

NATURAL SELECTIONS

AGE-OLD ISSUES

Can we be forever young?

By ROWAN HOOPER

Jeanette Winterson's latest novel, "The Stone Gods," is set in the future on a distant planet whose resources have been over- exploited by colonizing humans.

In Winterson's world people can genetically "fix" themselves at whatever age they please. What age would you choose to stay at forever?

In the novel, most women fix themselves at around age 20, and never get physically older. Most men fix a bit older, though some fix as late as in their 40s, and go for the mature/wise look.

Some women, pandering to some men's Lolita complexes, want to genetically reverse themselves to appear physically as if they are 12-year-olds.

Of course, we're nowhere near being able to stop the aging process, much less prevent death — but already we are becoming skilled at concealing the signs of aging.

In most contemporary cultures, youth and beauty are highly valued traits, and if you ain't got 'em you're almost certain to spend a decent proportion



A brewer in Neuzelle, Germany pours his Anti-Aging Bier with added seaweed and minerals AP PHOTO

of your time and money trying to appear like you have.

Even for the young and beautiful, the costs of maintenance, and staving off the inevitable aging, are significant. It's why so many people spend so much on cosmetics and fashion, and why advertisers spend billions persuading us — in language carefully chosen to suggest antiaging benefits without making overly confident claims — to buy their products.

Many of the products in this vast antiaging market have dubious benefits, and that's putting it mildly. Some, however, do seem to work, at least in tests on animals (mostly insects and mice).

Two methods appear to be most promising: antioxidation techniques, and dietary restriction. Artificial selection can increase lifespan too, and as we'll see, it works in butterflies (though obviously this isn't the sort of thing it's a good idea to do with humans).

Japanese longevity

Antioxidants are found in many foods, from red wine to tea and oranges. They are hyped because most of the damage in an aging cell is done by oxygen free radicals, and antioxidants can mop these up. The more antioxidants in your diet, the thinking goes, the slower you will age — but this conclusion is by no means certain. It may be one of the reasons why the Japanese live for a long time (the soya in miso soup and tofu is a rich source of antioxidants, as is green tea).

Some backing for the lifespan benefits of antioxidants comes this week from a study on *Rhodiola rosea*, a yellow-flowered plant from mountainous parts of Asia. Soviet scientists gave it to cosmonauts, because the herb boosts the body's response to stress.

Flies that were fed a diet rich in extracts of this flower lived 10 percent longer than normal. Since the herb is already used for stress relief, it will certainly now become the subject of research for

antiaging effects in humans.

"Our results reveal that *Rhodiola rosea* is worthy of continued study, and we are now investigating why this herb works to increase lifespan," said Mahtab Jafari, a professor of pharmaceutical sciences at the University of California, Irvine, who led the study.

Anything that contains antioxidants may be touted for possible antiaging properties. Bear in mind, however, that even if something works, it will only slow the effects of aging, not stop them. Also, it seems that you need to consume huge amounts to have any effect.

To achieve more radical lifespan returns you'll have to do something that to my greedy mind doesn't really make extra life worth living: starve yourself.

The reason this works, from an evolutionary point of view, is that if the body is starving it's unlikely to be able to reproduce successfully, so it's better to prolong life to give more chance for reproduction. In the journal *The American Naturalist* this week, scientists show that it is easy to increase lifespan by selecting animals that are resistant to starvation.

Jeroen Pijpe and colleagues at Leiden University in the Netherlands used artificial selection to achieve the lifespan-boosting effect in butterflies. In the wild, caterpillars that find themselves growing up in warm weather, in the dry season, turn into butterflies that are long-lived and more starvation resistant. Those growing up in the wet season, when it is cooler, become butterflies primed to quickly reproduce before expiring.

The team bred butterflies that were starvation resistant but were also primed to reproduce. The female butterflies switched from laying many small eggs to laying a few large, well stocked ones. In other words, just like what happens in humans in Japan and in other developed countries, the females started producing a few high-quality offspring instead of a greater quantity of offspring whose individual chances of successful survival were lower.

Researchers' wildest dreams

"We targeted genes that are needed to live longer," says Pijpe, who thinks that the same mechanisms will work in humans.

Finding those genes and doing anything with them, however, is a very long way off.

If it could be achieved, then the wildest dreams of longevity researchers might finally be realized. It might lead to a way in which we could get the longevity benefits of not eating very much — but without actually having to forgo the pleasures of good food.

Now that would be something worth living for.

The second volume of Natural Selections columns translated into Japanese is published by Shinchosha, priced at ¥1,500. The title is "Hito wa ima mo shinka shiteru (The Evolving Human: How new biology explains your journey through life)."

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