Immortality Quest Holds Enduring Allure

Scientists, faithful hope to tap into Fountain of Youth as Skeptics Scoff

By PATTY REINERT

HOUSTON – Miller Quarles has spent 84 birthdays on the planet, and he loves his life.

The Cal Tech-trained geophysicist, self-made millionaire and father of three loves his bridge-playing, his karate exercises, his daily match at the Fondren Tennis Club. He still drives. He still works.

And, of course, the sex is still good.

"Viagra? Don't need it," he brags. "Normally, I get out of bed with one girlfriend, have lunch with one and play tennis with another.

"Most older people I talk to, they've made out their wills and they're generally just waiting around to die," he says. "I have enjoyed my life so much, and I'm in excellent health. I want to live."

To clarify: Miller Quarles doesn't just want to live. He wants to live forever. And he's offering a $100,0000 reward for the scientist who finds the "cure" for what he considers the disease of old age. After all, he says, the Galapagos turtle lives to be 200. "We ought to be able to do as good as a turtle."

Now, a growing number of researchers and futurists insist we can.

They predict that within the next 20 years, there will be an injectable anti-aging drug that will stop – maybe even reverse – the aging process. Death, the most adamant say, will become optional.

Other scientists, of course, dismiss that claim as the same sort of quackery that has inspired men to graft goat testicles to their own in hopes of maintaining r=virility and prompted others to drink disgusting concoctions of mashed-up monkey parts in a fruitless quest for the elixir of youth.

But even the most skeptical agree that in the next millennium, living to 100 will become routine, and with rapid advances in medical research and technology, many people will remain in excellent health throughout their lives.

“We’re all living under a death sentence, whether we like it or not, but we are getting to the point where most of the people alive on Earth today will live as long as they want to,” says Ben Bova, author of numerous science-fiction books and a new non-fiction book *Immortality: How Science is Extending Your Lifespan and Changing the World.* “Most of the people on Earth today will not age.”

“No way,” counters Dr. Jim Smith, co-director of the Huffington Center on Aging at Houston’s Baylor College of Medicine.

“It’s a good thing Ben Bova is a science-fiction writer and not a scientist,” says Smith, who has devoted the past 30 years to the study of aging. “He may believe what he’s saying, but there’s a big difference between belief and knowledge.””

Biological clock identified

Yet just last year, researchers in Dallas, collaborating with the California biotechnology firm Geron Corp., announced that they had identified the body’s elusive “biological clock” and had figured out a way to keep it ticking, using what they call an “immortalizing enzyme.”

Las month, Drs. Jerry Shay and Woodring Wright, professors of cell biology and neuroscience at the University of Texas Southwestern Medical Center, reported in the journal Nature Genetics they have no kept their immortalized cells dividing more than 220j generations past their normal lifespan.

Other researchers theorize that aging is the result of unstable molecules called free radicals that bombard cells and damage them, eventually weakening the whole body. Taking vitamins C and E, as well as beta-carotene, could help rid the body of free radicals, they say.

Others are studying whether people can live longer by drastically reducing the amount of food they eat, and still others are investigating what role hormones such as SHEA, melatonin and human growth hormone play in the aging process.

While none of the research has produced a definitive answer to the aging question, scientists using a variety of methods have succeeded in extending the life spans of fruit flies, worms and mice in the laboratory.

Many researchers no believe that the human lifespan, once thought to be fixed at about 120, may not be fixed at all. Even the most conservative concede that if there is a maximum life span, its ceiling could eventually be pushed to 150.

So far, a French woman named Jeanne Calment holds the record for the longest human life: She died in 1997 at the age of 122.

But she may not keep the record long. Average U.S. life expectancy at birth has increased from 47 in 1900 to about 76 today, thanks to control of infectious disease, improved prenatal care and gains in workplace and automobile safety.

