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L'usage de tout système électronique ou informatique est interdit dans cette épreuve.

Rédiger en anglais et en 500 mots une synthèse des documents proposés, qui devra obligatoirement comporter un titre. Indiquer avec précision, à la fin du travail, le nombre de mots utilisés (titre inclus), un écart de 10 % en plus ou en moins sera accepté.

Ce sujet comporte les 4 documents suivants :

- un extrait d'un essai de Yuval Noah HARARI publié en septembre 2016 sur le site *openthemagazine.com* ;
- un extrait d'un article de Sam SHEAD publié sur le site de la chaîne de télévision américaine *CNBC*, le 21 septembre 2021 ;
- un extrait d'un article d'Andrea CHANG publié dans *Los Angeles Times*, le 22 février 2024 ;
- un dessin de Ben JENNINGS publié sur le site de *The Guardian*, le 12 septembre 2021.

L'ordre dans lequel se présentent les documents est arbitraire et ne revêt aucune signification particulière.

OPEN

The Last Days of Death

By Yuval Noah HARARI, *openthemagazine.com*, 08 September 2016

IN THE TWENTY-FIRST century humans are likely to make a serious bid for immortality. Struggling against old age and death will merely carry on the time-honoured fight against famine and disease, and manifest the supreme value of contemporary culture: the worth of human life. We are constantly reminded that human life is the most sacred thing in the universe. Everybody says this: teachers in schools, politicians in parliaments, lawyers in courts and actors on theatre stages. The Universal Declaration of Human Rights adopted by the UN after the Second World War—which is perhaps the closest thing we have to a global constitution—categorically states that 'the right to life' is humanity's most fundamental value. Since death clearly violates this right, death is a crime against humanity, and we ought to wage total war against it.

Throughout history, religions and ideologies did not sanctify life itself. They always sanctified something above or beyond earthly existence and were consequently quite tolerant of death. Indeed, some of them have been downright fond of the Grim Reaper. [...]

Modern science and modern culture have an entirely different take on life and death. They don't think of death as a metaphysical mystery, and they certainly don't view death as the source of life's meaning. Rather, for modern people death is a technical problem that we can and should solve.

How exactly do humans die? Medieval fairy tales depicted Death as a figure in a hooded black cloak, his hand gripping a large scythe. A man lives his life, worrying about this and that, running here and there, when suddenly the Grim Reaper appears before him, taps him on the shoulder with a bony finger and says, 'Come!' [...]

In reality, however, humans don't die because a figure in a black cloak taps them on the shoulder, or because God decreed it, or because mortality is an essential part of some great cosmic plan. Humans always die due to some technical glitch. [...]

An increasing minority of scientists and thinkers consequently speak more openly these days, and state that the flagship enterprise of modern science is to defeat death and grant humans eternal youth. Notable examples are the gerontologist Aubrey de Grey and the polymath and inventor Ray Kurzweil (winner of the 1999 US National Medal of Technology and Innovation). In 2012 Kurzweil was appointed a director of engineering at Google, and a year later Google launched a sub-company called Calico whose stated mission is 'to solve death'. [...]

Such dreams are shared by other Silicon Valley luminaries. PayPal co-founder Peter Thiel has recently confessed that he aims to live forever. 'I think there are probably three main modes of approaching [death]: he explained. 'You can accept it; you can deny it or you can fight it. I think our society is dominated by people who are into denial or acceptance, and I prefer to fight it.' Many people are likely to dismiss such statements as teenage fantasies. Yet Thiel is somebody to be taken very seriously. He is one of the most successful and influential entrepreneurs in Silicon Valley with a private fortune estimated at $2.2 billion. The writing is on the wall: equality is out—immortality is in. [...]

The breakneck development of fields such as genetic engineering, regenerative medicine and nanotechnology fosters ever more optimistic prophecies. Some experts believe that humans will overcome death by 2200, others say 2100. Kurzweil and de Grey are even more sanguine. They maintain that anyone possessing a healthy body and a healthy bank account in 2050 will have a serious shot at immortality by cheating death a decade at a time. [...]

In truth they will actually be a-mortal, rather than immortal. Unlike God, future superhumans could still die in some war or accident, and nothing could bring them back from the netherworld. However, unlike us mortals, their life would have no expiry date. [...]

Coming back to the realm of reality, it is far from certain whether Kurzweil's and de Grey's prophecies will come true by 2050 or 2100. My own view is that the hopes of eternal youth in the twenty-first century are premature, and whoever takes them too seriously is in for a bitter disappointment. [...]

