

Biotechnology and the Prolongation of Life

A Sociological Critique

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Puzzles surrounding health, longevity, and death have preoccupied the human mind throughout history, but the question "Can we live forever?" has a decidedly contemporary resonance, since modern medicine holds out the actual possibility rather than the merely fantastic promise of longevity. Furthermore, contemporary medicine offers us longevity without disability and infirmity. In one sense, the issues surrounding aging are quite simple: can we be happy, healthy, and chronologically old, or is physical deterioration and death necessarily a depressing and destructive experience? Is death ultimately inescapable? A number of popular science books—*How to Live Forever or Die Trying* (Appleyard 2007), *The Living End* (Brown 2008), and *The Immortalists* (Friedman 2008)—have recently explored the issues of life prolongation through the application of modern biotechnological inventions. The optimistic answer to the question about indefinite survival looks toward medical science and technology to secure survival without aging. Optimists are in search of a medical utopia that can not only prolong life indefinitely but also eliminate its attendant discomforts and disabilities. The optimism is of course not new. Nikolai Fedorov (1828–1903) argued in *What Was Man Created For* (1990) that with the application of science, human transcendence was possible. Death was not an inevitable outcome of human life but an avoidable evil. Thus the struggle against nature should have primacy over the social struggle, and

he realized that to overcome the scarcity imposed by nature, human beings would have to colonize space. By contrast, there is a well-established tradition of critical responses to the promises of medical science, challenging the view that humans can achieve almost complete control over their environment and rejecting the assumption that they could control their own biological evolution and destiny (Dubos 1959). The pessimistic response to utopian thought argues that technology cannot ultimately solve the problems of old age and that in some circumstances technology actually compounds our difficulties. In the contemporary debate about aging, the optimists are represented by scientists such as the Cambridge biogerontologist Aubrey de Grey, who in *Ending Aging* (2008) treats aging as an engineering problem, advocating a plan to eradicate death from aging through SENS—"Strategies for Engineered Negligible Senescence." The pessimistic view, which he has dubbed the "pro-aging stance," induces the populace to accept aging and its negative outcomes as both natural and unavoidable. The optimists argue that any commitment to the inevitability of death rests on implicit and often hidden religious assumptions about "nature."

Rejuvenation sciences claim to provide a range of solutions to resolve the problems of old age itself (as opposed to solving issues arising from age-related diseases). De Grey believes that recent developments—for example, in microbiology and its related technologies—offer the possibility that

death could be eliminated. To deny this possibility is simply irrational. Those who hold a negative perception on the life-extension project are accused of possessing a conservative outlook, being unnecessarily reluctant to embrace social change, and being constrained by rigid religious conceptions of the human life span, all of which restrict the potential offered by antiaging technology.

Of course the controversial but simple question "Can we live forever?" has a variety of answers. We can in fact distinguish various possible forms of survival (Callahan 2009). The first is basically the existing situation, involving a relatively long life in historical terms but with all the disability and immobility that characteristically goes with aging. This situation may be tolerable for the individual but costly for society with rising health-care costs. The second possibility might be an extension of life with relatively little disability and a quick death. In this case, medical science would have successfully overcome many geriatric diseases without finally providing us immortality. From an individual point of view, this outcome is clearly desirable. We could also imagine simply decelerated aging, which would mean slowing down the aging process, and finally there might be arrested aging, in which the aging process could be delayed or deferred for an indefinite period. The immediate medical goal of the immortalists is a version of arrested aging in which the inconvenience of morbidity could be more or less eliminated and immortality could be delivered through extensive geriatric engineering. This final outcome is clearly problematic because it is costly from an economic perspective, and it may also be disturbing for the individual, given a range of psychological problems that might follow life extension, such as boredom, depression, and despair. As a matter of fact, significant improvements in life expectancy have already been taking place in the developed world throughout the twentieth century, and decelerated and compressed aging both look feasible in the twenty-first century. In the light of these medical options, the developed societies have urgently to develop radical social policies toward aging, because the consequences of the demographic transition or "secular shift," in whatever form, are far-reaching and fundamental (Laslett 1995).