Numerous recent advances

With recent advances in heart medication and surgery, early detection and aggressive treatment of cancer and increases in the number of people eating healthier, exercising and giving up smoking, the fastest growing segment of the elderly U.S. population is now the so-called "old-old," those 75 and up. And while centenarians were extremely rare in 1900, there are now about 61,000 Americans who have reached their 100th birthdays. By the middle of the next century, there will be an estimated 600,000 of them in the United States alone.

Many people – especially baby boomers experiencing firsthand the burden of caring for aging parents and grandparents – view the demographic projections with dread. They see a future where more and more sickly elderly will be wasting away their final years in nursing homes. The thought of extending life is cruel, they say, because it would deny suffering people the relief of death and bankrupt those trying to care for them.

Even if people would no longer age and would therefore be spared the aches and pains, not to mention the heart disease, cancer, diabetes and blindness that often f=come in later years, they could still be vulnerable to Alzheimer's and other age-related mental health problems, says Nancy Wilson, a social worker at Baylor's Huffington Center. Then those with withering minds could be hopelessly and forever trapped in bodies that won't die.

"Aging is not a disease. It's part of the whole of life," Wilson says. "I don't want to have a whole society of people stuck in midlife. I think our society needs people who have slowed down and have the time to reflect on life."

Environmentalists in turn worry that immortality would wreak havoc on a planet already straining under the weight of overpopulation. Where would we put all these extra people?

Quarles, among others, suggests that instead of "throwing old people away" after investing a lifetime in nurturing and educating them, society should work on preventing unwanted pregnancies.

"It's easy for a young person to say, 'you're old and you're taking up space. You've lived your life and you need to die and get out of the way,'" Quarles says. "I'm a live and I have worked hard to take good care of myself. I'm not a burden on anybody. Why should I have to die to make room for someone who wasn't even wanted in the first place?"

Vibrant centenarians

Quarles and Bova, and thousands life them, dream of a world with healthy, vibrant centenarians, whose vast life experience and wise counsel would propel society into a time where age has no meaning, a future where multiple generations interact and work together, where a person could try multiple careers, see the entire world or – eventually – the universe.

“WE won’t be sitting on our porches in our rockers waiting for t=death to come,” Bova says. “We’ll be learning to SCUBA dive and studying to become an astronaut or a concert violinist.”

Immortality, of course, would change everything about the way people live and they way they value, or don’t value, life, he says. But rather than dooming the fragile planet, immortal humans would have every incentive to save it.

Take global warming, for instance.

“Once you realize you’re gong to be around for that, maybe you’ll do something about it,” Bova says.

“Some religious people get mad at me for thwarting God’s plan, but I tell them, if God wants you, you’ll go,” he adds. “People are always saying that scientists are playing God. Of course they are. That’s what scientists do.

“From the moment a caveman picked up a piece of bark and started chewing on it to make his stomachache feel better, humans have been trying to play God,” he says. “We change the natural order of things.”

Shay and Wright are working on that right now. Their studies focus on telomeres, the ends of chromosomes that have been likened to the protective plastic tips on the ends of a shoelace. As cells divide, the telomeres fray and shorten. Eventually, the body recognizes the shortened nubs as damaged DNA and signals the cells to stop dividing and die.

The only cells that continue dividing forever, and are therefore immortal, are reproductive cells and cancer cells. Shay and Wright concluded early last year that a natural enzyme, telomerase, in those cells prevents the ends of the chromosomes from fraying, allowing the cell to divide indefinitely.

A switch to stop cancer

Switching "off" telomerase in abnormal cells could stop cancer, they theorize. Switching it "on" in normal cells could stop aging. Because most major diseases come in later years, stopping aging could also stop many types of illness.

But critics of their research begged the question: If telomerase is found in cancer cells, does telomerase *cause* cancer?

Last month, a year after their original research was published, Shay and Wright announced they had used telomerase to force cells that normally divide 75 to 80 times to continue to divide more than 200 times. The cells have remained young and vigorous and likely will continue dividing forever, they say. More important, Shay and Wright claim they have answered the doubters: The cells have not become cancerous.

