



阅读空间 · 英汉双语主题阅读

你能长生不老吗?

高中和大学低年级适用

Could You Live Forever?



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庞丽霞 译

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20世纪50年代美国的一部电视喜剧中有这样一段对话：“人人都想有一个长寿且果实累累的一生”，主持人打开了话题。“是啊，是啊，果实是最好的，”2000岁的老寿星插话了，“有一阵，我光靠油桃就活了140年。我最喜欢这种水果了，既像桃，又像李，好一个水果啊。”

也许还没有人确切知道长寿的秘诀，但大概不会是油桃。关于减缓衰老延长寿命，科学家们已经并继续在努力探索着。研究人员发现，动物身上的某些基因比其他基因更直接地影响着它们的生命期限。比如，通过改变蠕虫的某种基因，它们的寿命竟然比正常的伙伴长出6倍！如果应用到人类身上，意味着人的寿命可能延长到500岁！研究人员还发现了一种技术，能够使人类和动物的细胞在实验碟里永远存活。

科学可以让人类和动物活得更久更健康。但你能长生不老吗？还有，科学能使人活得更快乐吗？



by Karen Hopkin

She took up fencing at age 85 and rode her bike until she was 100. She made her first movie appearance at age 114 and released a rap CD on her 121st birthday.

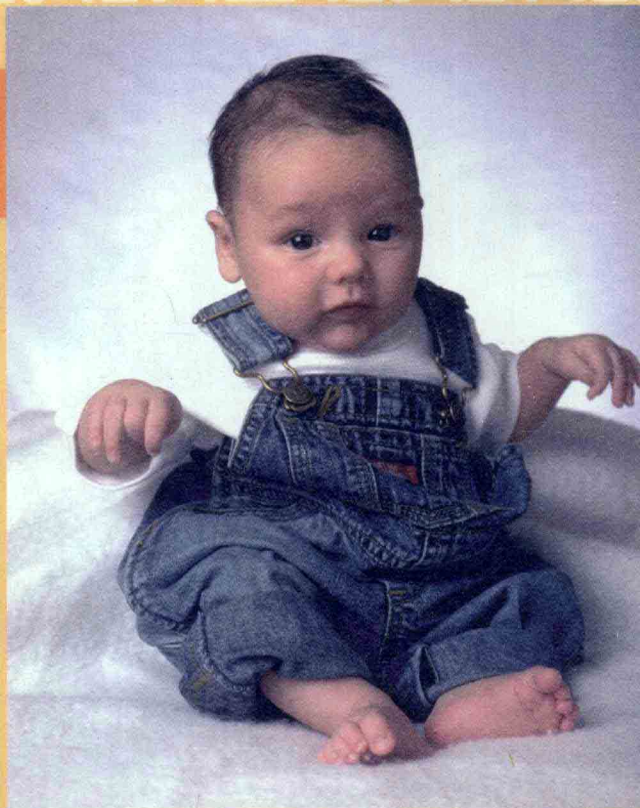
When it comes to long life, Jeanne Calment is the world's recordholder. She was born before Edison invented the light bulb and lived to the ripe old age of 122. When asked the secret of her longevity, Calment guessed that God must have forgotten about her.

Calment died in 1997, and since then no one has broken her record. So is 122 the upper limit to the human life span? Or will people keep living longer and longer? If scientists come up with some sort of pill or diet that would slow aging, could we possibly make it to 150 — or beyond?

Researchers who study the biology of aging have thought about these questions. And they don't entirely agree on the answers.

"When it comes to maximum longevity, everything is speculation," says Jerry Shay at the University of Texas Southwestern Medical Center. "Jeanne Calment lived to 122, so it wouldn't surprise me if someone alive today reaches 130 or 135."

