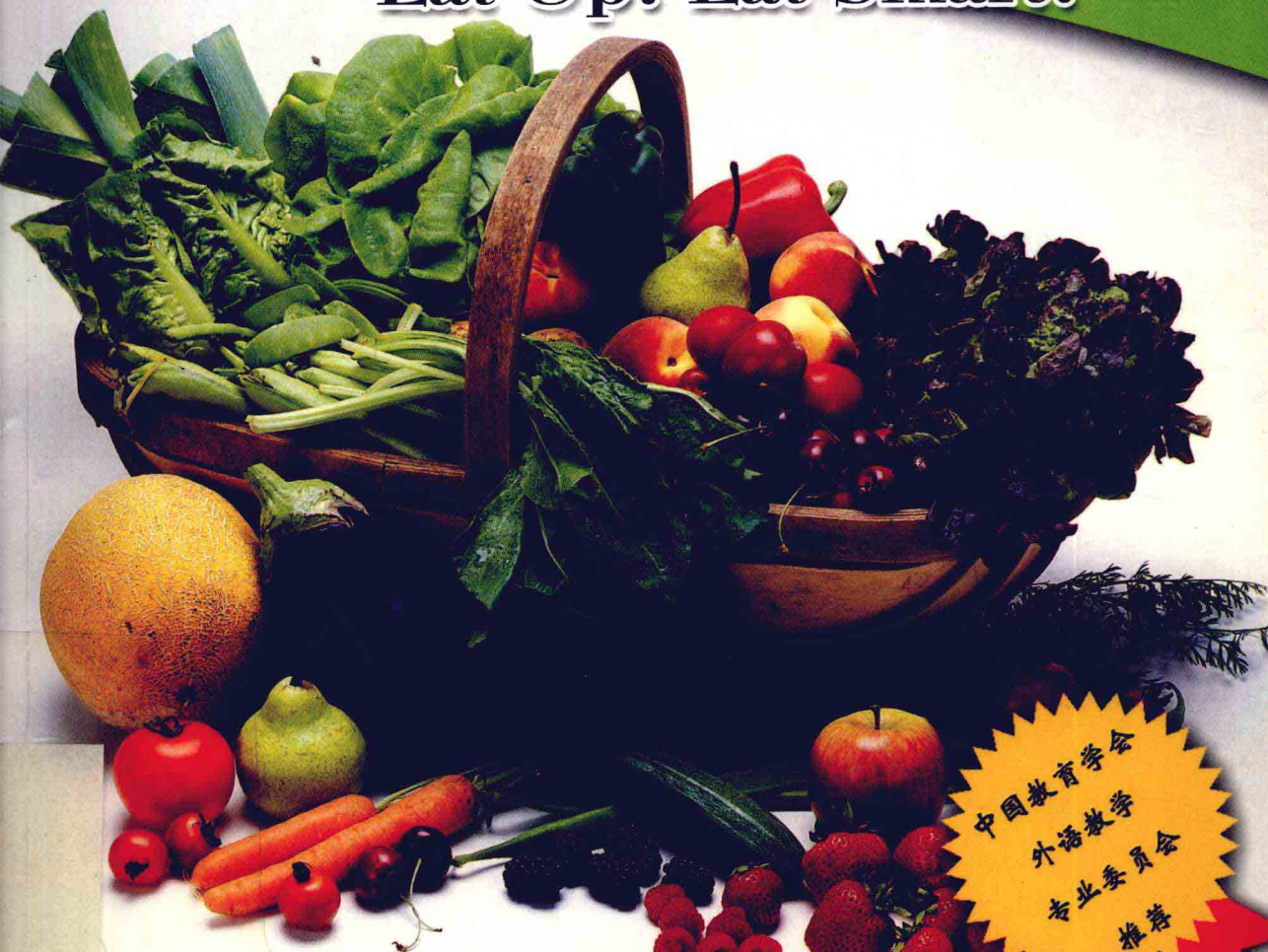
阅读空间·英汉双语主题阅读

吃的学问

高中和大学低年级适用

Eat Up! Eat Smart!



