Transhumanism and its Genesis: The Shaping of Human Enhancement Discourse by Visions of the Future

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ABSTRACT

Current discourse on human enhancement is strongly influenced by far-reaching, radical visions concerning the future of human corporeality and civilisation. These visions are most forcefully brought into the discussions by proponents of transhumanism, which constitutes both a worldview and a sociocultural movement that is increasingly influential in academia, industry and other sectors of society. Aiming to shed new light on our societies' current fascination with human enhancement discourse, three narratives concerning the genesis of transhumanism and the attractiveness of this worldview are presented. Such a historically interpretative approach may give rise to a new reflexive stance on current enhancement discourse.

> These bodies which now we wear belong to the lower animals; our minds have already outgrown them; already we look upon them with contempt. A time will come when Science will transform them by means which we cannot conjecture [...]. With one faith, with one desire, [men] will labour together in a Sacred Cause: the extinction of disease and sin, the perfection of genius and love, the invention of immortality, the exploration of the infinite, and the conquest of creation. (Winwood Reade, 1872)

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Introduction

Discourse on human enhancement is not a new phenomenon. The potentially radical impacts of new or emerging technoscience on human corporeality and civilisation only became the subject of major international discussion in the early 2000s, however. In April 2000, the computer scientist and entrepreneur Bill Joy had published an essay in which he argued that "[o]ur most powerful 21st-century technologies – robotics, genetic engineering, and nanotech – are threatening to make humans an endangered species" (Joy, 2000, n. pag.). In 2001, a remarkable workshop took place on the initiative of the U.S. National Science Foundation and the U.S. Department of Commerce. It aimed to foster a better understanding of the potentials of a number of important areas of research and development (such as the nano, bio, information, communication and neuro fields) and to promote their convergence and interplay with the overarching goal of improving human performance. The impressive list of participating individuals and institutions as well as the boldness of the claims made in the workshop proceedings (Roco and Bainbridge, 2003), in particular by the two editors, almost immediately attracted attention in various academic communities and in science and technology policy circles (cf. Kogge, 2008). Joy's essay – together with related activities pursued by a network of U.S., German and other opinion leaders in science and technology issues – had previously triggered an international debate in mass media and academia about humankind's technoscientific future (see, for example, Schirrmacher, 2001).

It soon became clear that an important role in these discussions was played by transhumanism, a worldview and sociocultural movement promoting a future in which human civilisation and corporeality have both been utterly transformed by science and technology. Transhumanism's visions of the future include not only the emergence and widespread use of enhancement technologies but also the 'uploading' of individual minds onto hardware, their quasi-telepathic interconnection and the extraterrestrial expansion of the (trans)human species.

As an organised movement, transhumanism is fairly small, yet it is not without influence, for example in academic bioethical discourse. As a worldview and broader intellectual movement, it is an important element of Western (and therefore of global) culture, for example with regard to science fiction and the sectors of popular culture influenced by this genre.

Academic and mass media discourse on human enhancement developed in the 2000s against this backdrop and in recent years appears to have been increasingly shaped by radical visions concerning the future of technoscience, human corporeality and civilisation.

In the meantime, it has also become evident that transhumanism is not only an unusual ideology and a small social movement but also a kind of worldview for significant parts of the technoscientific elite in the U.S. and elsewhere. Key players in the computer and Internet industry, for example, not only directly support transhumanists and promote their ideas but have also launched activities in their firms that have a decidedly transhumanist flavour (see, for example, Coenen et al., 2009, section 2.8.4, p. 106; McCracken and Grossman, 2013; Shanks 2013; Cadwalladr, 2014).

Many observers of and participants in discourse on human enhancement, in particular in Europe, still tend to see transhumanism's visions of the future as merely an outflow of specific developments in U.S. culture and as a kind of science fiction disguised as science. This appears to be too narrow a view of this phenomenon, however. In the early 2000s, Jürgen Habermas had already written the following:

> Bodies stuffed with prostheses to boost performance, or the intelligence of angels available on hard drives, are fantastic images. [...] Whether these speculations are manifestations of a feverish imagination or serious predictions, an expression of displaced eschatological needs or a new variety of science-fiction science, I refer to them only as examples of an instrumentalization of human nature initiating a change in the ethical self-understanding of persons who live in the mode of self-determination and responsible action. (Habermas, 2003, p. 41–42)

The question of whether transhumanist visions of the future are manifestations of a feverish imagination or serious predictions touches on an important aspect of the analysis of current discourse on human enhancement. 'Vision assessment' studies (e.g. Ferrari et al. 2012) explore how – and on the basis of what evidence and assumptions – imaginaries are influencing the creation of 'plausible futures' in academic discourse and society at large. Critics of excessively 'speculative' tendencies in ethico-political discourse on new and emerging technoscience (Nordmann 2007) have argued that transhumanism's stance towards the future is fundamentally flawed and contributes to a kind of ignorance of present challenges and options for action.

In this chapter, however, we are not concerned with these problems; instead, we would like to draw attention to questions such as that alluded to by Habermas in his remark, namely that the transhumanist visions could be an expression of displaced eschatological needs.

