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## **Back to Methuselah: the challenge of Ageing**

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**Cumberland  
Lodge**

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**The views in this essay are the views of the author and do not necessarily represent the views of Cumberland Lodge or its trustees.**

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## Introduction

### Are we programmed to die?

“There is no such thing as a biological clock for ageing”, said Professor Tom Kirkwood, Gerontologist at the University of Newcastle, at the beginning of the conference. There is no inherent ‘death-programme’ built into our genes. Whatever genes bring to the party, they do not bring any precise specification as to the length of life of the individual. Kirkwood conceded that genes may be one of a number of factors that determine longevity but there are other, more important ones.

In nature, there is no need for ageing since most animals get killed off before they live long enough to experience it. Natural selection in the form of extrinsic causes of death such as predation and infectious diseases prevents animals from experiencing the biological degradation that we now associate with ageing. Some studies in humans suggest that reproductive activity shortens life expectancy, as for example in the case of a study on aristocratic women that found that women with longer life spans have a lower fertility. However, this does not mean, underlined Kirkwood, that having children shortens our lives. It is not a case of asking “Shall I have a child, or shall I have another three years of life?” Reproduction does play a part in as much as it is part of a system of trade-offs occurring in nature. “If you invest a lot in maintenance and repair, you cannot invest in reproduction.” Kirkwood briefly explained the ‘disposable soma theory’ which deals with these repair mechanisms. An organism only needs to invest in maintenance and repair as long as it can reasonably expect to live, for maintenance

and repair are expensive.

Of bigger consequence for longevity than our genes and reproductive activity is the build-up of damage in our cells. This is what ultimately kills us, and it is not something we could avoid, for it is part and parcel of life. Each time a DNA sequence is copied in our body, i.e. each time a cell divides, mutations happen. No two cells in our bodies have the same DNA sequence. Thus, by the time that we reach adulthood, we live with many mutations. These copying errors are mostly caused by oxygen, which we need for breathing. Oxygen is a highly damaging chemical which is burnt in the mitochondria, our cells’ power stations. Stress also damages our cells, and is a major determinant in the ageing process. If we can decrease our exposure to cell damage and enhance our natural repair mechanisms, we can extend at least our healthy life span, if not our overall life span.

When asked about the role of telomeres in ageing, Tom Kirkwood explained that stress shortens the telomeres (which stop our chromosomes from unravelling). Telomeres act like a fuse preventing cells which have been exposed to stress from dividing ever again, thus being a natural cancer safeguard. They are a self-preservation mechanism, and not part of any ‘programmed ageing.’

“We are programmed for survival,” concluded Professor Kirkwood, and the ageing process is much more malleable than assumed. Ageing is driven by a build-up of faults in our cells, and it is up to us to reduce the body’s exposure to stress and free radicals by a healthy life style, good nutrition and exercise. Ageing and death, it has become clear, are part of faulty, disability and age-related diseases

life from the very beginning. Damage has been building up in our tissues from when we were in the womb, and if breathing oxygen is what keeps us alive, it is also what kills us in the end.

Although Tom Kirkwood recognised that we are not programmed to die, he did not mean to say that we will or can live forever. This was stressed by Professor S. Jay Olshansky from Chicago, who spoke about the limits of human longevity. Olshansky underlined that there is no biological limit since senescence is not an active programme but rather a by-product of reproduction and growth development, and of fixed genetic programmes such as cell division. There are no ‘death or ageing genes’, and in a sense this is a good message for human longevity since if there were a programme for ageing that is part of human existence, we could not do anything about it at the present time.

Olshansky explained that human longevity is limited by, amongst other things, our body design. “Our bodies are not intended for long-term use. They are for short term-use, and that is why we see problems the longer we live.” Bipedal motion, problems with our joints and hinges, problems relating to the flow of liquids through tubes and the clogging up of these all contribute to age-related illnesses.

“We are pushing ourselves beyond our biological warranty period”, and it is then that things start to go wrong in a major way. The longer we live, the more we will encounter illnesses such as Alzheimer’s which we would not see otherwise, and which our ancestors did not see to that extent. If we push out the envelope of human survival and decrease the risk of cancer, heart disease and stroke, we will push ourselves into older life spans where

frailty, disability and age-related diseases prevail. Our goal should thus not be to make ourselves live longer, but to make us live healthier while we are alive.

One cannot prevent ageing, but the individual can do a lot to prolong the functioning of our bodies. Exercise was stressed by both Kirkwood and Olshansky as being of enormous benefit. No matter what age one is, weightlifting and other exercise programmes can have a remarkable effect. Good nutrition and the avoidance of stress are other factors. Since it is oxygen that causes damage in our cells, anti-oxidants should help reduce damage. These should be absorbed in their natural form, though, rather than through pills. If taken in capsules rather than foodstuffs, they do not work as efficiently, for they are not presented in a form which the body recognises. Popping down pills is therefore not the answer to a longer and healthier life.