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王新 译

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吃的学问

原著：**George Erdosh** 等

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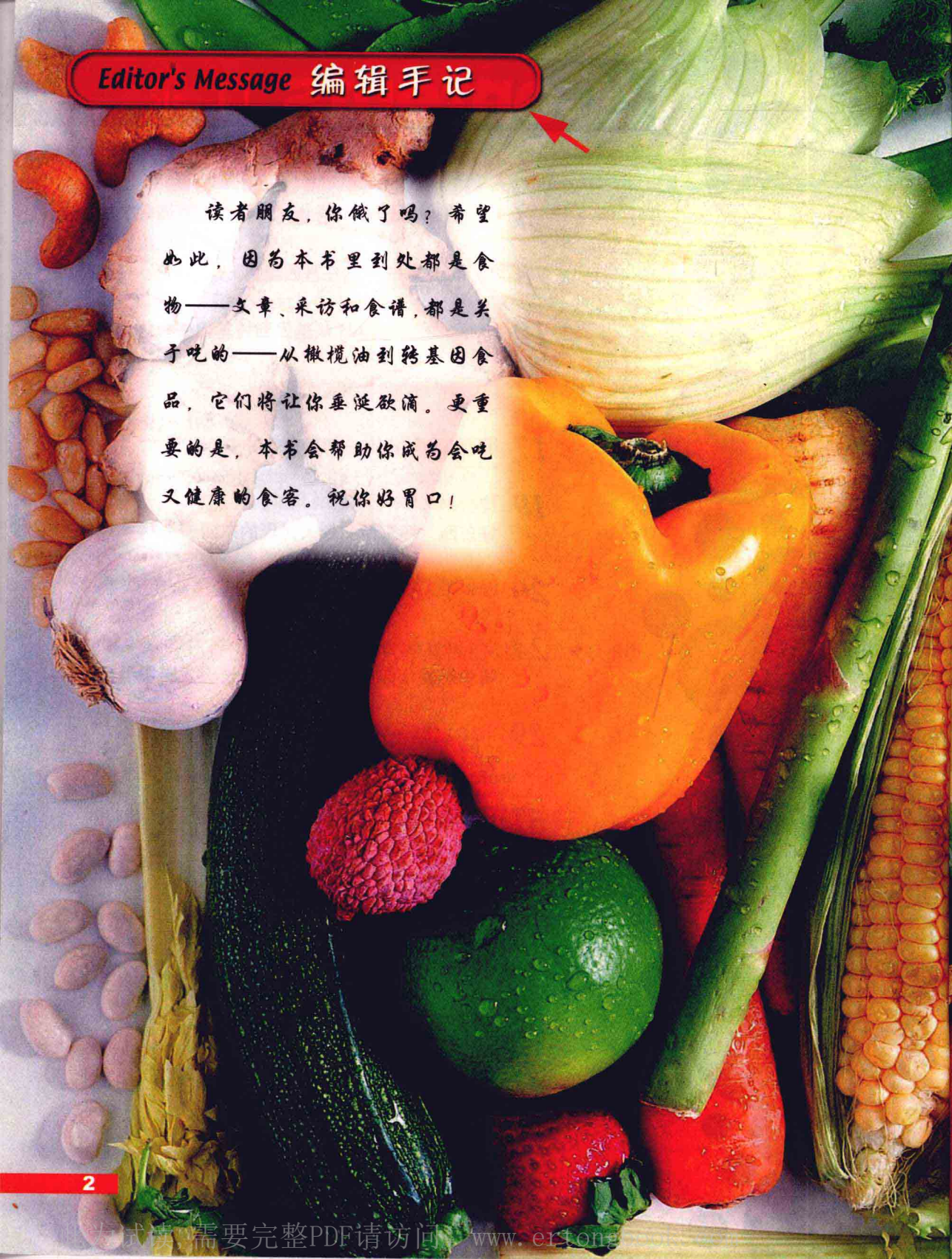


Editor's Message 编辑手记

读者朋友，你饿了吗？希望如此，因为本书里到处都是食物——文章、采访和食谱，都是关于吃的——从橄榄油到转基因食品，它们将让你垂涎欲滴。更重要的是，本书会帮助你成为会吃又健康的食客。祝你好胃口！

DESIGNER FOOD

化合食物

by George Erdosh

People think of "genetically altered food" with the same suspicion and distrust that they have when they hear about cloning animals, raising chickens with hormones, or building up muscles with steroids. All interfere with nature. Is this good? Is it safe? Before you make up your mind about genetic alteration, let's find out what it is.

人们对转基因食品充满了怀疑和不信任。就像他们听到克隆动物、用激素养鸡，或用类固醇增加身体的肌肉时所做出的反应一样。所有的这些做法扰乱了自然规律。这些做法好吗？安全吗？在你对转基因的做法下结论之前，让我们先了解它是什么。