For this purpose, three interpretations of transhumanism will be presented, all of which aim to shed light on this worldview against broader historical and societal backgrounds (for the following sections, cf. Coenen 2013a). These interpretations, respectively, focus on a new concept of human self-assertion developed since the second half of the nineteenth century, following the Darwinian blow to human narcissism (Section 2), the dream of an empire to end all empires (Section 3), and the role that eminent natural scientists of a radically left-wing political persuasion played in shaping transhumanism as an ideology for emerging technoscience (Section 4). In offering these interpretations, which all begin by focusing on British history in the late nineteenth and early twentieth centuries, we hope to show that current discourse on human enhancement is above all a manifestation of unsolved questions which are deeply rooted in Western history of ideas about science, technology and the future (Section 5).

1. Human Self-Assertion after Darwin

In 1902, H.G. (Herbert George) Wells (1866-1946) delivered a lecture to the Royal Institution, titled The Discovery of the Future (Wells 1902). After juxtaposing two attitudes towards the past and the future, he turned his audience's attention to Positivism, arguing that we should «take into account the speculations of a certain sect and culture of people who already, before the middle of last century, had set their faces toward the future as the justifying explanation of the present» (Wells, 1902, p. 330). Referring to Auguste Comte, Wells stated that in

> the narrow and limited past he recognized men had always been like the men of to-day; in the future he could not imagine that they would be anything more than men like the men of to-day. He perceived, as we all perceive, that the old social order was breaking up, and after a richly suggestive and incomplete analysis of the forces that were breaking it up he set himself to plan a new static social order to replace it. [...] And since he could see nothing beyond man in the future, there, in that millennial fashion, Comte had to end. Since he could imagine nothing higher than man, he had to assert that humanity, and particularly the future of humanity, was the highest of all conceivable things. (Wells, 1902, p. 331)

In Wells' opinion, however, this way of looking at the human species and at the future is obsolete:

> All that was perfectly comprehensible in a thinker of the first half of the nineteenth century. But we of the early twentieth, and particularly that growing majority of us who have been born since the 'Origin of Species' was written, have no excuse for any such limited vision. [...] We perceive that man, and all the world of men, is no more than the present phase of a development so great and splendid that beside this vision epics jingle like nursery rhymes, and all the exploits of humanity shrivel to the proportion of castles in the sand. We look back through countless millions of years and see the will to live struggling out of the intertidal slime, struggling from shape to shape and from power to power, crawling and then walking confidently upon the land, struggling generation after generation to master the air, creeping down into the darkness of the deep; we see it turn upon itself in rage and hunger and reshape itself anew; we watch it draw nearer and more akin to us, expanding, elaborating itself, pursuing its relentless, inconceivable purpose, until at last it reaches us and its being beats through our brains and arteries, throbs and thunders in our battleships, roars through our cities, sings in our music, and flowers in our art. And when, from that retrospect, we turn again toward the future, surely any thought of finality, any millennial settlement of cultured persons, has vanished from our minds. This fact that man is not final is the great unmanageable, disturbing fact that arises upon us in the scientific discovery of the future, and to my mind, at any rate, the question what is to come *after* man is the most persistently fascinating and the most insoluble question in the whole world. (Wells, 1902, p. 331)

We have included this long quotation not only because it illustrates the Wellsian preoccupation with the future of human nature but also for another reason: in the passage that starts by looking back "through countless millions of years", Wells – as he did in several other parts of the lecture – evoked and addressed what can be termed a new appraisal of both the 'mathematical sublime' and the 'dynamically sublime', as defined by Immanuel Kant.

During the course of the nineteenth century, gradualist geology, Darwinism and cosmology expanded the time horizons of modernity in both directions. The distant past and the far future increasingly became subjects of inquiry and speculation. The awe-inspiring timescales and vastness of the universe created a new urgency of the mathematical sublime. As Kant (2007, p. 18) pointed out, nothing that can be an object of the senses (even using such means as telescopes or microscopes) can be described as sublime; nonetheless,

there is in our imagination a striving towards infinite progress, and in our reason a claim for absolute totality, regarded as a real idea (ibid.), and this excites in us the feeling of a supersensible faculty (ibid.). This Kantian 'dynamically sublime' appeared not only in a new light, but also against the backdrop of scientific progress during the course of the nineteenth century, since the notion of our superiority to nature even in its immensity needed to be brought up to date with respect to this backdrop.

The "kind of self-preservation, entirely different from that which can be attacked and brought into danger by external nature" is characteristic in the Kantian point of view of our stance towards the dynamically sublime, and is reaffirmed in the post-Darwinian situation. Wells and others in the late nineteenth and early twentieth centuries intended to show that "humanity in our own person" in fact remains unhumiliated by the new insights into the immenseness of timescales and vastness of space, even though the individual might have to submit to external violence (Kant 2007, p. 92). Nature is only sublime "because it elevates the imagination to a presentation of those cases in which the mind can come to feel the sublimity of its vocation even over nature" (ibid.). Human 'self-preservation' as defined by Kant is glorified by Wells and others and turned into a specific form of highly modern human self-assertion vis-à-vis the natural sublime through visions of the future which incorporate the new perspectives resulting from gradualist geology, cosmology and evolutionary theory.