Steve Austad at the University of Idaho agrees. "There's no evidence that there's a limit to human longevity," he says. Experts used to say that humans couldn't live past 110. When people blew past that age, they raised



她在 85 岁的时候开始学习击剑；直到 100 岁还在骑自行车；114 岁时首次在电影中亮相；121 岁生日时发行了一张说唱 CD。

说起长寿，珍妮·卡尔门特是世界纪录保持者。她生于爱迪生发明电灯泡之前，去世时高寿 122 岁。当问及长寿的秘诀时，卡尔门特猜测说，上帝肯定是把她给忘了。

卡尔门特 1997 年去世，后来再没有人打破她的纪录。那么，122 岁是否是人类寿命的极限呢？或者，人是否会越活越长？如果科学家发明某种延缓衰老的药或者食品，我们是否可能活到 150 岁，或者更老呢？

研究衰老生物学的研究人员考虑了这些问题，对于答案，他们还存在一些分歧。

“当涉及人类寿命的上限时，一切都只是一个猜测，”得克萨斯州西南医学中心的杰里·西说，“珍妮·卡尔门特活到 122 岁，所以，如果现

HOW Long CAN PEOPLE LIVE?

the number to 120. Then Jeanne Calment thumbed her nose at that stop sign. So why can't we go higher?

The trouble with guessing how old people can live to be is that, in the end, it's all just guessing. "Anyone can make up a number," says Rich Miller at the University of Michigan. And even a scientist's guess is still a guess. "Usually the scientist who picks the highest number gets his or her name in *Time* magazine."

Technically, there's no "biological limit" to how long people can live, says Jay Olshansky at the University of Illinois. In other words, there's no special set of Death Genes that will switch on when it's time for us to check out. At the same time, animals that mature quickly and start reproducing early, like mice, tend to have shorter lives than animals that take their sweet time growing up, like turtles. Or humans. So people are already pretty long-lived.

In fact, some researchers think that we might already be living as long as we can. Maybe the folks who live to be 100 or more are already doing something to give their longevity a little extra boost, says George Roth, who works at the National Institute on Aging. Without realizing it, these super-old folk could be taking in fewer calories, a treatment that has been shown to slow aging in mice and rats. In that case, says Roth, "120 might be close to the max."

在有人能活到 130 岁或者 135 岁的话，我不会惊讶。”

爱达荷大学的斯蒂夫·奥斯塔德同意杰里·西的看法。“目前没有证据表明人类寿命存在极限，”他说。专家以前说，人类活不过 110 岁。当有人突破这个界限时，他们把这个数字提高到 120。后来，珍妮·卡尔门特又对这个终点嗤之以鼻。我们为什么不能再活得长一点呢？

猜测人到底能活多长，问题在于，最终这仅是猜测而已。“任何人都能够设想一个数字，”密执安大学的瑞彻·米勒说。即使是科学家的猜测也是猜测。“一般来说，选择了最大数字的科学家，他（她）的名字就往往能上《时代周刊》。”

伊利诺斯州大学的杰伊·奥利尚斯基说，人能够活多长，从技术角度讲，没有“生物学的界限”。换句话说，到我们该离开这个世界的时候，并没有一套死亡基因开启。与此同时，有一些动物，例如老鼠，它们很快就能成熟并进入繁殖期，它们的寿命要短于那些慢慢成熟的动物，例如乌龟或者人类。因此，人类的寿命已经算长的了。

实际上，一些研究人员认为我们的寿命可能已经达到极限了。在全国衰老研究所工作的乔治·罗丝说，或许那些百岁老人以及超过百岁的老人做了些什么，增加了自己的寿命。在没有意识到的情况下，这些超级老

人最长能活多长？

But what about all the new antiaging techniques that scientists are chasing? Won't they keep us alive for centuries? Actually, says Miller, any "miracle cure" for aging would probably keep most of us kicking until, oh, about 120. Look at it this way: Researchers right now are working on therapies that extend the life span of mice by 50 percent at most. So, if the average human life expectancy is about 80 years, says Miller, "adding another 50 percent would get you to 120."

So what can we conclude from this little debate? That life span is flexible, but not infinitely flexible, says George Martin of the University of Washington. "We can get flies to live 50 percent longer," he says. "But a fly's never gonna live 150 years." Of course, if you became a new species, one that matures at a different rate, all bets would be off, he adds.

Does Martin really believe that humans could evolve their way to longer life? "It's pretty cool to think about," he says with a smile.