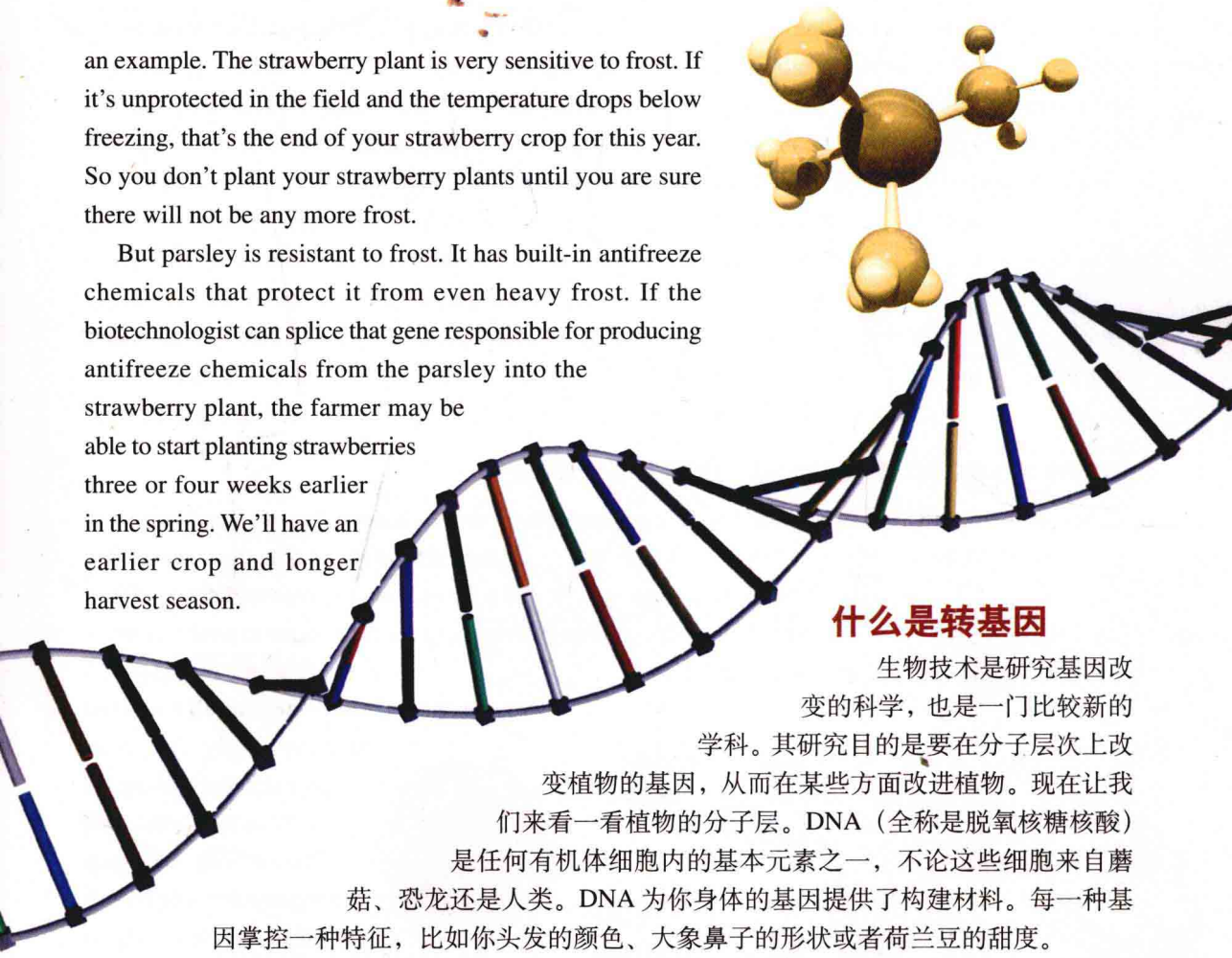
WHAT IS GENETIC ALTERATION?

Biotechnology, the science that deals with genetic alteration, is a relatively new discipline that alters a plant on the molecular level to improve it in some way. Let's get down to this level. DNA (short for deoxyribonucleic acid) is one of the basic elements in the cells of every living organism, whether they're from a mushroom or a dinosaur or a human being. DNA provides the building blocks for your body's genes. Each gene regulates a trait, like the color of your hair, the shape of an elephant's trunk, or the sweetness of Chinese peas.

Scientists can clip a gene from the DNA of one plant and splice it into the DNA of another plant that's genetic alteration. Of course, it really isn't as simple as it sounds. But it does work. The question is, Why do it? Here's

an example. The strawberry plant is very sensitive to frost. If it's unprotected in the field and the temperature drops below freezing, that's the end of your strawberry crop for this year. So you don't plant your strawberry plants until you are sure there will not be any more frost.

But parsley is resistant to frost. It has built-in antifreeze chemicals that protect it from even heavy frost. If the biotechnologist can splice that gene responsible for producing antifreeze chemicals from the parsley into the strawberry plant, the farmer may be able to start planting strawberries three or four weeks earlier in the spring. We'll have an earlier crop and longer harvest season.



什么是转基因

生物技术是研究基因改变的科学，也是一门比较新的学科。其研究目的是要在分子层次上改变植物的基因，从而在某些方面改进植物。现在让我们来看一看植物的分子层。DNA（全称是脱氧核糖核酸）是任何有机体细胞内的基本元素之一，不论这些细胞来自蘑菇、恐龙还是人类。DNA 为你身体的基因提供了构建材料。每一种基因掌控一种特征，比如你头发的颜色、大象鼻子的形状或者荷兰豆的甜度。

科学家能够剪下一种植物DNA中的一个基因并把它嫁接到另一种植物的DNA上。这就是转基因。当然，实际情况并不像我们听上去的那样简单。然而，这样做的确可行。问题是：这样做的目的是什么呢？这里有一个例子，草莓类植物非常怕霜。如果这种植物不加任何保护地生长，并且温度降到了摄氏零度以下，那么你今年草莓的收成就会化为泡影了。因此，只有当你确信霜降不会再来以后，再去种草莓。

另一方面，欧芹对霜有很强的抵抗力。它自身就有一种防冻的化学物质，可以使它免受强霜冻的伤害。如果从事生物技术的科学家能够从欧芹中把制造防冻物质的基因转接到草莓上去，农民也许就能够在春天提前三至四周开始种草莓。这样，我们就会有早一些的收成和更长的收获期。

Another example is plants' resistance to disease or pests or drought. Some have it, others don't. The ones that don't may benefit from the ones that do by genetic alteration.

