

AKADEMIE DER WISSENSCHAFTEN UND DER LITERATUR

Should we live forever?

Biological and Ethical Perspectives

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## Should we live forever? Interdisciplinary Perspectives

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“Should we live forever?” was the unifying question for a meeting that brought together the disciplines of molecular biology, medicine, literary studies, philosophy, and theology for a public discussion concerning aging and longevity. The idea of longevity has been at the heart of debates on a changing demographic reality in Western industrial nations. At the same time, the debate on longevity has been a highly complex and sometimes also a highly polarized one. It has drawn on bioethics debates as much as on questions of economics and social solidarity. Who pays the price, it has sometimes been asked, for an aging society? Who bears the burden, in crude economic terms of an increasingly besieged health care system, of an aging society? One of the central tenets of this collection of essays is that the debate on longevity may sometimes fail to consider the concept of perspective. What are the narratives about longevity and the desirability of a longer life, and who are their authors? What perspectives and subjectivities do these narratives imply, and to what extent do they seek to “universalize” their truth claims?

In this introduction, we would like to survey the issue by considering the question from various vantage points. Should we live forever? The keyword “forever” hints not only at the issue of a long life but also at eternal life (and eternity more generally) – a topic which is reflected in particular in the research field “eschatology” in theology (Mühling 2015). Since biblical reflection human life was not only understood in a temporal sense as a life span between birth and physical death. Furthermore, the notion of “eternal life” cannot be limited to “everlasting life,” referring to an after-life existence, a life that begins after physical death. It is more about the participation in the divine life, which is beyond biological existence in time and space, and emphasizes an entirely different

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quality of life for the believer, that can already be experienced within human life (Zimmermann 2016). Since the Enlightenment, however, some parts of Christian scholarly theology have found it increasingly difficult to reflect upon the concepts of “resurrection“ and “eternity“, with some scholars even developing a so-called total-death-hypothesis. By contrast, advances in the biological sciences over the past decades, have led to a new understanding of immortality and arguably a new ease in dealing with questions of immortality, especially in the fields of cell and developmental biology. It is, for example, now standard practice to be working on “immortal“ cell lines in laboratories around the world and much is now understood about the molecular mechanisms at work in maintaining cells in this state. The cellular processes underlying aging and death in whole organisms are also being deciphered. For instance, researchers have extended the lifespan of *Caenorhabditis elegans* (*C. elegans*) many-fold by manipulating genes identified to have a role in aging, such as those involved in the insulin/insulin-like growth factor-1 signaling pathway, TOR signaling and sirtuins (Uno & Nishida 2016). Members of the FOXO family have also been identified as key genetic influencers of aging that work through a variety of mechanisms, including insulin-signaling, stress resistance and programmed cell death (apoptosis; Martins 2016). Apart from genetic factors, environmental influences are also likely to be significant in affecting life span. Indeed, studies on monozygotic twins suggest that genetic factors account for a minority of the effect on lifespan (Passarino 2016). Restriction of calorie intake is one such environmental factor, which has led experimentally to significant increases in life span of a variety of species, from *C. elegans* to rhesus monkeys (Heestand, 2013; Colman 2014). Such environmental factors could also be influencing gene regulation epigenetically via, for example, histone modifications and microRNAs (Uno & Nishida 2016). Further exciting leads could come from organisms, such as planarian flatworms, that have a virtually unlimited capacity to regenerate and self-renew.

The dream of immortality – not only of individual cells but of entire organisms, even of humans themselves – has thus been rekindled outside of the realm of theology. In the near future, could it be possible to prevent the death of cells and in this way contribute to a significant lengthening of our life spans? Could it be possible to translate these findings to vertebrates and humans?

Studies into families who live longer than average are an interesting starting point to answer this question by probing genetic factors underlying aging in humans. For example, the FOXO proteins, which have been identified through

such studies to be significantly associated with longevity (Martins 2016). The current state of progress in such research was put to a panel of aging experts in 2013 at the event “Interventions to Slow Aging in Humans: Are We Ready?” (Longo 2015). The panel identified a number of areas that may prove promising in the goal of slowing aging in humans, such as drugs that mimic low calorie intake. Importantly, the panel indicated that these efforts were aimed not just at extending life but also at delaying the onset of aging-related diseases, i.e. of extending human healthspan rather than just lifespan. However, not all agree that human life can be extended and it has recently been suggested that there is a biological limit to human lifespan (Dong 2016). Although human life expectancy has increased over the past century together with advances in medicine and biotechnology, the researchers found that maximum life expectancy has plateaued since the 1990s, and suggest that we are approaching the “natural limit” of human lifespan.

In the following text, Chris Scott will discuss further efforts in eradicating cellular dying processes. He will also address the dreams of the “American immortal”, which have been reignited through such work and have even stimulated an entire industry aimed at selling products that promise longevity (Scott/Lorenzo 2015).

But apart from these efforts and dreams, we might ask more fundamentally: Is it not an integral part of what it means to be human that we must confront and accept death? As Daniel Callahan, President Emeritus of the Hastings Center (Callahan 1998, 21) expressed it: “Death is an inescapable reality of human life and always will be.” Many centuries earlier a Psalmist according to biblical tradition expressed this idea metaphorically: “As for mortals, their days are like grass; they flourish like a flower of the field; for the wind passes over it, and it is gone, and its place knows it no more.” (Psalm 103:15-16). Another Psalmist thus concludes: “So teach us to count our days that we may gain a wise heart” (Psalm 90:12).

Perhaps one may be inclined to view such expressions of *memento mori*, as some philosophers do, as a conservative, apologetic endeavor. And yet, even cell biologists like Rose warn of false expectations (Rose 2009) as the elixir of life firmly remains in the realm of mythology. Since a human’s aging and dying process is multifaceted, the issue is not one of immortality but rather only of extending a life span. The question posed at the beginning of this text thus needs

a slight revision. It should not be asked “Should we live forever?“, but rather “*Should we live as long as possible?*” (Overall 2003, 95-123).

The dream of extending our lives is as old as humanity itself. Consider the Greek myth of Eos (Greek: Ἠώς, *Ēōs*), the goddess of the dawn who was particularly fond of young men. Because she was so enamored with Tithonus, a prince of Troy, she petitioned Zeus to make Tithonus immortal. This was granted, but Eos had forgotten to also ask for eternal youth. Thus, over time, the young, athletic Tithonus became old and helpless. When he was no longer able to move due to the weakness brought on by age, Eos no longer wished to be with him, so she placed the shriveling body into a cradle and hung it in small chamber. From it, the weak voice of the once strong man henceforth chirped. According to later retellings of the story, Zeus actually turned Tithonus into a cicada, living eternally, but begging for death to overcome him.