The immortalist objective to give us both youthfulness and longevity is a utopian ambition. However, we need to take the ambition and the dream seriously. From a sociological perspective, immortalism as a program tells us a lot about the society in which we live, especially its subjective individualism, its obsession with technological solutions, and its overwhelming confidence in scientific advance. The medical dream of a long and trouble-free life tells us a lot about the baby-boomer generation, its continuing influence, and its reluctance to leave the historical stage. The immortalist program also brings to our attention a range of exciting and imaginative aspects of medical technology and research that *may* in the long term have a radical impact on the human life cycle. For example, any discussion about the life-extension project brings into view the possibility of a posthuman society (Fukuyama 2002). However, there is a more challenging literature associated with the Transhumanist Association which claims that we are close to manufacturing posthuman beings who will be so radically transformed by medical science that they will be no longer unambiguously human according to our contemporary standards. Cybernetics and informatics will, alongside biomedicine, produce enhanced beings that will be immortalized by such technological advances (Hayles 1999). Although this debate may look like science fiction from the perspective of conventional medical sociology, these developments should, in my view, become an aspect of sociological research, because these technologies already impinge on our lives and they are reshaping existing concepts of mind and body. As we will see in this chapter, the transhumanist agenda has in fact an elegant and persuasive philosophical defense (Bostrom 2005) that deserves sociological scrutiny.

The Body and Aging as Engineering Problems

In 1967 Christiaan Barnard performed the first heart transplant operation at the Grote Schuur Hospital. Similar experiments had been conducted on chimpanzees, and in the majority of these early heart transplant operations, the pa-

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tients died shortly afterward. Despite Barnard's technical brilliance, his patient died eighteen days after the operation from pneumonia. At the time, heart transplants were often regarded as medical gimmickry, and they were condemned as expensive technology solutions for a limited number of patients in a world where the mass of humanity, especially in Africa, lived relatively short lives with depressingly high levels of poverty and morbidity. Almost half a century later, we regard organ transplants as routine low-risk procedures, and medical science is now experimenting with hearts and other organs that can be cultivated in the laboratory with modern genetic technologies. In the context of the prolongevity debate, a heart transplant can be regarded as a technique for extending life, and such procedures can be seen as relevant to the goal of living indefinitely.

Heart transplant operations can be perceived as tangible proof of the project to treat the aging body as simply a defective machine, which was anticipated by an unusual partnership between the famous flyer Charles Lindbergh and Alexis Carrel, the founder of tissue culture, who in developing experimental medicine had grown human tissue outside the body. Having successfully flown across the Atlantic in 1927, Lindbergh wanted to enlist experimental medicine to cure his sister-in-law, who suffered from a damaged mitral valve in her heart. Lindbergh's response to her condition was to think of the defective heart valve as one might respond to a defective oil pump in an airplane engine. When Lindbergh established a working relationship with Carrel, the engineer and the experimental scientist dreamt of the possibility of removing the heart from a sick patient, repairing it, and implanting the restored organ in the patient (Friedman 2008). One outcome of Lindbergh's professional involvement with Carrel at the Experimental Surgery Division of the Rockefeller Institute was his conclusion that death was simply the avoidable consequence of failed bodily machines.

The notion that we can regard the ailing body as a defective machine has a long history, but it is only in recent times with the development, for example, of nanotechnology that the prospects of an engineering solution to aging begin to gain greater recognition and prominence. An engi-

neering solution to the contingency of life can be regarded as compatible with Cartesianism, in which the body as a physical object is merely an extension of the person (Turner 2008). Much of this experimental work rests on the research of K. Eric Drexler. Born in Oakland, California, in 1955, Drexler completed his early research at the Massachusetts Institute of Technology (MIT) and participated in National Aeronautics and Space Administration summer studies in 1975 and 1976 on space colonies. During the 1970s, he began to develop ideas about the applications of molecular nanotechnology. In *Engines of Creation* (1986) he proposed to construct a nanoscale "assembler" which would be able to build a copy of itself with the use of an arm and a computer. This development could lead eventually to the efficient mass production of nanomachines. Because assemblers can copy themselves, such nanoproducts would have low marginal costs. With Christine Petersen, Drexler founded the Foresight Institute in 1986 to prepare for nanotechnology, and in 2005 he joined Nanorex to participate in their projects to develop molecular software. Drexler's work has been criticized because currently there is no way to build his proposed assembler, and while Drexler and his colleagues have produced some designs for simpler machines, the design tasks remain formidable. Finally, there are no reliable procedures to distinguish between the failures and successes of possible applications of these designs.