Nevertheless, every failed attempt to overcome death will get us a step closer to the target, and that will inspire greater hopes and encourage people to make even greater efforts. Though Google's Calico probably won't solve death in time to make Google co-founders Sergey Brin and Larry Page immortal, it will most probably make significant discoveries about cell biology, genetic medicines and human health. [...]

Hence even if we don't achieve immortality in our lifetime, the war against death is still likely to be the flagship project of the coming century. When you take into account our belief in the sanctity of human life, add the dynamics of the scientific establishment, and top it all with the needs of the capitalist economy, a relentless war against death seems to be inevitable. [...]

The scientific establishment and the capitalist economy will be more than happy to underwrite this struggle. Most scientists and bankers don't care what they are working on, provided it gives them an opportunity to make new discoveries and greater profits. Can anyone imagine a more exciting scientific challenge than outsmarting death—or a more promising market than the market of eternal youth? [...]

CNBC

Silicon Valley's quest to live forever could benefit humanity as a whole — here's why

By Sam SHEAD, *CNBC's* technology correspondent in London, September 21, 2021

All things must die, according to the poet Alfred Lord Tennyson, but that could be about to change.

A growing number of tech billionaires have decided they want to use their enormous wealth to try to help humans "cheat death."

Amazon's Jeff Bezos, Alphabet's Larry Page, Oracle's Larry Ellison and Palantir's Peter Thiel are just a few of the super-rich who have taken a keen interest in the fast-emerging field of longevity, according to interviews, books and media reports.

While breakthroughs are far from guaranteed, they hope that various medicines, therapies and other life science technologies will enable humans to live well beyond 100 years old and possibly to 200, 300, or even longer.

But are their efforts going to benefit humanity as a whole or just an elite few? It's a tricky question that divides opinion.

"Technologies that initially are only affordable to the rich typically become more widely available with time," Stefan Schubert, a researcher at the London School of Economics and Political Science who specializes in 'effective altruism', told CNBC. Indeed, this is true of everything from air travel to smartphones and medicine.

Tech investor Jaan Tallinn, the co-founder of Skype, told CNBC that Silicon Valley's quest to live forever will eventually benefit humanity as a whole.

"I think involuntary death is clearly morally bad, which makes the quest for longevity a morally noble thing to engage in," Tallinn said. [...]

Tallinn added that he thinks it's "counterproductive" to require that a new service be available to everyone before anyone is allowed to use it, but he said he understands the instinct.

Sean Ó hÉigeartaigh, co-director of Cambridge University's Center for the Study of Existential Risk, told CNBC that many advances in longevity science could have broad benefits, adding that they could reduce the occurrence or severity of older age-related diseases including dementia and heart health.

[...]

Some are concerned that the Earth's finite resources could come under strain if people live longer, healthier lives.

However, by the time meaningful life extension advances are made, Ó hÉigeartaigh expects population numbers to be more stable in more parts of the world thanks to progress in women's empowerment and other factors.

"The challenges of our unsustainable resource footprints will need to be addressed long before science solves aging," Ó hÉigeartaigh added. "We have many more pressing things to worry about than the risks of life extension, such as climate change in the coming century."

While some believe that billionaires should be able to spend their money on what they see fit, not everyone thinks tech billionaires should be using their money to fund life extension research.

Jon Crowcroft, a computer science professor at Cambridge University, told CNBC they'd be better off pump-

ing more of their billions into climate change mitigation technologies instead of longevity research.

"It's a bit pointless living forever on a dying planet," said Crowcroft.

But Tallinn told CNBC he finds the tech billionaire's efforts to support longevity research "commendable."

"I think it's generally unfair to pit good causes against each other in a world where most resources are wasted on morally unimportant or even reprehensible things," Tallinn said.

Bezos, the second richest man in the world behind Elon Musk, has invested some of his $199 billion into a new "rejuvenation" start-up called Altos Labs, according to a report from MIT Technology Review earlier this month.

[...]

Meanwhile, Google founders Sergey Brin and Larry Page helped launch Calico, a secretive venture that's tracking mice from birth to death in the hope of finding markers for diseases like diabetes and Alzheimer's, according to a report in The New Yorker. Calico is part of Alphabet, the holding company that also owns Google.

One of the biggest advocates for life extension among the tech billionaires is Thiel, who co-founded PayPal and Palantir. [...]

