

# Science and imagery in the ‘war on old age’

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## **ABSTRACT**

Several professional groups present themselves as ‘waging war’ on old age. They construct old age as a naturalised, self-evidently negative, biological phenomenon, which must be attacked and defeated. These groups make different claims to technical expertise and their ability to control natural phenomena, and use different weapons to defeat ageing. There are those who focus on cosmetic interventions, that is, the control of the body and the removal or masking of the signs of ageing. There are those who equate old age with ill-health and identify themselves as warriors in a battle with disease, and others whose objective is to understand the fundamental intra-cellular processes of ageing and what controls the human life span, and then to extend its limits. A fourth group aims to make human immortality possible. Examination of the language and symbolic practices of these groups reveals that they share a dominant cultural view that devalues old age and older people. The use of military metaphors to describe the importance and difficulties of their task is most prolific among the first and fourth of these groups. The second and third groups disguise a contradiction in their aim of understanding the diseases and disorders of old age by advocating the goal of an extended ‘healthy life span’, which avoids having to confront the moral dilemmas of extending the lifespan for its own sake.

**KEY WORDS** – anti-ageing, biogerontology, cosmetics, healthy ageing, immortality, lifespan, military metaphors, senescence.

## **Introduction**

The prospect of a deeper scientific understanding of ageing processes and their technical manipulation is encouraging the ‘biologisation’ of old age. Recent scientific interventions have achieved dramatic increases in longevity in yeast, nematode worms, fruit-flies and mice. Some suggest that these experiments open the possibility of greatly extended human longevity, and such views are eagerly transmitted in popular science communications (Olshansky and Carnes 2001; Benecke 2002; Fukuyama 2002; Butler *et al.* 2004; Rennie 2004). This paper examines the impact of the culture of science on the meaning of old age, and particularly the claim

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that science can stop or postpone ageing and death, either completely or in the long term. The claims have spawned several controversies among biogerontologists (Moody 2002; Binstock 2003, 2004; Vincent 2003). One reaction has been to distinguish ‘genuine’ science from the bogus claims that it is now possible, or will be soon, to reverse ageing and to extend life, some of which are formulated in quasi-scientific or medical language. Another has been a contention about the priority (and funding) to be given to research programmes that seek radical extensions of the human lifespan. These controversies provide opportunities to observe the ways in which the science of ageing influences and is influenced by wider cultural phenomena. It will be argued that the anti-ageing movement is contributing to the social devaluation of the final stage of human life.

### **Aims and information sources**

The research on which this paper is based has had two interacting elements. One has been textual critiques, firstly of the output of the proponents of anti-ageing interventions and of biogerontology in popular science publications and academic journals, with a focus on both the constructs and language that are employed to describe human old age, and secondly of accounts of two controversies about the effectiveness of anti-ageing science and medicine. These are Olshansky and others’ disputes with the *American Academy of Anti-Aging Medicine* (A4M) (Olshansky, Hayflick and Carnes 2002a, 2002b; Olshansky, Hayflick and Perls 2004), and the reaction to Aubrey de Grey’s ‘Strategies for Engineered Negligible Senescence’ (SENS) research programme (de Grey *et al.* 2002; de Grey 2003; Nuland 2005; Warner *et al.* 2005). The other element has been attendance at biogerontology conferences and events at which interviews with several leading anti-ageing practitioners were arranged, with the same focus on the displayed conception of human old age and ageing. The research has then been an individual investigator’s scoping or pilot study. This paper focuses on the language and imagery that is used among anti-ageing practitioners to characterise ‘old age’, particularly to understand why it is viewed so negatively. The paper’s starting point is that old age is a cultural category.

### **Cultural variations in the representation of human ageing**

Some aspects of the trajectory of social and biological changes over the lifespan are identified as ‘ageing’. Age is also understood as a sequence of

categories differentiated by specific criteria – including not least measures of chronology. Human cultures not only classify individuals and groups by 'age' but also develop normative expectations about 'ageing'. The specific content of these processes and categories are contested and their meanings are not fixed. The lifecourse has different life stages in different eras and cultures. New stages in the 20th century have included 'teenager' and 'third-ager'. There are also stages of the lifecourse with less definite ages and sequential positions, and some that not all experience (*e.g.* child-raising). Historical gerontology has usefully documented the changing understanding of old age and the rise of the modern dominance of medical definitions (Achenbaum 1978; Van Tassel and Stearns 1986; Cole 1992; Katz 1996, 2005; Lupton 2000; Thane 2000). Foucault described very well the shift in the understanding of the body in old age:

The aged body became reduced to a state of degeneration where the meanings of old age and the body's deterioration seemed condemned to signify each other in perpetuity. By recreating death as a phenomenon in life, rather than of life, medical research on aging became separate from the earlier treatises that focus on the promise of longevity (Foucault 1973: 41).

Building on the Foucauldian approach, Katz (1996) identified a key discursive change that started in France during the late-eighteenth and early-nineteenth centuries, whereby 'medical research developed what we have called a discourse of senescence: a new organization of associated ideas and practices that captured the aged body through three commanding perceptions' (1996: 40). He listed these as: (i) 'the aged body as a system of signification', by which physicians now examine bodies for indications that they mask 'inner states of disorder'; (ii) the aged body as having a distinct pathology requiring medical therapy; and (iii) the aged body as a dying body. He argued that in pre-modern society, death was understood as a mysterious external force, while during the early 19th-century, science reconceptualised death as an internal phenomenon of the body. I suggest that contemporary science is also engaged in reconceptualising death and old age. Hayflick observed that it is impossible to die of old age in America today because it has been removed as one of the 130 permitted 'causes of death' on a death certificate (Moody and Hayflick 2003).