Despite these damaging criticisms, the potential applications of nanotechnology are significant. In medical procedures, Drexler proposes that nanocomputers would give surgery much greater precision and speed. Such machines could also be employed to help the immune system more accurately identify and combat cancer cells. These nanohealth machines could in principle be implanted to correct the failures of the aging body, thereby finally fulfilling what we might call the iatro-engineering dreams of Lindbergh. Drexler's machines could assist in the development of cryonics—freezing bodies for a future medical restoration of life—in which the resuscitation of frozen patients would require considerable corporeal reconstruction and repair. Finally, Drexler demonstrated in *Nanosystems* (1992) that these assemblers are consistent with the known laws

of chemistry, and the possible medical applications of these developments were considered in some detail by Robert A. Freitas in *Nanomedicine* (1999). It is assumed that the first assembler will be built within the next decade.

One might reasonably predict that some aspects of today's prolongation gimmickry—cryonics and nanoprotein machines—will become routine procedures in the next fifty years. Some version of Aubrey de Grey's engineering solutions to the causes of aging—cell depletion, cell excess, mutations of the chromosome, mitochondrial mutations, cellular debris, and cross-linking—may also become commonplace procedures for prolonging human life. Many of the other recommendations for delaying aging—cosmetic surgery, vitamin supplements, dietary regimes, exercise, a modest consumption of red wine, and so forth—are already accepted without much public controversy. The more questionable solutions, such as the massive calorie restriction recommended by some pathologists—possibly as a solution for diabetes—may also become standard practice but in some modified form (Mason 2006). Even a more advanced and reliable version of cryonics might become part of mainstream medical technology. Some medical conditions such as single-gene disorders, Huntington's disease, cystic fibrosis, and sickle cell anaemia will be in the front row of targets for genetic interventions, and other conditions will be rapidly added to the list of treatable problems.

We might also reasonably assume that, regardless of any ethical or economic objections, these technological inventions and their applications are probably unstoppable and inevitable for four reasons. The first is the obvious quest for economic profit. Prolonging life—whether in the conventional form of geriatric tourism, cosmetics, diets, vitamins, and exercise routines, or in more experimental medical regimes—is already a feature of global business, and with aging populations business opportunities will only increase around an emerging global retirement industry. Stem-cell research offers significant opportunities for regenerative medicine. Second, the desire of human beings to live longer is a more or less permanent feature of human society, from ancient China to modern-day America. Third, even if legislation in the United States sought to curb

certain forms of medical research—such as stem-cell research—other countries such as Singapore would provide a safe haven for such scientific experimentation. Finally, there is a specific driving force that will be characteristic of the next three decades—the aging of the baby-boom generation, which has enjoyed a lifetime of consumerism and relative affluence. Despite their aging and imminent retirement, boomers are now reluctant to relinquish their significant acquisitions of property and power (Kinsley 2008). In the short term, we may expect life expectancy in the developed world to approach one hundred years, but in the long term, life expectancy may simply keep increasing with improvements in the standard of living and in conjunction with new medical technologies. In the twenty-first century, life expectancy may extend well beyond 120 years for elite social groups.

Is the indefinite prolongation of life socially desirable, as opposed to being merely in the interests of the individual? To answer this question, let us start by making a basic economic assumption that scarcity is unavoidable and hence conflicts over resources are inescapable. Scarcity is the basic assumption of economics as a science, and without that assumption one could not understand such phenomena as competition, rational choice, or inequality. Some natural resources such as water and fossil fuels may be scarce simply because they are inadequate for human need. Therefore, extending life in a context of scarcity must result in increased social competition, if not social conflict. The prolongation of life by an immortalist social movement will increase social conflict between generations and between the long-living elite and the short-living majority. The elite will be constituted of the rich, primarily from the northern hemisphere, and the majority of the poor will be located in the southern hemisphere and their life span will actually decrease as a consequence of poverty, social deprivation, and infectious diseases. Over time these medical technologies—such as stem-cell therapies, organ transplants, nanomedicine, and cryonics—will become cheaper and more effective, and therefore available to a wider range of social groups. But we cannot expect these treatments to become universally available at affordable prices. In the modern world, it is now possible to

treat conditions such as AIDS/HIV with modern drugs, thereby controlling many of the opportunistic conditions such as pneumonia that eventually kill the victims of this disease, but these drugs have not been available in much of Africa and Asia at an affordable price. If in some future world there is an effective antiaging drug, it is unlikely that this drug will be available in the impoverished, deprived, and war-torn areas of such an unequal world.