人可能减少热量的摄入,这是为了减缓老鼠老龄化速度的一种治疗方法。在这种情况下,罗丝说:“120可能接近上限。”

但是,科学家新近研究的那些抗衰老的技术又如何呢?它们难道不能让我们活几百年吗?米勒说,任何抗衰老的“神奇治疗”都能够让我们活到,嗯,大约120岁。这样看这个问题:研究人员现在正在研究治疗方法,能够把老鼠的寿命延长50%。因此,如果人均期望寿命为80岁的话,米勒说:“增加50%意味着你可能活到120岁。”

那么,从这场小的争论中,我们可以得出什么结论呢?华盛顿大学的乔治·马丁说,结论便是寿命是灵活的,但不是无限的灵活。“我们可以使苍蝇寿命增加50%,”他说,“但是一只苍蝇永远也活不到150岁。”他又说,当然,如果你变成一个新的物种,一个以不同速度成熟的物种,那就是另外一回事了。

马丁是否真的相信人类可以不断进化,寿命越来越长?“这样想很酷,”他笑着说。

Wanna Bet?

by Karen Hopkin

It's one thing to blow smoke about how long humans can possibly live. But two scientists feel strongly enough about the question to put their money where their mouths are. Last year, Steve Austad and Jay Olshansky placed a bet on whether anyone alive in the year 2000 will still be around in 2150. In other words, will someone alive today live to be 150?

The guys drew up a contract and each put \$150 in a bank account. The winner's heirs will get the cash. With interest over 150 years, the payoff will come to about \$500 million.

Both men believe that for a person to make it to 150, scientists will have to come up with some sort of treatment to slow aging. Can they do it in time?

想打赌吗？

到底能活多久？把这当作谈资是一回事。但是，有两位科学家对这件事十分热衷，以至于掏钱打了一个赌。去年，斯蒂夫·奥斯塔德和杰伊·奥利尚斯基为这个问题下了赌注，即2000年活着的人是否在2150年还会活着？换句话说，现在活着的人是否会活到150岁？

两个人签了一份合同，并在一个银行账户内各存了150美元，赢家的后代届时会得到这笔钱。加上150年的利滚利，这笔钱到期时可达约5亿美元。



Olshansky:
No way.

Even if we developed a technology 10 to 20 years from now, I can't imagine we could slow aging enough to add another 30 years to the human life span. Besides, you'd have to find the right person, someone who will already live to be a supercentenarian. What are the chances you'll find one? This is a no-brainer.

My relatives will be wealthy.

奥利尚斯基：
不可能。

在未来的10~20年之内，我不相信我们能找到一种技术，能有效延缓衰老，足以使目前的寿命再延长30岁。而且，你还得找对人，一个能成为超级百岁寿星的人。你能找到这样一个人的几率是多少？这可不是个聪敏之举。我的亲戚会很富有。



Austad:
Yes way.

Even if the technology is not available for 50 years, there'll still be a bunch of 50-year-olds whose aging we can slow down. Now, more and more people are living to 100. And the more 100-year-olds you have, the more will live to 110. The more that live to 110, the more that will live to 120. For this bet, only one person has to live to 150. That's only about 20 percent more than 122. I think it's a slam dunk.

奥斯塔德：
完全可能。

即使50年内找不到这种技术，但是目前我们还有无数50多岁的人，我们可以减缓他们的衰老速度。现在，越来越多的人能活到100岁。百岁老人越多，就可能有越多的人活到110岁。活到110岁的人越多，就越会有人活到120岁。要赢的话，只要有一个人活到150岁就行了。这仅比122岁长了约20%。我认为这是个十拿九稳的大扣篮（打赌）。

Counting Your Birthday Candles

by Karen Hopkin

You can't know for certain how long you will live. But to give you an estimate, scientists collect information about when people die and use it to figure out the risk of dying at any given age.

The numbers presented in this life-expectancy table are all averages. That means that in a stadium packed full of 10-year-old boys, half will die within 23,449 days – and the rest will live longer.