One crucial element of this new concept of human self-assertion is the expectation that human corporeality will be improved, or even superseded, by a new form of corporeality. Of course, similar visions had already been developed previously, for example by Francis Bacon, the Marquis de Condorcet and William Godwin; however, Wells and others brought forward their visions of the future against the background of a new scientific appraisal of the natural sublime and with a decidedly critical stance towards older (social-)Utopian ideas about the future.

A crucial role was played in this context by Winwood Reade (1838-1875; see initial quotation above) This somewhat colourful figure, best known as a hero of the freethinker movement but also an Africa explorer in contact with Charles Darwin who influenced people as diverse as Winston Churchill, George Orwell and Wells, had published a universal history in 1872 entitled 'The Martyrdom Man' (Reade 1910). In the last two sections of this work, headed the "The future of the human race" and "The religion of reason and

love", Reade developed the blueprint for the ideological nucleus of modern transhumanism by creating a specific set of visions of and a narrative about the future of humankind. In his vision of the far future, outer space will be colonised by virtuous men endowed with new bodies created by "Science". Humanity will evolve to become a true collective, "united by the same sentiment which united the primeval clan, and which made its members think, feel, and act as one" (Reade 1910, p. 514). Reade already exhibits the following elements of modern transhumanism: the desire to overcome (by scientific means) the human body, which is seen as outmoded as compared with humanity's intellectual progress; the hope that humankind will be able to rid itself of the "stamp" of "lowly origin" in the human "bodily frame" which Darwin had mentioned and characterised as "indelible" in the final paragraph of 'The Descent of Man' (1871); the contempt for human corporeality; the quasi-religious ideological approach and opposition to traditional (Christian) religion; the extremely far future perspective; the hope for an 'invention of immortality'; and the expectation that a biologically transformed (post-)humanity will become a God-like entity ruling the universe.

It is important to note that Reade's and the Wellsian visions of the future were both based on teleological notions of progress. Reade believed, for example, that such scourges of humanity as war, famine and slavery were means used by Nature to realise historical progress but that they will, like religion, become obsolete in the future. Although he also often pointed out possible catastrophic or dystopian developments, Wells believed – as did Reade – that natural and human history are evolving towards a much greater human dominion over nature, including over human nature itself.

The early transhumanist visions of Reade and Wells were further developed by a number of important scientists like John Burdon Sanderson Haldane, Julian Huxley and, in particular, John Desmond Bernal (cf. Parrinder 1995), all of whom added to them a higher degree of technoscientific imagination. In Reade's opinion, it was "Science alone" which could "ameliorate the condition of the human race' (Reade 1910, P. 511). Wells, Haldane and Bernal departed from this point of view by more strongly emphasising the importance of political reforms, while Bernal in particular developed ideas about a technological transformation of human corporeality.

Before returning to this crucial step in the development of modern transhumanism, we would like to draw attention to Reade's two other important contributions to the emergence of transhumanism. On the one

hand, he argued that an understanding of the laws which regulate the complex phenomena of life would enable us to predict the future in the same way as we are already able to predict the movements of the planets. The above-mentioned 1902 lecture by Wells, as well as a 1929 essay by Bernal (1970) that played a crucial role in the development of modern transhumanism, followed in Reade's footsteps in this regard (cf. Parrinder 1995). On the other hand, Reade's 'The Martyrdom of Man' shows how the genesis of transhumanism has been influenced by the notion of an 'empire' and shaped by the imperialist reality of the late nineteenth and early twentieth centuries.

Before turning to this latter aspect of transhumanism's history, we would like to briefly sum up what we conclude from the analysis above: Reade and Wells put forward a new concept of human self-assertion in line with their views of scientific progress in the nineteenth century. These views were based on teleological concepts of progress concerning both natural history and social developments. As Reade wrote:

> You blessed ones who shall inherit that future age of which we can only dream; you pure and radiant beings who shall succeed us on the earth; when you turn back your eyes on us poor savages, grubbing in the ground for our daily bread, eating flesh and blood, dwelling in vile bodies which degrade us every day to a level with the beasts, tortured by pains, and by animal propensities, buried in gloomy superstitions, ignorant of Nature which yet holds us in her bonds; when you read of us in books, when you think of what we are, and compare us with yourselves, remember that it is to us you owe the foundation of your happiness and grandeur, to us who now in our libraries and laboratories and star-towers and dissecting-rooms and work-shops are preparing the materials of the human growth. (Reade, 1910, pp. 589-539)

Faced with what they saw as fundamental changes to the natural sublime driven by a new scientific outlook in the second half of the nineteenth century, Reade and Wells created awe-inspiring narratives about the past and visions of the future in which human technoscientific progress itself became endowed with features of the sublime.