Transhumance

There is the possibility of a more radical and challenging future, which will be the unintended consequences of modern medical technology. Elsewhere I have argued that our humanity is defined by our vulnerability, which is simply a consequence of being a perishable organism that ages and is subject to inescapable morbidity and mortality (Turner 2006). Vulnerability—from the Latin word for “wound”—defines a shared human world of risk with which we can cope through a shared culture. Collective institutions—law, government, religion, and family—are social mechanisms that offer some respite from our ontological vulnerability. Life-extension medicine promises to solve the problem of our vulnerability by paradoxically creating a posthuman world. The contemporary life-extension movement is driven by a profoundly individualist ideology that offers individual solutions but largely ignores many of the social consequences—generational conflict, the exhaustion of basic resources, and massive regional inequalities. One might argue of course that our contemporary situation is in any case characterized by violence, inequality, and scarcity and that medical technology is at least one solution to our vulnerability. However, a significant increase in the immortals in a world of declining fertility rates and existing scarcities would result in a posthuman world in which the only long-term solution to scarcity would be either a radical reduction in the human population or the colonization of outer space. In other words, the prolongevity movement has to offer some alternative to a Malthusian future. Given these economic assumptions about scarcity, pessimistic conclusions about the impact of

life extension on resources, social capital, and social harmony appear inevitable. However, in the literature on transhumance, a range of proposals begins to address some of these issues. For example, transhumanist philosophy has produced a number of responses to the argument that longevity would create psychological malfunctioning. Because the immortalist worldview is what we might call a fix-it ideology, their proposal is that we can live in a posthuman world provided we have the correct brain-enhancing antidepressant drugs. A prolonged existence could be tolerable with the appropriate pills. Such an argument assumes that human mental functions and psychology would not change significantly. However, a posthuman society will have individuals of greatly enhanced intelligence, and it would be technologically possible to upload the brain into an electronic medium such as an electronic chip. These posthuman uploads would not suffer from biological senescence and they would not be a significant drain on scarce resources. Uploading would also solve the problem of cryonic patients, whose brains could be copied into a computerized system. These proposals are related to developments in artificial intelligence. Rodney Brooks (2002), a founding fellow of the American Association for Artificial Intelligence and director of the Artificial Intelligence Laboratory at MIT, argues that humans are simply “wetware” organic machines that could be duplicated with metal and silicon, and hence prolongevity could be achieved through processes related to or resembling uploading and duplicating. The possibility of creating transhuman existence raises the possibility of a future society composed of humans who are subject to decay and extinction and posthuman beings that are equipped with superior intelligence and blessed with technological immortality (Kurzweil 1999). Would such a world resemble the futuristic nightmare of Stanley Kubrick's *2001: A Space Odyssey*?

Theories of Aging

While transhuman theory may appear implausible, it has the merit of bringing into focus the nature of aging and forces us to reconceptualize often-sterile debates about the greying of populations. It brings

into critical focus the question, What is aging? Contemporary genetic thinking about aging has been significantly influenced by Thomas Kirkwood in such publications as *Time of Our Lives* (1999) and "The End of Age" (2001). The Kirkwood view of aging argues that it is the consequence of limited investments in somatic maintenance and repair, owing to competing priorities in reproductive investments. Longevity is programmed by the settings of genes relating to repair and maintenance. Aging is the outcome of damaged cells and tissues that have accumulated through the life course, and thus a great variety of mechanisms contributes to the aging process. The principal genes determining longevity are related to these maintenance functions, such as antioxidant enzymes. It follows from these assumptions that the maximum human life span is not fixed and determined but malleable, for example, through the limitation of exposure to cellular damage.

