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Remember the Six Billion

For millennia we have raged against the dying of the light. Can science save us from that good night?

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Between now and the year 2123 a tragedy of Brobdingnagian proportions will befall humanity, causing the death of more than six billion people. I'm serious.

According to Carl Haub, a demographer at the Population Reference Bureau in Washington, D.C., between 50,000 B.C. and A.D. 2002, about 106 billion people were born. Earth's population is currently around 6.3 billion. Of the approximately 100 billion people born before us, every one has died. To the extent that the past is the key to the future, that means that within the next 120 years (today's maximum life span), more than six billion humans will suffer the same fate. And there is not a damn thing we can do about it. Or is there?

For most of our history, humans could turn only to prayer and poetry to help cope with this reality. Today we are offered scientific alternatives--if not for immortality itself, then at least for longevity of biblical proportions. All have some basis in science, but none has achieved anything like scientific confirmation. Here is a short sampling, from the almost sublime to the near ridiculous:

Virtual immortality. According to Tulane University physicist Frank J. Tipler, in the far future we will all be resurrected in a virtual reality whose memory capacity is 10 to the 10¹²³ bytes. If the virtual reality were good enough, it would be indistinguishable from our everyday experience. Boot me up, Scotty. One problem, among many, is that Tipler's resurrection machine requires so much energy that the universe must one day collapse, which present data show is not going to happen.

Genetic immortality. Oh, those pesky telomeres at the ends of chromosomes that prevent cells from replicating indefinitely. If only we could genetically reprogram normal cells to be like cancer cells. Alas, this is no solution, because biological systems are so complex that fixing any one component does not address all the others that play a role in aging.

Cryonics immortality. Freeze. Wait. Reanimate. It sounds good in theory, but you're still a corpcicle. And when your tissue is thawed, your cells will be mush. Don't forget to pay the electric bill in the meantime.

Replacement immortality. First we replace our organs (which today are often rejected), then our cells and molecules nano-a-nano (not yet technologically feasible), eventually exchanging flesh for something more durable, such as silicon. You can't tell the difference, can you?

Lifestyle longevity. Because this is a goal we can try to implement today, the hucksters are out in force offering all manner of elixirs to extend life. To cut to the chase, S. Jay Olshansky, Leonard Hayflick and Bruce A. Carnes, three leading experts on aging research, have stated unequivocally in the pages of this magazine

that "no currently marketed intervention--none--has yet been proved to slow, stop or reverse human aging, and some can be downright dangerous" ["No Truth to the Fountain of Youth," *Scientific American*; June 2002].

It has never been satisfactorily demonstrated, for example, that antioxidants--taken as supplements to counter the deleterious effects of free radicals on cells--attenuate aging. In fact, free radicals are necessary for cellular physiology. Hormone replacement therapy, another popular antiaging nostrum, helps to counter short-term problems such as loss of muscle mass and strength in older men and postmenopausal women. But the therapy's influence on the aging process is unproved, and the long-term negative side effects are unknown.

As a lifelong cyclist, I am pleased to report that proper diet and sufficient exercise are tried-and-true methods of increasing the length of your life. These, along with modern medical technologies and sanitation practices, have nearly doubled the average lifetime over the past century. Unfortunately, this just means that more of us will get closer to the outer wall of 120 years before inexorably succumbing to the way of all flesh.

As 20th-century English poet Dylan Thomas classically admonished, "Do not go gentle into that good night .../Rage, rage against the dying of the light." Rage all you like, but remember the six billion--and the 100 billion before. Until science finds a solution to prolonging the duration of healthy life, we should instead rave about the time we have, however fleeting.

Michael Shermer is publisher of Skeptic (www.skeptic.com) and author of How We Believe.