

THE ELUSIVE FOUNTAIN OF YOUTH

“I believe we will reach a point around 2029 when medical technologies will add one additional year every year to your life expectancy.”

Ray Kurzweil

“Health technology, which for five thousand years was symptomatic and episodic—‘Here are some leeches!’—is becoming an information technology, where we can read and edit our own genomes.”

Bill Maris

“No one wants to live to 130 if it includes a 50-year stint in a nursing home at the end.”

Andrew Steele

The older I get, the closer I pay attention to news articles portraying the latest advances against the age-old enemies of man: disease, the inevitable deterioration of our human bodies (aging) and death. Many of the most recent battlefield weapons against these foes are spilling out of research labs using mRNA technologies for today’s vaccines to target the infamous SARS-CoV-2 spike protein.¹

What a remarkable time to live!

My novel, which I first started almost three decades ago, features the potential of a future zoonotic pandemic as its central theme. For that reason, I am keenly interested in the world of proteins and viruses. In recent days, for example, Stanford scientists posted the entire mRNA sequence for the *Moderna* vaccine on the open-source code repository *GitHub*. The *Pfizer-BioNTech* genome, based on publicly available information, was published by Bert Hubert last year.²

We’ve come a long way baby. The first virus to have its genome read was MS2—containing a paltry 3,569 RNA letters—published in 1976. Today’s COVID virus genome is nine times longer than MS2. The quest to develop effective vaccines against SARS-CoV-2 (and the various mutations now spreading around the globe) has led to some 350,000 bits of research, many of them on preprint servers that make findings available almost immediately to researchers around the world. Globally, 293 Covid-19 vaccines are in various stages of development: 10 of which are in use or approved, and 70 of which are in clinical trials.³

One spillover from this tsunami of biogenetic advances is research into the human body’s aging process. Researchers now are identifying specific proteins—such as the ADAR1p110 isoform RNA editing protein—that protects *telomeres* (repetitive DNA sequences at the end of chromosomes) from degrading.⁴

Moreover, this latest spate of biogenetic frenzy has prompted me to return to one of my favorite topics, the quest to extend human longevity—and the role being played today by

¹ Among the many articles on this topic, see “Bright side of the moonshots: science after the pandemic,” *The Economist*, March 27, 2021.

² Tom McKay, “Stanford Scientists Post Entire mRNA Sequence for Moderna Vaccine on Github,” *Gizmodo*, Mar. 29, 2021.

³ Anne Gulland, “How the Moderna, AstraZeneca, Pfizer and other Covid vaccines compare,” *The Telegraph*, Apr. 9, 2021

⁴ “RNA editing protein ADAR1 protects telomeres and supports proliferation in cancer cells,” *MedicalXpress*, Mar. 12, 2021: article details research of Dr. Kazuko Nishikura’s team at The Wistar Institute.

billionaire hi-tech titans in funding the research for such activities. These developments, camouflaged by our current obsession with the pandemic, stand out above all the others in today's human efforts to counterfeit (and eventually surpass) God's plan for human *Life*.

Scientific breakthroughs in this arena (including advances in mRNA technology and related biogenetic areas) are almost daily occurrences and promise to have a profound effect on the futures of my grandchildren—and yours. Acclaimed futurist Jane Metcalfe says younger generations are now standing at the threshold of a “neobiological revolution” where the next phase of the digital revolution combined with developments in biology will alter the human race:

“We are sequencing our genomes, we are mapping our brains, we're harnessing things like DNA and bacteria and viruses and yeast in order to create new species, new opportunities, new energy sources, new drugs ... [and where] doctors delete inherited disorders at their genetic root to spare the suffering of future generations while also curing the diseases of aging and extending life.”⁵

Two recent articles addressing this neobiological revolution and the role of billionaire techno-elites in funding attempts to extend life, are Adam Piore's “Can Blood from Young People Slow Aging? Silicon Valley Has Bet Billions It Will,” in the most recent issue of *Newsweek* magazine (Apr. 2021); and, Andrew Steele's, “The Best Remedy For Our Diseases? Aging Less,” *The Wall Street Journal*, April 9, 2021. Both are well worth the read.