Cultural categories are established through constructing contrasts and boundaries that mark semantic space. Meanings cannot be established in isolation, and categories are part of meaningful systems that interlock. To understand old age, it is necessary to know its boundaries and how to recognise the markers between what is and is not old age. If we examine the language and the communications of those involved in the anti-ageing movement, we can see how the meanings they create are achieved, which

distinctions are important, and which key concepts and categories are used to explain and understand old age (*cf.* Doyle 1997). The debates are about the boundaries of the science of ageing, who counts as a *bona fides* scientist, and who can claim knowledge about old age, on what basis and with what consequences. Katz has usefully reminded us that such debates have a long history:

Thom's investigations destroyed the idea that an individual could conserve vital powers and extend life beyond the normal range of statistical and medical expectations. In so doing, he contributed to a medical fixing of the human lifespan proposed in other institutions, such as life insurance and pension and retirement programs. Pre-modern writers had assumed that a person could live to about 200 years given the right physical, moral, and environmental conditions. One can hardly question that a lifespan of 80 or 90 years, implied by Thoms, is obviously more realistic than one of 200 years. However, Thom's work had a more important impact: it signalled the conceptual shift from the human lifespan as a miraculous possibility to a clinical, biological certainty (Katz 1996: 45).

Meanings of 'old' are communicated in concrete situations using mutually comprehensible linguistic and cultural resources. As the details of much biochemical and physiological research are not comprehensible by lay people, it is understandable that practitioners use metaphors when communicating with non-biologists. Military metaphors are particularly useful because they explicitly or implicitly characterise old age as an unmitigated enemy.

### **The 'anti-ageing movement' and its targets**

The characterisation of anti-ageing medicine and the broader movement are contested. Three definitions from the literature are informative. Post and Binstock (2004: 1) emphasised that the intentions of the practitioners of 'anti-ageing interventions [have] a wide variety of ambitions and measures to slow, arrest, and reverse phenomena associated with aging'. Mykytyn (2006: 644) regarded 'anti-ageing medicine as a social movement. ... Anti-ageing's core mission [is to] to herald and operationalize aging itself as treatable'. The *Longevity Meme* website emphasises the diverse practices of different anti-ageing groups:

Like it or not, 'anti-ageing' now has a number of quite different common meanings and connotations. Each is championed by a particular group or loose coalition of interests:

- For the scientific community, anti-ageing research refers exclusively to slowing, preventing, or reversing the ageing process.

- In the medical and more reputable business community, anti-aging medicine means early detection, prevention, and reversal of age-related diseases.
- The wider business community – including a great many fraudulent and frivolous ventures – views 'anti-aging' as a valuable brand and a demonstrated way to increase sales. ... Broadly, and very charitably, we can look at these varied definitions of anti-aging as meaning 'to look and feel younger in some way', which has no bearing on how long you live or how healthy you actually are (Reason 2002).

We can map the field of anti-ageing by exploring the diverse professional groups that present themselves as 'waging war' on old age – as challenging the inevitability of ageing. They construct old age as a naturalised, self-evidently negative, biological phenomenon, which must be attacked and defeated (Vincent 2006*a*). They use different weapons by which to defeat ageing based on their differing claims to technical expertise and ability to control natural phenomena. Four groups can be recognised on the basis of their different approaches to old age:

- Those who direct their control of the body to the removal of the signs of ageing, whose objectives might be characterised as symptom alleviation.
- Those who equate old age with ill-health and identify themselves as warriors in a battle against disease and whose objectives are to effect cures.
- Those whose objective is to control fundamental intra-cellular processes and thus to transform ageing by extending or breaking the limits to the human life span.
- Those whose explicit aim is to achieve immortality and for whom the enemy is death.

From this starting point, anti-ageing science can be classified variously by the motives of the practitioners, their different disciplinary expertise and practices, the length of lifespan extension they propose, and the different social groups to which they are affiliated (Table 1).<sup>1</sup> It is important to emphasise that this classification of anti-ageing science does not identify groups with clear boundaries, but rather is a first map of an extensive field in which many activities and academic and professional disciplines overlap. We can take the example of the ageing brain by way of illustration. Anti-ageing commercial entrepreneurs who sell their dubious brain-exercise CDs fall into the cosmetic category, but their sales pitch appeals to well-founded research that has shown that mental stimulation is a factor in reducing the risk of Alzheimer's disease. There is serious biomedical research into drug therapies for Alzheimer's with, for example, an important debate about the administration and effectiveness of *Aricept* (donepezil). This is clearly medical research. There is associated research into