你无法肯定地知道自己能活多久。但是，科学家为了给你估计出一个大概数字，收集了关于人什么时候去世的信息，并使用这些信息估计在任何给定年龄去世的可能性。

这个寿命预测表中的数字均为平均数，这意味着在一个挤满 10 岁男孩的体育馆里，有一半可能在 23 449 天内死去，而另一半会活得长些。

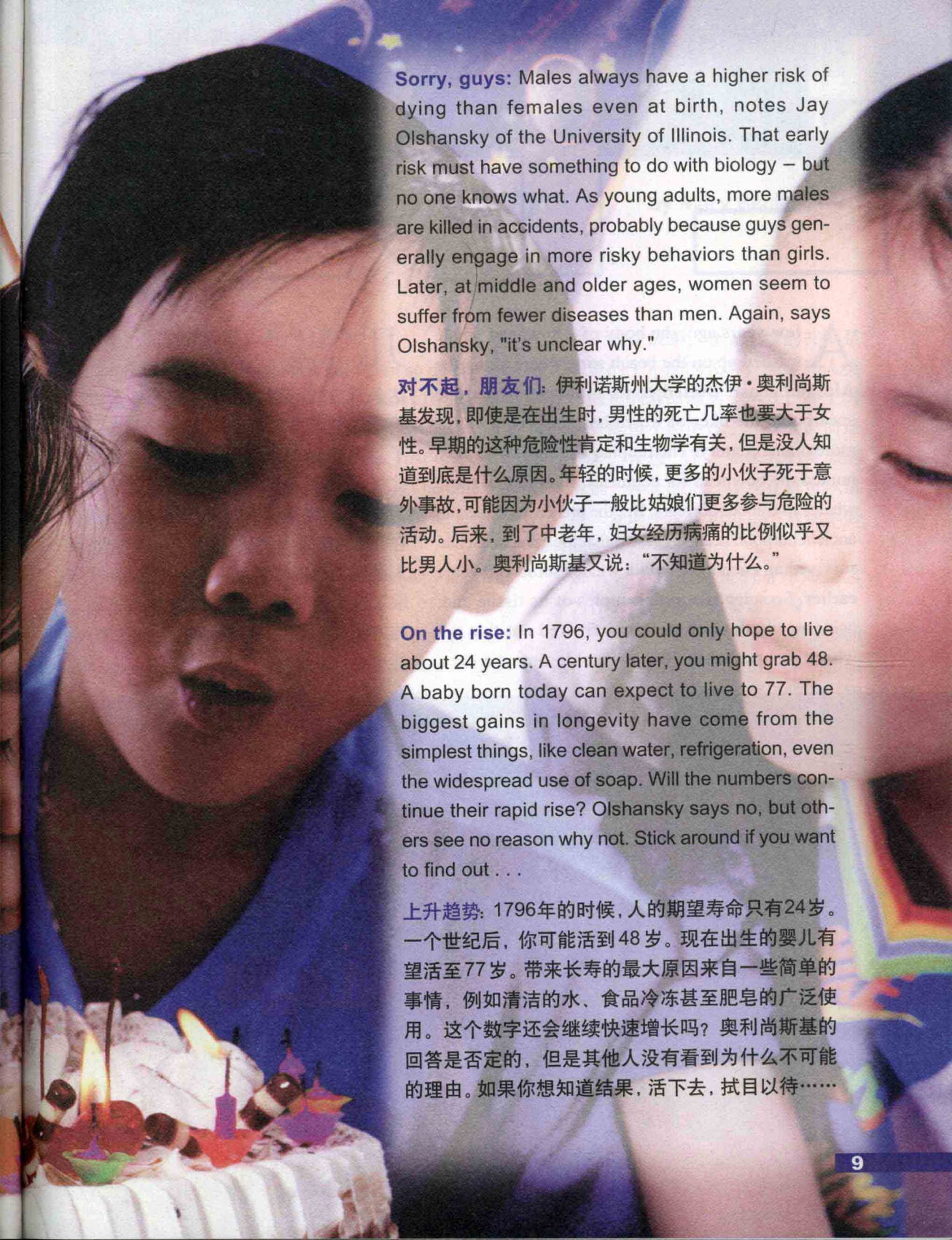
The good

news: Your chance of surviving to your next birthday is 99.9 percent – at least for the next 20 or 30 years. Enjoy!