CHANGING PLANTS ISN'T NEW

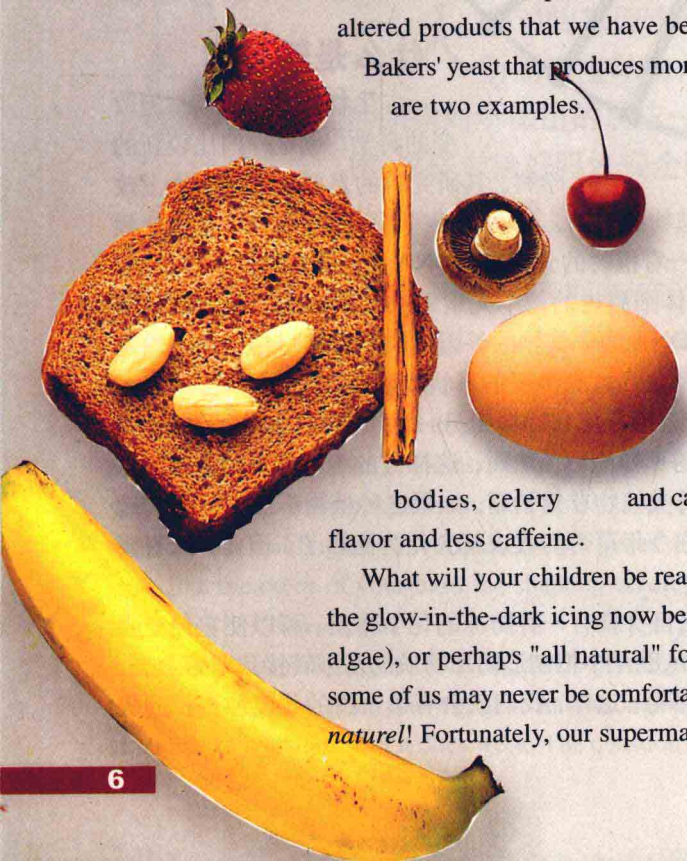
Ever since humans started growing plants some 10,000 years ago instead of picking them in the wild, farmers have improved plants a great deal. The original apples were the size of crabapples, bitter and flavorless; green peppers were cherry-size and so hot that you were in agony should you bite into one. Wild strawberries were no bigger than M&Ms. Without altering some of our plants, we couldn't have survived and supported today's huge world population.

The difference between then and now is the length of time that is necessary to develop new crop strains. Back then, farmers always selected and saved the best of their crops to plant as the next year's seeds. This strategy of repeated selection for specific food qualities allowed food plants to slowly improve until we got large, juicy, tasty apples, sweet green peppers, and strawberries that take more than one bite to eat.

Today's genetic alteration makes the same kinds of changes, but the results come in a few years.

HOW SAFE IS GENETIC ALTERATION?

No one knows for certain how safe genetic alteration is. Scientists believe that most alterations are as safe as the traditional method of slow plant breeding for improved food plants. There are genetically altered products that we have been using for at least 10 years without ill effect. Bakers' yeast that produces more bubbles and a cheese enzyme to produce cheese are two examples.



There are many, many genetically altered products ready for your supermarket or waiting for government approval: potatoes with properties that allow them to absorb less fat in the french fryer, rice that has higher nutrition, seed oil that is less harmful for our overweight bodies, celery and carrots that stay crisp longer, and coffee with better flavor and less caffeine.

What will your children be reaching for in the supermarket someday? Will it be the glow-in-the-dark icing now being developed (containing genetically engineered algae), or perhaps "all natural" foods will once again be the rage. The fact is that some of us may never be comfortable with "designer food" . After all, it just isn't *au naturel*! Fortunately, our supermarkets still offer fare for the less adventurous.

另外一个例子涉及植物对疾病、害虫或干旱的抵抗力。有些植物有这种抵抗力，有些植物没有。通过基因转移，没有这些抵抗力的植物会从有抵抗力的植物那里受益。

改变植物并不是新鲜事

大约一万多年前，人类开始种植植物，而不像以前那样从野地里拾捡这些植物的果实。从那时开始，农民就已经对植物做了很大的改进。最初的苹果同山楂一样大，苦而无味，青椒同樱桃一样大小，很辣。如果你咬上一口的话，你就会感到极大的痛苦。那时的野生草莓不比巧克力豆大。如果不对一些植物进行改变，我们人类就活不到今天，也没能力养活今天众多的世界人口。

现在与过去的区别在于培育出新物种所需要的时间。那时，农民总是挑出他们最好的收成，留下来作来年的种子。这种反反复复挑选特质品种的方法使得植物能够慢慢地改进，直到我们得到又大又好吃并且多汁的苹果、甜味的青椒和一口吃不完的大草莓。

今天的转基因做到了同样的改变，但其结果几年之后才会表现出来。

转基因有多安全?

