

Lumosity targets mental process

Exercises to keep brain lively are not just for the aging

Los Angeles Times

Some of those seeking a mental recharge are surprisingly young. At 28, Lucas Mills has just entered Yale Law School after taking a year off to surf, explore the computer graphics industry and knock around Los Angeles.

"You can notice differences in performance, especially when you go from college to the real world, where you're not as stimulated every day," Mills said. "With the specter of law school looming, I decided I had to do better."

A friend introduced Mills to an online cognitive exercise program called Lumosity, commercially launched this summer.

Lumosity presents a range of exercises that target different mental processes that decline with age, including working memory, speed of processing and attention.

The program was designed to address the needs of the baby-boom-and-older demographic, and its makers have conducted small-scale clinical trials of its effectiveness on this group. But they've found since its launch that the program has gained a devoted audience of twenty- and thirty-somethings as well.

"It was a nice little tuneup," said Mills, who enjoyed the lively graphics of Lumosity's games and that its program allows a subscriber to track his improvement and advance to more challenging levels.

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navigate the other path, toward ripe old age.

Regardless of how Grandma and Grandpa died, it's a good idea to be realistic. Death comes to all. Without dwelling on morbidity, people can eat right, exercise and do what they can to remain as healthy as possible.

"There are people who don't manage to think about death at all. They might pay a price," says Dr. Robert Butler, president of the International Longevity Center and Pulitzer Prize-winning author of "Why Survive: Being Old in America." "You don't want to spend your life morbidly thinking about your old age and death. But you want some sort of balance between that and total blind faith."

A stark reminder often comes when parents die. "That's a call to arms in the reality of life and death," Butler says. "You see yourself as the next in line." The best shot at a long and healthy life is to live the healthiest lifestyle possible in the time you've got left. Better now than never. "No sense crying over spilt milk," Butler says. "It's never too late to start. Take the stairs. Modify your diet."

Every age has its angst, from the agony of the teenage pimple on prom night to the stressful demands of young adulthood, to the onslaught of wrinkles and the need for that first pair of reading glasses, then the aches and pains that inevitably pile on with the decades.

What's inside the head is another matter. "Only the shell grows old," Fordyce says. "In mind and spirit, you feel the same inside."

Bennish says she has "this magical number inside me. It's 27," she says. These days, the acting parts she gets are godmother, grandmother and a character in American Girls Revue known as "White Braids." But when she's on her bike, her inline skates or her hour long walks, she still feels 27.

Walker bought an airplane in 1935 before he ever owned a car, became a military flight instructor during World War II and a civilian flight instructor later, raised two sons, ran a pawnshop, survived colon cancer and a robbery beating, and is now studying classical guitar. He is living the long life he always believed was in the cards.

Robust and youthful lives for 1,000 years

What if the only certainty is taxes?

By JOEL GARREAU
The Washington Post

WASHINGTON — Aubrey de Grey may be wrong but, evidence suggests, he's not nuts. This is a no small assertion. De Grey argues that some people alive today will live in a robust and youthful fashion for 1,000 years.

In 2005, an authoritative publication offered \$20,000 to any molecular biologist who could demonstrate that de Grey's plan for treating aging as a disease — and curing it — was "so wrong that it was unworthy of learned debate."

Now mere mortals — who may wish to be significantly less mortal — can judge whether de Grey's proposals are "science or fantasy," as the magazine put it. De Grey's much-awaited "Ending Aging: The Rejuvenation Breakthroughs That Could Reverse Human Aging in Our Lifetime" has just been published.

The judges were formidable for that MIT Technology Review challenge prize. They included Rodney Brooks, then director of MIT's Computer Science and Artificial Intelligence Laboratory; Nathan Myhrvold, former chief technology officer of Microsoft; and J. Craig Venter, who shares credit for first sequencing the human genome.

In the end, they decided no scientist had succeeded in blowing de Grey out of the water. "At issue is the conflict between the scientific process and the ambiguous status of ideas that have not yet been subjected to that process," Myhrvold wrote for the judges.