### **The value of human life**

Old people, said Jay Olshansky, sometimes do not seem to value their lives as much as younger people. They may feel a burden to their relatives, and sometimes even to society. They often feel their bodies have betrayed them. Tom Kirkwood pointed to a study of 85 year-olds across all health spectrums. The question asked of them was: ‘how do you compare your health to the average health of people of your age?’ 75% said that their health was much better than the average 85-year old population. Although this is, of course, statistically impossible, it still shows how positive people feel can about their age.

Jay Olshansky said, “if you ask an old person whether they want to live one

more day, they say 'yes'." He continued by pointing towards the picture of an old woman: "This woman at the age of 110 has every right to live one more day. A day in the life of this woman is of equal value to a day in the life of a child. We tend to devalue the elderly because they have lived a longer life. A fundamental mistake that we have made for a long time! A day in the life of an individual is of equal value, no matter what age an individual may be!" In the light of ensuing discussions during the conference, it seems necessary to add to this the postscript 'no matter how sick or healthy, or how well developed a human being may be.'

In his defence of eternal human life John Harris, Professor of Bioethics at the University of Manchester, pointed to a generally accepted adherence to the intrinsic value of life. If human life is sacrosanct, he suggested, then this view has profound consequences for how we treat it at its beginning and end.

John Harris stated that "as long as life is of acceptable quality to the person whose life it is", we have an overriding moral imperative to save life and postpone death.

This is in clear contrast to what, for instance, the Archbishop of Canterbury said in an article published shortly before the conference (The Times, 20<sup>th</sup> January 2005). Rowan Williams affirmed that "what anyone's life means is not exclusively his own affair. He lives in relation – to others and to society." As a Christian Williams rejects the argument that here is a situation that has no meaning, where God "cannot break through". However, even for non-believers, the wish to terminate one's life has consequences. "We can hardly say

that [someone's] life is without significance just because he says so; the society he lives in has a view about the worth of human life which cannot be mortgaged by how any individual feels." The pressure put on the elderly by relatives or hospitals to "take a quick way out that is convenient for others" is just one side of the problem. The Archbishop asks how far an individual's 'right to die' (if it exists) entails an obligation on others to kill. "What about the pressure a sick person who is determined to die places on those around them?"

"What legal implications could arise about the deliberate frustration of someone's legally secured rights, if relatives or physicians refuse to act? And even if it were a matter of complete consent between patient, family and physicians, we should have given legal sanction to the assumption that the meaning of a life is no more than what an individual or a group of individuals decides to give it. An American court some years ago ruled that a terminally-ill adult possessed a "constitutionally guaranteed right" to receive medical assistance in ending his life. The ruling was finally overturned but, says Williams, "the language was revealing", and the whole debate about assisted dying is "badly obscured by the language of individual 'rights'".

John Harris criticised the "fair innings" argument which assumes that up to the point, whenever it is, that someone has had their "fair innings", they have equal entitlement to health care and life saving devices, but beyond that point they have reduced or zero priority in the care and medical services. He exposed the thinking behind the "fair innings" argument as one which measures the value of life in units

of lifetime. After a certain point, its discounting begins. He made it clear that when “you rob someone of their life, you not only rob them of what they have at present, but also of all they will ever have.”

Harris then went on to say, however, that the “wrongness consists in taking something from [human beings] that they want”. While this is true *prima facie*, a strict interpretation of this sentence allows for the extension of the principle to people who do *not* want to live any longer. It might then imply that it would not be wrong to kill people who did not value their own lives.

Professor Steven Rose, Director of the Brain and Behavioural Research Group at the Open University, challenged Harris’ arguments by pointing out that abstract principles about extending human life indefinitely will not work because the life on an individual impacts on other human beings. No one lives in a vacuum. Accordingly, Rose said, “You cannot look at the sanctity of life at one end but disregard it at the other.” John Harris thought that embryos (whom he does not see as human persons) suffering from motor-neurone disease, for instance, that are used for therapeutic cloning never had a chance of a healthy or happy life or of developing properly at all.

If it is human life, not just healthy human life, then every experimenting with or killing of it must be prohibited. You do not kill one human being, however small, undeveloped or disabled, in order to save the life of another unless you are under duress (or ‘necessity’ in English law). The necessity for therapeutic cloning, however, does not exist.

Harris quoted Age Concern’s Millennium Papers: “An individual’s entitlement to the concern, respect and protection of the community, does not vary with age or life expectancy”.

To this anyone concurring with Rowan Williams’ thoughts would add that it must not vary either with the individual’s or anyone else’s sense of the value of the life they lead.

Many of the difficult issues raised and the views taken by different speakers and delegates depend on the concept of human life and human personhood. John Polkinghorne took the view that the very early human embryo is human life, but not yet a human person. This implied the possibility of using the very early embryo instrumentally for serious medical purposes unlikely to be attainable by a non-embryonic route, on a case-by-case licensed basis. This is the view of the Warnock committee and the state of current legislation in the UK.