A myth recounts – as was already evident to Sallust – that which never was but is ever valid. The question concerning immortality therefore challenges not only death, but is also intimately related to the question of aging. And when one considers contemporary nursing homes and intensive care units, one may wonder if the focus of modern medicine upon postponing death has also forgotten the request for “eternal youth.” For this reason, there is wisdom in encouraging modern biological research to focus on understanding aging and on “bio-gerontology” and “longevity-research.”

As the newly emerging field of centenarian research has shown, exemplified by long-term research projects such as the “*Heidelberger Hundertjährigenstudie*” (HD-100) and the New England Study of Centenarians (NECS), the life sciences have set out to study what is often portrayed as the “enigma of longevity” (Vaupel/Jeune 1995) on a molecular level, which also takes centenarians’ resilience into account. Centenarians in particular have become what has been termed “paragons of old age”; what is seen as desirable in this context is not only longevity, but “successful aging” (Katz/Marshall 2003). Studying the physical fitness and cognitive ability of centenarians, scientists have sought to unpack the mystery of extreme longevity, thus implicitly inviting a general public to emulate centenarians’ lifestyles. Biomedical approaches to centenarian research have often prompted, in the public debate, a connection between successful aging, longevity and individual achievement. As the website of the New England Study of Centenarians puts it, centenarians have become “[a] Model of Aging Well. Centenarians (age 100+ years) markedly delay disability towards the end



of their very long lives, at an average age of ~93 years (that's 33 years beyond the age of 60!). Thus, we regard these individuals as wonderful models of aging well. Some of our subjects, ~15% have no clinically demonstrable disease at age 100 years and we call them 'escapers' (<http://www.bumc.bu.edu/centenarian/overview/>). Here, extreme longevity is linked to a long life lived free of disease, as the very category of "escapers" implies. Yet, this emphasis on successful aging may also be highly problematic since it implies that lives lived with illness or with disability to some extent lag behind the successful lives of centenarians and the so-called "Oldest Old." This notion of extreme old age as an achievement in itself has often disregarded the social conditions under which we live and under which we age. Thus, discussions on longevity have often downplayed the role of social inequality and of systemic imbalances with regard to individuals reaching extreme old age.

And thus, our question needs to be phrased even more precisely. It should not ask "Should we live forever?" nor "Should we live as long as possible?" but "*Should we live as long and well as possible*" or "*Should we prolong our healthy life span?*" But then, who defines what "healthy" life means? And how long must or may a lifetime be until one – in biblical language – may die "old and satisfied with life" (e.g. Abraham in Gen 25:8). The Bible itself presents multiple perspectives on this issue. It tells of Israelite ancestors who live to be hundreds of years old – the oldest of all being Methuselah, who reputedly lived 969 years! – a symbolic number. But a Psalmist writes "The days of our life are seventy years, or perhaps eighty, if we are strong" (Ps 90:10). And in the New Testament, Jesus, in the Gospel of John, cries out from the cross "It is fulfilled" even though he was hardly older than thirty. Is it a certain number of years then, for instance age 100, indeed any quantitative measure, that is to be pursued? Or is it rather how the years one is given are lived?

Why, however, should humans strive to become ever older? From a purely evolutionary-biological perspective it is, in fact, not immediately apparent why an organism should continue to live beyond their reproductive phase. Yet, since humans can continue to contribute to social, cultural and scientific developments (and simply continue to enjoy life), reproduction is not the only reason for wanting to stay alive and not the only measure of a fulfilled life.

What are other criteria that allow life to be viewed as fulfilled? And what does fulfilled mean in this regard – "meaningful", "happy", "complete" (Meilander 2013, 89)? And what about the many humans who remain unfulfilled

in their plans and hopes after a long life? Are there other ways to “fulfill”, to achieve a life that is complete? For instance, to narrate a life-story, as it is considered by the Graduate School on “Life Writing – Life Sciences: Boundary Experiences of Human Life between Biomedical Explanation and Lived Experience” at Johannes Gutenberg University Mainz. This program, which links the life sciences, medicine and the humanities, is based on the assumption that new developments in biomedicine confront us with decisions which we never before had to take, and which can be seen as *Grenzerfahrungen*, as liminal experiences, in the genuine sense of the term. While it can be argued that such liminal experiences of human life have always been part of the human condition, they may be experienced today as being even more extreme given the (alleged) malleability of the human body and human life by means of biotechnological progress and forms of enhancement. In assisted human reproduction and in end of life decisions, biotechnologies and new developments in the life sciences have created new ways of coming into the world (for instance, through technologically assisted reproduction) and of extending life. But is everything that is possible also desirable? Here, we argue that in order to make sense of these biomedical options, individuals often turn to life writing narratives. Biomedical explanation hence needs to be in dialogue with lived experience. Life writing narrative, seen in this context, may become a form of alternative knowledge, possessing an expertise of its own (Paul, Banerjee, Efferth 2015).

What does this mean for concepts of aging? What happens, we might ask, if we read arguments saying that it would be better to end a life than live with severe impairment through the life narratives of people living with impairment? Life writing, as Thomas Couser has argued, can thus also be seen as “quality of life writing.” We may come to assess the quality of lives lived with impairment less in abstract terms than from the perspectives of those living such lives. As Couser notes, “contemporary life writing [...] often deals with conditions that raise questions concerning quality of life. The term ‘quality of life’ is intended to distinguish individuals’ sense of the worth of their existence from mere quantity, that is, the duration of their lives [...]. A good example of both autobiography and what I call quality-of-life writing is *Elegy for Iris* (1999), John Bayley’s memoir of his life with the late philosopher and novelist Iris Murdoch” (Couser, *Subjects* ix).

In this as in many other contexts, the debate on longevity has been closely connected to arguments about the quality of life. Under what conditions, some

have asked, do we want to live into extreme old age? And what is the quality of life we associate with extreme longevity? At what cost, in other words, do we want our lives to be prolonged? These qualities, as Christine Overall has argued, often contain an “ableist” bias, that is, a bias which elevates “ability” as a common norm. If it is argued that it would be more desirable to pass on than to live on one’s life with impairment, this conversely implies that a life lived with impairment may invariably be associated with a “poorer” quality of life. It would hence be imperative, as Overall implies, to re-read some of the arguments advanced with regard to longevity from the perspective of disability studies.