好消息：你活到下一个生日的几率是 99.9%，至少在以后的 20 年或 30 年间会是如此。好好享受吧！

Males		Females	
Age	Days of Life Remaining	Age	Days of Life Remaining
9	23,814	9	26,006
10	23,449	10	25,677
11	23,084	11	25,312
12	22,719	12	24,947
13	22,353	13	24,581
14	21,988	14	24,216
15	21,659	15	23,851
16	21,294	16	23,486

数一下你的生日蜡烛



Sorry, guys: Males always have a higher risk of dying than females even at birth, notes Jay Olshansky of the University of Illinois. That early risk must have something to do with biology – but no one knows what. As young adults, more males are killed in accidents, probably because guys generally engage in more risky behaviors than girls. Later, at middle and older ages, women seem to suffer from fewer diseases than men. Again, says Olshansky, "it's unclear why."

对不起，朋友们：伊利诺斯州大学的杰伊·奥利尚斯基发现，即使是在出生时，男性的死亡几率也要大于女性。早期的这种危险性肯定和生物学有关，但是没人知道到底是什么原因。年轻的时候，更多的小伙子死于意外事故，可能因为小伙子一般比姑娘们更多参与危险的活动。后来，到了中老年，妇女经历病痛的比例似乎又比男人小。奥利尚斯基又说：“不知道为什么。”

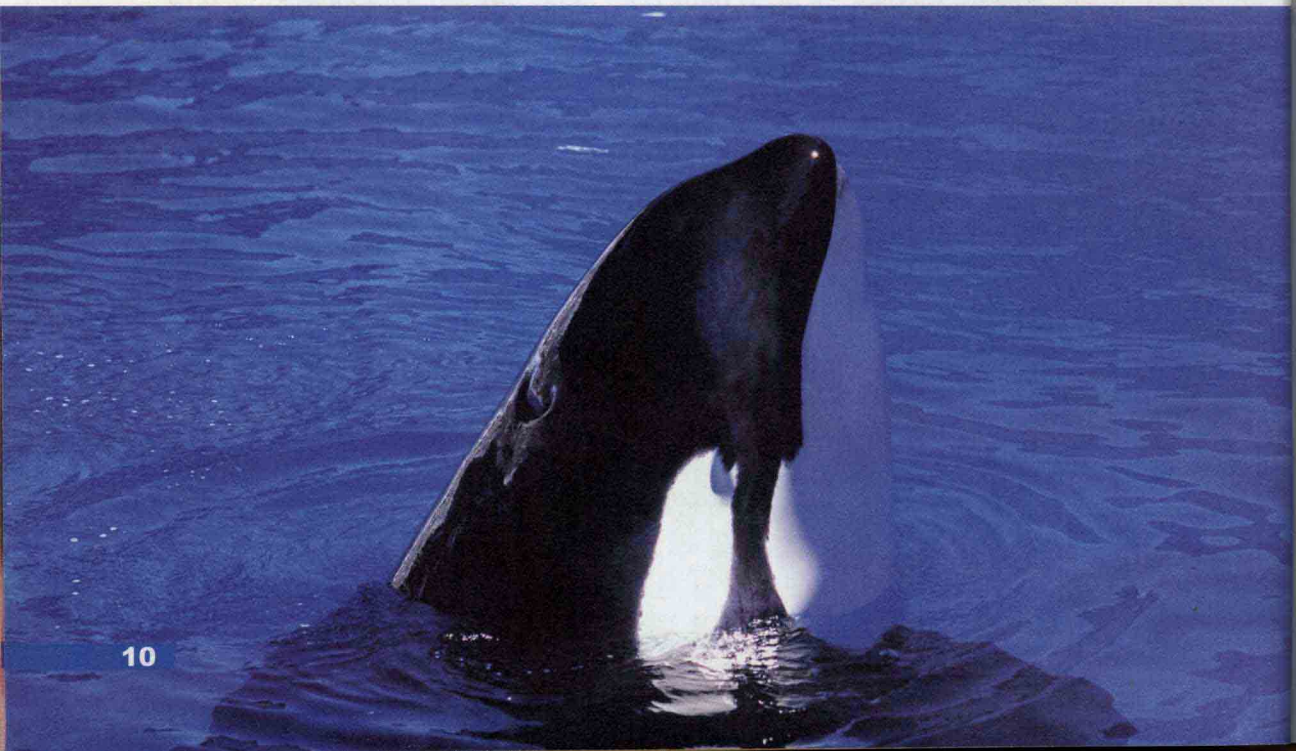
On the rise: In 1796, you could only hope to live about 24 years. A century later, you might grab 48. A baby born today can expect to live to 77. The biggest gains in longevity have come from the simplest things, like clean water, refrigeration, even the widespread use of soap. Will the numbers continue their rapid rise? Olshansky says no, but others see no reason why not. Stick around if you want to find out . . .