没有人能够确切地说出转基因到底有多安全。科学家们认为大多数的转基因同传统上为改进植物而进行的缓慢的育种过程一样安全。有些转基因产品我们用了至少10年，并没有不良影响。例如，面包房里产生更多气泡的酵母和做奶酪的奶酪酶。

许许多多的转基因产品准备进入超市销售或正在等待政府的审批。这其中包括：在油炸时，吸油更少的马铃薯；营养成分更高的水稻；对过于肥胖的人害处较小的植物油；能在更长时间保持香脆的芹菜和胡萝卜；口味更好而咖啡因含量更少的咖啡。

将来某一天，你的孩子在超市里会想要什么呢？会是开发之中的能在黑暗中发光的糖霜（里面含有转基因的海藻）吗？也许“纯天然”食品又会十分畅销。事实上，有些人可能永远也不会对“合成食物”感到舒服。毕竟这种食物不是纯天然的。幸运的是，我们的超市给顾客提供的还是相对安全的食品。

It's In the Genes
它在基因里

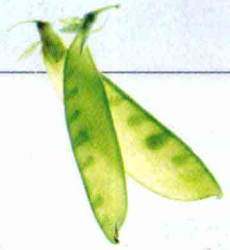
by Barbara Eaglesham

Sometimes an unfortunate event will have far-reaching positive consequences. When Austrian Johann Mendel's father died, Johann could no longer afford to continue his studies in science at an advanced local school. Instead, in 1843 he entered a monastery that had a reputation as a center for scientific study. Here, he took the Christian name Gregor and began experimenting with crossing pea plants in the monastery garden.

Mendel pollinated plants himself (before the insects could do so randomly), over and over, until offspring exactly resembled parents. Then he crossed plants with different traits – AA (red flowers) and bb (white flowers), for example. To his surprise, the first-generation plants looked like only one of the parents (red flowers – taking one trait from each parent, you get the combination Ab, which, mysteriously, looked like AA). Crossing these with each other (Ab × Ab) produced a mixture: 75 percent that looked like AA (red flowers – 25 percent AA, 50 percent Ab)

有时，不幸的事件会产生深远的正面结果。当奥地利人约翰·孟德尔的父亲去世后，他再也没有钱在当地一所高等学校继续进行科学研究了。于是，1843年，他进了一所修道院。这所修道院被人们认为是一个科学研究的中心。到了这里，他使用自己的教名格里戈尔，并在修道院的花园里开始进行豌豆杂交试验。

在昆虫给这些豌豆随意授粉之前，孟德尔对它们反复进行人工授粉，直到它们的后代同它们外表完全一样为止。然后，他用不同特征的豌豆进行杂交——例如，AA（红花豌豆），bb（白花豌豆）。令他感到惊奇的是，第一代的豌豆外表仅仅同上一代豌豆中的一种类似。杂交的后代是由红花豌豆和白花豌豆结合产生的(Ab)，但它却奇怪地与红花豌豆（AA）非常相似。这种豌豆再相互杂交（Ab × Ab）后所产生的后代就不只是一种了：75% 像红花（25% 的 AA，50% 的 Ab)；25% 表现出第一代失去的特征：白花（bb)；当时的科学



and 25 percent that looked like the lost parent, having white flowers (bb). Scientists of his day expected the first generation (Ab) to look like a blend of the two traits, instead of resembling just one parent.

From this work, Mendel realized that traits had to be carried in something like a package – a gene. He also realized that each offspring received one unit of information (chromosome) from each parent. He concluded that just because a trait is passed down, it isn't necessarily visible (it might not be expressed). His hard work and insight weren't recognized in his lifetime, but he eventually came to be known as the "Father of Genetics."

We've learned a lot since then. Chromosomes are found in the nucleus of cells, and there are 46 (23 pairs) in every one of ours. One chromosome of each pair comes from one of our parents, the other chromosome from the other parent. Deoxyribonucleic acid, or DNA, is found in all chromosomes and carries the code of life. DNA is a double helix, shaped like a twisted ladder, whose rungs are made up of pairs of nitrogen base-molecules. There are four bases, called adenine (A), thymine (T), guanine (G), and cytosine (C). They fit together like puzzle pieces: A with T and G with C. Just the way the arrangement of letters in language carries meaning, so does the order of the bases carry a code.

家预想第一代（Ab）表现出父母结合起来的特征，而不仅仅表现出父母一方的特征。

从这项研究中，孟德尔意识到植物的特征应该像“包裹”般传递：这就是基因。他还意识到每一个后代从父母双方各得到了一个染色体。他的结论是：特征即使传给后代，也并不一定会在后代中显现。在他有生之年，他的辛勤工作和远见卓识并未得到重视，但他后来渐渐地被称为“遗传学之父”。

从那时起，我们了解了很多东西。染色体存在于细胞核内。我们每人都有46个染色体（23对）。每一对染色体中的一个来自父亲，另一个来自母亲。DNA在所有染色体中都存在，并且它携带有生命密码。DNA是双螺旋状物，就像一架扭曲的阶梯。而梯子的横档是由一对对含氮碱基分子构成。共有四个碱基：腺嘌呤（A）、胸腺嘧啶（T）、鸟嘌呤（G）和胞嘧啶（C）。它们像积木一样拼在一起：A和T在一起，G和C在一起。就像语言中的字母排列会产生意义一样，这些碱基也带有遗传密码。

FROM GENES TO GMOS

从基因到转基因生命体

Today, genes can be isolated, identified, and cloned (copied over and over), then inserted into other organisms to alter their traits. The process is called *genetic engineering*. For this technology to develop, a few tools were necessary. In the 1970s, scientists isolated bacterial plasmids. These are hula-hoop-shaped double-stranded units of DNA that can be moved easily from one cell to another. They also discovered "scissors," called *restriction enzymes* for cutting the DNA into predictable, reproducible patterns. These enzymes are used to "snip apart" plasmids at very specific DNA sequences, leaving free ends that

can be rejoined as the scientist chooses. Restriction enzymes occur in bacteria as part of a natural defense mechanism to guard against invading viruses. Many different types are now available, each cutting DNA at a different sequence of base pairs.