Narratives may hence be fundamental to how we conceive of a “full life,” or, in its German terminology, “*gelingendes Leben*”. The philosopher Sebastian Knell named this “eunarrated life” (Knell 2015, 193-232). Or, as the theologian Henning Luther pointed out, the fragmentary character of a human life is only completed and reconciled by means of embedding it in a wider story of his community and tradition, theologically speaking the story of God and humanity (Luther 1991; Fechtner/Mulia 2014).

A final aspect may reveal the medical dimension of our issue. By using the term “anti-aging” a fundamental problem comes to light. Is age an unnatural phenomenon that must be fought? Is old age like a disease that must be treated or even eradicated? In contemporary research, two models confront each other (see Schweda/Marckmann 2012):

a) *The dichotomy model*: Illness and aging are two different processes. Physiological aging is not a disease and death is a natural occurrence that does not need to be prevented.

b) *The continuity model*: At least on the cellular level, there is no clear-cut distinction between physiological aging and pathological developments. Old age is ultimately an accumulation of diseases and damage, ultimately resulting in death.

One quickly realizes how fundamental these questions are. To those inclined towards the continuity model view, the medical struggle against disease as inextricably linked to the struggle against aging. Saving lives is thus equivalent to prolonging life. As a consequence, the question arises whether there is a similar duty to prolong a life as there is to save a life? If so, research focusing on prolonging life could even become a moral obligation.

And thus, our opening question requires further refinement. Regardless of the various ways in which the question is posed, reformulated, or made more

precise, the query was always introduced with “Should we ...?” According to Richard Marvin Hare’s analysis of the “Language of Morals” (Hare 1952) this is, *per se*, an ethical question. We are not asking “Can we ...?” or “How can we ...?” but rather “Should we ...?” In other words, should we do all that is possible to prolong life? Such ethical and philosophical aspects will be addressed in the following text contributed by Christine Overall.

It is also striking that the “should question” is phrased in the plural, i.e. should *we* ...? Apart from an individual ethical component, the longevity issue also contains a societal ethical component. What would it mean if, in the future, 7-8 generations were living simultaneously? The utilitarian Peter Singer suggested that prolonging life necessarily results in a decrease of the greatest possible happiness for the greatest number of individuals. Should, therefore, only those who are underprivileged be allowed to live longer so that, after many years, they may achieve the same level of fulfillment that some university students from the middle and upper class have already achieved by their mid-20s? Would older generations rob younger ones of opportunities and hence prevent them, at least in part, from fulfilling their lives? Does this lead to a duty to die at some point, which contradicts the duty to prolong life mentioned earlier?

The questions briefly touched upon above require a multi-disciplinary approach to even begin to reasonably answer them. The following texts by Christine Overall and Chris Scott are an attempt to shed some light on what is still a poorly illuminated area of scholarly investigation.

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# The Question of Longevity

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Should we seek to live forever?

It's a deeply difficult and significant question. Rather than trying to answer it, I propose to consider a simpler one: Should we seek to live *longer*? This question may be understood in two different but related senses: First, should individuals strive to extend their lives? This is a question of individual ethics. And second, should scientific research, cultural programmes, and health care systems be directed toward increasing human longevity? This is a question of social policy.

A number of social theorists and philosophers answer no to both of these questions. Among them are such luminaries as Francis Fukuyama (2002), Leon Kass (2001, 2003), and Ezekiel Emmanuel (2014). I call their viewpoint "fatalism," which I define as the theory that human beings should simply accept our temporal finitude, living equanimously within its confines and not attempting to extend the human life span, either individually or collectively (Overall 2017). In this paper I survey some of fatalists' key arguments against living longer. I will demonstrate that fatalism about human longevity not only lacks justification; it could even threaten the wellbeing of many different groups of people.

## The "Graying" of the Developed World

The problem with extending human longevity, according to fatalists, is that it will result in a drastic increase in the number of elderly people in the population. Fatalists are united in seeing the "graying" of the inhabitants of developed countries as a serious problem.

Francis Fukuyama, for example, predicts that an increase in the number of elderly people will produce the "feminization" of voting age populations, with a resulting decline in support for war, defense spending, and the use of force

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abroad (Fukuyama 2002, 62-63). Indeed, he believes that the “political tone” of the global North will be set by “elderly women” (Fukuyama 2002, 63). At the same time, he thinks that life extension will “wreak havoc” with the “hierarchical behavior” that is “innate” in human beings (64). On the one hand, he predicts a future with fewer active workers (61). But on the other hand, he laments that the “natural tendency of one generation to get out of the way of the up-and-coming one will be replaced by the simultaneous existence of three, four, even five generations,” and the appropriate “generational succession” in business and government will be disrupted (65). “Three or more generations” could be “active and working at the same time” (66). Or alternatively, “society will increasingly come to resemble a giant nursing home” (67). “Political, social, and intellectual change will occur much more slowly in societies with substantially longer life spans” (66). Society may become “postsexual,” and youth culture will go into “terminal decline” (70). Fukuyama says that “institutionalized forms of ageism” will be necessary to deal with these problems (67). Yet at the same time, he predicts that old people past the age of 65 “may find their lives both emptier and lonelier,” and retirement “may seem simply pointless” (71).

Some of Fukuyama’s predictions appear positive in nature: Surely it would be good for societies to withdraw their support for war, defense spending, and the use of force. Less hierarchical behavior might also be beneficial, particularly for those who are perennially relegated to the bottom of the hierarchy. But unfortunately, Fukuyama’s criticism of life extension exhibits a mindless adoration of youth and drips with loathing for old people, especially but not only old women. He fails to recognize any benefits that old people can bring to society when they have the ability to survive and thrive past their sixties – benefits based on experience, practice, observation, knowledge, and social skills.

It is difficult to see why, exactly, having three or four generations working together would be a bad thing (see Marsa 2016). The reality is that many elderly people continue to do paid work (e.g., National Institute on Aging 2015); many engage in volunteer work (e.g., Cook and Sladowski 2013); and others care for family members, such as spouses, disabled children, or grandchildren. Fukuyama invents a catch-22 situation in which whether they work or do not work, elderly people are claimed to constitute a serious problem for their nation. If they work, elderly people block the advancement of young ones and derail the cultural trajectory of their nation. If they don’t work, elderly people become a resource drain in their ubiquitous nursing homes. Thus, the roots of Fukuyama’s



fatalism are ageism and sexism: He is deeply and unjustifiably biased in favour of youth and against old people, particularly old women.