2. An Empire to End all Empires

Reade wrote 'The Martyrdom of Man' after having already travelled through Africa twice. The book reflected the imperialist context of his life and activities, the author not only displaying an almost afro-centric stance but also providing

a grand narrative in which all past human endeavours and British imperialism in particular were presented as steps towards a grandiose future. All the empire-building of the past merely foreshadowed the coming (trans)human empire over nature. In 'New Atlantis' (1627; in Latin 1624), Francis Bacon had defined «the knowledge of causes, and secret motions of things; and the enlarging of the bounds of human empire, to the effecting of all things possible» (Bacon 1996, p. 480) as marking the end of all activities of the Utopian proto-technoscientific community. As Sarah Irving has pointed out with regard to Britain in early modern times, it is important to note that the term 'empire' denoted both «plenary authority or sovereignty, whether over territory or over intangible phenomena such as ideas» (Irving 2007, p. 33) and the need for us to take into account the relationships between the theory and the practice of the idea of empire in order to «reorient our thinking about the conceptual history of the British Empire». Early on in the histories of the British Empire and of science in Britain, «grand hopes for recovering man's pre-lapsarian epistemic empire» shaped discourse on the territorial empire.

In marked contrast to the usual rhetoric of "the white man's burden", Reade placed scientific progress centre-stage in his universal history, thereby influencing Churchill (Jablonsky 1991, p. 20), Wells and others. Although tensions between imperialist and anti-imperialist sentiments or ideas are evident throughout 'The Martyrdom of Man', it can be understood as an attempt to purify and perpetuate the imperial dream. Reade longed for humanity to become emancipated from the bonds of both traditional cultures and nature, and aimed to build a global, even cosmic (trans)human empire over nature. As an ideological endeavour, early transhumanism thus appears to be a project of an empire to end all (political) empires.

Similarly, Wells combined the critique of the militaristic features of imperialist societies and of other elements of the traditional social order with grandiose visions of a new and global empire based on reason, science and technocracy. There was always a tension in Wells between these visions and his liberal concerns regarding threats to individual freedom and human rights. These concerns led him, for example, to reject all 'static' Utopias and to create dystopian visions of an entirely rational, collectivist society, such as the Selenite insect society in The First Men in the Moon (1901). The Selenites have in some sense perfectly realised the Wellsian Utopia of a true empire of reason, a peaceful society giving preference to mental over physical strength yet at the same time employing brutal means to organise this very society,

subjecting for instance some of their offspring to torture and surgery in order to create slave classes that will serve the needs of the ruling intellectuals. Notwithstanding his concerns that attempts to realise his Utopia could lead to the creation of illiberal and inhumane dystopian societies, Wells forcefully promoted this very Utopia. As Dietmar Dath (2005) has pointed out, he argued in favour of socialism's transition from a romantic, static Utopianism to a bio-political technocracy, thereby extending the universalism of the British Empire to an interstellar level. In the final scene of the film 'The Shape of Things to Come' (1936), which was based on a work by Wells and whose script was written by Wells, the character that epitomises the Wellsian Utopia (and was styled after Bernal) is asked whether there will never be any age of happiness and never be any rest. In response, he declaims:

> Rest enough for the individual man: too much, too soon and we call it death. But for Man, He must go on, conquest beyond conquest. First this little planet with its winds and ways, and then all the laws of mind and matter than restrain him. Then the planets around him, and at last out across the immensity to the stars. And when he has conquered all the deeps of space and all the mysteries of time, still he will be beginning.

After the demurring remark by another character that "we're such little creatures" and "poor humanity's so fragile, so weak –little, little animals", he adds: «Little animals. If we're no more than animals we must snatch each little scrap of happiness and live and suffer and pass, mattering no more than all the other animals do or have done. It is this – or that: all the universe or nothing. [...] Which shall it be?»

As Dath (2005) writes, the "civilising of the universe", imagined on the basis of a British notion of 'empire', is a vision of the future in which the emotional instincts shaping technoscientific progress are not repressed or tamed but are set free and "discharged" in a bold enterprise aimed at the complete conquest and reconstruction of the physical world.

Although Wells was not free from prejudices and sentiments characteristic of the imperialists of his times, his Utopia represents a step forward in the process by which early transhumanism became increasingly distanced from the imperialist context in which it had emerged. As George Orwell wrote about him:

> Mr. Wells [...] belongs to the non-military middle class. The thunder of guns, the jingle of spurs, the catch in the throat when the old flag goes by, leave him

> manifestly cold. He has an invincible hatred of the fighting, hunting, swashbuckling side of life, symbolised in all his early books by a violent propaganda against horses. [...] If one looks through nearly any book that he has written in the last forty years one finds the same idea constantly recurring: the supposed antithesis between the man of science who is working towards a planned World State and the reactionary who is trying to restore a disorderly past. [...] On the one side science, order, progress, internationalism, aeroplanes, steel, concrete, hygiene: on the other side war, nationalism, religion, monarchy, peasants, Greek professors, poets, horses. History as he sees it is a series of victories won by the scientific man over the romantic man. (Orwell, 1941, 136)

Early British transhumanism can be deemed a collectivist project aimed at perpetuating the imperial dream by purifying it. Although Wells occasionally expressed racist sentiments, one of his main lines of argument amounted to a systematic othering of the non-scientific mind. The targets of this 'othering' could be the populations of the colonies or the Jews, but at least as often were the traditional British and Western elites. Following in his footsteps, yet distancing themselves from Wells politically, the radically left-wing natural scientists Haldane and Bernal took the transhumanist attack on the old order to a new level. As communists, both not only developed a more concrete vision (in technoscientific terms) of a future in which the promises of religion have been fulfilled in this world, but also erased all racist vestiges from the transhumanist collectivist project's imperialist past. It appears to be no accident that both men spent significant amounts of their lives supporting the development of science and technology in the (former) colonies.