In 2006, he donated $3.5 million to support anti-ageing research through the non-profit Methuselah Mouse Prize foundation. "Rapid advances in biological science foretell of a treasure trove of discoveries this century, including dramatically improved health and longevity for all," he said at the time. Thiel had upped his investment in Methuselah Mouse Prize foundation to $7 million by 2017, according to Time.

According to The New Yorker, Thiel and Bezos have both invested in San Francisco-based Unity Biotechnology, a company whose founder reportedly said he wants to "vaporize [1] a third of human diseases in the developed world."

On the other side of the Atlantic, British billionaire Jim Mellon told CNBC last September that he was planning to take Juvenescence, his own life extension company, public in the next six to 12 months.

It's yet to happen, but Juvenescence is continuing to invest in a wide range of anti-ageing therapies that it thinks have the potential to extend the human life.

[...]

Los Angeles Times

Can money conquer death? How wealthy people are trying to live forever

By Andrea CHANG, *Los Angeles Times*, February 22, 2024

Peter Diamandis, a week away from turning 63, bounds out of a Starbucks on a recent morning with a cup of decaf [and] his daily medley of 70 supplement capsules in his pocket. [...]

The serial entrepreneur is in the standard uniform of serial entrepreneurs: jeans, sneakers, fitted black T-shirt, Apple Watch, Oura Ring and puffer vest, the back of which says, "Life is short ... until you extend it."

"I woke up at 6. I meditated for 15 minutes [...]." Diamandis says as he makes his way up Wilshire Boulevard. "Went through my dental protocol. Did push-ups and sit-ups and squats. And then came here."

"Here" is a sixth-floor doctor's office in Santa Monica, where the XPrize founder has been coming every few weeks to undergo therapeutic plasma exchange. The $7,500 procedure involves removing blood, running it through a machine to separate out the plasma and replace it with albumin and saline, and then returning the replenished blood to the body.

"I'm basically giving myself an oil change," Diamandis says once he's hooked up, a large-gauge needle poking out of each arm, deep red blood flowing in both directions. He'll be here for the next three hours.

Therapeutic plasma exchange is typically done to treat a number of diseases, but as far as Diamandis knows — and he has gone to great lengths to know — he is in excellent health. Instead, he's using it prophylactically as part of the $120,000 he spends every year to live as long as possible.

He is hardly alone in the pursuit. The eternal quest to delay or even conquer death has reached new levels of fascination in recent years, spurred by a growing number of researchers studying the aging process and major investments in the field from billionaires including Jeff Bezos, Larry Page, Sergey Brin, Peter Thiel and Sam Altman.

The anti-aging movement has also gotten a boost — and a fair share of ridicule — from extreme tales of rich immortality biohackers such as Los Angeles multimillionaire Bryan Johnson, who claims that death is no longer inevitable. The 46-year-old tech entrepreneur follows an audacious $2-million-a-year "don't die" plan [...] in an attempt to turn back his biological clock.

Longevity is the medical frontier and lifestyle fad of the moment, but it remains a hotly debated and controversial topic within the scientific community.

1. To vaporize : to eliminate, to disintegrate

Although human lifespan has more than doubled since the early 1900s — life expectancy at birth is now about 73 years globally — it is unclear whether any of the buzzy treatments widely marketed today will amount to a meaningful increase in quantity and quality of life down the line. Skeptics criticize much of the remedies being peddled as scientifically unproven and nothing more than hype and false hope.

There are also moral questions at play and a basic philosophical disagreement over whether aging should be considered a disease that can be reversed — and, if so, what that even means. Without aging being defined as an illness, longevity treatments face a murky regulatory path with the FDA.

"The promise and the potential are transformative, and I really do think we're going to see a revolution in health because of longevity medicine," said Mitchell Lee, a molecular geneticist and chief executive of Ora Biomedical, a biotech firm focused on developing therapies to help people live longer, healthier lives. "The cold water to splash on the face is we are not there yet. We don't know of any single intervention that improves healthy lifespan". [...]

Diamandis has become a prominent spokesman for the industry and an investor in it, directing a third of his $600-million venture fund, Santa Monica-based Bold Capital Partners, into longevity and other health-related startups.

