simulation*, trans. by Sheila Faria Glaser (Ann Arbor: The University of Michigan Press, 1994), p. 1.

[20] Baudrillard, *Simulacra and Simulation*, p. 2. For further reflections in this vein, see Benjamin Woolley, *Virtual Worlds: A Journey in Hype and Hyperreality* (London: Penguin Books, 1993).

[21] Herbert A. Simon, *The Sciences of the Artificial* (1996; rpt. Cambridge, MA: Massachusetts Institute of Technology Press, 1999), p. 2.

[22] Simon, p. 4.

[23] Mary Tiles and Hans Oberdiek, *Living in a Technological Culture: Human Tools and Human Values* (London and New York: Routledge, 1995) p. 23.

[24] For further imaginative speculations on this theme, see Jonathan Sawday, `What a Piece of Work…' *Independent on Sunday*, 13 February 2001, review section, p. 15. For a fictional evocation of future human evolution (spanning some two billion years, and eighteen distinct species), see Olaf Stapledon's novel *Last and First Men: A Story of the Near and Far Future* (1930).

[25] Sigmund Freud, *Civilization and Its Discontents*, in *The Standard Edition of the Complete Psychological Works*, trans. by and ed. by James Strachey (1961; rpt. London: Vintage, The Hogarth Press and The Institute for Psychoanalysis, 2001), XXI, p. 90.

[26] Freud, pp. 90-91.

[27] J. Z. Young, *An Introduction to the Study of Man* (Oxford: Clarendon Press, 1971), p. 516.

[28] Freud, p. 89.

[29] Freud, pp. 91-92.

[30] Kevin Warwick, *March of the Machines: Why the New Race of Robots will Rule the World* (London: Century, 1997), p. 256.

[31] On the context of Heidegger's post-war Bremen lectures which eventually resulted in 'The Question Concerning Technology' see Heinrich Wiegand Petzet, Parvis Emad and Kenneth Maly, *Encounters and Dialogues with Martin Heidegger, 1929-1976* (Chicago and London: University of Chicago Press, 1993), pp. 53-56.

[32] Friedrich Hölderlin, *Poems and Fragments*, trans. by Michael Hamburger (Ann Arbor: The University of Michigan Press, 1966), pp. 462-63.

[33] Heidegger, pp. 333-34.