Well yes, that. Plus the question that has tantalized humans forever. What if the only certainty is taxes?

Dodging death has long been a dream.

In "It Ain't Necessarily So," Ira Gershwin writes:

*Methus'lah lived nine hundred years
Methus'lah lived nine hundred years
But who calls dat livin' when no gal'll give in
To no man what's nine hundred years.*

Aubrey David Nicholas Jasper de Grey, 44, recently of Britain's Cambridge University, advocates not myth but "strategies for engineering negligible senescence," or SENS. It means curing aging.

With adequate funding, de Grey thinks scientists may, within a decade, triple the remaining life span of late-middle-age mice. The day this announcement is made, he believes, the news will hit people like a brick as they realize that their cells could be next. He speculates people will start abandoning risky jobs, such as being police officers or soldiers.

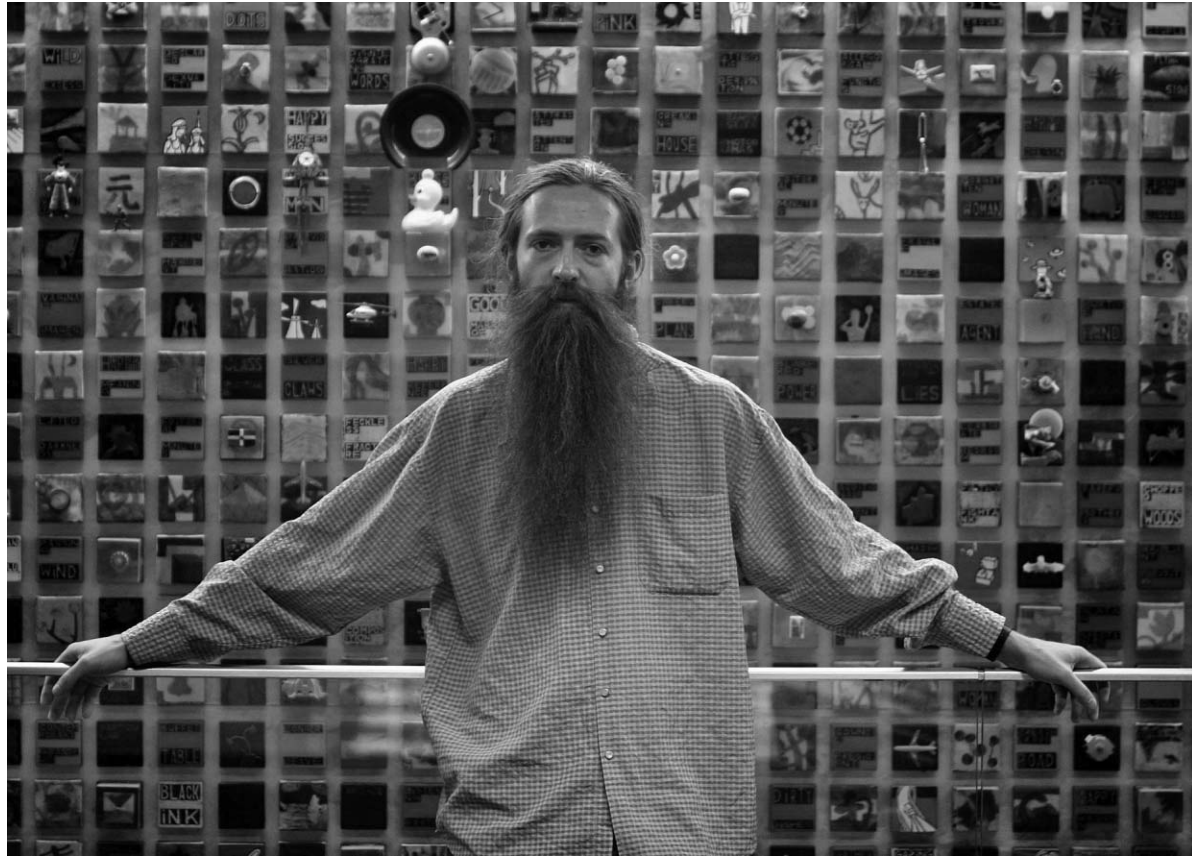
De Grey's looks are almost as striking as his ambitions.