"Cancer is life a runaway car," Shay says. "The gas pedal's stuck the brakes don't work, the tank is full of gas and the steering wheel has just come off in your hands. What we've shown is that telomerase is just fuel in the tank. It adds fuel to the car, but the brakes still work, you can steer, you're in control of the car."

Other researchers are studying whether eating a diet high in nutrients but low in calories would increase longevity.

The theory's most ardent proponent is anti-aging guru Roy Walford, who has succeeded in extending the life span of mice in his California lab. He conducted preliminary experiments on humans while serving as the doctor for the Biosphere 2 project, an ecological laboratory stet up in the Arizona desert as a prototype space station.

Walford and seven others spent two years sealed inside the small ecosystem and consumed a tightly controlled diet of about 1,800 calories a day. All lost weight and exhibited the same physiological changes that Walford's rodents did on a similar diet, including decreases in blood sugar and cholesterol.

Many have dismissed the Biosphere 2 findings as scientifically invalid, but Walford's theory is gaining momentum among mainstream researchers.

"It works in rats and macaques, and there is every reason to think that it will work in humans. Bu the question is, are we willing to do it?" asks Dr. Michael Fossel, a Michigan State University professor, editor of the Journal of Anti-Aging Medicine and author of the 1996 book *Reversing Human Aging.*

"Most of us are not willing to stop smoking or fasten our seatbelts or watch who we sleep with so we don't get AIDS, so are we really going to restrict diet to the extreme needed to make us live significantly longer and healthier? I don't know."

Extending 'health span'

Other researchers, including some at the Huffington Center, are focusing not on extending life span, but on extending "health span," the number of years older people will remain healthy and strong.

Their studies on human growth hormone and DHEA could result in effective therapies that, while they wouldn't necessarily prolong life, would make old age much more tolerable by improving people's strength and stamina as they age. The side effects, however, include carpal tunnel syndrome, liver damage and increased cancer risk.

Smith and his colleagues are also working on cellular research they hope could lead to reversing osteoporosis, which makes the bones brittle and often causes elderly people to fall and break their hips.

"It may not be as glamorous," he says, "but it affects a tremendous number of people and speaks to real quality –f-life issues, like, 'Do I have to the to the nursing home?'"

Fossel, like many anti-aging aficionados, is following all of the research but is most hopeful about telomerase.

If it works, it would make the human life span indefinite," he says. "It also could be a blanket cure for cancer.

"I know it's hard to believe right now, but the day will come when your granddaughter calls you up and says, 'I can't meet you in Italy this weekend because my tumor came back but I'll be there on Monday.' And she won't be able to understand why you are so upset to hear that her ovarian cancer is back," he says. "You aren't concerned when you hear the word 'polio,' but your parents would bristle, =. Saying the word 'cancer' to your grandchildren will mean nothing to them."

Shay acknowledges that his research could lead in the near future to a test to determine the presence of telomerase, which would help doctors, =diagnose cancer earlier and begin treating it. A telomerase inhibitor might eventually stop cancer in its tracks, keeping tumors from growing bigger.

The research also could help patients with diabetes by keeping their limited supply of insulin-producing cells dividing indefinitely, eliminating the need for injections.

Biology 'not that simple'

But Smith and other veteran researchers are still as suspicious of telomerase as they are of any other claim that spawns phrases such as "Fountain of Youth" or "blanket cancer cure."

“There’s not a lot of real evidence that they can work the sort of miracles people say it can,” Smith says. “Biology is just not that simple.”

Shay conceded that his research is only one piece of a very complicated aging puzzle.

“There’s no magic bullet, no Holy Grail of aging that all of a sudden is going to make us healthy, wealthy and wise,” he says. “That’s fine for fairy tales, but I work on this every day and I am skeptical. We are beginning to understand, and there are some very valid areas of investigation, but I don’t think we should get too carried away.”

Shay also points out that while there are now more centenarians than ever, there is no documented case of a person living past 122.