### **The “Human Life Cycle”**

In two well-known essays, Leon Kass, another fatalist, extolls what he regards as the natural rhythm of human lives. There is, he says, “something inherently good or dignified about ... the human life cycle (with its rhythm of rise and fall)” (Kass 2003). Kass criticizes those who advocate extending the human life span for regarding time

“abstractly, ... as a homogeneous and continuous dimension, each part exactly like any other, and the whole lacking shape or pattern. Yet, the ‘lived time’ of our natural lives has a trajectory and a shape, its meaning derived in part from the fact that we live as links in the chain of generations. For this reason, our flourishing as individuals might depend, in large measure, on the goodness of the natural human life cycle, roughly three multiples of a generation: a time of coming of age; a time of flourishing, ruling, and replacing of self; and a time of savoring and understanding, but still sufficiently and intimately linked to one’s descendants to care about their future and to take a guiding, supporting, and cheering role” (Kass 2003).

According to Kass, “a flourishing human life” must be lived “in rhythmized time, mindful of time’s limits, appreciative of each season and filled first of all with those intimate human relations that are ours only because we are born, age, replace ourselves, decline, and die – and know it” (Kass 2003).

But Kass’s claims about the rhythm of life are highly romanticized. The life stages he cites are not always inevitable and not even always desirable.

First, not everyone is able to go through them, and not everyone even wants to. For example, more and more people are not interested in “replacing” themselves. Kass claims, “Like the other animals, man is built for reproduction. ... We are built with leanings toward, and capacities for, perpetuation. Is it not possible that aging and mortality are part of this construction, and that the rate of aging and the human life span have been selected for their usefulness to the task of perpetuation?” (Kass 2001). He goes so far as to claim that our growing longevity is “incompatible with accepting the need for procreation and human renewal: a world of longevity is increasingly a world hostile to children” (Kass 2003).

But perpetuating oneself through procreation need not be the centrepiece of human life, and – on a planet crowded with seven billion people – focusing on procreation as the central purpose of human life threatens the future of the very environment in which we live. While human beings (not just “man”) have reproductive capacities, we need not act on them. If we do act on them, we may justifiably do so only to a limited extent. If many people seek meaning aside from, or beyond, having children, then their life span need not be tied to their role in self-perpetuation.

Second, it is difficult to see why “decline” should be considered a desirable part of the supposed human life cycle. Decline is not a particularly valuable part of life, especially if it involves pain and suffering or the loss of cherished abilities and inclinations. It is neither pleasant nor rewarding, and the person who undergoes it is unlikely to benefit or learn from it. Why should these conditions be extolled? Nonetheless, Kass writes, “Would it be good if each and all of us lived like light bulbs, burning as brightly from beginning to end, then popping off without warning, leaving those around us suddenly in the dark? Or is it perhaps better that there be a shape to life, everything in its due season, the shape also written, as it were, into the wrinkles of our bodies that live it?” (Kass 2003).

It may be that if individuals lived healthily in old age and then died suddenly, people would be surprised. But if this pattern became the norm, they would also get used to it. I can’t see why such a situation is worse than watching one’s elderly friends and family members go through a period of decline. Wouldn’t most people prefer to see their loved ones stay healthy for as long as possible? Moreover, mental and physical decline generates social and health care costs for societies; avoiding such costs by preventing or reducing decline near the end of human lives would surely be a benefit. Indeed, as Peter Singer remarks, “enabling those who are young or middle-aged to remain youthful longer would attenuate the looming demographic problem of an historically unprecedented proportion of the population reaching advanced age” (Singer 2012). In other words, stretching out earlier life stages could have the effect of reducing the costs – economic, but also medical and psychological – of the final stage of life. For that reason, the goal of extending the healthy period of old age and minimizing decline – ill health, suffering, and age-related impairments – seems highly justifiable.

Third, no reasons are given for thinking that “three multiples of a generation” are more desirable than, say, four, or even five. What exactly is wrong with

living long enough to have a relationship with one's great-grandchildren, if any, or one's great-grandnieces and great-grandnephews? Kass's pronouncement that living for three multiples of a generation must be enough is just as arbitrary as Fukuyama's disparagement of the prospect of three generations working together.

### **Fatalism and Life Extension**

Kass claims that it is impossible to determine a reasonable amount for life extension:

“How many years are reasonably few? Let us start with ten. Which of us would find unreasonable or unwelcome the addition of ten healthy and vigorous years to his or her life, years like those between ages thirty and forty? We could learn more, earn more, see more, do more. Maybe we should ask for five years on top of that? Or ten? Why not fifteen, or twenty, or more? If we can't immediately land on the reasonable number of added years, perhaps we can locate the principle. What is the principle of reasonableness? ... We have no answer to this question. We do not even know how to choose among the principles for setting our new life span” (Kass 2001).

But it is unclear why exactly we must fix on a *particular age* as the maximum that human beings are allowed to hope or aim for. Life expectancy has increased dramatically in the past; it is still increasing in the present. It certainly needs to improve in nations that lack the privileges enjoyed by western societies. But I see no good argument in the work of fatalists for insisting that life expectancy must go no higher than it currently is in developed nations.

Human beings have been engaged, for more than a century, in efforts to improve human health and wellbeing. These steps include better maternity and infant care, better health care throughout the life span, better infection control, vaccinations against diseases, improved nutrition, anti-smoking campaigns, extended education, better housing, improvements in work conditions, decreases in environmental dangers, and reductions in violence and war. Increased longevity itself was not, usually, the immediate goal of these steps; instead it was a side effect of changes in material living conditions, changes in medical care, and changes in political and cultural arrangements, all intended to reduce the incidence of disease and impairments.

There have been no disastrous outcomes of these efforts; to the contrary, they have uniformly improved people's lives. Kass claims that "the recent gains in health and longevity have produced not contentment but rather an increased appetite for more" (Kass 2003). But he provides no evidence to demonstrate that increases in health and longevity have produced discontent, nor does he provide reasons for thinking that an "appetite" for even better health and longer life is a mistake.

Life expectancy has increased enormously over the last century. According to the World Bank, the average global life expectancy at birth for a child born in 1960 was 52. For a child born in 2014, it was 71. In Canada, life expectancy at birth in 1921 was 57.1; ninety years later, in 2011, it was 81.7 (Statistics Canada 2014). Germany's life expectancy improved from 69 in 1960 to 81 in 2014 (World Bank n.d.). Such increases in life expectancy are universally seen as desirable and good. Indeed, global leaders and health policy analysts regard increasing life expectancy as an important goal. Swaziland, for example, had a life expectancy in 2015 of 58.9 (World Health Organization 2016); no one can dispute that increasing that number by at least twenty years would be good for the citizens of Swaziland.