Today, unbeknownst to most of us, three important trends are converging that will influence life's longevity for almost all of us. First, an exponential growth in pandemic-related research activities is spilling over into other biogenetic, health-related areas. Secondly, during the pandemic over the last year or so, the number of global billionaires grew by 30 percent (according to *Forbes*' 35th annual ranking, 660 such individuals joined the category over the last year—the total swelling to 2,755—with 495 being first-timers).⁶ Simply put, there are more people with more money than ever before, and willing to spend it on projects designed to extend their own lives. And finally, an explosive growth in the number of *geroscience* health start-ups signal a change in thinking about the process of aging and some of the most intractable diseases facing mankind (the term *geroscience* here focuses on identifying beneficial elements of blood that dissipate as we age and others that accumulate and cause damage).⁷ One of these firms, *Alkahest*, has identified more than 8,000 proteins in the blood that show potential promise as therapies.⁸

As a result, *in our lifetime*, well-funded hi-tech titans of the Silicon Valley, Beijing, Shenzhen, and Tel Aviv (among others) have joined the human longevity hunt and are racing to cure aging itself. As Piore observes: “Their goal is to hack the process of aging itself and, in the process, delay or stave off the onset of many of the diseases most associated with growing old ... [they have] a newfound confidence that ‘aging’ can be measured, reverse-engineered and controlled.”⁹

⁵ Carolyn Abraham, “The Biological Revolution Is More Than Just Impossible Hamburgers,” *Zoomer*, July 2, 2019.

⁶ See, among others, Michael Snyder, “The Number Of Billionaires In America Has Absolutely Exploded During The Pandemic,” *The Economic Collapse*, Apr. 8, 2021.

⁷ Adam Piore, “Young Blood.”

⁸ *Ibid.*

⁹ *Ibid.*

The economic benefits to be derived from such a quest—if successful—are beyond my wildest imagination. Even now, billionaire tech titans around the world are placing their hopes in future novel therapies and gadgets aiming to upgrade the human operating system—which they regard as a machine running on bio-algorithms—at the level of cells, DNA and now mRNA.¹⁰ Among the recent advances: a method to create human replacement tissues with a 3D printer;¹¹ reducing the time and cost of decoding DNA and mRNA (what formerly took years of research can now be achieved for a fraction of time and cost);¹² nanorobots constructed out of DNA strands that can be programmed to deliver drugs to specific targets; and, frighteningly, biohackers who can use readily available data to decode DNA and mRNA (using a massive treasure trove of bio-data from smartphones, *Fitbits*, workout machines and wearable devices). Cloud computing now stores this data and it is being manipulated by artificial intelligence (as I discuss in other writings).

Of course, there are important ethical concerns with the latest fusion of billionaire funds and biogenetic research activities. Perhaps this is best illustrated by a recent episode of the popular television series *Silicon Valley* featuring a well-heeled dotcom billionaire who had his own “blood boy” following him around to provide on-demand transfusions.¹³

What does all this mean on a personal level?

A few days ago, I drove back to Springboro, Ohio to visit my aging parents. Like most people, I tend to view my parents the way they were 20 or 30 years ago, when they were more vibrant, independent and healthy. Now, my dad is 93 years-old and has settled for a sedentary lifestyle: sitting home in his living room easy-chair watching westerns on television. Of course, John Wayne movies are his favorite. But most of the time, because of the regime of medicines he takes every day, dad sleeps in the chair (usually with a firm grip on the channel changer). Bed sores and associated infections have become major challenges. As many of you know, my dad is a former WWII-era Marine and was a picture of health well into his 80s, playing pick-up games of basketball at least twice a week. He still drinks as much as three gallons of whole milk per week and has never had a beer, cigarette or soda.

John Thompson, legendary basketball coach of the Georgetown Hoyas, once said that “age is an undefeated foe.” My dad is a case in point. These days, dad’s ankles are swollen like pumpkins, in large part, because he refuses to walk or exercise as he should. Dad has short-term memory loss and is being treated with the same medicine they use to treat Alzheimer’s patients. We are thankful for his insurance and a county health program that sends nurses to the house twice weekly to bath dad and check on his condition.

Only two things are sure to get dad out of his chair these days: a family game of cards in the kitchen or a morning trip to nearby *Mom’s Restaurant*—a hangout for Kentucky basketball fans and local farmers—for some eggs, sausage, biscuits and gravy.

Observing my dad closely these days is causing me to think long-and-hard about the difference between *existing* and *living* as one enters the so-called *golden years*.