TABLE I. *A typology of anti-ageing science*

Type	Anti-ageing practice	Life ext'n aim (yrs) <sup>1</sup>	Key characteristics of ageing (the enemy)	Techniques (weapons, armoury)	Desirable outcomes (victory)
<b>Cosmetic</b> (Symptom alleviation)	<p>Cosmetic practices: hair colouring, make-up, anti-wrinkle cream, botox (botulinum toxin) and surgery to disguise the signs of ageing.</p> <p>Prophylactic regimes: exercise, diet or dietary supplements and life style programmes intended to stave off the signs of physiological ageing.</p> <p>Compensatory techniques: human growth hormone, Viagra, HRT, designed to replace failing functions and sustain a youthful standard of performance. (Many of these practices clearly shade into 'regenerative' medicine).</p>	None	<p>Wrinkles, skin tone, obesity, fatigue, loss of sex drive, hair loss/colour.</p> <p>Loss of self-esteem, socially-acceptable body image, inner balance, spirituality, the pressures of modern life.</p>	<p>Snake oils, creams, surgery.</p> <p>Drugs, hormone replacement, human growth hormone,</p> <p>Exercise, fitness, life style changes to smoking, diet.</p>	Preserving youthful looks and demeanour
<b>Medical</b> (Curative)	<p>Regenerative medicine – stem-cell therapy, transplant surgery, to re-establish functionality in failing organs.</p> <p>Clinical interventions for the specific diseases of old age – particularly drug therapies for cancer, heart disease, arthritis, designed as cures as opposed to palliative therapies.</p> <p>Medical therapies based on life-style change: diet and exercise regimes designed as treatments for degenerative diseases of ageing.</p>	A few	<p>Diseases and their symptoms in particular those such as cancers, heart disease/circulatory disorders, respiratory disease, auto-immune disease, arthritis, osteoporosis, dementias – Alzheimer's, associated with older people.</p> <p>Specific genetic disorders, <i>e.g.</i> progeria.</p>	<p>Research: drugs and therapies.</p> <p>Clinical practice, technical innovation and improvements <i>e.g.</i> heart surgery, transplants, stem cells.</p> <p>Application of science (genome research) to treatment, cure or prevention of specific (genetic) conditions.</p>	Cure (including the elimination of disease)

<p><b>Biological</b> (Preventative)</p>	<p>Epidemiological research: surveys of centenarians and other long lived people to establish their special features, <i>e.g.</i> characteristic genes or distinctive functioning. The objective being to develop therapies using the knowledge obtained.</p> <p>Evolutionary modelling: to find and by-pass evolutionary limits to the life span.</p> <p>Science of cell processes and in particular cell senescence – the basic biological processes of cell metabolism, cell functioning, cell reproduction: how cells live die and reproduce. This science is closely linked to the fourth sub-type, both of which have been responsible for greatly extended life spans in model species in laboratory conditions.</p> <p>Genomic science: scientific work to map gene sequencing and identify genetic processes and products. There is no single gene or set of genes for ageing, but the science holds out the prospect of gene therapies/genetic modification that will slow, halt or reverse ageing processes.</p>	<p>Many</p>	<p>Senescence - declining efficiency of cellular reproduction and integrity.</p>	<p>Manipulation of genome and protein cascades to prevent or repair senescence. Mimic the longevity effect of calorie restriction.</p>	<p>Extending the healthy life span.</p>
<p><b>Immortalist</b> (Elimination)</p>	<p>Commercial products and technical devices: <i>Alcor</i> and other cryonics enterprises offer to keep your body frozen until science has progressed sufficiently to revive you and keep you alive.</p> <p>Scientific programmes for biological immortality: biologists/theoreticians have presented detailed programmes of scientific research to achieve immortality, including the widely publicised SENS.</p>	<p>Infinite</p>	<p>Death, bodily ‘failure’</p>	<p>Science-based regenerative techniques to systematically renew or replace failing organs and processes.</p>	<p>Slowing, stopping or reversal of ageing processes.</p>

Notes: 1. Life extension aim in years. HRT: hormone-replacement therapy. SENS: Strategies for Engineered Negligible Senescence (see text).

brain-enhancement drugs that appear to have a preventative effect on dementia and which have enhanced the cognitive performance of aircraft pilots (Yesavage *et al.* 2002); they are marketed for children taking exams. In terms of cell biology and biochemistry, enhancing cell protection and repair chemistry could sustain the functioning of brain cells. Immortalists, on the other hand, build on stem-cell science to foresee the possibility of brain cell replacement and repair, thus enabling undiminished mental function in extended lifespans. Both mainstream and bogus science are contested across all four categories.

### **Language and imagery**

In both biogerontological and popular discourse about old age, metaphors of the body are employed. A common example represents the body as a machine (Shilling 1993), and efforts to prevent the diseases and disorder of ageing, and ageing itself, are objectified and distanced by imagining these efforts as a battle. The contributions in Kenyon, Birren and Schroots (1991) helpfully explored various epistemological approaches to the study of the individual and the collective metaphors of ageing used in many disciplines and contexts. They feature representations of the ageing person as a traveller and naturalistic metaphors of the time and seasons, but given what is now apparent about anti-ageing science, there are surprisingly few references to military metaphors. Mechanical metaphors can be seen as a logical accompaniment of the medical approach to the body, with its roots in the Enlightenment and the development of modern science. The French philosopher Jean-Jacques Rousseau exemplified the reasoning:

I see nothing in any animal but an ingenious machine, to which nature hath given senses to wind itself up, and to guard itself, to a certain degree, against anything that might tend to disorder or destroy it. I perceive exactly the same things in the human machine, with this difference, that in the operations of the brute, nature is the sole agent, whereas man has some share in his own operations (Rousseau 1755: 23).