“If aging were completely reversible,’ he asks, “wouldn’t someone in all of this time have lived to be 170 or 180 naturally?

“We have not developed a mechanism that would allow us to live forever, and I don’t think we’ll be injecting anything into people in the near future,” he adds. “In my lifetime, though, I do think people will routinely live to 90, and in my kids’ lifetime, people will routinely live to 100 or 110, and we’ll slowly push it up from there.”

Despite his caution, devout futurists cling to telomerase as their best chance of cheating death, and biotechnology and pharmaceutical companies are anxiously watching the research with dollar signs in their eyes.

In his own quest, Quarles, who made his fortune telling Texas oilmen where to drill, put up $50,000 in seed money to start Geron Corp. Nearly a decade ago. The firm is now a world leader in aging research and is sponsoring Shay’s and Wright’s work on telomerase in Dallas.

As Geron was just beginning, Quarles also announced his $100,000 reward for the cure, and has since written to every wealthy, aging person he can think of – including all the former presidents of the United States, and billionaires Ross Perot and Bill Gates – and encouraged them to up the ante. So far, no one has.

And while some gains in anti-aging research have been made, anyone hoping to collect Quarles’ prize had better work fast; it expires in 2000.

“I’m trying to save my own ass,” he admits. “And who wouldn’t According to the charts, I only have about five years to live. The clock is ticking.”

Some might be tempted to dismiss Quarles as a loony old coot with too much money to spend and too much time on his hands. But then, they haven’t seen him slam a tennis ball. Or speed down the Southwest Freeway. Or show off his gem collection. They haven’t seen the “In” boxes and “out” boxes on his office desk in downtown

Houston, labeled “recent articles,” “to do ASAP,” and, the fullest tray, “unfinished business.”

He may be a zealot, but he’s not crazy.

Sincerely hoping for a cure

He’s not all that different from the hopeful cancer patient who keeps up with the latest medical research, or the AIDS sufferer who insists that with enough research dollars, a cure can be found. Who would have believed even five years ago the progress that has been made in AIDS research? Is Quarles any less realistic than those who spend billions each year trying to beat old age with cosmetics or plastic surgery?

Even if he’s wrong about aging being something that can be cured, there’s no doubting the sincerity of his belief.

“Remember,” he says, “they got mad at Galileo, and later he was proved right. You’ll probably live to 200. Start planning on it right now.”

Many people say they don’t want to live forever, Bova says. They say they’ll just let nature take its course. Yet when death inevitably comes knocking, the vast majority will fight it. They’ll submit to chemotherapy, radiation, bypass surgery, dialysis, insulin injections. Some will even go so far as to cut out their hearts and transplant them with someone else’s, if only to buy a few more years.

“People don’t want to die,” he says. “Every living this is biologically driven to try to stay alive. Why should old people be any different?”

While Shay and other scientists concentrate on cell cultures in petri dishes, they credit the dreamers with exciting the public about the potential implications of their fledgling research. That excitement, they hope, will bring more funding for their work.

“Maybe I’m just a little more realistic, or maybe they are just more forward-thinking,” Shay says of the futurists. “As a scientist at the bench, I think about all the little individual steps. They are talking about quantum leaps.

“There’s no way they can prove what they’re saying and there is no way I can disprove it. I’m extraordinarily excited about the work we’re doing now, but I can’t think 1,000 years down the road.”

Meanwhile, Bova, who has made his living thinking 1,000 years ahead, has yet to decide how long he would like to live or whether he’d actually sign up for the “cure” if his predictions come true.

“I always say I’d be the second one in line,” he laughs. “I’d like to see if the first person keels over before I take it.”

But Miller Quarles’ resolve is unwavering, and if his hopes are sagging, you can’t see it. When confronted by the doubters, he shrugs in the way one would expect a seen-it-al, heard-it-all octogenarian to do.

“What’s the alternative? Urinating all over the place, losing my teeth, losing the brain? I just don’t want to go out that way,” he says. “If it’s a dream, well, it’s a dream.”

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