

# Immortality

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Mortality is one of the very few things that mankind has fought tooth and nail against and has yet to win over. Our species has conquered this world almost entirely, yet we still die. We have, as a species, been fascinated with overcoming the death “problem.” In fact, Dr Aubrey de Grey, one of the most pronounced advocates of anti-aging science, wants to “deal with aging itself as a disease and as something to be defeated” [3]. Earlier examples of the desire to live eternally can be traced back to Alexander the Great, in which he “may have been looking for a river that healed the ravages of age” [1]. More commonly known, however, is the search for the fountain of youth; a fountain that would grant eternal youth to whomever drank from its waters. Often the search for this fountain is credited to a “16th-century Spanish explorer [named] Juan Ponce de Leon” [1]. A more supernatural example would be the concept of deities, such as the Christian God, because God cannot die, always has been and always will be. There are also many different definitions and types of immortality which are frequently developed in science fiction based media. For instance, Anne Rice writes almost exclusively about our world being inhabited by physically immortal, “undead” vampires. Because of this, immortality tends to be lumped into science fiction with things like flying cars and world sized spaceships. For the purposes of this research we have chosen to delve into the idea of physical immortality; the kind of immortality that Ponce de Leon sought with his fountain. Our research has found that this may not be science fiction for much longer.

Medical advancements have made some serious headway in extending our lives. Of course, were not immortal quite yet, but we have greatly increased our lifespan in the last hundred years. For the U.S., in 2007, the average life expectancy was about 77.9 years [4], up from 58 in the year 1900 [5]. That is a 34% increase in longevity. Think about that. In the span of barely two human lifetimes we have increased the length of that life by over a third of one.

Many methods have been devised to “combat” death and aging. One very promising method is the use of nanomachines: “Nanomedicine is the process of diagnosing, treating, and preventing disease and traumatic injury, of relieving pain, and of preserving and improving human health, using molecular tools perhaps 10 to 20 years from today nanorobots may join the medical armamentarium, finally giving physicians the most potent tools imaginable to conquer human disease, ill-health, and aging” [8]. Another possibility is stem cell research. Stem cells are cells that “serve as a sort of internal repair system, dividing essentially without limit to replenish other cells” and can become “another type of cell with a more specialized function, such as a muscle cell, a red blood cell, or a brain cell” [7]. Scientists have been looking into ways to utilize stem cells for healing damaged parts of the body. Of course, one could extend this concept into constant replacement, effectively granting infinite amounts of temporary immortality, and this thought is not uncommon. In 2006 “Tokyo University geneticist Shinya Yamanaka recently hit on a way to convert any normal adult cell into an immortal stem cell, capable of both living forever and morphing into any type of organ or tissue needing replacement in a sick or aging body” [6]. Yamanakas studies suggest a way to convert regular cells into stem cells, eliminating the requirement of harvesting stem cells from human embryos. This creates an infinite source of regenerative material from ones own body. If either of these methods develops fully, then we, as a race, will have the building blocks of eternal life.

Dr Aubrey de Grey, the scientist we named earlier, is easily the most common name we found when researching biological immortality. The name for his particular type of medical research is “strategically engineered negligible senescence” [3], or SENS. The idea behind SENS is that the metabolic process in humans causes cellular damage, and that, to become immortal, we simply have to discover exactly what damage is being caused and either repair it or stop it from happening at all. His ideas encompass nearly all of the previously mentioned methods of immortality. For instance, he wants to use nanomachines to defeat cancer, and stem cells to repair cellular decay [3]. His research isnt anywhere near flawless, of course. The European Molecular Biology Organization criticizes SENS by concluding that “nearly all of de Greys proposed interventions were deeply flawed, unreasonable and possibly dangerous” [3]. A reward of \$20,000 was offered to anyone who could thoroughly debunk de Greys theories, and, despite overwhelmingly negative criticism towards SENS, “decided no scientist had succeeded in blowing de Grey out of the water” [2]. Dr Aubrey de Greys ideas are still considered plausible, but its going to take a great deal more research and development to have them come anywhere near perfection or fruition. It is safe to say that mortalities death may start becoming more reality and less fantasy.

An intriguing question about immortality is just why people seek it. Some reasons are fanciful, like Ponce de Leon's. Some historians joked that he sought the fountain of youth "because he was an old man who wanted to restore his sexual vigor" [1]. Eternal youth has always been quite the passion of developed nations. Take the cosmetics industry for example. We try so hard, and spend so much money slathering ourselves in various pastes and gels in an effort to emulate eternal youth. Clearly the desire is there. Oh the number of things you could do when you have unlimited time to do them; "the adventure of living another 500 years on a planet as overburdened as ours would be, if nothing else, an antidote to boredom" [11]. On the more responsible end, we might "tread more lightly on the Earth because we would each preserve one body, one piece of human equipment, instead of continually having to replace it" [11]. This means that our long stay on earth will almost force us to become more responsible about ourselves and the environment overall. In fact, it might give us the "eternal" foresight we need to sustain and even save the environment, because we will see the ten thousand year ripples we cause. Between having an infinite amount of time with which to do things and looking damn good while doing it, who wouldn't we want to be immortal?