Lupton (1994: 62) located the model in economic and technical change: ‘since the industrial revolution, the mechanical metaphor has been frequently used in discourses on the body’. These mechanical metaphors reflect the technology of the time; for the Victorians, the steam engine was one such metaphor:

Living forces had been considered as standing apart from the rest of nature. Vital force, or vitality, had been thought of as something distinct in itself; and that



there was any measurable relation between the powers of the living organism and the forces of heat and chemical affinity was of course unthinkable before the formulation of the doctrine of the correlation of forces. But as soon as that doctrine was understood it began to appear at once that, to a certain extent at least, the living body might be compared to a machine whose function is simply to convert one kind of energy into another. A steam engine is fed with fuel. In that fuel is a store of energy deposited there perhaps centuries ago. ... The engine then takes the energy thus liberated, and as a result of its peculiar mechanism converts it into the motion of its great fly-wheel. With this notion clearly in mind the question forces itself to the front whether the same facts are not true of the living animal organism (Conn 1903: 22).

Other times and technologies have spawned different metaphors. Familiar metaphors from the era of electricity are 'recharging our batteries' and 'blowing a fuse', clockwork metaphors include 'feeling run down' and 'ticker' for the heart, and other body metaphors borrow from hydraulics, transport and computing. Lupton has interpreted the mechanical metaphor for the body as a 'cultural logic':

The mechanical metaphor includes the idea that individual parts of the body, like parts of a car or plumbing system, may 'fail' or stop working, and can sometimes be replaced. The metaphor has the effect of separating mind and body, of valorizing medical techniques which focus upon locating a specific problem in part of the body and treating only that part. ... Hence the importance of the technological imperative in biomedicine: the dependence upon the use of machinery to fix machinery (Lupton 1994: 63).

The literature of biogerontology is full of mechanical metaphors of the body and its ageing. The popular science texts of Alex Comfort (1979) and Tom Kirkwood (1999) are replete with such images, which were also heard frequently at the biogerontological conferences I attended. One leading biologist at the International Conference on the Functional Genomics of Ageing (ICFGA) in 2006 stated that 'functional genomics is a tool-box ... the question is how to use it in the correct way'.<sup>2</sup> At a meeting of the London Regenerative Medicine Network and in other presentations, Aubrey de Grey used the 'stopping the super-tanker' metaphor to describe halting the ageing process, and repeatedly drew the analogy with the trials and proving of powered flight – from the Wright Brothers to jet planes – to envisage the future of anti-ageing 'therapies'. He also talked about 'escape velocity' to describe the point at which progress in lengthening the life span overtakes the rate of decline in life expectancy with age. Across the whole field of biogerontology, particularly in anti-ageing promotional material, there are many images of clocks, and hour-glasses stand for time and when inverted for the goal of overcoming ageing (this image is used in the Alcor Inc. (2005) promotional DVD).<sup>3</sup>

*War and military metaphors*

Military metaphors are closely related to mechanical metaphors of the body through images of the technology of warfare, and importantly contain the idea of violent conflict. Duerden Comeau and Kemp (2007) recently discussed the use of these metaphors in relation to the ageing of information-technology workers, and Lupton has discussed the military metaphor and its use in medical discourse to good effect:

The language of warfare is extremely common in modern medical and public health discourses. ... The immune system for example, is commonly described as mounting a 'defence' or 'siege' against the 'invasion' of 'alien' bodies or tumours which are 'fought', 'attacked' or 'killed' by white blood cells, drugs or surgical procedures. ... In such texts, bacteria are anthropomorphised into wily aggressors, deliberately changing themselves to elude detection and attack from their human foes. ... [Scientists] use colourful metaphors of war to describe their efforts; language that perhaps gives their endeavours legitimacy and a sense of great importance, [and to] position them[selves] as the 'generals' in the battle against disease (Lupton 1994: 67).

The particular value of military metaphors in anti-ageing discourse is that they identify the enemy, the fundamental processes of ageing. The exclaimed slogan of the American Academy of Anti-ageing Medicine is, 'Ageing is not inevitable! The war on aging has begun!' Magalhaes, a Harvard biologist, entitled his 2003 paper, 'Winning the war against aging', and web-blogger Frank Rummel (2007) offers a *Report from Trenches of War on Aging*. In the field of anti-ageing medicine, the relationship of the people who are ageing (*viz.* all of us) to old age is constructed as antagonistic through the metaphor of war, while the practitioners of anti-ageing medicine are seen as soldiers or warriors and their techniques imagined as weapons. As the United States President's Council on Bioethics (2003: 161) has it, 'We mean not so much to slow the passing of the years as merely "to shield our bodies from brutal bombardment by the silent artillery of time" (in Abraham Lincoln's memorable phrase)'.

*Military metaphors in four types of anti-ageing activity*

I will examine in turn examples of war metaphors from the four identified types of anti-ageing ambitions and interventions: cosmetic, medical, biological and immortalist. Instances in *cosmetic anti-ageing* are many and varied. They are used by the cosmetic brand *Dove* (a Unilever company) in its advertising and are prominent in the publicity material of the American Academy of Anti-Aging Medicine and many other promotional organisations, to the extent that these metaphors characterise an argument. References to a 'war on ageing' are used very frequently by companies to

sell anti-ageing products or treatments that play on the fear of a loss of physical attractiveness (Table 2).