If increasing life expectancy is universally recognized as beneficial to human beings, why wouldn't future increases also be desirable? Fatalists believe that social policy should motivate and support acceptance of our current life span, rather than trying to lengthen it. But their supposed optimum life expectancy is, not coincidentally, defined in terms of an age just short of the current life expectancy in developed countries. Thus, Ezekiel Emmanuel recommends, "Once a country has a life expectancy past 75 for both men and women, this measure should be ignored" (Emmanuel 2014); that is, any country with an across-the-board life expectancy past 75 should make no efforts to increase life expectancy.

But choosing age 75 – or in Kass's case, "three multiples of a generation" – is clearly an expression of fatalists' own limited cultural standpoint. Kass and Emmanuel define the human life cycle in terms of contemporary middle-class western lives in the early 21st century. Yet ninety years ago, a fatalist might have argued that a life lived to age 60 in Canada should be enough. Sixty years ago, a fatalist might have argued that a life lived to age 70 in Germany should be enough. As human beings live longer, we see that they have worthwhile lives, that they have good reasons to remain alive, and that their existence makes a difference in their communities. For that reason it is at least premature, and

certainly lacking justification, to specify an age at which human beings should supposedly stop wanting to live longer – particularly when that age is derived from one very specific and limited cultural context.

### **Fatalism and Life Stages**

Recall that Kass claims that those who advocate extending the human life span supposedly regard time “abstractly, ... as a homogeneous and continuous dimension, each part exactly like any other, and the whole lacking shape or pattern” (Kass 2003).

But as Lynda Gratton and Andrew Scott remark, “longevity is not just about ageing – it has crucial implications for all ages. Already, people are marrying and having children later, creating mid-career breaks, taking time out to explore, building their own businesses, going back to education” (Gratton and Scott 2016). In other words, extending life expectancy has effects on all the stages of human life. Far from making life stages “homogeneous” and exactly the same, longer lives enable human beings to devote more time to key phases of their existence, phases that are becoming more rather than less differentiated, including adolescence, young adulthood, middle adulthood, and old age itself.

Some of these effects on life stages have already occurred. Consider, for example, the relatively recent invention of adolescence as a distinct phase of human life. A century or more ago, there was no possibility for young people to have an extended period of education, personal growth, and social exploration; all but the very wealthy had to begin working in their early teens. Now, in the twenty-first century, we see a prolongation of adolescence, even into the mid-twenties (Wallis 2013), at least within relatively privileged developed nations. Because parents are living longer, healthier, and more independent lives, it becomes possible for their offspring to be dependent on them for longer. Life landmarks arrive later today than they did a hundred years ago – e.g., the completion of education (with far more young people now earning a university degree), independence from the parental home, taking on a full-time job and becoming financially autonomous, marriage (if it happens), parenthood (if it happens), and buying a home (if it happens). In addition, middle age and old age arrive later. At ages that were considered to be elderly half a century ago people may still be doing paid labour, engaging in volunteer work (Gillan 2015), returning

to school, and caring for family members. Clearly, our various life stages are not mere fixed biological givens, but are subject to social influence and manipulation.

It is not at all clear why the lengthening of any life stage is incompatible with the kind of flourishing that Kass extolls. Far from these life stages being “homogeneous,” they are in fact becoming more strongly differentiated as they are extended.

### **Fatalism and Demographic Variations in Life Expectancy**

The errors in fatalists’ viewpoints, and their failure to provide justification for their claims, appear to originate from their relatively advantaged positions as well-educated middle-class Americans. Fatalists take the situation of middle-aged, privileged male Americans as representative of the kinds of lives that everyone should respect and seek to emulate. But their lives are in many ways not representative of the lives of everyone who would be affected by fatalists’ policies with respect to longevity.

First, longevity is gendered; that is, it is different for men than it is for women. In general, women’s life expectancy is greater than that of men. In 2015 in Germany, for example, men’s life expectancy was 79; women’s was 83, according to the World Health Organization (2015). In Canada there is the same discrepancy: Statistics Canada projects that in 2017, life expectancy will be 79 for men and 83 for women (Statistics Canada 2015). If people are supposed to be content with a life expectancy of only 75, or the equivalent of three generations, the effects on the aging population will likewise be gendered. For example, a social policy of fatalism could result in a lack of adequate health care support for women who live longer than the fatalist limit, on the grounds that they should be content not to live well into their eighties. It could also mean that no social, scientific, and medical efforts are dedicated to increasing men’s life expectancy beyond its current boundary.

Second, longevity is strongly influenced by individuals’ socio-economic class and race. In general, members of racialized minorities and indigenous peoples have lower life expectancies than white people, and poor and working class people have lower life expectancies than middle-class and owning-class people. In Canada, for example, the Inuit people of the far north are projected to have

the lowest life expectancy for 2017 of any group in the country: only 64 years for men and 73 years for women (Statistics Canada 2015). In the United States in 2011, Black non-Hispanic citizens had significantly lower life expectancies than whites or Hispanics (Centers for Disease Control and Prevention 2014). And in Germany, life expectancy varies greatly depending on socio-economic factors such as education, household income, work status, and vocational class (Luy et al. 2015).

Fatalists should seriously consider how poor people, working-class people, and minority-group members would be affected if a nation were to adopt a policy of not encouraging increases in life expectancy. Would fatalists be willing to apply their policy across the board, so that in a society where the average life expectancy is already 75 or higher, no special efforts would be made to increase the life expectancy of members of less privileged groups? Or alternatively, would fatalists be willing to support efforts that might increase the life expectancy of dominant groups above 75, as part of efforts to bring minority groups members up to 75? When the heterogeneity of populations is fully recognized, it becomes evident that adopting a fatalist approach to social and health care policies generates problems that either contribute to further disadvantages for minority groups, or that undermine the very principle of fatalism: that existing life expectancies must be accepted.

## Conclusion

In this paper I have shown that fatalism about human longevity has many weaknesses. Fatalism's catastrophic predictions about the graying of future populations rest on ageist and sexist assumptions that valorize youth and underestimate the importance of old people, especially old women. Fatalism promotes a romanticized yet culturally specific concept of the supposedly natural human life cycle, a concept that fails to recognize the real variations in people's lives and aspirations. In addition, fatalism overlooks the fact that life expectancies have been increasing for many decades, with no untoward consequences for the populations affected. And fatalism fails to take notice of the many positive ways in which human life stages are changing and lengthening, to the benefit of those who now live longer and fuller lives.