Polkinghorne conceded there was no particular point at which the embryo as human life as human embryo turns into a human person. The human embryo in the Warnock committee’s eyes is to be accorded profound but not absolute respect. This is in stark contrast to other positions such as the Catholic Church’s, which accords absolute moral status to the human embryo and sees it as a human person from the beginning. Moreover, the Catholic Church rejects any attainment of medical purposes, however serious, through the deliberate artificial creation and destruction of human life.

Human personhood, it was said during the meeting, derives, *inter alia* from social interaction. This, however, starts long before birth. Mother and child are already

bonding in the womb, and what closer relationship can there be than that between mother and child? If human personhood is rejected for a small 'cluster of cells', what about a large cluster of cells in the form of an old and frail adult, unable to speak, talk or think, in a persistent vegetative state? Is he or she in social interaction? What makes one a person? Any attempt to denounce human personhood, whether at the beginning of life or at the end, is, in the view of the author, artificial and rather futile.

### **Do we and should we want to be Methuselahs?**

Knowing that we are not programmed to die does not mean we are immortal. Tom Kirkwood and Jay Olshansky made various suggestions for the extension of life. They both stressed, though, that it is impossible (with today's knowledge) to live forever, and even to extend the life span significantly, say for another fifty or one hundred years, is not feasible. Both were adamant that to extend the healthy life span for another ten years would be revolutionary. We should aim to improve the quality and health of our lives rather than extending life span *per se*, since the more we push the age barrier beyond the 80 or 90 years' range, the higher the risk of frailty and disability and of illnesses that do not kill us but significantly reduce our quality of life.

The reasons for why we cannot live forever have already been touched upon above. We are in one way prisoners of our 'imperfect' bodies (imperfect from a bio-mechanical point of view). Some argue that we can replace body parts, but, as Olshansky made clear, "we cannot replace everything." We cannot replace, for

example, the entire cardiovascular system, neither the brain. Olshansky warned that we have to be extremely careful if we modify our bodies, for there will always be trade-offs, for example in terms of growth or reproduction. Scientists ought to move with extreme caution when manipulating the human body. Even if one did change the human morphology, though, this would only extend the life span for a couple of years, but not produce a dramatic effect. One would have to 'fix' the body at the molecular level and look at organisms that live longer as perhaps a way to find interventions that might extend life in humans. Tom Kirkwood pointed towards organisms that have a much better DNA-repair mechanism, for instance, or use energy more efficiently.

Even if we could, though, would we want to be Methuselahs? John Harris advocated that those who want to extend life indefinitely should not be prevented from doing so; Niall Dickson, Chief Executive of the King's Fund, challenged the notion that an ever longer life was necessarily desirable, given the personal, social and political consequences. While not being opposed (quite the contrary) to the advances of medicine that enable people to survive past infancy and live longer than ever, he suggested that life spans way beyond what we contemplate now would create an uncertain future. "What sort of life do we mean when we are talking about living to the age of 200?" We do know, he said that given the current rate of scientific advances that we are unlikely to see a step change in extending our life span within the next forty years. If it were possible for us to live 2 or 200 years, what would life be like? We would have to rethink the societal contract between old and young.

When the modern state pension was created by Sir William Beveridge, he expected that the state would only have to pay out for a couple of years only, after that most pensioners would be dead. Just imagine a society of 250 year old people. Would they go on working?

The institution of marriage, friendships and indeed all social relationships would have to be reconsidered. Until the middle of the last century, marriages lasted because partners normally died within twenty or thirty years of taking their vows. There was no need for divorce. What would happen to “lifetime” commitments of any kind if life would mean 200 years or longer?

What would happen to reproductive cycles and fertility? How many people can the planet bear? The Chinese dictate of the “one child family” might seem positively liberal, said Dickson, when faced with the prospect of people living for 200 years.

If we wanted to increase our lives significantly, we would have to manipulate our bodies and maybe even our minds. If we rejuvenated our minds, however, would we be the same people? Mind and body are intertwined, as John Polkinghorne pointed out: “we are a package deal”. We are complex beings with a material and a spiritual dimension.

Numerous questions remain to be answered regarding the extension of human longevity. The simple act of asking the question of whether we want to live up to the age of 200 points towards a deeper fear of death than many would comfortably admit. John Polkinghorne vividly explained in his talk the Christian hope of a destiny beyond death. An

Anglican priest and delegate at the conference supported this by asking: “How far is this debate influenced by fear and a profound denial of death? I am not completely in control of my life and my destiny. Human creativity, though, is profoundly linked with facing mortality and the questions we ask about the meaning, value and purpose of our deaths. This has led others and me to believe that to die is to live, and that continue to die and to give way to one’s self is a profound source of creativity.”

Whether believer or not, a lot of the debate about eternal life on earth arises from a fear of death, and maybe fear that one has not led a meaningful life so far. We have to accept more our human and biological nature, and should maybe not try and reverse a process which has been built into us and commenced when we were in the womb. Steven Rose recommended the following: “We should accept that we will age, and contemplate our own deaths. We should accept that the world will exist without us, but not without the consequences of our acts.”