In *medical anti-ageing* discourse, researchers and practitioners use military metaphors, including, for example, some heart specialists who attended the 2006 ICFGA. Introducing his presentation on the use of stem-cell technology to repair damaged hearts, a Sicilian transplant surgeon asked, 'What is the real emergency for society that both clinicians and scientists are trying to solve?' His rhetorical answer was 'end-state organ failure'. This implied that the role of medicine and science is to 'defeat' death. My notes on the imagery used at the medical-academic and biology conferences suggests, however, that the use of military images is quite rare, which may be because at a scientific conference the participants self-define as scientists and shun ethical, and particularly polemical, expressions. Non-science metaphors are more appropriate when communicating to a broad audience, and are more common in popular science journals such as *Nature* and *Scientific American* than in professional journals like *Cell*.<sup>4</sup>

Turning to the *biology of ageing*, the biochemistry and physiology of the ageing cell has been a source of great interest for decades, and many scientists in many countries are dedicated to understanding cell processes and their relation to ageing. The biologists concerned with cell replication processes relevant to ageing use various metaphors to explain and characterise their understanding. The terms 'immortality' and 'senescence' have undergone an interesting transformation within cell science from metaphors to technical terms (Vincent 2006*b*). In their conference presentations, biogerontologists frequently make classical (Greek and Roman) references – Prometheus came up several times at the 2006 ICFGA – indicating a desire to associate with a particular intellectual and educational tradition. A common strategy is to anthropomorphise biological or biochemical components – to talk about cells 'deciding' or about a 'very intelligent molecule'. Other images are invoked, for example, stem-cell therapists talk about the 'live' products as like 'chemicals' or 'drugs'. The *Klotho* gene is referred to as the 'killing gene'.<sup>5</sup> There were exceptions but overall few military metaphors were heard at fundamental-biology conferences or have been found in the discipline's professional journals. At the conferences, there is much talk of damage and repair. Although not strictly military metaphors, these references to conflict have connotations of what 'ought' and 'ought not' to be happening in a cell, and this discourse is pervaded with the normative sense that ageing is 'bad'.

There are biologists with positions in the leading British and American universities whose stance on anti-ageing is that it provides a route to immortality (Hall 2003). These *immortalitists* frequently use military

TABLE 2. *Uses of military metaphors in the promotion of cosmetic anti-ageing products*

Title or identifier	Author or source	Metaphor and explication
Waging a war against aging: the latest in anti-aging techniques (title of article)	Teri Brown, <i>Iparenting</i> . Online at <a href="http://www.iparenting.com/articles/1696.php?wcat=158">http://www.iparenting.com/articles/1696.php?wcat=158</a>	Ask any number of women how they feel about aging, and chances are you will receive some very passionate replies. It seems to be a topic most abhor, yet many obsess over. Traci Draper, 33, is no exception. 'I am fighting it all the way', says Draper, laughing. 'I don't believe I'd ever undergo surgical treatments, so I am fighting it now while I still have a chance. I exercise, drink lots of water and lather lotion on my face every morning and night ... no matter what!'
<i>Collagen</i> and <i>Botox</i> (product review)	Susan Aschoff, staff writer, <i>St Petersburg Times</i> (Florida), 26 March 2002	<i>Collagen</i> and <i>Botox</i> help fight the war on aging. But it's an ongoing battle.
<i>Sleeping Peel</i> . Sephora Inc. (product advertisement)	<a href="http://www.sephora.com/browse/product.jhtml?id=P42701">http://www.sephora.com/browse/product.jhtml?id=P42701</a>	The latest weapon in the war against aging, this amino acid antioxidant exfoliant literally levels your fine lines (in less than a week), while simultaneously lightening dark spots from sun damage. Use daily under moisturizer to slow your complexion's clock.
Dermalogica – Multivitamin: Power – Firm. (retailer's advertisement)	<a href="http://www.comparestoreprices.co.uk/health-products.asp">http://www.comparestoreprices.co.uk/health-products.asp</a>	Your eye and lip areas JUST WON THE WAR against premature ageing!
Anti-ageing (lifestyle product promotion)	<a href="http://www.mankind.co.uk/goshopping.asp?GroupID=718">http://www.mankind.co.uk/goshopping.asp?GroupID=718</a>	Don't give in to ageing skin without a fight! These treatments have been specifically developed to give you the best chance in the war against fine lines and wrinkles, skin discolouration and loss of skin tone. Try a treatment moisturiser or serum to encourage cell turnover and to keep skin fresh and younger-looking.
Moisturise, moisturise (products review on <i>Saga</i> website, a company that specialises in serving mature adults)	<a href="http://www.saga.co.uk/health_news/article/C580ACFE-D082-11D6-B8B1-00508BAEC55C.asp?bhcp=1">http://www.saga.co.uk/health_news/article/C580ACFE-D082-11D6-B8B1-00508BAEC55C.asp?bhcp=1</a>	Forgetting your before-bed moisturiser – and that means men too. While you sleep, skin turnover speeds up, so last thing at night is the ideal time for applying moisturiser as it's absorbed by the skin at a faster rate. Look for creams containing the antioxidant vitamins A, C and E which will help in the war against free radicals, unstable molecules that can wreak havoc with skin cells.