Unsurprisingly, we again note that transhumanism, being a quasi-Utopian ideology, is shaped by and reacts to core features of the societies in which it emerged. From this perspective, it can be deemed a techno-social imaginary which deals less with actual developments in science and technology than with the hopes and fears concerning science, technology and the future of humankind characteristic of the British, and for that matter Western, history of ideas.

3. Transhumanism as an Ideology for Technoscience

Following in the footsteps of Wells and building on a provocative and influential vision of the future developed by his friend Haldane in 'Daedalus, or Science and the Future' in 1923 (Haldane 1924), Bernal wrote 'The World,

the Flesh and the Devil. An Inquiry into the Future of the Three Enemies of the Rational Soul' in 1929 (Bernal 1970).[1]

This essay was published in the same, remarkably popular series of books as Haldane's speech and other works on science, technology and the future. Bernal's essay not only assembles earlier visions of the future by Haldane and others and develops new, technology-oriented ones; together with these older essays and works from the 1930s it also foreshadows almost all core elements of today's transhumanism (with the exception of 'cryonics', visions based on the digital revolution and, arguably, nanofuturism). In 'The World, the Flesh and the Devil', we encounter neuro-electric interfaces and the vision of a massive cyborgisation of human beings; ectogenesis (which had already been envisioned in Haldane's speech and was later popularised by Aldous Huxley's 'Brave New World'); artificial (biological) life; a quasi-immortality of individual minds in a human-machine symbiotic superstructure resembling an organism; the conquest of outer space (to which end technological solutions are described in some detail); and the universe's saturation with earth-based intelligence, an idea also familiar from today's leading transhumanist Ray Kurzweil (2005). Further core features of today's transhumanism (for example the expectation that maximum human lifespan will be significantly extended and the vision of perfect control over human emotional life) can be found in essays by other early transhumanists who were friends of or in close contact with Bernal, such as Haldane and Julian Huxley (cf. Heil, 2010).

[1] As has been pointed out elsewhere (Coenen 2013b; cf. Coenen, 2010), the early transhumanist works had an astounding impact on cultural discourse on science, technology and the future, one major literary reaction being the development of classic twentieth century dystopian thought. Haldane's influence on 'Brave New World' (1932) is well-known, as is the fact that this still highly influential novel was originally intended to be a direct attack on Wellsian utopianism. In a certain sense, the authors of the classical dystopian novels of the twentieth century, such as Charlotte Franken (in 'Man's World', 1926) and Yewgeny Zhamyatin and George Orwell (in 'The Road to Wigan Pier', 1937), reacted primarily to works by the proponents of early transhumanism. The same holds true for the popular Christian authors C.S. (Clive Staples) Lewis and J.R.R. (John Ronald Reuel) Tolkien. Lewis attacked Haldane in his science fiction writings, and his essay on 'The Abolition of Man' (1942) is still influential among conservative bioethicists. Tolkien's immensely popular trilogy 'The Lord of the Rings', written in the 1930s and 1940s, can in many respects be read as a critique of the transhumanist visions of Wells, Haldane, Bernal and others (Coenen, 2010; Hogan and Clarfield, 2007). Twentieth century dystopian thought and influential Christian critiques of technoscientific progress were thus deeply indebted to the early transhumanist imagination – and both continue to shape current discourse on science and technology, their ethical aspects and the future of human nature.

'Mechanical man', the product of an age-old merging of humanity – or rather, human brains – with technology which only apparently breaks with organic evolution, is actually in Bernal's view more in keeping with the true tradition of continued evolution and "the logical outcome of the type of humanity that exists at present" (Bernal, 1970, p. 42) – while 'normal man' is an evolutionary dead end.

If we look at the context of transhumanism's development in the first third of the twentieth century, we note first of all that Reade's original anti-religious impetus was intensified by its younger proponents such as the communists Bernal and Haldane. The latter not only spent considerable time engaging in polemics with Christian apologists such as C.S. Lewis and Arnold Lunn, he also appeared to have viewed the transhumanist visions of the future as his personal *ersatzreligion* throughout his life (Adams, 2000). An almost fanatic Catholic as a boy, Bernal not only alluded, perhaps mockingly, to religious ideas in the title of his 1929 essay, but also argued that, when thinking of the future, even the least religious of men all retain in their minds and cherish an idea of some transcendental, superhuman event which will bring the universe to perfection or destruction (Bernal, 1970, p. 74). While we hold the future still timidly, however, we now "perceive it for the first time, as a function of our own action" (Bernal, 1970, p. 74). As Reade already claimed, the (post)humanity of the future thinks, feels and acts as one, quasi-telepathically, yet in Bernal's essay it is a union, initially of human brains, and – at a later stage of cyborgisation – of artificially embodied minds that are interconnected by neuro-technological means.