His slightly graying chestnut hair is swept back into a ponytail. His russet beard falls to his belly. His mustache — as long as a hand — would have been the envy of Salvador Dali.

A little over six feet tall and lean — he weighs 147 pounds, the same as in his teen-age years — de Grey shows up in a denim work shirt open to the sternum, ripped jeans and scuffed sneakers, looking for all the world like a denizen of Silicon Valley.

Not far from the mark. De Grey's original academic field is computer science and artificial intelligence. He has become the darling of some Silicon Valley entrepreneurs who think changing the world is all in a day's work. Peter Thiel, the co-founder and former CEO of PayPal — who sold it in 2002 for \$1.5 billion, pocketing \$55 million himself — has dropped \$3.5 million on de Grey's Methuselah Foundation.

"I thought he had this rare combination — a serious thinker who had enough courage to



LOS ANGELES TIMES

Biologist Aubrey de Grey argues that some people alive today will live in a robust and youthful fashion for 1,000 years. De Grey, shown here at San Francisco's airport, created the Methuselah Foundation to support scientific research extending the lifespan by, oh, 900 years.

break with the crowd," Thiel says. "A lot of people who are not conventional are not serious. But the real breakthroughs in science are made by serious thinkers who are willing to work on research areas that people think are too controversial or too implausible."

The future

At midday in George Washington University's Kogan Plaza off H Street NW, you are surrounded by firm, young flesh. Muscular young men saunter by in sandals, T-shirts and cargo shorts. Young blond women sport clingy, sleeveless tops, oversize sunglasses and the astounding array of subtle variations available in flip-flops and painted toenails.

Is this the future? you ask de Grey.

"Yes, it is precisely the future," he says. "Except without people who look as old as you and me."

"Of course the world will be completely different in all manner of ways," de Grey says of the next few decades. His speech is thick, fast and mellifluous, with a quality British accent.

"If we want to hit the high points, number one is, there will not be any frail elderly people. Which means we won't be spending all this unbelievable amount of money keeping all those frail elderly people alive for like one extra year the way we do at the moment. That money will be available to spend on important things like, well, obviously, providing the health care to keep us that way, but that won't be anything like so expensive. Secondly, just doing the things we can't afford now, giving people proper education and not just when they're kids, but also proper adult education and retraining and so on.

"Another thing that's going to have to change completely is retirement. For the moment, when you retire, you retire forever. We're sorry for old people because they're going downhill. There will be no real moral or sociological requirement to do that. Sure, there is going to be a need for Social Security as a safety net just as there is now. But retirement will be a periodic thing. You'll be a journalist for 40 years or whatever and then you'll be sick of it and you'll retire on your savings or on a state pension, depending on what the system is. So after 20 years, golf will have lost its novelty value, and you'll want to do something else with your life. You'll get more retraining and education, and go and be a rock star for 40 years, and then retire again and so on."

The mind reels

Will we want to be married to the same person for a thousand years? Will we need religion anymore? Will the planet fill to overflowing?

But first — why are these questions coming up now? And why are we listening to answers from Aubrey de Grey?

Aging consists of seven critical kinds of damage, according to de Grey. For example, unwholesome goo accumulates in our cells. Our bodies have not evolved means quickly to clean up "intracellular aggregates such as lipofuscin." However, outside our bodies, microorganisms have eagerly and rapidly evolved to turn this toxic waste into compost. (De Grey made this connection because he knew two things: Lipofuscin is fluorescent and graveyards don't glow in the dark.)

By taking soil samples from an ancient mass grave, de Grey's colleagues in short order found the bacteria that digest lipofuscin as easily as enzymes in our stomachs digest a steak. The trick now is getting those lipofuscin-digesting enzymes into our bodies. That has not yet been done. But, de Grey says, comparable fundamental biotechnology is already in clinical use fighting diseases such as Tay-Sachs. So he sees it as merely an engineering problem.