Once a plasmid is snipped open, a foreign piece of DNA, cut by the same enzyme scissors, can be taped, end to end, into the plasmid using another enzyme, DNA ligase. This is the glue that sticks all the pieces together. The new plasmid is inserted back into a cell, where numerous copies

如今，基因可以被分离、识别和克隆。并且，将基因插入其他生命体中还能改变它们的特征。这一过程叫基因工程。要发展这种技术，我们需要一些工具。20世纪70年代，科学家分离出了细菌的原生质。它们是形似呼拉圈的双股DNA单位，可以被轻易地从一个细胞转移到另一个细胞。科学家们还发现了被称为限制酶的“剪刀”，可以把DNA分裂成可以预测的和可以复制的形式。这些酶被用来在特定的DNA的序列中把原生质切断，留下的一端可以被科学家们自由地重新连接。作为抵抗病毒的自然防御机制的一部分，限制酶存在于细菌中。现在科学家们已经发现了许多种限制酶。它们在碱基对的不同序列中切断DNA。

一旦原生质被分开后，用同样限制酶剪开的外来的DNA片段和它的被分 开的那一端被粘到一起，形成了新的原生质。连接时使用的是另一种酶——DNA 连接酶。这种胶可以把所有的碎片粘到一起。新的原生质被插回细胞中，在那里可以进行多次复制。如果把特定的基因材料引入高速复制的目标细菌中，细胞就会变成生产有用物质的微型工厂。例如，当埃克森公司的瓦尔迪兹号油轮

can be made. Introduction of specific genetic material into rapidly reproducing target bacteria can turn the cells into miniature factories for production of useful substances. For example, when the *Exxon Valdez* oil freighter ran aground in 1989 and spilled thirty-eight million liters of oil, oil-eating bacteria, created in just this manner, were used in the cleanup operation. The oil was broken down five times faster with help from the genetically modified organisms (GMOs).

Plasmid technology has also been developed for moving targeted genetic material into plants. In this technique, scientists use the plasmid from a bacterium that causes tumors on plants. In nature, this bacterium transfers genetic material into plant tissues by releasing plasmids onto damaged plant cells. The plasmids enter the plant tissue and produce a swelling, or tumor. Because of this special ability to invade plant tissue, these tumor-inducing (TI) plasmids are now used routinely as "taxi cabs" to carry target genes into a wide variety of plant cells, including, for example, corn. The European corn borer is a common pest in this economically valuable crop. When pesticides are used against them, timing is critical. If sprayed too late, the corn borer will already have made a home inside the corn stem and will not be killed. CIBA Research was the first company to develop what has become commonly known as Bt corn. It contains genes that allow it to resist infestation by the corn borer. The Bt genes came from a bacterium called *Bacillus thuring ensis* . It produces a protein called Bt protoxin. When an insect larva eats these bacteria, the toxin contained in the bacterium attaches to the insect's gut and makes holes in it, and the larva starves to death. Bt corn can be grown using less pesticide, and sometimes even no pesticide.

在1989年搁浅后，它泄露了3800万公升的油。用上述方法创造出的吃油的细菌被用于清理油污的行动。有了转基因生命体（GMOs）的帮助，油分解的速度提高了五倍。

细胞质技术还被应用于把目标基因材料转移到植物的过程中。在应用这种技术时，科学家们使用导致植物肿瘤的细菌中的原生质。通过把原生质释放到损坏的植物细胞上，这种细菌把基因材料转移到植物的组织当中。原生质进入植物组织后产生了浮肿，或者说是肿瘤。因为具有这种特殊的侵袭植物组织的能力，这些导致肿瘤的（TI）原生质被人们习惯地当成"出租车"来使用，目的是把目标基因带到多种植物细胞当中，比如说，玉米细胞。欧洲玉米螟普遍存在于玉米这种经济价值很高的农作物当中。使用杀虫剂消灭这种害虫时，时机的掌握很关键。如果杀虫剂喷洒得太晚，玉米螟早已经在玉米茎的内部安家了。这样，它们就不能被杀死。CIBA研究所是第一家研制出我们通常所称的Bt玉米的公司。这种玉米中含有能够抵御玉米螟的基因。这种Bt基因来自于一种名为图根菌的细菌。它会产生Bt原霉素的蛋白质。当昆虫的幼虫吃了这些细菌后，细菌中的霉素就会附着在昆虫的内脏，并在上面打出许多洞。这样，幼虫就会被饿死。Bt玉米在生长过程中需要很少，甚至不需要杀虫剂。