上升趋势：1796年的时候，人的期望寿命只有24岁。一个世纪后，你可能活到48岁。现在出生的婴儿有望活至77岁。带来长寿的最大原因来自一些简单的事情，例如清洁的水、食品冷冻甚至肥皂的广泛使用。这个数字还会继续快速增长吗？奥利尚斯基的回答是否定的，但是其他人没有看到为什么不可能的理由。如果你想知道结果，活下去，拭目以待……

L I V I

A few years ago, the body of a bowhead whale washed up on the beach somewhere along the Alaskan coast. Buried in its blubber lay a stone spearpoint, the likes of which has not been used for more than a century. The Iñupiaq Eskimos, who have hunted the bowhead for centuries, figured that these whales live about 60 years. But the presence of such an ancient harpoon head suggested that the great beast had survived an encounter with a whaler some 100 years earlier. So scientists took samples of its tissue and, using newly devised methods, figured out that the whale was probably 200 years old – maybe even

几年前，一头北极露脊鲸的尸体被冲上了阿拉斯加某地的海滩。人们在这条鲸鱼的鲸脂中发现了一个石制的矛头，这种矛可能有100多年没有人用过了。Iñupiaq 爱斯基摩人几百年来都捕猎北极露脊鲸，他们认为这种鲸鱼的寿命约为60年。但是，这一古代鱼叉叉头的存在，表明这个大家伙100多年以前和猎鲸人遭遇之后依然活了下来。因此，科学家取了这头鲸鱼的组织样本，使用新近制定的方法，发现这头鲸鱼可能已活了200岁甚至更长。



NG

It Up

by Mary Beckman

older.

What's amazing about this tale is not so much the bowhead's great age, but how long whales live compared to us. The beached bowhead had outlived not just one but several generations of people. Just think, if humans lived as long as whales, you might be able to instant message Thomas Edison — although he might be too busy to reply right away.

So how do whales live so long? And why are our lives so much shorter?

Researchers have spent decades trying to answer this fundamental question: what governs how long a creature can live? Why is it that the neighbor's cat can spend a leisurely 18 years napping on the porch while your sleek white rat dies after two? Pets, plants, insects, and people all age at different rates — and a handful of scientists are trying to learn why. The answer may suggest how we, too, can live as long as a whale.

IN THE FAST LANE

Early in the quest for the secrets of aging, scientists noticed that larger animals, such as humans and

对于这个故事，令人吃惊的并不是这头鲸鱼的了不起的长寿，而是和人类相比，鲸鱼的寿命确实非常长。冲上海滩的这头鲸鱼不但活过了一代人，而是好几代人。设想一下，如果人的寿命能够像鲸鱼一样长的话，你现在就可以给托马斯·爱迪生发个短信，尽管他未必有时间回信。

那么，为什么鲸鱼的寿命如此之长？为什么我们的寿命要短得多？

几十年来，研究人员一直都想要回答这个基本问题：什么控制一个生物能活多久？为什么邻居家的那只猫可以懒散地在门廊上打盹，度过18个春秋，而自己那只乖巧的白鼠两年之后，便一命呜呼？宠物、植物、昆虫、人类都以不同的速度衰老，多少批科学家在探寻为什么。答案可能会揭示我们如何才能像鲸鱼一样长寿。

