

Where Is Thy Sting? [Life extension & other interventions]

By NICHOLAS D. KRISTOF

sst. Wanna live to the age of 600?

This may not be as absurd a question as it sounds. Genetic medicine is making enormous strides, and it may hold the promise — or maybe it's the peril — of eventually making us something closer to immortal.

"Our life expectancy will be in the region of 5,000 years" in rich countries in the year 2100, predicts Aubrey de Grey, a scholar at Cambridge University. (This is, of course, a great prediction to make because none of us will be around in 2100 to mock him if he's wrong.)

At a moment when we're all fretting about whether we'll be blown up tomorrow by nuclear terrorists, it may seem odd to worry instead that we'll someday survive forever. But just to give you something new to bite your lip about, let me tell you about roundworms. Roundworms are ideal specimens for geneticists to play with because they grow old and die in less than three weeks. By tinkering with two genes, scientists have produced roundworms that live six times as long as normal. The catch is that the worms are unusually sluggish — imagine the globe as a nursing home for sluggish Methusalehs.

Other research on aging concerns human cells. Scientists generally think there is a natural constraint, the Hayflick limit, on how many times such cells can divide in tissue culture before they decay and die. But some work indicates that human cells given a copy of the telomerase gene can divide indefinitely, a step toward immortality on a cellular scale.

"The high priests of our secular age, the molecular biologists, have begun to address mortality in a way no group, no generation and no society has ever dreamed of before," Stephen Hall writes in his new book, "Merchants of Immortality."

Sure, our organs may give out. But scientists are now breeding special kinds of pigs that may be able to grow replacement hearts and lungs — and one day pigs will grow human hearts and lungs, with human DNA, not their piggy equivalents.

"Immortality, in many mythologies, is the defining difference between gods and mortals and, even if the myths are incorrect, not an attribute to be assumed lightly," notes my Times colleague Nicholas Wade in his fascinating book "Life Script." "Would one dare do anything so risky as carouse, drive a car, hit the ski slopes, if three hundred years of life would be thereby imperiled?"

It feels as if we are drifting along toward new genetic technologies without thinking through where we are headed, without an adequate regulatory structure and without enough scientific education so citizens can make well-informed decisions. Life extension is not everything, after all. Near-starvation and castration both bring unusual longevity, but few of us choose either option.

Congress has still not gotten around to banning human reproductive cloning (partly because the bill that would do that goes too far). But the fundamental questions that we face in genetics go far beyond cloning.

"We've evolved now so that we can master our own evolution," said Charles Cantor, chief scientific officer at a gene discovery company called Sequenom. "I don't think we have the wisdom to manage it, but we have the tools."

What does it mean that we humans could master our own evolution?

Consider dogs. DNA tests show that all modern dogs evolved from wolves and were initially bred by cavemen who knew nothing about the genome. Yet the dogs were rapidly transformed into everything from toy poodles to Great Danes. If we begin to reshape our own genetic code, we could presumably achieve even greater variation among our human descendants.

Partly I'm worried because I lived in China in the early 1990's when a much more modest technology, ultrasound scans, became widely available. Used properly by doctors, ultrasound machines can save lives, but in China they were used to find out fetuses' sex so females could be aborted. Now one-sixth more boys are born in China than girls.

We are now blundering in a similar way toward genetic manipulations, a technology that we should embrace — but prudently. It will reshape humanity far more than fire, electricity, space exploration or any other branch of science we have encountered. We might remember the wisdom of Odysseus, who was offered immortality by a luscious goddess, Calypso, but turned her down to grow old and die with his wife, Penelope.