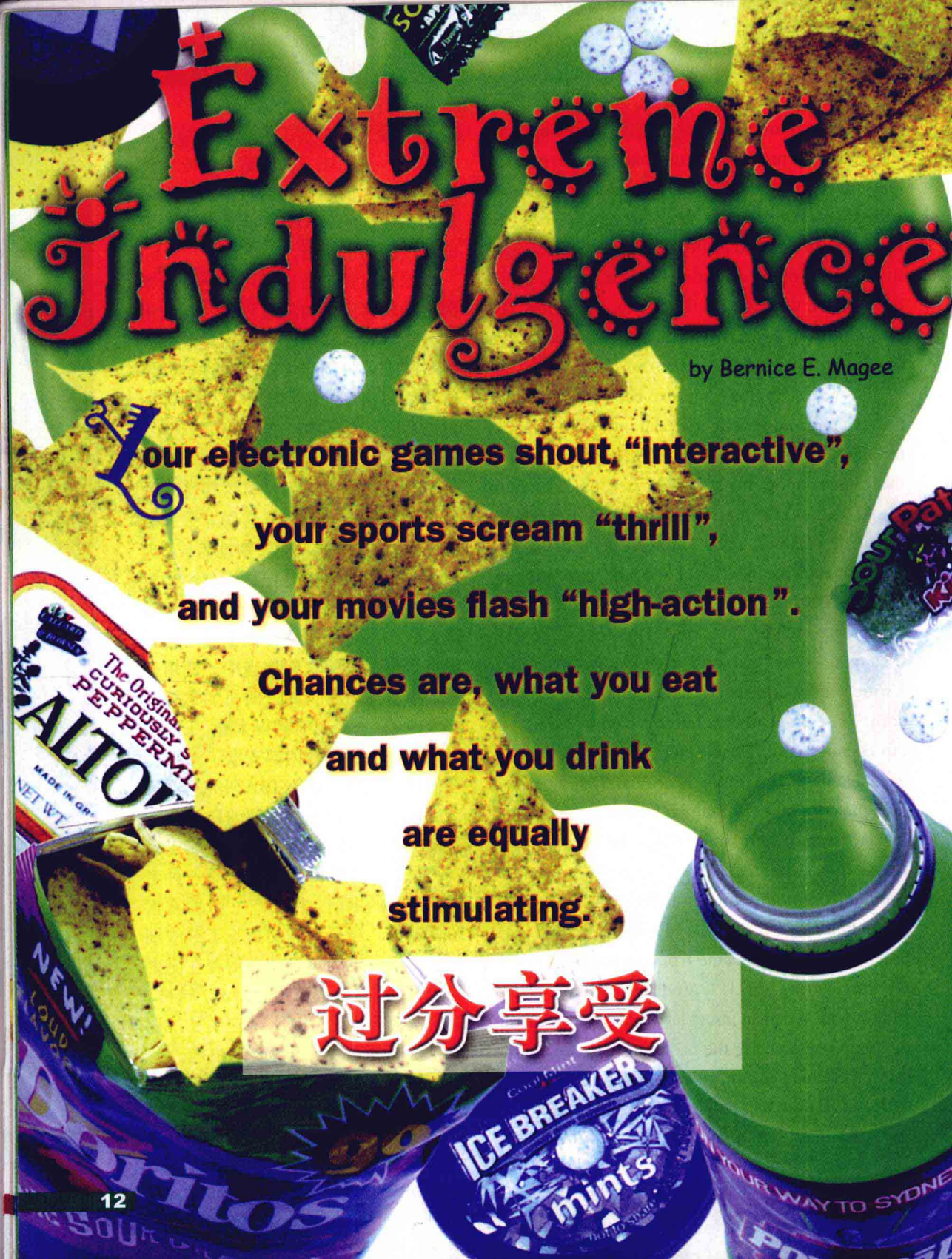
by Barbara Eaglesham

Extreme Indulgence

by Bernice E. Magee

Your electronic games shout "interactive",
your sports scream "thrill",
and your movies flash "high-action".
Chances are, what you eat
and what you drink
are equally
stimulating.

过分享受



Your electronic games shout "interactive", your sports scream "thrill", and your movies flash "hight-action". Chances are, what you eat and what you drink are equally stimulating.

We live in a sensory-overloaded environment. So, why not take taste to the extreme and indulge in intense flavors? Brand-name products like Doritos "Sonic Sour Cream" chips, Powerade "Green Squall" sports drink, Ice Breakers mints, and Sour Patch Kids deliver catchy names, eye-catching colors, and flavor. You may prefer your lunch or dinner to be mildly flavored, but when it comes to snack food, you break loose and take a risk.

According to Tom Vierhile of Marketing Intelligence Service, Naples, NY, new lines and new varieties of products in the sour and intense flavor categories rose steadily in the '90s. "Interest in flavors continues to be there," states Vierhile. "[Sour and intense] have been around long enough not to be a fad."

Psychologists and consumer specialists study the behavior of potential buyers of these products. Amanda Smith, consumer insights specialist at International Flavors & Fragrances, Dayton, NJ, states that "kids' opinions count", when her company is developing a new, bolder flavor. Youth, whose taste buds are keener than adults', paradoxically favor flavors twice as intense as those preferred by adults. Smith believes there are several reasons for this preference. "Kids like fun products," she says. "They like competitions with Warheads [an intensely sour candy], for instance, and they ask, 'How can I be free of my parents' influence?'"