*Note:* All the cited websites were accessed in March 2007.

metaphors. For example Joao Pedro de Magalhaes, a postdoctoral fellow at Harvard Medical School who works on ageing, describes his motivation in the following terms:

I want to conquer aging because aging is and will be the major cause of suffering and death among the ones I love. I want to end aging to safeguard the future because I want to choose my future instead of being ruled by this hostile force. I want to cure aging because otherwise I will die. I don't know if I'll succeed, but I know I will not quit since to quit is to die (Magalhaes 2006: unpaginated).

At the London Regenerative Medicine Network meeting of October 2005, Aubrey de Grey, billed as from the Department of Genetics, University of Cambridge, in his presentation referred to 'the war on ageing' as a 'real war', and spoke of doing 'serious damage to ageing soon'. De Grey is associated with the Alabama registered Immortality Institute for Infinite Lifespans. He appeared, for example, on a publicity card for their November 2005 conference, together with their motto and main mission, 'Conquering the blight of involuntary death' (Immortality Institute 2002), and has published a paper entitled, 'The war on aging', in a volume sponsored by this organisation (de Grey 2004b). De Grey's website presents a cute, furry mouse, which is characterised with splendid irony as 'ammunition in the war on ageing'.<sup>6</sup> The image publicises a *Methuselah Mouse* prize that aims to promote the science of extended human longevity: the prize money raised to date stands at \$4,513,673, and will be awarded to whoever creates the longest-ever-lived mouse. De Grey and others have raised considerable private finance to support their research, and the immortalists' fund-raising documents are creative. One is presented as a medieval vellum scroll (Figure 1). De Grey's website also uses an extended military metaphor and polemical language that contrasts greatly with more precise and cautious academic scientific usage.<sup>7</sup>

### Interpretations and conclusions

What is the nature of the foe in the war on ageing? Should we not consider making peace with it? We can classify the different meanings ascribed to old age and reference them against the enemy and tabulate the weapons and strategies used in the war (see Table 1). Figure 2 sets out the same data as Table 1 on two dimensions, the first being the scale of the human life span extension that is claimed or sought, from none or negligible to immortality, and the second the level of scientific credibility or authority. Many claims of the anti-ageing advocates are highly contested, and many scientists judge them to be 'unscientific'. The scientific status of advocacy

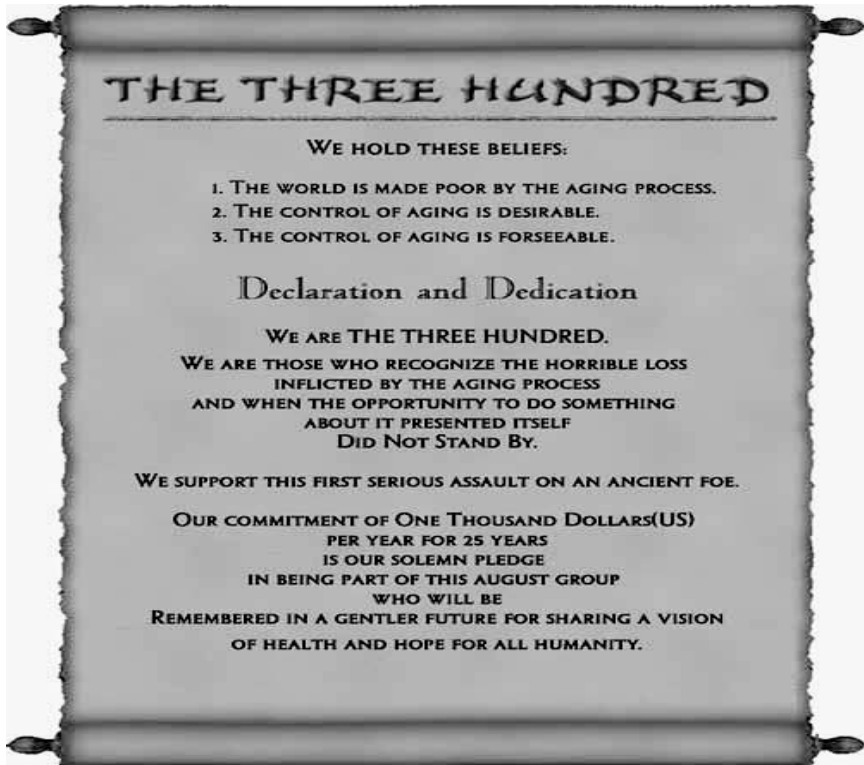


Figure 1. The anti-ageing declaration accompanying an advertisement for the Methuselah Mouse Prize of the Methuselah Foundation, Lorton, Virginia. Source: <http://www.mprize.org/index.php?pagename=threehundredlist>

documents and statements can be gauged by the originator's academic position and the type of publication (with peer-reviewed papers having the greatest scientific authority). The 'credibility scale' runs roughly from the marketing staff of commercial companies that have no medical or biological accreditation, to professional scientists with a position in a major university (particularly in a well-established laboratory) and many peer-reviewed papers in leading scientific journals. Figure 2 shows that mainstream science, in the sense of hypothesis testing and knowledge generation using experimental methods, can be applied to the entire spectrum of anti-ageing activities, from cosmetics to the search for infinite longevity.