The new 'complex minds' could "extend their perceptions and understanding and their actions far beyond those of the individual", while sense of time could be altered in dramatic ways: "the events that moved with the slowness of geological ages would be apprehended as movement, and at the same time the most rapid vibrations of the physical world could be separated" (Bernal, 1970, p. 44). Bernal describes these complex minds as 'angels' through which "the interior of the earth and the stars, the inmost cells of living things themselves, would be open to consciousness [...] and the motions of stars and living things could be directed" (ibid.). Eventually, "the heritage of the direct line of mankind – the heritage of the original life emerging on the face of the world" will disappear, "being preserved perhaps as some curious relic, while the new life which conserves none of the substance and all of the spirit of the old would take its place and continue its development" (Bernal,

1970, p. 46). Furthermore, Bernal adds, in an almost Gnostic fashion, that "consciousness itself may end or vanish in a humanity that has become completely etherealised, losing the close-knit organism, becoming masses of atoms in space communicating by radiation, and ultimately perhaps resolving itself entirely into light" (Bernal, 1970, p. 46).

The quasi-religious character of these evocations of a new technoscientific sublime is obvious, and the transhumanism of our times often follows in the footsteps of Bernal, Haldane, Reade and Wells in this regard. There is thus more than a grain of truth in current polemics against transhumanism in which religious and other critics characterise the transhumanist movement and the flights of fancy of its most radical proponents as techno-eschatological or pseudo-religious.

If we look at transhumanism's genesis in the context of a struggle between left-wing or liberal-technocratic progressives on the one side and (often right-wing) apologists of Christian religion and the old social order on the other side, however, the current discussions appear to have too narrow a perspective. The skirmishes between transhumanists and their critics today are one element of a 'culture war' over science and technology which is largely shaped by discussions in the U.S. (in particular on Darwinism) and seldom touch on fundamental questions concerning the political and social order. Although frequently overlooked today, the transhumanism of Bernal and Haldane was arguably part and parcel of a broader fight against the old social order of their times; this fight, in which both men acted as famous 'red scientists' (Werskey 2007), was not merely a 'culture war' but a conflict which shaped the twentieth century and became a global 'cold war' after the victory over fascist Germany and its allies.

When some of today's scientists resort to transhumanist ideology and visions of the future in an attempt to counter critiques by or to provoke religious conservatives, ecological activists and other ideological adversaries, however, the situation is very different. Given the new surge in religiously framed and politically influential irrationalism in recent decades, something that is not limited to the countries shaped by Islam but is also evident in the U.S., the stance taken by transhumanist scientists is psychologically understandable. The means they use, however, and indeed often their posture, are also problematic. They are now acting in a global context in which societies are strongly shaped by technoscience and in which scientists and engineers, enjoy very considerable social status. Criticisms of science and technology

aimed at taming technoscientific progress are also societally relevant, yet they clearly do not represent the view of the political establishment nor of other leading representatives of the social order – as was the case to a certain extent in the Britain of Haldane's and Bernal's time. Quite on the contrary, transhumanism is increasingly the ideology of choice among important members of the societal elites such as several leading figures of the U.S. computer and Internet industry. As has been argued elsewhere (Coenen 2013b), discourse on some fields of new and emerging technoscience and on human enhancement in particular suffers from an ideological imbalance: at one end of the spectrum of opinions, the one marked by radical criticisms of technoscience, a barrier is erected against unscientific beliefs and fundamentalist currents of thought. At the other end of the spectrum, however, the one which is strongly influenced by transhumanism, the limits to salvation ideologies and mythical thought are permeable.

There is another element of early transhumanism's quasi-religious character which should be taken into account when considering current discourse on human enhancement, namely the specific notion of progress on which the transhumanist visions of the future are based. Haldane, for example, opined in the 1920s that "there is no theoretical limit to man′s material progress but the subjection to complete conscious control of every atom and every quantum of radiation in the universe" and that "there is, perhaps, no limit at all to his intellectual and spiritual progress" (Haldane, 1937, p. 144). In 'The World, the Flesh and the Devil', Bernal repeatedly, after the boldest flights of fancy, stopped short of defining an end to progress, pointing out that another, as yet unimaginable progress might be feasible. In his view, we should not stop our imaginations until they are fully exhausted: while the fulfilment of all major promises of traditional (Christian) religion is in fact already imaginable on the basis of scientific prophecy and all eschatological questions are thereby solved, progress must never end. In adopting this stance towards the future, Bernal and the other pioneers of transhumanism not only created an alternative to Christian religion and, as we will see below, touched on unresolved questions in the Western history of ideas about science, technology and the future; they also supported a broader agenda for firmly establishing technoscience in society. As Haldane pointed out in the early 1930s, the transhumanist visions of the future served specific purposes:

> Such speculations as these are very far from idle. They are eminently desirable, because man does not generally even know what he wants, much less how to get

> it. A discussion of possibilities will have two effects. It will enable people to come to some opinions as to the possible goal of human evolution [...]. And it will focus attention on the necessity for more knowledge before we can even suggest means of attaining that goal. Pictures of the future are myths, but myths have a very real influence in the present. [...] Our greatest living mythologist, Wells, is certainly influencing the history of the future, though probably in ways which he does not suspect. The time will probably come when men in general accept the future evolution of their species as a probable fact, just as to-day they accept the idea of social and political progress. We cannot say how this idea will affect them. We can be sure that if it is accepted it will have vast effects. It is the business of mythologists to-day to present that idea. (Haldane, 1937, pp. 98-99)

As an ideology for emerging technoscience, early transhumanism consciously aimed to weaken traditional religion's grip on elites and, more broadly, on society, and to fascinate the public by offering a vision of the future in which humans and their societies have been utterly transformed by means of science and technology. For these purposes, the pioneers of transhumanism also used certain radical postures and elements of cultural history. Reade had already styled himself as, and in some sense had indeed been, an adventurer at the fringes of society and a martyr for a great cause. In 'Daedalus', Haldane wrote:

> The conservative has but little to fear from the man whose reason is the servant of his passions, but let him beware of him in whom reason has become the greatest and most terrible of the passions. These are the wreckers of outworn empires and civilisations, doubters, disintegrators, deicides. In the past they have been, in general, men like Voltaire, Bentham, Thales, Marx, and very possibly the divine Julius, but I think that Darwin furnishes an example of the same relentlessness of reason in the field of science. I suspect that as it becomes clear that at present reason not only has a freer play in science than elsewhere, but can produce as great effects on the world through science as through politics, philosophy, or literature, there will be more Darwins. Such men are interested primarily in truth as such, but they can hardly be quite uninterested in what will happen when they throw down their dragon′s teeth into the world. I do not say that biologists as a general rule try to imagine in any detail the future applications of their science. The central problems of life for them may be the relationship between the echinoderms and the brachiopods, and the attempt to live on their salaries. They do not see themselves as sinister and revolutionary figures. They have no time to dream. But I suspect that more of them dream than would care to confess it. (Haldane, 1924, p. 83-84)

Although he tempered his technocratic fervour in his more Marxist writings after the 1920s, Bernal adopted a similar posture in 'The World, the Flesh and the Devil'.[2] Also in line with the Wellsian ideas developed in 'The Discovery of Future', a restless, forward-looking and future-oriented technoscientific elite is juxtaposed with the conservative parts of humanity among which the followers of old-fashioned social Utopianism are also counted. In the future, the latter will happily live in a Utopian global society on earth characterised by Bernal as a "human zoo", and will be secretly controlled by an extra-terrestrial technoscientific elite that has been turned into cyborgs. In his essay, Bernal also took advantage of the Gothic fearful delight with the monstrous and long-standing fascination with mechanical beings. In his view, the 'mechanical man' he envisioned as the man of the future must "appear to those who have not contemplated him before as a strange, monstrous and inhuman creature" (Bernal, 1970, p. 73).

From the start, transhumanism exhibited a radical posture against not only the old social order but also against purportedly old-fashioned social Utopianism. Again, there is thus more than a grain of truth in the many criticisms of transhumanism which focus on what the critics see as its ignorance concerning the real obstacles to human progress, such as global injustice. Today, in a time when transhumanism has become the favourite ideology of parts of the digital upper class, such criticisms suggest themselves, but the fact that a certain imbalance between social and technoscientific progress was already evident in the early transhumanist visions propelled by radical leftists such as Bernal and Haldane shows that the transhumanist vision of human progress is in fact not limited to this world but is above all an expression of metaphysical concerns and eschatological needs.

When looking at the history of transhumanism in the first third of the twentieth century, it appears as an ideology for emerging technoscience, creating a new kind of sublime in an attempt to combat social obstacles to technoscientific progress as perceived by the early transhumanists. Bernal, Haldane, Wells, Julian Huxley and other pioneers of transhumanism were heavily involved in a wide variety of activities aimed at improving the societal role of applied science, the funding and organisation of science, and its public

[2] Neither Bernal nor Haldane ever abandoned their transhumanist visions, still adhering to them even once they had become globally prominent 'red scientists' – the best-remembered of their manifold roles. Even in the late 1950s and early 1960s, they were still publishing radically transhumanist visions of the future (Bernal 1958; Haldane 1963).

communication. Even some of their boldest visions of the future breathe the spirit of emerging technoscience. Bernal's species (techno-)brain is, for example, structured internally in a hierarchical manner, since "to some minds might be delegated the task of ensuring the proper functioning of the others, some might specialise in sense reception and so on" (Bernal, 1970, p. 44). Thus a "hierarchy of minds" would evolve, Bernal argued, in a fashion similar to Wellsian technoscientific elitism and foreshadowing the 'cybermind' visions of our times, driven forward by the likes of Hans Moravec and Marvin Minsky.