Although there are many problems with fatalism, its crucial error, in my opinion, arises from fatalists' treatment of human longevity as if it were a single, monotypic phenomenon. On the contrary, longevity has varied enormously in recent history, and continues to vary from nation to nation. Moreover, within individual nations, longevity varies by sex/gender, by race, and by socio-economic class. As a result, it is impossible to say that extending longevity is, across the board, wrong. Indeed, condemning the extension of human longevity often buys into systems of oppression such as sexism, racism, and ageism. Moreover, the recent beneficial trajectory of increased human life spans undermines arguments about the allegedly dangerous outcomes, cited by fatalists, of living longer lives.

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# The Longevity Situation Realities and Imaginaries

CHRISTOPHER THOMAS SCOTT<sup>1</sup>

The Scots see death as imminent.  
Canadians see death as inevitable.  
And Californians see death as optional.

*Ian Morrison*

## Introduction

This essay traces the modern history of longevity research, situating it in a broader social context of beliefs about technology, aging, and our wish for longer, healthier lives. By way of analysis, I use epistemological approaches established in the social sciences, symbolic interactionism, and pragmatist philosophy. These methods, called “grounded theory”, offer an empirical basis to the study of social life through qualitative research. Communities of science, belief systems, and prominent social movements are examined through grounded theory, and the exercise reveals how future narratives are imbedded in the longevity discourse; measures the valence of anticipatory frameworks utilized by the actors; and finally, offers insight into whether the imaginaries of longevity can co-exist with present day realities of human finitude.

Our perceptions and beliefs about lifespan, healthspan, and immortality (which I will collectively call human longevity) are informed and influenced by collections of actors that inhabit and produce discourses in an array of scientific and research-based social worlds. Strauss and Corbin, in their construction of grounded theory, define social worlds as groups with shared commitments to specific activities and goals, often sharing resources to achieve these goals.<sup>2</sup> A social world has a primary activity, a particular site, and a defined technology or technologies. Multiple collective actors that inhabit these social worlds engage in all manner of negotiations and conflict through discourse. The discursive

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2 Strauss, A.L. (1978). A Social Worlds Perspective. *Studies in Symbolic Interaction*, 1, 119-128.

sites, or arenas, contain multiple social worlds, and situating them in an arena is the first analytical task. The human longevity arena includes various interacting and overlapping social worlds, containing an array of individuals, collectives, collateral, and commodities. These communities engage, compete, and set boundaries for their activities. Some are distinguished by their technologies, such as gene therapy or gene editing. Others are bound by institutions that fund research, such as the National Institute of Aging, or by a specific disciplinary approach, such as the Stanford University Center on Longevity, binding together biology, architecture, psychology and economics. Industries, associations, and professional organizations also situate in this arena.

Longevity-based activities are socially constructed as a system of beliefs and specific practices. In emerging fields of technology, this manifests in the gathering of power described in the philosopher's Bruno Latour's second principle: "Scientists and engineers speak in the name of new allies that they have shaped and enrolled; representatives among other representatives, they add these unexpected resources to tip the balance of force in their favor."<sup>3</sup> Through interviews and ethnographic study, I have identified many communities that align with human longevity. Here, I begin with three major scientific groups as a way trace 60 years of history in the aging sciences. In describing these social worlds, I will use approaches from a modern iteration of grounded theory called situational analysis.<sup>4</sup> The groups are classic aging research, anti-aging research, and modern longevity research.

### **The Longevity Situation: Three dominant scientific-social worlds**

Classical aging research, the oldest member of the three, centers on the mechanisms underlying the human body's decline in an attempt to intervene in diseases such as Alzheimer's and kidney failure. Studied since the 1970's, these mechanisms include our declining immune response, exhaustion of stem cell renewal, genetic oxidative damage, and targeting biochemical pathways that

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3 Latour, B. (1987). *Science in action: how to follow scientists and engineers through socie* Cambridge, Massachusetts: Harvard University Press.

4 Clarke, A. (2005) *Situational Analysis: Grounded theory after the postmodern turn*. Sage Publications, Thousand Oaks.

sense the environment and response to metabolic stress.<sup>5</sup> The groups and actors that coalesce around these sites of activity are overwhelmingly disciplinary and largely sequestered into traditional academic departments and other research institutions, both private and public. Informed and molded by legacy fields such as cell, molecular, and developmental biology; embryology, genetics, and immunology, these groups connect to various nonhuman actants that make up a social network. These include scientific journals, conferences, student training programs, tools, physical sites, and platform technologies. Among the social worlds considered here, the classical networks of aging are the oldest, most robust, most powerful, and most entrenched. However, even the most established networks are potentially transient, requiring a constant making and re-making. The relations between actors must need to be repeatedly performed, enhanced, or renewed and commodities exchanged, or the network will dissolve. Newer, more nimble networks can evolve and establish spaces in arenas that are rapidly evolving and where boundary-setting can most easily occur. This is especially true for emerging areas of science, where vacuums of inquiry and power-seeking occur more often than not.

One such social network emerged from the shadow of classical aging research in the 1990's. Anti-aging research has its roots in the classical aging sciences, but use approaches that would significantly extend life or even reverse the process of aging. The discovery of longevity genes in invertebrates in the 1990's unleashed what would become the first of a series of scientific programs that extended the lifespan of worms, flies, and mice – with the end game a medical intervention that could be used in humans. A group of biotechnology companies emerged and with them groups of eclectic actors: out-of-the-mainstream scientists, venture capitalists, futurists, technology mavens, and aging gurus, most notably Aubrey D.N.J. de Grey. De Grey, who no formal training in the biological sciences, is notable for his ability to reimagine and articulate a technology-driven future of immortality, and was featured in a 2016 documentary film called *The Immortalists*. In the film, and in his essays, de Grey equates aging with disease. By disconnecting the natural process of aging with its life affirming and life enhancing elements, de Grey instead insists we eliminate it: “It is ageist and mo-

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5 Scott, C. and DeFrancesco, L. (2015). Selling Long Life. *Nature Biotechnology* 33(1):31-39.

rally repugnant to not treat aging as a disease that needs a cure.”<sup>6</sup> His narrative contains identifiable dystopian strains: we must avoid aging; we must fight it; and we must eradicate it.

Dystopian and utopian narratives run side-by-side all longevity-based discourse, but they are especially apparent in the anti-aging sphere. Using David Nye’s analysis as a reference point, utopian narratives describe emerging technology as inevitable, ameliorative, and transformative. In this case, the certainty of living radically extended lives (inevitability); that longer lives are better and more ordered (ameliorative); and that longevity science will reshape social reality, in this case, by redefining our notions of old age (transformative).<sup>7</sup> By contrast, dystopian narratives describe technologies as apocalyptic, satiric, and unnatural. Biotechnologies, if used improperly, are the agents of doom (apocalyptic); new technologies may unexpectedly make life worse or lead to the reverse of expected outcomes (satiric); or run counter to natural law; in this case, death is described as immutable, deterministic, and obligatory to the species (unnatural). The emotional response to these narratives – fear and hope – are rendered as important social and political vectors and are found with startling effect. For example, this quote from an anti-aging company executive: “100 years from now we’re going to look back and be shocked at this horrible world we used to live in where people used to get old and die.”<sup>8</sup> The fear of death, decay, and the inevitability of decline arrayed against the utopian inevitability and new social realities of the near future.