Kirkwood's reinterpretation of existing biological theories has important implications for the social and commercial exploitation of biogerontology. Following Kirkwood's approach, the aim of biomedicine is to enhance the ability of an individual "to imitate the immortal germinal line" (Moreira and Palladino 2008, 37). These scientific developments quite specifically support antiageist social policies, holding out the promise of achieving a better fit between individual mortality and social functioning. These developments suggest that we should regard our biological constitution as merely a somatic vehicle for reproducing the genetic line. Furthermore, the notion that we are simply constituted by the disposable soma is the ultimate definition of human vulnerability. The thrust of the medical program of the prolongevity movement is that we can in fact delay the disability of the soma by invasive and determined medical engineering, that is, through rejuvenative medicine (de Grey 2008).

The Baby Boomers and the Demographic Transition

What is problematic about the current prolongevity debate is that it rarely addresses the political economy of aging—who will pay for it,

what will the unintended consequences on the environment be, how will it influence family life, and how would it change the balance of power between generations or indeed between nations? One reason for the absence of any serious attempt to understand the social consequences of living forever is that the ideological underpinnings of the immortalist movement are largely individualistic and are thereby consistent with the values of the baby-boom generation that has celebrated youth, youthfulness, and success. In the drab postwar years of rationing and restrictions, the baby-boom generation brought a new zest for life and enjoyment, but it became a movement that was shaped by the consumer boom of the 1970s. Although the immortalist case is often wrapped up in a moral claim about the unacceptable fact of death—how can we let thousands of people die each year globally of old age?—the immortalist ethos is essentially private and personal. It is not overly concerned with issues of justice, dependency, or economic growth. The prospect of significantly extending the expectation of life in the affluent societies of the northern hemisphere by the application of medical research on stem cells has clear Malthusian implications for the world as a whole. There is a close relationship between poverty and injustice, and therefore we should take this Malthusian question seriously if we are to understand the relationship between human rights and poverty. The transhumance argument that, as the costs of rejuvenative medicine declined, these therapeutic interventions would become widely available to the public and gross inequalities between the rich and the poor would diminish is not convincing. Inequalities in morbidity and mortality have not diminished with technological improvements in medicine. Although it is at this stage merely sociological speculation, one can nevertheless assume that, if successful on a large scale, the life-extension project would produce a range of major socioeconomic and environmental problems. Increasing world inequality between the rejuvenated, immortalized North and the naturally aging senescent South would further inflame the resentment of deprived social groups against wealthy aged populations. As the AIDS/HIV epidemic takes a significant toll on life expectancy in many

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impoverished African societies, the differences in the demographic profile between the North and South are becoming extreme. Life extension in the North implies increasing environmental degradation, global warming, and consequently further depletion of natural resources. In addition to social class conflicts over limited resources, there may be intergenerational conflicts, including conflicts over jobs, retirement benefits, and pensions. Much sociological research on generational relations has rejected the idea that increasing life expectancy will lead to intergenerational conflict, but the life-extension project raises issues about such generational equity not covered by the current discussion. Whereas eighteenth-century political economists like Thomas Malthus and the Marquis de Condorcet realized that there was an important connection between the organic perfection of Man (to use their language) and the improvement of society, the modern immortalist movement pays scant attention to the social conditions that would be necessary to sustain large cohorts of human beings enjoying a prolongation of life (Turner 2009).

There is a paradox in scientific discourses of rejuvenation. On the one hand, there is a wish to prolong life; on the other, there is an indifference to the means to prevent premature death. Assuming a link between wealth and health, it is unjust to value some lives more than others, that is, to value the addition of extra years to already long lives rather than adding extra years to those whose lives are relatively short as a result of poverty. While life expectancy in many African societies is declining as a consequence of poverty, authoritarian governments, new wars based on warlordism and drug barons, and the AIDS epidemic, lives in many northern-hemisphere societies are being extended. The prospect of further life extension will simply increase this global gap between the rich and the poor. Considerations about existing inequality should moderate arguments about the health rights of the elderly to live longer, regardless of the unintended consequences for other communities.

However, moral standards regarding human life are constantly challenged by new technologies (Latour 2002) that affect the foundation of human rights. If death by old age is perceived

as pathological, it is likely that older adults will compete with other age cohorts for access to scarce medical resources. If instead death in old age is considered normal, then premature deaths in underdeveloped countries would in turn be interpreted as a priority since they are incongruent with the current norms defining the "natural" life span. Queuing for resources is thus central to the tensions emerging from the life-extension project, because it establishes a hierarchy among humans that determines medical care. The question is, Upon what shared values, if any, is queuing organized within the project of immortalist longevity?