Immortality seems to be quite a boon, if everyone got what they wanted. However, a more pressing issue, and one that is often swept under the rug when hot new things come about, is just what happens if we do not die. An obvious problem comes to mind, shown by a scathing comment against Dr Aubrey de Greys SENS idea; "Just imagine another 50 million people a year on the planet and never effing leaving! Effing brilliant" [3]. Overpopulation would be one massive crisis. Yes, physical immortality does mean we won't die from old age or decay, and in de Grey's vision, by disease or illness either, but we can still die by starvation. Right now the world has roughly 6,883,938,417 human inhabitants [9]. Imagine if even half of that number was immortal. Imagine if they were all immortal. Ker Than, from the LiveScience website, brings up three fairly common concerns that spawn from this sort of dilemma; overpopulation, opportunity, and value of life.

"In an immortal society, how do you make room for new generations?" [10]. As was brought up a moment ago, just what happens when our currently overpopulated planet has an almost negligible death rate? Yes, death still occurs, given our definition of physical immortality, not indestructibility, but at a substantially slower rate. This brings to mind many ethical concerns in and of itself, such as the desire, nay, necessity for population control of some kind. John Harris, the bio-ethicist that Than interviewed for LiveScience, states that we may need to employ a form of "generational cleansing, which would be difficult to justify" [10]. Than clarifies that "This would involve

people collectively deciding what length is reasonable for a generation to live and then ensuring individuals died once they reached the end of their term” [10]. Difficult to justify indeed. How much of humanity would be willing to submit themselves to a “limit” on their immortality? How many of our social values and morals would be completely uplifted by the frightening notion of a millennium by millennium genocide? Sadly, very few have dared ponder these questions, and who could blame them with the allure of immortality floating in the same thought stream?

“Will everyone have an equal chance to drink from a fountain of youth?” [10]. From a basic control standpoint, this presents a massive problem. Most people would feel the tantalizing pull from the promises that immortality brings. If we allow full, unlimited access, then we smash into the prior mentioned overpopulation problem at full tilt. If we don’t, then who gets to be immortal? Who would regulate it? “Most scientists and ethicists agree that life-extension technology will likely be very expensive when first developed, so only a small number of wealthy individuals will be able to afford it” [10]. “If a cure for aging became available to the rich before the poor, which is the way the world always turns, then the unfairness of life might become absolutely unsustainable” [11]. Like televisions and computers, only the ultra rich will have access originally. Maybe the government would intervene, given the sensitive nature of this type of human advancement, but I sorely doubt that they would pass immortality out like free Halloween candy. Can we even justify denying anyone eternal life? If self regulated then the rich and powerful may make a grab for power and acquire control over the capabilities to make someone immortal, and if it is regulated by the government then it may turn into a case of self interest and only the super specialized, super intelligent, and super elite will have access. If immortality is attainable and it is denied to someone, then that is virtually condemning them to death, as the immortal may not die but the denied surely will. If one was able to even momentarily justify refusing such a thing as immortality to perhaps millions of dying people, then wouldn’t they have to suffer the guilt for eternity?

“If people live longer but are miserable for decades, will views on suicide and euthanasia change?” [10]. This is one of the most, to us, ethically intriguing issues with immortality. Then seems to be a bit of a pessimist, saying that by granting immortality we are “telling someone they must live, [and] we condemn them to not just years, but decades or centuries of torment” [10]. This is true, in a sense. Life has pain and pleasure, and much debate has been done over whether or not one can exist without the other. Life’s short span ensures that those pleasures and pains are equally short. However, living forever ensures that we continue life’s cycles of happiness and

anguish, eternally. This is, of course, assuming it is cyclical. A rich business tycoon that lives forever in a mansion off the coast of Hawaii will have a significantly better eternity overall than the endless struggle of an alleyway drunkard who, by some tremendous misfortune, may not have any escape option. Granted, those are extremes, and if immortality becomes prevalent enough to be administered to the general public by an opt in method then I'm fairly certain said homeless man wouldn't want to live forever. Still, the unfortunate negative side of this is that someone might lose his or her eternally sworn loved one or someone might get stuck in an overwhelmingly negative spiral for a great deal longer than the sixty or so years that is now considered adulthood. What then? Do we allow people to die on their own terms and no longer abhor suicide? In fact, how can the powers that be, whom pass judgment on those who can and cannot become immortal, live with the fact that at times they may be "condemning" someone to eternal hell on earth? Eternity is a long, long time, and it is certainly plenty of time to experience everything, good or bad, a thousand times over. Harris gives one more powerful statement in the LiveScience writing: "It is one thing to ask, 'Should we make people immortal?' and answer in the negative. It is quite another to ask whether we should make people immune to heart disease, cancer, dementia, and many other diseases and decide that we should not," [10]. This cannot be thought of without thoroughly examining all ethical concerns and weighing the pros and cons. Imagine, for instance, you were the only scientist to discover the secret to immortality, and no other scientist was anywhere close to it. This may not be a fairy tale for some scientists for much longer. Given the ethical concerns stated in this document as well as many more that I am sure you have thought of during the course of reading this, would you tell the world? Would you give us eternal youth, and would you bestowing upon us a great blessing, or a veiled, eternal curse?

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