¹⁰ Abraham, “The Biological Revolution.”

¹¹ Biomedical engineers at the University of Utah announced late in 2018, they could use stem cells from a patient’s own body fat, then grow them in specific patterns on hydrogel, to 3D print custom tendons, ligaments and spinal discs for human implantation. Cited in Abraham, “The Biological Revolution.”

¹² *Ibid.* In 2000, it cost \$3 billion to unravel a human genome, within five years the cost is expected to fall to less than \$100.

¹³ Piore, “Young Blood.”

During my previous visits back home, we would take dad over to Aunt Martha's—his nonagenarian sister—for a card game of hand-and-foot. Unfortunately, Aunt Martha passed in December 2018. But while she was alive, as was their custom, dad and Aunt Martha would sit together hand-in-hand and talk about events and personalities from their youth in vivid detail, some that happened over 80 years ago. Yet my dad cannot remember if he took a pill ten minutes previously.

The human mind is so amazing!

Let me interject here that all the Akers are avid card players. Family lore has it that my paternal grandfather and his brothers had enough Native American blood (Cherokee tribe) to qualify for land in Oklahoma during the land rush. So, they collected all their money and entrusted the family fortune with their youngest brother to go out west and participate in the land rush itself. On the train ride to Oklahoma, he was flimflammed in a poker game and lost all the brothers' money.

So much for our family's brush with wealth and fame!

But back to my dad. My point is, that because dad took such good care of his body during his youth, he could easily live another 10-15 years in his present physical-mental limbo.

What about my mom? She also has been remarkably healthy. She is now 91 years old, but in recent months has had knee surgery and a broken wrist as a result of a fall in the bedroom. Before that, she suffered a fractured hip after a fall in the kitchen. As dad's health has deteriorated, she has taken on the role of dad's 24-7 primary caregiver. Mom consistently resists any advice to put dad in a nursing home: he is too big, and stubborn, for her to handle at times. Simply put, the demands of being a constant provider for dad is wearing her out. Her character is more suited to singing and teaching Sunday School at local churches—the more Pentecostal the better—or walking up to the local donut shop to testify about her Lord.

Because she is tending to dad, she hasn't done either one for a long time.

Mom would thrive in a nursing home environment: it would suck the life out of dad.

At any rate, both my parents have defied the odds. As Andrew Steele observes in his essay: "Every year that you're alive, your risk of dying increases by 10%. This starts out innocuously enough: In your 30s, your odds of death in any given year are less than one in 1,000. But compounding 10% per annum starts to add up frighteningly quickly: By age 90, if you're lucky enough to make it that far, your odds of not making your 91st birthday are roughly one in six."¹⁴ Worldly statisticians call my parents *lucky*: I call them *blessed*.

If you would ask my mom about human longevity, she would say that it is good we grow old, frail and eventually die, "lest we fall in too much love with the things of this world." Mom's logic in this regard is the exact opposite of what is happening today among the globe's wealthiest elites. Today, there is a growing cadre of these technological elites pursuing a well-funded, and very real, quest to extend human longevity and, to achieve immortality itself. The motivation for these twin endeavors, it seems to me, is twofold: human hubris (these elites believe they are uniquely essential to mankind's future and, as such, their lives must be prolonged); and, secondly, they aspire to use human-based technological means to alter God-ordained life constraints. Perhaps the website of the *Coalition for Radical Life Extension*¹⁵ says it best: "The

¹⁴ Andrew Steele, "The Best Remedy For Our Diseases? Aging Less," *The Wall Street Journal*, Apr. 9, 2021.

¹⁵ *The Coalition for Radical Life Extension* is an Arizona-based non-profit organization that was founded in 2016, by James Strole, a wealthy American real-estate investor. The organization seeks to galvanize mainstream support

deathist paradigm has to go ... It's time to look beyond the past of dying to a future of unlimited living.”¹⁶

My parents are hardly alone. The U.S. population, in particular, is aging. By 2035, older people will outnumber people under 18 for the first time in American history, according to the U.S. Census Bureau. Last year, for the first time, there are more people on Earth over the age of sixty-five than under the age of five.¹⁷

Many of my more conspiracy-minded friends view the ongoing pandemic as a tailor-made opportunity to reverse this demographic surge: the need to develop, rationalize, and support by mass information techniques a “natural” disease that targets the elderly—whom many elites regard as no longer useful and as human sponges soaking up an inordinate amount of human resources. This economic utilitarian mindset, (especially when combined with the insatiable desire of bureaucrats, authoritarians and high-tech titans to control our lives as well as a diminishing respect for the God-ordained value and dignity of human life), gives us a troubling glimpse into the future.