在快车道上

在对衰老奥秘的早期探索中，科学

享受生活

whales, outlive smaller ones, such as dogs, cats, birds, and mice. The bigger the body, or so it seemed, the longer the life span. To explain this observation, scientists proposed the "rate of living" theory. All animals, they argued, have the potential to live the same amount of time, but those with higher metabolisms and faster heart rates — the smaller ones like birds — run through their allotment more quickly than we humans, with a heart rate of 70 beats per minute, or, say, a massive elephant, whose heart thumps at a ponderously slow 28 beats per minute. Some even thought that every creature might be allocated the same number of heartbeats.

Over time, though, the rate of living idea fell out of favor, and according to Steve Austad, a scientist who studies aging at the University of Idaho, it is now officially dead. The hypothesis was mortally wounded when it couldn't account for some of nature's dramatic exceptions. For example, hummingbirds have a heart rate so fast you can't count it, yet they live up to 14 years in the wild. At the same time, shrews — little insect-eating mammals that have a hummingbird's high-powered metabolism — survive only a couple of years.

家们注意到，体积较大的动物，例

如人类和鲸鱼，要比体积小的动物寿命长，例如狗、猫、鸟、老鼠。体积越大，或者看起来越大，寿命就越长。为了解释这一现象，科学家提出“生命速度”理论。他们说，所有的动物都有潜能活同样长的时间，但是那些新陈代谢和心跳速度快的动物，诸如鸟之类的小动物，要比人类和大象更快地耗尽它们的限额，人类的心脏每分钟跳动70次，而庞然大象的心跳沉重缓慢，每分钟只有28次。甚至有人认为，每种动物能达到的心跳总次数都是一样的。

但是，随着时间推移，生命速度这种想法慢慢失去了市场，而且，按照爱达荷大学研究衰老的科学家斯蒂夫·奥斯塔德的说法，这一理论现已正式消失了。这一假论的致命缺点就是无法解释自然界的一些神奇的例外现象。例如，蜂鸟的心跳速度快得无法计数，但是，它们可以在天然环境中存活14年。与此同时，地鼠这种捕食昆虫的哺乳动物，其新陈代谢速度可以和蜂鸟相提并论，但是寿命仅为两三年。



EAT THY NEIGHBOR

Part of the answer to an animal's longevity might lie in its environment. In the wild, most animals have to avoid predators, survive nasty weather, and scrounge for food in lean years. Not the naked mole rat. These wrinkled little rodents live in large communities in narrow, protected burrows under the ground in East Africa. They survive on bugs and worms and rarely come out to face the elements. The critters have been cozing up in their subterranean nests for so long that they've lost their hair, they can't shiver, and they can't regulate their body temperature like most mammals do. Even so, these odd creatures appear to live 20 years or more, says Paul Sherman, a researcher at Cornell University who keeps colonies of the animals in his laboratory. He attributes their longevity to the relative safety of their environment.

Do more predators really add up to shorter lives? With the help of a big pack of opossums, Austad put the theory to the test. These long, slinky animals are a tasty treat for many large predators. But Austad found an island off the coast of Georgia on which opossums have been living in peace, without natural predators, for more than 4000 years. And, indeed, he found that these predator-free islanders live about 25 percent longer than their continental cousins.