War images are most often used by those who promote the interventions (the left side of Figure 2). They are elements of the rhetoric used to address non-specialist audiences but have limited scientific credibility

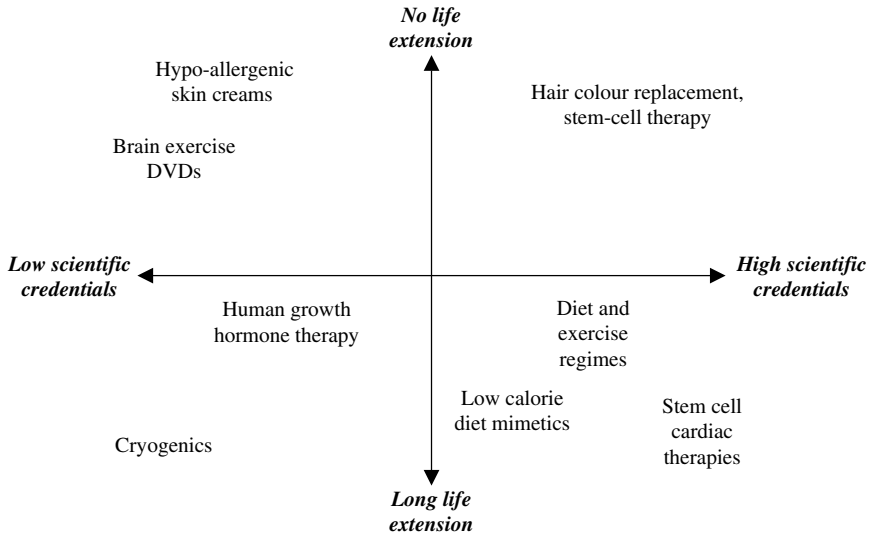


Figure 2. The dimensions of contemporary anti-ageing medicine.

(‘scientific’ evidence is cited but generally not from mainstream sources). ‘Hard’ scientists are not immune from using metaphors, but in their exchanges they generally use more exact analogies. For example, the term ‘senescence’ is a technical term in biogerontology and frequently used in the study of cell processes. War images tend to be used by those who are excluded from recognised science – those who are struggling to get inside the respected networks and who most frequently address non-specialist, non-scientific audiences.

Dramatic military metaphors and images are useful for fund raising and publicity, but less so for gaining recognition by established biomedical and clinical science. One leading London biologist described the cosmetic and immortalist anti-ageing practitioners whom he wished to exclude from science as ‘quacks and loonies’ (*cf.* Gerontological Research Group 2002). The cosmetic charlatans can readily be excluded from mainstream science as ‘quacks’, but less easily excluded are those who draw on science to develop or supply cosmetics, particularly cosmetic surgeons. Immortalists are generally excluded by mainstream science as ‘lunatics’, for putting forward fantasies that are beyond the known capability of science. When ‘immortalists’ conduct research in respected biology laboratories and attract large amounts of private funding, however, the ‘exculsion’ is inconsistent (Shostak 2002; Hall 2003).

How does mainstream academic biogerontology differentiate its activities from those of ‘quacks and loonies’ and establish its superior

legitimacy? To which values and symbols do they appeal to establish their authority? Mainstream biogerontological science does *not* loudly advertise its ability to extend human longevity by longer and longer periods, but rather repeatedly appeals to the goal of increasing the ‘healthy life span’. These scientists present themselves as studying fundamental biological processes in order to improve the health of older people – they ignore or dismiss the construction that the objective is to extend the lifespan, although concede that this may be a consequence. By emphasising the goal of a longer ‘health span’, mainstream scientists seek to distance themselves from ‘quacks and loonies’. Cosmetics are treated as trivial, and the dubious goal of immortality is seen as a chimera and as irrelevant because it is not primarily concerned with disease. The rhetorical use of the ‘health span’ was noted during four of my interviews with scientists at the 2006 ICFGA. They described the goal of their work variously as, ‘[so] we can age in better health not as “old-old” but [in] healthy old age’, ‘not so much to prolong ageing but to reduce societal costs and pain’, ‘to ease the ageing process, why not? The aim is to ease suffering not necessarily to prolong life’, and to work on ‘caloric restriction [because it] prevents cancer and could really improve the quality of life. Maybe it will also extend the lifespan to 150 years but that is not the driving force’.

The ‘health span’ concept is the dominant mode of explanation but is not without problems. Much epidemiological research has shown that lifestyle factors, such as diet, exercise, mental activity and avoidance of stress, are significant influences on health extension. This opens the door not only to scientific studies of lifestyle influences on longevity but also to a role for ‘anti-ageing’ interventions and medicine that are close to ‘new age’ lifestyle marketing and ‘alternative’ therapies – both of which are in evidence at the conferences of A4M and its offshoots across the world. The use of the ‘health span’ concept does not entirely avoid the moral and social dilemmas associated with a fundamental increase in the achieved human lifespan. Irrespective of the conditions in which we live, is it desirable to extend human life *per se*? Some people, including influential scientists, clearly think that it is. William Haseltine, head of Human Genome Sciences, an important pioneering genomics biotechnology company, is cited by the US President’s Council on Bio-Ethics (2003: 162) as having declared that ‘the real goal is to keep people alive forever’.<sup>8</sup>

Immortalists commonly (if often implicitly) have a fixed view of the age at which they wish to live the rest of their lives. They see their own biological ageing as being halted at 13, 25 or 32 years, or some other preferred chronological age. It could be argued that this is a middle-aged



perspective. Older people look back at several life transitions and there is research evidence that they adapt to bodily change (Oberg 2003). Immortalists seem to lack a positive vision of themselves in their later life stages, as for instance characterised by maturity, experience and adjustment. They discount the social process of ageing and do not seem to have an understanding that society and social relationships do not stand still, and that neither they nor an idealised body can be fossilised at any particular chronological age. The war on ageing is conceived entirely around a biological model of ageing and excludes any understanding of human ageing as complex social and psychological processes.