William Bainbridge, a science manager, sociologist and important transhumanist of our times, wrote that "[i]n the distant future, we may learn to conceptualize our biological lives on Earth as extended childhoods preparing us for the real life that follows in cyberspace" and that "the transition from flesh to data will not be so much metamorphosis as liberation" (Bainbridge, 2004, p. 119). In his vision, we "will travel across immensity" as "information contained in a star-spanning database", creating "new bodies along the way to dwell in every possible environment, and have adventures of the spirit throughout the universe" (ibid.). We should, Bainbridge wrote, "no more lament the loss of the bodies that we leave behind than an eagle hatchling laments the shattered fragments of its egg when it first takes wing" (ibid.).

While such remnants of the heroic youth of technoscience may appear somewhat out of place in our times, their increasing relevance in current discourse on science, technology and the future shows not only that the technoscientific sublime created since the 1870s is still with us, but that it remains at the heart of technoscience. Apparently, today's global players such as Google still follow an agenda which was developed in Britain in the heyday of imperialism and after the Great War as a reaction to a perceived crisis of progressive thinking and as a contribution to the establishment of technoscience in society. Notwithstanding its focus on individual choices, the ideological foundations of current discourse on human enhancement are collectivistic. Due to their ultimately eschatological orientation, the transhumanist visions of the future could and can be elements of politically quite different projects, such as British imperialism, communism and 'digital capitalism'. Nevertheless, current transhumanism, as an ideology for technoscience, always expresses the belief in a grand narrative about the future of humankind and thereby also shapes discourse on human enhancement in a way that allows science and technology to appear as the means of individual and collective salvation.

Conclusion

It is important to note that the grand transhumanist narrative about science, technology and the future of human nature does not form the ideological basis for all social practices and cultural movements relevant to current discourse on more radical visions of human enhancement. The rather old-fashioned modern-progressive ideology of transhumanism is but one element of a variety of developments in which human corporeality is re-defined and re-designed with a view to finding new ways in which to merge humans and technologies. Not all of the new cyborgs (see, for example, Lanxon, 2012) who technologically often follow in the footsteps of either the researcher Kevin Warwick or the performance artist Stelarc are transhumanists. Ideologically, some of them are inspired for example by Donna Haraway's cyborg feminism (cf. Haraway 1991) or other intellectual traditions that are critical of "classically" modern beliefs in progress. Current cyborgism may lead to a diversity of body modifications, not all of them compatible with the grand transhumanist narrative about the future. Some of the new cyborgs and certain voices in current discourse on human enhancement criticise or do not place the emphasis on attempts to improve human performance along the usual transhumanist lines. Attempts to extend human bodily faculties by means of implants and other devices do not always seek to improve individual competitiveness in capitalist society, and many users or promoters of cyborg technologies are not aware of or indeed reject the transhumanist narrative which regards the use of these technologies as one of the first steps towards a transhuman species.

Transhumanism – and therefore large parts of discourse on human enhancement – can be deemed both a symptom of and an attempt to end the overstraining of the rationality of the modern idea of progress diagnosed by Hans Blumenberg (1983). This overstraining by eschatological anxieties and hopes led to the "transformation of progress into a faith encompassing the future" (Blumenberg 1983, p. 49). Modern self-assertion is not only based on the progress that has been made concerning the means of self-preservation for individuals and the species at large. Against the background of the Western history of religious ideas, modern self-assertion has also always implied adopting a new stance towards the eschatological questions inherited from the Christian past. Given that some members of the technoscientific and intellectual elites are virtually obsessed with visions of radically new means of

self-preservation (such as 'cybernetic immortality') nowadays, in an era in which the scourges of humanity that Reade had believed to have been almost overcome are still with us, we may be well-advised to rethink the way in which modern self-assertion is entangled with both eschatological anxieties or hopes and our understandings of human self-preservation. As proponents of the Frankfurt School have persuasively argued, the fearful obsession with self-preservation is anachronistic and prevents us from realising the truly progressive potential that is latent in modern society. In light of the strange fact that the grand transhumanist narrative about the future has fascinated and continues to fascinate representatives of a wide variety of political persuasions, discourse on human enhancement should be redirected. The technoscientific sublime, which was created by the pioneers of transhumanism and appears to be increasingly influential in our times, is the fearful obsession with human self-preservation writ large. We may be able to break its spell by more fundamentally questioning its focus on abilities than was done in discourse on human enhancement. Gregor Wolbring has pointed out in numerous publications (see, for example, Wolbring 2007) that the 'transhumanisation of ableism', i.e. the establishment of the 'enhanced' human body as the new norm, is merely the most recent manifestation of a more fundamental problem shaping our societies, namely our obsession with abilities. If we could learn not to judge individuals by their abilities (and not to reduce them conceptually to these abilities), we might also be able to develop a vision of our common future that differs qualitatively from the transhumanist cosmic prophecies, renouncing all manner of empire-building and gloomy evocations of the technoscientific sublime.

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