LIVE LONG AND BE HUNGRY

Austad's experiment with the opossums indicates that predation cuts many lives short. But what causes those who escape being someone else's dinner to die eventually, too? To understand why animals age,

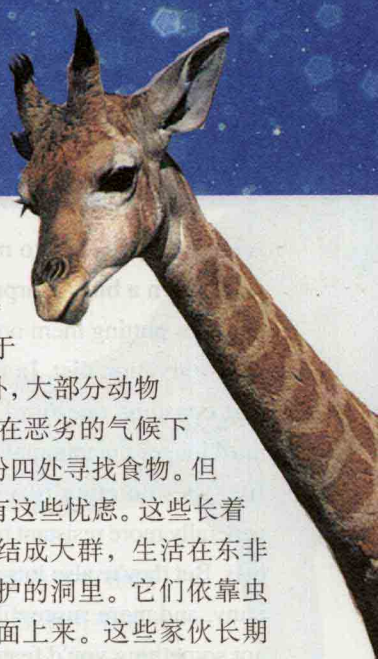
吃掉你的邻居

一只动物长寿的部分原因可能在于其生活环境。在野外,大部分动物必须避开捕食者,在恶劣的气候下生存,在歉收的年份四处寻找食物。但是,无毛鼯鼠却没有这些忧虑。这些长着皱褶的小啮齿动物结成大群,生活在东非地下狭窄的、有庇护的洞里。它们依靠虫子为食,很少到地面上来。这些家伙长期舒服地呆在地下的洞里,以至于毛都脱落了,它们不会发抖,无法像大多数哺乳动物一样调节身体的温度。保罗·舍曼说,即便如此,这些古怪的家伙似乎可以活20年或者更长,保罗是康奈尔大学的一位研究员,他在实验室中豢养了几群鼯鼠。他把鼯鼠的长寿归结于相对安全的生活环境。

更多的捕食者是否会导致寿命变短?在一大群负鼠的帮助下,奥斯塔德测试了这一理论。这些负鼠身体修长,线条优美,是很多大猎物口中的美食。但是,奥斯塔德发现在远离佐治亚州海岸的一个岛上,4000多年来,负鼠没有天敌,一直平静地生活着。他发现这些没有捕猎者的“岛民”的确比它们在大地上生活的表亲寿命要长25%。

活得长、吃得少

奥斯塔德在负鼠身上做的实验表明,捕猎者缩短了很多动物的寿命。但是,还有很多动物逃脱了成为别人盘中餐的命运,但是为什么最终也死去了?科学家为了明白动物衰老的原因,便努力使这一过程停



scientists have tried to make them stop — or at least slow down a bit. A surprisingly successful approach involves putting them on a nutritionally balanced but near-starvation diet. In the laboratory, rats and mice that consume one-third fewer calories live about a third longer than animals that are allowed to eat their fill. These dieting rodents are sleeker, leaner, and generally more resistant to stress than their more portly pals. But they're also lots wimpier: less muscular, more puny, and more susceptible to bacterial infections — not something you'd feature in an advertisement for a wonder diet that promotes long life.

Another problem with this calorie-cutting method for slowing aging, says Austad, is that maybe the "normal" lab mice eat too much, turning into pudgy little cage potatoes that age much faster than they would in the wild. "When we restrict their diet, are we just returning them to their natural state?" he wonders.

To address this question, Austad turned to spiders. "Spiders are great to study because they suck the juice out of bugs and leave traces of what they've eaten," he says. By counting the carcasses left in spider webs in the forest, Austad could determine exactly how much spiders eat in the real world. He then started a batch of laboratory spiders on a diet equivalent to nature's — in



止，或者至少减缓。有一个

方法获得了惊人的成功，该方法把它们控制在营养均衡但是近乎饥饿的饮食之下。在实验室中，与尽情吃饱的老鼠相比，那些少吃三分之一的老鼠寿命能够延长三分之一。这些节食的老鼠与那些肥胖的同伴相比，更加光滑，更加苗条，一般说来，能够承受更大的压力。但是，它们也要“差劲”得多：它们肌肉较少，身材弱小，更易受到细菌感染，这些都不是你在一则宣传长寿的神奇食品的广告中会看到的。

奥斯塔德说，这种为了延缓衰老而降低热量摄入的方法还存在另外一个问题，那便是，可能“正常的”实验鼠吃得太多，变成“笼子里的小土豆”，比在野外生活时衰老速度快很多。“当我们控制它们的饮食时，是否仅仅使它们回到了天然状态？”奥斯塔德怀疑道。

为了研究这个问题，奥斯塔德转向了蜘蛛。“蜘蛛是很好的研究对象，因为它们吮