At Youth Market Systems Consulting, Glendale, CA, psychologist Dan S. Acuff explains the underlying reason behind marketing intense flavors to teens. It is "a very experimental stage of life" that involves "trying out all kinds of experiences", he explains.

你玩的电子游戏是"互动"的，从事的运动是"亢奋"的，观赏的电影是"惊险的"。你吃的和你喝的可能同样令人刺激。

我们生活在一个充满了感官刺激的环境中。那么，我们为什么不把味道调到极限，然后自己好好享受一番呢？像"奶油酸薯条"、"绿色呼啸"运动饮料、"破冰"薄荷糖和"酸甜"糖果这样一些知名商标的食品名字诱人，颜色惹眼，口味独特。你可能更喜欢口味适中的午饭和晚饭。可是，吃零食时，你就要放纵一下自己了，愿意冒一点风险。

纽约那不勒斯营销情报部的汤姆·维耶里说，在90年代，拥有酸味等强烈口味的新类别和品种的产品急剧上升。"人们现在对口味的兴趣仍未衰减，"他说，"这些口味存在了这么长时间，已经不再是一种时尚了。"

心理学家和消费品专家们研究了这些产品的潜在购买者的行为。阿曼达·史密斯是坐落在新泽西州代顿市国际口味和香味公司的消费者分析专家。她说当她的公司在开发一种新的更大胆的口味时，只有"儿童的意见才算数。"年轻人的味蕾比成年人要敏感得多。但矛盾的是，他们喜欢的口味强度却是成年人的两倍。之所以如此，史密斯认为有三个原因。她说："孩子们喜欢新奇的产品。比如，他们喜欢同'弹头'牌强力酸味糖较劲。他们问：'我怎样才能不受父母的影响呢？'"

在加利福尼亚州格林代市青少年市场体系咨询公司中，心理学家丹·S·阿科夫指出了向青少年营销强烈口味的深层原因。"那正是一个生命中喜欢尝试各种经历的阶段。"他解释道，"男孩子们对于强

"Liking intense flavors is a sort of macho ritual" with boys, he adds.

At Nabisco, Inc., East Hanover, NJ, John Barrows of the life Savers divisions explains that Ice Breakers gum was a five-year research and development effort that produced TFC, Tiny Flavor Capsules. Using a liquid mint flavor in a capsule that breaks when the product is chewed, Ice Breakers gum entered the market in 1995. Five years later, Ice Breakers mints appeared, followed by "Cool Blasts" mints. "It's a smaller mint, absolutely powerful, just a blast of mint," reports Barrows.

In 1999, Powerade "Green Squall" was on the leading edge of more intensely flavored beverages. It boasted a "fierce" blend of melon, pineapple, and other fruit flavors and a "grasshopper juice" color. Earlier in the decade, Altoids high-intensity breath mints started a trend for intense flavors. Ice Breakers and Powerade are two products that now ride the waves of the interest Altoids stirred.

MANUFACTURING INTENSITY

Just how is "intense" flavor achieved? "Flavor systems are fairly simple," says Mary Svoboda, creative flavorist at Edgar A. Weber & Co., Wheeling, IL. "Products are over-flavored – for instance, with a lot of citric acid," she states. An extremely intense product like Mega Warheads, launched in 1993, contains three acids: malic, citric, and ascorbic. It's wise to read the warning on the package in this particular case: Eating multiple pieces may cause a temporary irritation.

Flavor itself is a complex sensory experience involving taste and smell. To chemosensory scientists at Monell Chemical Senses Center, Philadelphia, PA,

烈口味的热衷显示出他们的男子气概。"

新泽西州东汉诺瓦市纳比斯科公司的约翰·巴罗解释说，破冰牌口香糖经过了五年的研究和开发，最后才有了TFC（微小苦味胶囊）。胶囊中是薄荷口味的液体。口香糖被嚼开后，胶囊就破了。这种产品于1995年上市。5年后，破冰薄荷出现了，随后出现了"寒冷风暴"牌薄荷。巴罗说："这种薄荷虽然外形小一些，但威力巨大，就像薄荷爆炸了的感觉一样。"

1999年，威力公司的"绿色呼啸"牌领先于强烈口味的饮料。这种饮料声称混合了西瓜、菠萝和其他水果的口味，并有一种"蚂蚱饮料"的颜色。90年代初，奥托德强力薄荷开创了追求强烈口味的潮流。破冰和威力现在主导着奥托德掀起的这一浪潮。

制造强烈口味

"强烈"口味是如何获得的呢？玛丽·斯沃博达说："制造口味的方法很简单。比如，某些产品靠大量的柠檬酸来增强口味"。玛丽是富有创造性的口味专家，供职于伊利诺斯州威灵市的埃德加·A·韦伯公司。像1993年推出的"超级弹头"那种口味非常重的产品就含有三种酸：苹果酸、柠檬酸和抗坏血酸。在这种特殊的情况下，读一读包装上的警告是明智之举：吃很多片会引起短暂的不适。

口味本身是一种涉及味觉和嗅觉的复杂的感官体验。对位于宾夕法尼亚州的蒙奈尔化学感应中心的化学感应专家们来说，味觉意味着4种感觉："甜、酸、咸和苦，外加第5种可口的感觉。Umami一词来自日语，意思是"味道好极了"。