Intergenerational Exchange

We should consider the issues of prolongation and social rights against the more general issues of social solidarity and security. These questions point to the likelihood that we should look at pensions from the perspective of intergenerational exchanges and the question of generational equity. It is well recognized that the welfare states of northern Europe have rested on an explicit social contract between generations. This modern contractual welfare state is based on intergenerational transfers of resources through taxation and social expenditure. In addition to this public or formal contract, there is an informal and domestic contract between generations within households. Generally speaking, the state works to reinforce and sustain the informal contractual arrangements operating within households. With the aging of Western populations, declining fertility, and compulsory retirement, there has been increasing political pressure to modify the generational contract. Critics of the existing arrangements have argued that the baby boomers or the "welfare generation" has captured the welfare state and its resources, ensuring that social funding is directed away from the young to the elderly (Thomson 1996). The social construction of a demographic imperative is based on the economic assumption that welfare has become an unacceptable public burden. Lobby groups in the United States have campaigned against public expenditure on the elderly, promoting instead the idea of personal responsibility and obligation

within the family. Fears about a social burden have also been associated with the idea that there is growing conflict between generations over the unequal distribution of resources.

The debate about intergenerational reciprocity can be usefully divided into two competing positions (Williamson, McNamara, and Howling 2003). There is the generational equity argument that each generation should take care of itself rather than relying on other generations or the state. Privatization of resources is one logical outcome of this position. The alternative is generational interdependence, which emphasizes the diversity of emotional, cultural, and economic exchanges between generations and, in criticizing the emphasis on economic exchange, integrationist arguments draw attention to the social importance of reciprocity norms. By contrast, the equity framework arose in the 1980s as a response to the perception of a growing economic crisis attendant upon radical demographic changes. This framework was associated with a number of conservative institutions such as the Cato Institute and the Olin Foundation. It also had an advocacy wing organized by AGE (Americans for Generational Equity). Their argument was based on the findings of empirical research that suggested that, while the economic status of the elderly had been improving, that of their children had been declining. This framework argued that existing provisions were unfair and more importantly unaffordable (Marmor, Cook, and Scher 1999). Dependency ratios between workers and pensioners, it was claimed, showed that current welfare arrangements could not be sustained indefinitely into the twenty-first century and immediate action was required to provide for these demographic changes. It was in this context that some economists predicted that age wars would replace class wars as the elderly use their political influence through interest groups such as the American Association of Retired Persons to steer resources toward pensions and health care and away from educational investments for younger generations (Thurow 1996). As age conflict increases, the possibilities for age integration declines.

The interdependency or integration framework arose essentially as a critique of these pes-

simistic predictions about generational conflict. The interdependency position recognized that the elderly do not function politically as an integrated and coherent category but are divided, like the rest of the population, by class, gender, and ethnicity. The interests of rich and poor elderly do not necessarily coincide. Furthermore, there is little evidence that the elderly vote as a block, and often the interests of different age groups coincide. For example, in the early 1980s young and old opposed cuts to education and health programs (Minkler 1991). A recent analysis of data from the British Retirement Plans Survey undertaken by the Office for National Statistics on behalf of the Department of Social Security found that parents who help their children are more likely to receive support, children respond to parents in need, and divorced fathers are the least likely to be involved in exchanges with children (Grundy 2005). Finally, it is unrealistic to expect each generation to be responsible for itself, because this ignores changing fortunes brought about by historical contingency. The generation of the Depression faced unusually hard circumstances that shaped its entire future (Elder 1974). Similarly, we may speculate that the current credit crisis and the turmoil in the U.S. financial and housing markets in 2008–2009 will have a significant impact on young families who are currently struggling with a global financial meltdown not of their making (Edmunds and Turner 2005). Research on generations clearly demonstrates that historical contingency means that we cannot assume a level playing field between one generation and another, and hence the idea of fairness is not easily applied in these circumstances (Edmunds and Turner 2002). The problem with the equity perspective is that it makes little or no allowance for those vulnerable social groups who do not have the resources to cope with exceptional circumstances such as natural disasters, economic crises, or social turmoil. In all of these circumstances, it is very difficult to see how social justice between generations could be achieved. Any significant prolongation of life within the immortalist framework will certainly intensify conflicts in the public arena over scarce resources, even where these public conflicts may be absent within the family itself.