Anti-aging science seemed promising. A family of genes extended the life span in yeast. Mice were engineered with twice the normal life span. A set of genes were identified at the University of California, San Francisco, which, when mutated, extended the life span of the laboratory worm tenfold and increased health in old age. Money and excitement followed: resveratrol, a compound found in red wine, was thought to hold the key. Severe caloric restriction, too, worked in animal studies. The discovery of the human “aging gene” was thought

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6 Sathian, S. (2016). Is Silicon Valley Birthing the Next Pro-Lifers? January 8, 2016 *OZY* Found at: <http://www.ozy.com/fast-forward/special-series-is-silicon-valley-birthing-the-next-pro-lifers/64847> Accessed January 3, 2017.

7 Nye, D.E. (2007). *Technology Matters: Questions to live with*. The MIT Press ISBN 9780262640671. Accessed 7 November 2016.

8 Bill Andreessen interview, August 2016.

to be imminent. Like other cycles of innovation in biology, anti-aging research failed to produce meaningful results.

The newest approach – called longevity research – is an effort to extend the period of healthy life by slowing the biological process of aging. The interventions that spring from these studies would slow the aging process so that one year of clock time is matched by less than one year of biological time. The idea is to compress the infirmities of old age into a short period at the end of life – thereby increasing ‘health span’. The benefit: good health staying with us longer into old age; in essence, living long *and* living well. This approach recognizes that the diseases that plague the elderly are the new killers: cancer, diabetes, obesity, and dementias. The rise of these conditions is largely a product of living long enough to experience them. Aging is messy; different species age at different rates; different groups within a species age at different rates (humans have cohorts of super centenarians who live beyond 100); and different organs within individuals age at different rates. Indeed, no one knows what “dying from natural causes” really means.

Yet longevity research attempts to reimagine the questions of aging. Lifestyle, environment, epidemiology, genetics, and the tools of big data are coming together in a host of new ways. Some approaches will collect human data over a life’s trajectory. Another project will monitor the levels of as many as 2,400 chemicals in a person’s blood, gut, and various tissue sites. Even the technology giant Google has invested millions in longevity research, applying its vast resources in data management and machine learning to information culled from the human genome and proteome. It sounds hopelessly complicated. The Human Genome Project illustrated how difficult it is to understand the interactions of a finite set of genes. Longevity research will attempt to make sense of five or ten times this complexity in its pursuit to solve conundrums of aging, health span, and long life.

Despite the realities of the biology, longevity science feeds civilization’s relentless pursuit to achieve immortality. The philosopher Steven Cave defines the modern-day, technology-driven quest as the “medical immortal.”<sup>9</sup> The bioethicist Zeke Emanuel identifies a pill-popping, vitamin swilling, by-any-

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9 Cave, S. (2012) *Immortality: The quest to live forever and how it drives civilization*. Crown, New York, p 286.

means-necessary variant he calls the “American Immortal.”<sup>10</sup> A new optimism has bloomed among longevity enthusiasts, finding a new rendition of the immortality narrative.

### **Belief systems and movements**

Belief systems at work in human longevity are not exclusive to scientists and engineers. Achieving an ever-increasing human health span and lifespan are central to the transhumanism and singularity movements, which contend that human nature is incomplete and that we should use new technology to improve human capacities and enhance human lives. For followers of the Singularity, the notion is even more radical: a point of self-achieving, cosmic transcendence, where human actors recede as anachronisms.<sup>11</sup> Transhumanists describe a moral imperative to radically extend life. They see no real difference between preventing disease and other forms of human enhancement, such as engineering our bodies to become stronger, or to supplement our intelligence reaching a point of superintelligence, where the understanding of the universe is complete. These visions include death as the final enemy.

In a 2015 essay, Zoltan Istvan, an American transhumanist, claims that scientists are conducting “[longevity research] for a singular and extremely human reason: they don’t want to die. [And in an] age spilling over with new radical science, medicine and technology – they might not have to, either.”<sup>12</sup> How the belief systems of transhumanism and singularity intersect are revealed in passage from a recent *New York Times* profile of Istvan:

[Istvan supporter] Horn, with his Calvinist background, seemed to me now a walking illustration of the way in which scientific progress had displaced divine providence as our culture’s locus of faith. He embodied, in fact, the religious dimension of transhumanism: a movement that, in its grand mythos of the coming Singularity, maintains a Christian distaste for the flesh and its frailties.

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10 Emanuel, Z. (2015) Why I Hope to Die at 75. *The Atlantic Monthly*. Found at <https://www.theatlantic.com/magazine/archive/2014/10/why-i...die-at-75/379329> Accessed February 4, 2016

11 Lilley, S. (2013). *Transhumanism and Society: The social debate over human enhancement*. Dordrecht, NL: Springer.

12 Istvan, Z. (2015). Antiaging experts make a million-dollar bet on who dies last. *Gizmodo* February 23. Found at <http://bit.ly/1DPRYiX>. Accessed February 7, 2017.



Its delirious eschatology foretells a final unity with the technological divine, through which the elect will make the transition from time into eternity.<sup>13</sup>

Though they share the religious and faith-based dimensions of religion, these movements stand in contrast to traditional notions of Christian hope and the expectation of redemption, a coming new reality through God's promise. The theologian Ted Peters succinctly describes this futurology as a becoming, rather than an eschatological coming.<sup>14</sup> Transhumanists, for their part, reject religion even as they adopt faith-based notions of a coming transcendence. They see religion, with its heaven-based hegemony, as an impediment to alternate visions of a counter world. Religion is the past. Transhumanism, with its hope for immortality, is the future.