Even if you think I may be going a bit too far here, one fact is indisputable: we are all looking at the uncomfortable prospects of a rapidly graying world.

However, one huge obstacle the technocrat-elites are bucking in their quest for longevity and immortality is the conventional wisdom that human beings have a definite expiry date—not to exceed 120 years. In my college classrooms, I frequently refer to this so-called *Hayflick Limit*. The term dates back to 1961, when gerontologist Leonard Hayflick, at the University of California, showed that human skin cells grown under laboratory conditions tend to divide approximately 50-70 times before they become *senescent* (no longer able to divide).¹⁸

The prevailing theory prior to Hayflick's research was that normal cells are immortal.

There are at least 20 startups trying to transfer *senolytics* (therapies to combat cell senescence) from the lab to the clinic.¹⁹ Human trials are beginning. Recently, the NIA, under its director, Richard Hodes, plans to spend about \$100 million over the next five years on basic research aimed at understanding “cellular senescence.”²⁰

As early as the mid-80s, Elizabeth Blackburn—who won a Nobel Prize in 2009 for her work in genetics—and her colleagues discovered that the “clicking clock” in cells were *telomeres* (as I noted before, repetitive DNA sequences at the end of chromosomes which protects them from degrading). With every cell division, the telomeres get shorter and, in turn, the cells become senescent.

For that reason, much of the recent anti-aging research centers on *telomerase*, the enzyme that adds nucleotides to the telomeres. Telomerase is a reverse transcriptase enzyme that carries its own RNA molecule which is, in turn, used as a template when it elongates telomeres. These

for for science that might one day significantly prolong human life and claims thousands of “early-adopting advocates.”

¹⁶ Quote is from Alex Moshakis, “How to live forever: meet the extreme life-extensionists,” *The Guardian*, June 23, 2019.

¹⁷ See, among other reports, Andrew Zaleski, “Why Jeff Bezos is backing this Silicon Valley scientist who is working on a cure for aging,” *CNBC*, August 29, 2018.

¹⁸ Senescent cells are those that have stopped dividing and secrete proinflammatory factors that suppress the normal mechanisms of cellular repair and create a toxic environment for their neighbors. For a discussion of the prospects that a new class of anti-aging drugs—senolytics—may treat such cells, see Piore, “Young Blood.”

¹⁹ Steele, “The Best Remedy.”

²⁰ Piore, “Young Blood.”

enzymes are active in normal stem cells and most cancer cells but are normally absent in somatic cells. In April 2018, the structure of telomerase was discovered through cryo-electron microscopy by UC Berkeley scientists. Telomerase allows each offspring to replace the lost bit of DNA allowing the cell line to divide without ever reaching the *Hayflick limit*.

That is the good news. The bad news is that this same unbounded growth is a feature of cancer cells.

But that is not the entire story. Within the human body, most cells do not simply senesce, they are repaired, cleaned or replaced by stem cells. Your skin degrades as you age because your body cannot carry out its normal functions of repair and regeneration.²¹

The bottom line: Hayflick's limit has stood the test of time. The longest verified lifespan in recent history was Jeanne Calment of France (1875-1997) who lived to the age of 122 years, 164 days.²² Kane Tanaka is currently the oldest living person at 118 years of age. Japan's graying population is home to most of the world's oldest humans: as of February 2018, there were 69,000 people over 100 years old (9,000 men, 60,000 women).²³

A final note on this section: "Aging causes 85% of deaths in the U.S. but receives just 6% of government health research funding—substantially less than research into diseases like cancer and Alzheimer's that aging causes."²⁴ Sigh.

²¹ "Lust for life: breaking the 120-year barrier in human ageing," *The Conversation*, June 3, 2013.

²² In recent weeks, several media accounts have challenged Calment's age claims. She also was somewhat of a medical marvel, reportedly a chain smoker until reaching 117 years old. See Moshakis, "How to live forever."

²³ Emiko Jozuka, "World's oldest person dies at 117," *CNN*, July 27, 2018.]

²⁴ Steele, "The Best Remedy."