

Lewis Terman's study found that people who were conscientious as children were likely to live longer.

HEALTH

A long, diligent life

A 90-year cohort study hints that personality plays a unexpected part in lifespan, finds Marten Lagergren.

What factors predict a long, healthy and successful life? In 1921, psychologist Lewis Terman at Stanford University in California embarked on an ambitious project to find out. He selected around 1,500 gifted children from schools in the state and followed them from the age of 11 into adulthood, collecting a variety of data to see what might predict later success and accomplishment. Continued after his death in 1956 by other Stanford researchers and still ongoing, Terman's project has become the world's longest-running longitudinal study.

Psychologists Howard Friedman and Leslie Martin have brought the work up to date by painstakingly collecting information on those subjects who have died. Using death certificates, they have determined the length of life and cause of death, opening up a range of new analyses. *The Longevity Project* summarizes their findings on how life circumstances link to health outcomes, albeit for

this select group. Some results are as expected, such as that smoking is bad for longevity. Others turn conventional wisdom on its head.

For example, working hard for long hours in a demanding job to achieve high status is better for your health and life expectancy than taking it easy and lacking ambition. Marriage is a blessing for men more than women; and men suffer more adverse health effects from divorce, perhaps turning to drink or drugs. The authors emphasize the benefits of an active social network — more common for women — as a buffer against life's harmful events. And they are critical of simple health advice, such as to jog or eat less fat, arguing that it is the whole approach to life that is essential, not the details. To give a person a list of health recommendations does not work, they point out, if the person cannot or does not follow them.

For a review of two books on longevity science, see: go.nature.com/kmdesk

Friedman and Martin explore how personality influences lifestyle choices using Terman's meticulous records of the character traits of the children he followed, as noted by parents and teachers. When the children were interviewed as adults 20 years later, the same qualities were evident. The best predictor of a long and healthy life turned out to be conscientiousness — the extent to which a child was prudent, dependable and persistent in the accomplishment of his or her goals.

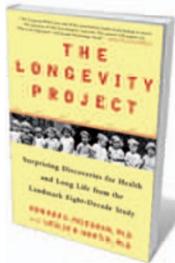
Conscientious people do more to protect their health and are less likely to engage in risky activities such as smoking, drinking or drug-taking, the study found. They also find their way to happier marriages, better friendships and optimum work situations. As a result, they are less likely to die from all causes.

Being physically active as a child is also a predictor of longevity, but only if that activity is maintained into and beyond middle age. The life-years gained by jogging may amount to no more than the time you spend doing it, the authors note. So we needn't all aim to run marathons; rather, we should just maintain an activity that we enjoy.

All this might seem to suggest that our fate is largely determined from childhood, but Friedman and Martin take a more constructive view. We can work with our personality to improve our health, they say, but it takes time for the benefits to accrue. You do not become conscientious overnight. It is the long-term, determined work of adopting and sticking to healthy habits and seeking good social environments and relationships that makes the difference. Later follow-up of Terman's subjects showed that conscientiousness in middle age and later counts almost as much as in childhood.

The authors provide self-tests for readers on a range of health-related factors such as catastrophizing (the tendency to always imagine the worst), life satisfaction, physical activity, marital happiness, job passion and accomplishment, and social-support network. They explain what these factors mean and provide guidance for improving one's lifestyle.

The difference in length of life between men and women has always intrigued epidemiologists and demographers. *The Longevity Project* adds a new twist by suggesting



The Longevity Project: Surprising Discoveries for Health and Long Life from the Landmark Eight-Decade Study

HOWARD S. FRIEDMAN AND LESLIE R. MARTIN
Hudson Street Press/Hay House: 2011.
272 pp.
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that behaviour also influences the longer lifespan of women. In the study, children of either sex who were drawn to masculine careers (those shown by tests to be mostly preferred by men, such as being a mechanical engineer or pilot) had a shorter lifespan than those who preferred more feminine occupations (such as being an interior decorator or working with children). Thus, cultural dimensions may explain why life expectancy for the sexes differs over time and between countries and cultures.

There are caveats to this milestone study. One issue is that it was originally planned for a narrower purpose: to investigate predictions of career success and

failure. Terman picked white pupils with high IQs from San Francisco schools, so the sample is not representative of the wider population. Conclusions cannot be drawn concerning minority groups, educational level, social class or geographic area. The authors do their best to account for these limitations in their analyses.

Another problem is inevitable in any longitudinal study. Terman's subjects, who were born around 1910, had very different lives from ours. Many societal changes have occurred in the past century, particularly in gender roles. Terman's subjects, known as Termites, lived at a time when most women were expected to stay at home. The different life choices available today are likely to result in smaller gender differences in health and longevity.

The Longevity Project focuses mainly on the individual. The role of society in fostering good health and long life is seldom mentioned in the book, except when exposing the failure of current health propaganda. Despite ubiquitous recommendations to eat less and keep fit, obesity rates in the United States and in many other developed countries are soaring. The authors recognize that other studies are badly needed to examine the impacts of public policy on health and to develop more successful approaches. As they show in this excellent book, it will be a difficult task. But it is necessary. ■

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"Children of either sex who were drawn to masculine careers had a shorter lifespan than those who preferred more feminine occupations."



MARK HALETT PALEOART/SPL

Giant ground sloths went extinct some 10,000 years ago, but could provide conservation lessons for today.

CONSERVATION

After the auroch

Emma Marris is gripped by an account of our love–hate relationship with extinct megafauna.

It puzzles me that the many large, now extinct mammals of the Pleistocene Epoch have nowhere near the legions of fans claimed by dinosaurs. Mammals win the popularity contests among existing animals, yet few children can rattle off the weights and dietary habits of the gargantuan North American ground sloth *Megalonyx jeffersonii* or Australia's massive buck-toothed marsupial *Diprotodon optatum*. *Stegosaurus* gets all the love.

One fanciful explanation is that we have an abiding guilt for having killed them all off in our spear-hurling days. And it seems likely that human hunting played some part in many of these extinctions. In *Once and Future Giants*, biologist and journalist Sharon Levy lays out the evidence for this theory — and explores what this species drain can teach us now. The patterns and consequences of the Pleistocene die-offs can help us to predict how landscapes will change if we lose big mammals, and help us to spot warning signs of impending extinctions.

As we hesitantly take collective responsibility for these extinctions, we feel their loss more keenly. Today's 'wild' has diminished along with the megafauna. Spend enough time studying mastodons and moa, and even our most

rugged landscapes begin to look tame and denuded. North America's wolves and grizzlies no longer thrill; Yellowstone Park looks like a petting zoo. "We live in a highly abnormal world," writes Levy, quoting US palaeoecologist David Burney. "We think of ground sloths and saber-toothed cats as peculiar and foreign, but it is the world of our own ancestry, the world our species evolved in."

So, scientists and conservationists who can easily envision the landscapes of 13,000 years ago, just before the late Pleistocene extinctions, find themselves yearning for the past. They are starting to experiment with restoring these landscapes by introducing surrogates to fill long-vacant ecological roles — to graze, to browse, to kill, to knock over trees, even to terrify.

Levy recounts various rewilding experiments. Some have been intentional, such as the Pleistocene Park nature reserve in north-eastern Siberia, where rare native Yakutian



Once and Future Giants: What Ice Age Extinctions Tell Us About the Fate of Earth's Largest Animals
SHARON LEVY
Oxford University Press: 2011. 280 pp.
\$24.95