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Despite the cogency of the interdependency standpoint, the equity lobby has been successful, because the simple logic of its appeal to individualism resonates with the neoconservative climate that was sustained long after the departure of political leaders such as President Reagan and Prime Minister Thatcher. The political appeal to responsibility and personal choice against compulsory measures remains a potent aspect of the view that generational interests are on a collision course. While sociologists have generally supported the notion that intergenerational reciprocity, even with the decline of traditional family structures, is a significant aspect of modern societies, tensions over resources will inevitably persist, mainly because there is the suspicion that older, retired generations are parasitic on younger, employed generations. With the credit crunch, there has been much talk about the need for a reassertion of values and moral guidelines to stem the greed that has become associated with the consumer boom of the 1990s. The emerging focus on morality may also provide ammunition for the integration argument.

Conclusion: The Right to Longevity?

Scientific research seeking to prolong human life has generated a number of criticisms. Two questions—one empirical and the other normative—dominate current debates about life extension: Can we live forever? and Should we live forever? The first question emerges mainly from the field of biomedical sciences, concentrating on the feasibility of biological engineering as a method capable of prolonging life, on the protection of consumers from quackery, and on maintaining the credibility of biomedical science (Binstock 2003, 2004). The second or normative question is primarily embedded in the fields of humanities and social sciences, being concerned with social and ethical issues (Vincent 2003). The works of Francis Fukuyama (2002) and Leon Kass (2002) have been particularly influential in recent years, both contesting the virtues of prolonging life beyond the “normal” human life span.

Rejuvenation sciences will not be easy to regulate because of the mixed and often contra-

dictory outcomes they have for individuals and for societies. Legislative regulation to limit or to control the scope of antiaging technology would not be easily enforced for political reasons. In addition, it is perfectly rational for an aging individual to embrace the opportunities to extend life, even where the technology may have negative consequences for society as a whole. Stem-cell research is a good example of this problem. It is reasonable for an individual to wish to add extra years to his or her “natural” life span, even if this means spending much time distracted by geriatric disease and discomfort, while waiting for anticipated future cures for existing morbidity. Contrary to the immortalist promise of good health in old age, it is more plausible to imagine a common situation where elderly individuals are enjoying significantly longer lives but with mounting problems from their (as yet) incurable and threatening conditions such as Parkinsonism and Alzheimer’s disease. In that case, societies will be exposed to the phenomenon of decompressed morbidity—when disabilities are compressed into the final stages of life—and hence the social costs of longevity will be significant.

In addition to these economic consequences, the moral arguments against the life-extension project are considerable, even though such an enhancement of the life span is at present remote. If antiaging technology can in principle make it possible to live forever, technology will corrode existing ethical systems, because the conventional relationships between the ethical life, the good society, and the management of the body are being dissolved by advances in medical sciences. Medical regulation of the body does not, for example, presuppose any personal responsibility for conduct, apart from compliance with a medical regime. The new biotechnology breaks the traditional connection between morals and longevity, because we can in principle solve most of life’s troublesome issues by medical interventions. While medical science encourages me to manage my body carefully, it also promises to solve my problems when things go wrong. The uneasiness that many have with this project can be understood through the moral legacy of religions on current value systems. For religious institutions, which constantly participate in debates over

values, the life-extension project presents a serious challenge, because the traditional theology of the Christian churches presumed the achievement of personal salvation and the enjoyment of eternal life on the basis of being virtuous and without sin. Rejuvenation sciences promise not an eternal sacred life but an eternal, or at least extended, secular life. The life expectancy of an individual is not based on moral worth, but on the outcome of a political debate about the allocation of sufficient resources to meet the research goals of the life-extension project.