Longevity narratives are often articulated by other sets of actors, including theologians, ethicists, and philosophers. In ethical discourse, a basic taxonomy emerges – apologists argue against life extension; prolongevists support it. Describing the spectrum of philosophical positions between these two poles is beyond the scope of this essay, and can be found in Christine Overall's excellent inquiry of immortality.<sup>15</sup> Among the constellation of apologist philosophers and bioethicists, it is not uncommon to find scientists who firmly support the natural inevitability of death. For example, belief in a natural life (and natural death) appears as a form of genetic determinism. Scientists such as Heidelberg's Peter Kramer (cell death), Leonard Hayflick (cell cycle exhaustion) and the American author Sherwin Nuland (neurosciences) are three prominent examples. Kramer, in his remarks at a May 2016 Mainz longevity workshop, explains the mechanisms of genetically programmed cell death, or apoptosis. "There can be no life without death," Kramer flatly states.<sup>16</sup> In response to those that would propose radical life extension, Hayflick, whose research explores the genetic differences between aging and longevity, says, "when I hear someone has

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13 O'Connell, M. 600 Miles in a Coffin Shaped Bus, Campaigning Against Death Itself. New York Times February 9, 2017. <http://nyti.ms/2k8ku7F> Accessed February 9, 2017.

14 Peters, T. (2011). Progress and Provolution. In *Transhumanism and Transcendence: Christian hope in an age of technological enhancement*. Ronald Cole-Turner, ed. Washington, DC: Georgetown University Press.

15 Overall, C. *Aging, Death, and Human Longevity*, a philosophical inquiry. 2004, University of California Press, p 99.

16 Should we live forever? Biological and Ethical Perspectives. July 20, 2016. Found at: <https://www.youtube.com/watch?v=SIolsFBr-Ls> Accessed January 3, 2017.

reversed the aging process, it is tantamount to saying that someone has reversed gravity.”<sup>17</sup> For his part, Nuland writes:

Mankind cannot afford to destroy the balance of nature by tinkering with one of its most essential elements, which is the constant renewal within individual species and the invigoration that accompanies it. Renewal requires that death preceded it so that the weary may be replaced by the vigorous. This is what is meant by cycles of nature.<sup>18</sup>

In sum, classic aging research has yielded to a far more ambitious effort fueled by a bolus of baby boomers faced with an incomplete picture of their golden years – extended lifetimes, surely, but with the potential that some of those years will be spent in suffering decline. Will this sudden embrace of big science finally reveal a way to defy death? As a biologist and bioethicist who has experienced the slow drumbeat of scientific progress and observed society’s fascination and unalloyed hope for a medically enhanced future, I say: not in my lifetime (sorry, Singulatarians). Our grandchildren may see life prolonging or life enhancing technologies that come from this research. In the meantime, we will die, as all humanity has died before us.

### **Imagine the future (but play life richly)**

Is it possible to live a full and satisfying life in the face of finitude and still believe in the power of technology to improve and lengthen it? Steven Cave offers the beginnings of a solution. Cave asserts that those who obsess about life extending technologies fail to grasp the value of being *now*. There is a virtue of connecting with others and living a fully realized life by engaging a wider set of interests. Anticipation, to the extent that it is connected to the fears of growing old, growing weaker, and suffering in our final years, does us a disservice. Anticipatory modes enable the production of possible futures that are lived and felt as inevitable in the present. By dwelling on these fears, Cave tells us, “we bring death into life, only then to die without having really lived.”<sup>19</sup>

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17 The Immortalists (2014) <http://theimmortalists.com>. Accessed February 5, 2017.

18 Nuland, S. *How We Die* (1994). Alfred A. Knopf, New York p. 267.

19 Op Cite Cave, S. (2012), p 299.

Does this mean we should relinquish our narratives about longevity or immortality? Anticipation can render powerful notions of hope for a better future, too. The hopeful imaginaries constructed by the actors in the longevity situation help set trajectories for technologies that someday can improve our lives. Focusing on one biochemical pathway of aging, as De Gray correctly argues, may indeed someday lead us to interventions that might slow or reverse it. The pursuit of rosy biotechnological futures may lead to incremental, but important, advances. If, in the pursuit of longevity, a discovery emerged that would prevent or slow a disease of aging – such as sarcopenia or muscle wasting – we would surely welcome it. Sarcopenia is a significant contributor to falls in the very old, and the sequelae of falls, including broken hips, knees, and backs, are a leading cause of morbidity and mortality among the aged. If imagining a lifespan of 150 brings us these discoveries, we should not hesitate to do it.

While living radically extended lives or achieving immortality can be rich theoretical places for imagining possible human futures, they perhaps are best suited to help us reflect on how we value and live our present lives. Christine Overall describes popular accounts of the journey of growing old or battling a fatal illness as an accomplishment, taking a certain kind of perseverance of character. This has the danger of overemphasizing the intrinsic value of life irrespective of its quality, leading us to strive to preserve life by any measure possible. What should be valued, according to Overall, is not “sheer temporal endurance itself but something connected to that endurance, the living of life in an exemplary way.”<sup>20</sup> This observation suggests something deeper at work: that experiencing, creating, perceiving, planning, anticipating, valuing, and acting out a fully realized human life – within the limits of our lifespan – has moral significance.

In her critically acclaimed one-person Broadway show, *Let Me Down Easy*, the actor and playwright Anna Deavere Smith re-enacts interviews with people observing the rich identity of the human body, its vulnerability, and its resilience.<sup>21</sup> On the topic of human resilience, Deavere-Smith channels Susan Younes, a Musicologist at the University of Notre Dame. Younes describes the remarkable life of the composer Franz Schubert, who learned in 1822 at the

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20 Op Cite Overall, C. (2004), p 99.

21 Isherwood, C. Woman of 1,000 faces considers the body. New York Times October 7, 2009. Found at <http://www.nytimes.com/2009/10/08/theater/reviews/08easy.html>. Accessed November 14, 2016.

age of 25 that he had an incurable, and quite deadly disease: syphilis. What did the young Schubert do? He poured every essence of himself – his fear, his anger, and his musical genius into the lasting beauty of composition. Six years later, Schubert died. In his brief time in Vienna, he composed *over one thousand* works of music.

Contemplating his impending death from liver cancer, the neuroscientist and celebrated author Oliver Sachs put into sharp focus the value and prospects of a satisfying human experience, even in the face of physical and emotional suffering. In 2015 essay, he evinced a clear path: deepen his friendships and achieve new levels of understanding and insight.<sup>22</sup> Sachs, who died just months later, cites the philosopher David Hume, who upon learning he was mortally ill at 65, wrote a short, inspiring autobiography in a single day in 1776. Like Hume, Sachs set about straightening his accounts with the world.

Schubert, Hume, and Sachs – each armed with the foreknowledge of a time of dying – give us instructions on how to live our ordinary, everyday lives evermore richly. While we imagine a future of healthier, longer lives, we should not forget to attend to the lives we live. Let us strive to deepen our friendships, and create, compose, plan, and experience living in exemplary ways.

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