To sum up, the most prolific use of military metaphors is by the promoters of cosmetic interventions and immortalists. These components of contemporary anti-ageing science most appeal to non-scientific audiences. On the other hand, the medical specialists and the biologists of ageing disguise the contradiction of their approach to old age by use of such terms as 'healthy life span', which avoids having to confront the moral dilemmas of extending the lifespan for its own sake. The rhetoric of a 'war on ageing' positions the practitioners of anti-ageing medicine on moral high ground, as valiant warriors against a terrible fate. 'Science' claims intellectual and epistemological superiority, but for this to be sustained, its failures or slow progress have to be explained away as a function of insufficient funding and resources. Because scientific knowledge is culturally understood as the progressive and 'true' knowledge, it is seen as infallible in its potential control of bodily mechanisms (Vincent 2006a). Importantly this rhetoric positions older people as 'the defeated'. Older people are characterised by the different elements of anti-ageing science as having lost their good looks, succumbed to disease, become overwhelmed by senility, and as surrendering to death. Constructing older people as the defeated adopts another battle metaphor, denies the possibility of positive models of old age, and reinforces the fear of ageing and death. These attitudes to human ageing require us to redouble our efforts to avoid old age. In claiming the legitimacy of science as the source of true knowledge, anti-ageing science and its battle against ageing undermines old age as a necessary and potentially positive and fulfilling stage of the lifecourse.

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## NOTES

- 1 A referee suggested that it would add clarity and precision to specify the scientists and products noted in the table. I had deleted another column with these data, partly to sustain good relationships with the informants for the continuing research, and partly in the knowledge that these contested topics have led to expensive legal proceedings, as between Jay Olshansky and the University of Chicago, on one side, and between Drs Klatz and Dr Goldman of the American Academy of Anti-Aging Medicine on the other.
- 2 International Conference on Functional Genomics of Ageing. I attended the third in this series of conferences as an observer at Palermo during 29 March–1st April 2006. I thank The British Council for a grant which enable that observation to take place. Interview data and field notes from the conference constitute part of the observational data for this paper.
- 3 Alcor Inc. is an American company which offers *inter alia* a commercial service in cryonic preservation.
- 4 Examples from popular science journals include: ‘Is a fountain of youth in your future? By elucidating the factors that drive the ageing process, researchers are hoping one day to postpone the ravages of age – and perhaps prolong life’ (Hopkin 1999), and ‘The battle against aging’ in *The Quest to Beat Aging* (Taubes 2000).
- 5 Klotho was one of the three Greek Fates or Goddesses that purported to spin the thread of life (the others were Lachesis and Atropos). The Klotho gene according to a team led by Johns Hopkins University scientists produces effects in mice apparently similar to ageing in humans (Arking *et al.* 2002).
- 6 Available online at <http://www.mprize.org/index.php?pagename=newsdetaildisplay&ID=062> [Accessed 13 April 2006].
- 7 An interview with Aubrey de Grey, transcribed from the Sage Crossroads website was reproduced by The Alliance for Aging Research. In response to the probe, ‘you’ve gotten quite a bit of attention lately for predicting that we will have the science within our lifetimes to extend human life spans to possibly thousands of years. Could you explain your point of view?’, he replied, ‘It comes in three parts. Within 10 years, with proper funding – about \$100 million a year – I think we can develop a panel of seven types of “rejuvenation therapies”, three of which I just mentioned, that will at least treble the remaining lifespan of already middle-aged mice. That will initiate a genuine “war on aging” which will attract many billions per year, which will, I think, translate such technology to humans by 2030, allowing middle-aged humans to live to about 130 on average. That, in turn, will let such people survive – in good health, mind – long enough to benefit from the second-generation rejuvenation therapies that may be needed to combat subtler aging components that we haven’t yet discovered – so they will live even longer, so they’ll get third-generation therapies, *etc.* That ‘bootstrapping’ cycle means that people will live several hundred years because they will only die of accidents and such like. If they get more risk-averse as a result, as I predict, this will rise to thousands of years. Aging is an enemy. It saps our strength and ability to enjoy life, cripples us, and eventually kills us. Tens of millions die from age-related conditions each and every year. Comparatively few people know that degenerative aging can be modestly slowed with diet and lifestyle choices, as is the case for many medical conditions. Comparatively few people are aware of serious scientific efforts, presently underway, aimed at understanding and intervening in the aging process – in order to one day reverse its effects. One day, scientists will find a way to defeat aging. We would like this breakthrough to happen while we are still alive and in good health to benefit from it’ (Alliance for Aging Research 2004, unpaginated).
- 8 Reported in *Science* 290: 2249 (22 December 2000). See also Haseltine (2001).

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