An aging process of this magnitude will also have a significant impact on the viability of the state, since the tax base will be seriously eroded because there will be an imbalance between the working population and retirees. Even if retirement is postponed or made more flexible, there is a serious issue about how the productive population will be replenished as dependency ratios increase in the developed world. Longevity for the privileged generation will curtail the employment opportunities of the young and increase the possibility of tensions between the generations. The citizenship claims of the elderly will no longer match their contributions to the system. One solution to this problem for developed societies is to continue to import labor from the less developed world. There is currently a large army of Filipino domestic workers in Singapore and the Gulf States, providing services to families with elderly relatives, while Mexican migrants both legal and illegal supply the labor market of the U.S. Southwest. North African and more recently east European migration has been important in the labor markets of the European Union. Japan, which has historically resisted inward migration, has become increasingly dependent on Korean and Chinese labor. There are other solutions that involve delaying entry into the labor market, for example, by providing universal access to higher education and abolishing the retirement age. Another solution is to shorten the working week in order to guarantee more opportunities for employment for all. Another prospect is the development of some form of social storage by sending the elderly to gated communities outside their homeland. This strategy is already employed by Japan, for example, where many Japanese retirees

are now in retirement compounds in Thailand and Malaysia enjoying leisure activities and medical services at competitive prices. The major solution in many of the Anglo-Saxon economies—the United States, United Kingdom, Australia, Canada, and New Zealand—has been an attempt to dismantle the postwar welfare capitalist system of social security primarily through the privatization of pension schemes (Blackburn 2002).

Because economists have generally regarded the aging of the developed world as an important threat to continuing global economic growth, there is considerable interest in the commercial possibilities of stem-cell research as a feature of regenerative medicine (World Bank 1994). Companies operating in the Caribbean and Southeast Asia are already offering regenerative medicine as part of holiday packages, designed to alleviate the negative consequences of degenerative diseases such as multiple sclerosis or diabetes. These social and medical transformations imply an interesting change from early to late modernity. In the early stages of capitalism, the social role of medical science was to improve health care, thereby making the working class healthy and efficient. The application of medical science was to produce an efficient labor force, but late capitalism does not necessarily need a large labor force at full employment, because technology has made labor more efficient. In the new biotechnological environment, disease is no longer a negative force in the economy but on the contrary an aspect of the factors of production. The economy can capitalize on disease by keeping people alive longer. It is thus very likely that the economic interests of the corporate world will have an important role in funding antiaging technology. The new approach to the science of aging has resulted in a merger between the biomedicine business and governmentality, encouraging citizens to exercise responsibility for their own aging and the dependency of their relatives. One implication of Kirkwood's science of aging is that the diseases of the elderly are avoidable, being amenable to social and political interventions. Kirkwood had pointed out that aging is primarily a disease peculiar to human societies, since animals in the wild rarely live long enough to experience aging. Because "death is a preventable and unnecessary event" (Moreira and

Palladino 2008, 40), the new gerontology opens up huge commercial possibilities to improve lifestyle and diet to enhance the repair of the body and to delay its ultimate disability.

In conclusion, any extension of life must be considered alongside the reform of society. This issue of individual improvement and social reform was the important message of the Enlightenment reformers such as Thomas Paine, William Godwin, Mary Wollstonecraft, and Marquis de Condorcet around the time of the French Revolution. The organic perfection of Man, they argued, could only occur alongside a radical reform of society, including the abolition of the aristocracy and the monarchy, the extension of the franchise to women, the improvement of agriculture, and the reform of education. Although the pessimistic criticism of the reformers often appeared to be triumphant in the writings of Edmund Burke and Jeremy Bentham, democratic improvement in Europe and North America did in fact take place—wages improved, famine became a rarity, women got the vote, and adult literacy became universal. In the twenty-first century, the extension of life must also take place alongside a revival of civil society and citizenship, the refashioning of public institutions, the enhancement in pensions, and a more equitable system of general taxation. Furthermore, these reforms to manage the consequences of extended longevity more adequately cannot be confined to nation-states. A global strategy is required to deal with aging populations, declining natural resources, and global warming. The principal sociological criticism of the immortalist agenda is that it does not engage with the issue of social reform that is the legacy of the political economy emerging from the original debate around Malthus. If from an economic point of view scarcity is an inevitable aspect of human society, where will we find the resources to sustain the deeply aged without damaging the life chances of people in developing societies and without an erosion of the opportunities of youth in the developed world?

Note

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