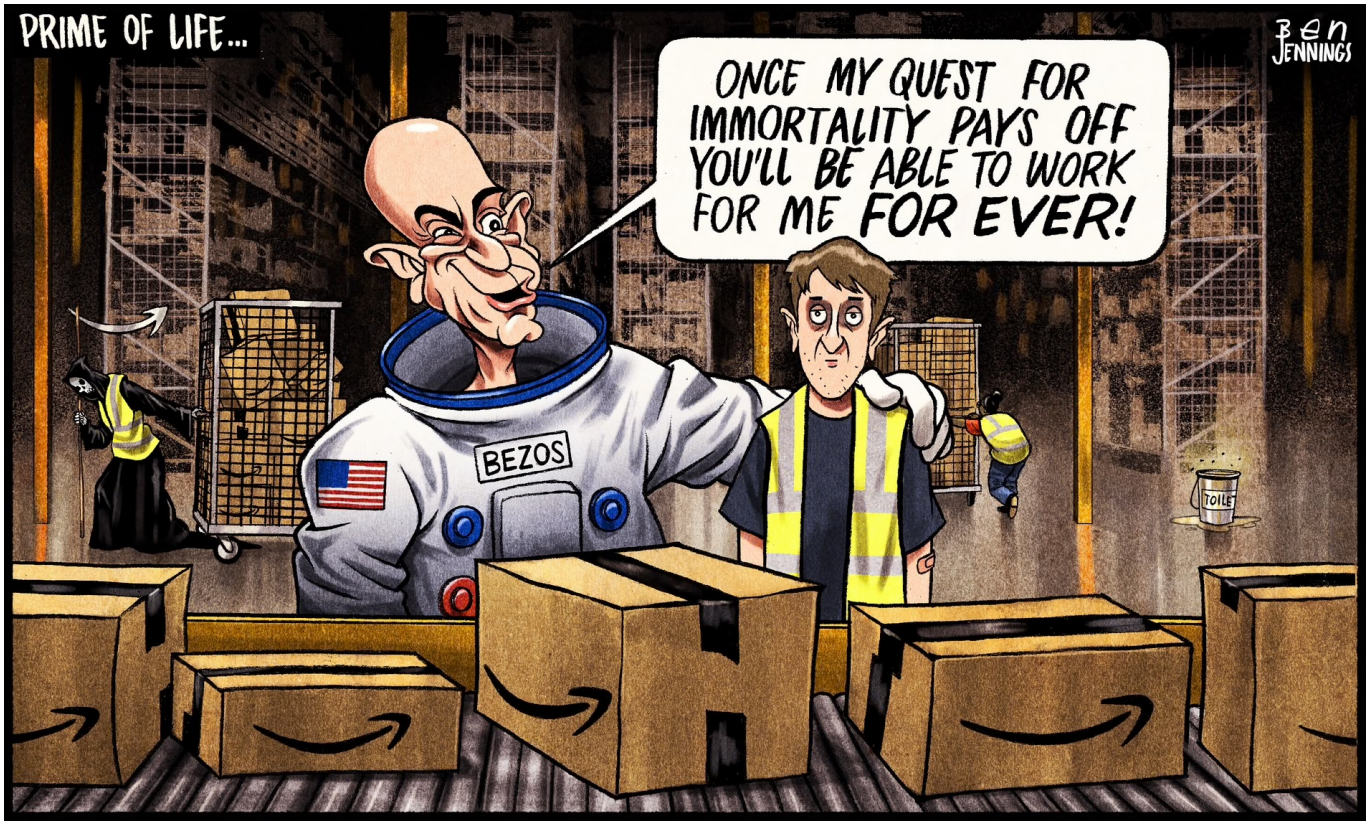
[...]

And as a technologist who has started more than 25 companies, most of them in the space, health-tech and education industries, he sees humans making enormous leaps in the near future and doesn't want to miss out. In particular, he believes we are getting close to "longevity escape velocity," a theory embraced by immortalists that posits that, at some point, scientific breakthroughs will extend a person's remaining life expectancy by more than a year for every year that they stay alive.

"Going to the moon, going to the asteroids, seeing humanity spread itself through the solar system — I want to witness and participate," he says over the gentle whirring of the plasma exchange machine as a team of doctors and nurses monitor his vitals [...].

Diamandis is the first to acknowledge his live-long goal is not altogether altruistic. Longevity, he said over lunch at the Casa Del Mar hotel in Santa Monica in April (grilled fish, steamed veggies, shot of olive oil at the end), is "the biggest business opportunity on the planet."

[...]



"Jeff Bezos's Quest for Immortality"

By Ben JENNINGS, published in *The Guardian*, September 12, 2021

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