Examples like this make up the 262 pages at the center of "Ending Aging."

By 2005, his ideas had attracted enough attention as to no longer be merely controversial. De Grey was being pilloried as a full-blown heretic.

"The idea that a research programme organized around the SENS agenda will not only retard ageing, but also reverse it — creating young people from old ones and do so within our lifetime, is so far from plausible that it commands no respect at all within the informed scientific community," wrote 28 biogerontologists in the journal of the European Molecular Biology Organization. Their recommendation: more of the patient, basic scientific research that is their stock in trade.

"Each idea that we decide to pursue will cost years of work and a great deal of money, so we spend a lot of time — at meetings, seminars and in the library — trying to search for and weigh alternatives, and looking for loopholes in our chain of arguments before they are pointed out to us either by peer reviewers or experimental results.

"Presented by an articulate, witty and colourful proponent, a flashy research agenda might catch the eye of a journalist or meeting organizer who is hunting for attention, publicity and an audience; however, the SENS agenda is easily recognized as a pretence by those with scientific experience.

Put up or shut up

"Why not simply debate with de Grey and let the most convincing arguments win? It is ... our opinion that pretending that

such a collection of ill-founded speculations is a useful topic for debate, let alone a serious guide to research planning, does more harm than good both for science and for society."

The resulting uproar was followed by the put-up-or-shut-up smack-down in MIT Technology Review. The upshot was intriguing.

"In our judgment none of the 'refutations' succeeded," Myhrvold, one of the judges, writes in an e-mail.

"The 'refutations' were either ad hominem attacks on de Grey, or arguments that his ideas would never work (which might be right, but that is what experiments are for), or arguments that portions of de Grey's work rested on other people's ideas. None of these refute the possibility that he is at least partially correct.

So beyond the question of whether immortality is feasible, is it a good idea?

Why is it, when you bring up the idea of living forever — even if robust and healthy, not drooling on your shoes — some people just recoil viscerally?

"It's probably the majority that recoils viscerally," de Grey says. "It's what I call the pro-aging trance.

"Since the beginning of civilization, we have been aware that aging is ghastly and that aging is utterly inevitable. ... So we have two choices. Either we spend our lives being preoccupied by this ghastly future or we find some way to get on with our miserably short lives and make the best of it.

"If we do that second thing, which is obviously the right thing to do, then it doesn't matter how irrational that rationalization might be. ... It could be, well, we're all going to go to heaven. Or it could be, we're going to have overpopulation. Or it could be, it will be boring. Or, dictators will live forever.

"It doesn't matter what the answers are. It's so important for them to maintain their belief that aging is actually not such a bad thing, that they completely suspend any normal rational sense of proportion."

But if people don't die, won't we indeed fill the planet shoulder to shoulder?

"The birthrate is going to have to go down by an order of magnitude," de Grey acknowledges. "But even if that is going to be a severe problem, the question is not, do problems exist? The question is, are they serious enough to outweigh the benefits of saving 100,000 lives a day? That's the fundamental question. If you haven't got an argument that says that it's that serious that we shouldn't save 30 (bleeping) World Trade Centers every (bleeping) day, don't waste my time. It's a sense of proportion thing."

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"root problems" of age-related memory lapses: The brain begins to filter out distractions more poorly and so takes note of incoming information — whether street signs or the name of a new acquaintance — more slowly and less clearly.

Mahncke of Posit Science says that if the notion of brain fitness is to take hold — and the market is to grow — companies will have to establish their scientific credibility by conducting clinical trials with their products. Working with the University of Southern California's Andrus Gerontology Center, Posit Science has just completed the recruitment of 524 subjects to participate in a trial of its Brain Fitness program in those older than 65.

"This is a fast-moving field," Mahncke said. And companies — some with the participation of neuroscientists, some without — are making sweeping claims that are "just so much hot air" until they have been demonstrated in well-run studies, he adds.

In the meantime, customers are paying their money and taking their chances, on the argument that some organized program of mental stimulation — even imperfect — is better than enduring the slippage of mental acuity without a fight.