科技英语选读

Biotechnology · Environmental Science

生物技术·环境科学

主编：陈大明

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Readings in English for Science and Technology

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前　言

英语作为一门主流国际交流语言，其作用已日显重要。如何学好英语一直是人们关心的热点。近些年来，英语教学界基本认同了语言学习脱离不了文化这样一个道理。通过英语去更多地了解全球信息革命、科技突破、观念迭代、生活方式变更等已成为当今英语爱好者新的渴望和学习动力。

为适应英语学习这一新变化，许多新书已经面市，但是，总的来看，介绍社会生活方面的多，涉猎科技的少；而在科技读本中，内容综合的单本书多，按学科分类的丛书少。为了帮助大学四级以上英语水平的读者扩大知识面并能较系统地把握国外科技新进展，我们通过北京市高校研究生英语教学研究会组织了四所高等院校近二十位教师和专家编写了《科技英语选读》这套丛书。这套系列丛书共四卷，覆盖了十几门学科，如机电、化工、材料、信息、网络、生物技术、环境科学等。选材力求遵循新颖全面、理论与应用并重、旨趣性强三个原则。

1．新颖全面。

入选文章既要突出学科最新成果和发展方向，又尽可能地反映该学科的全貌。《生物技术·环境科学》包括生物芯片、克隆和转基因动物、DNA 指纹分析等前沿性文章。同时，读者还能读到生物技术简史、人类基因组工程、农业生物技术等从不同侧面勾画生物技术的论述。《制造业·汽车技术》系统介绍机电一体化技术、虚拟制造、机器人等，汽车技术方面则选用了塑料汽车、电动汽车、模拟驾驶系统等文章。《化学与化工·材料·应用物理》让读者了解到纳米技术、航天材料、塑料电源等方面的知识，也较为全面地介绍了激光、超导、核动力等。《网络·通讯·计算机》选取网络安全、电子商务、虚拟现实、多媒体等方面的最新材料，同时还让读者了解到 Java 语言、浏览技

术、Intranet 等信息技术的发展动向。

2. 理论与应用并重。

丛书重点突出技术的实用性。理论性文章少而精，重点突出技术的应用。如 E-mail 的有效使用、网上商务、远程存取办公资料等，都直接面对信息社会的生活需要。在“生物技术”中，除五篇关键性理论介绍外，大部分都是应用方面的文章，如基因疗法、克隆技术、DNA 分析等。“环境科学”则着重介绍资源保护方面的现状和发展。

3. 旨趣性强。

为避免科技读物枯燥晦涩的弊病，丛书坚持了知识性与趣味性并重，所选文章读起来有益并且有趣。“制造业”中不仅选用了介绍机器人的文章，还包括了微观技术、军事侦察、三维动画等有趣的题目。“环境科学”涉及了太空开发动植物、生态旅游、野生动物保护等有趣的题材。《化学与化工·材料·应用物理》则收录了几篇具有探索性的小论文，如《利用 CO_2 制造绿色塑料》、《植物回收重金属》。

由于读者已经具备一定的英语基础，本套丛书的练习便集中在专业词汇释义、难句、概念和背景的注释上。我们希望该套丛书能够帮助广大英语爱好者和科技爱好者更好、更快地阅读英语科技文章并能拓宽知识面，把握科技时代的脉搏，充满信心地迈向二十一世纪。

编　者

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Part I

Biotechnology

生物技术

（1—29）

1. What Is Biotechnology?
什么是生物技术?

Biotechnology in one form or another has flourished since prehistoric times. When the first human beings realized that they could plant their own crops and breed their own animals, they learned to use biotechnology. The discovery that fruit juices **fermented** into wine, or that milk could be **converted** into cheese or **yogurt**, or that beer could be made by fermenting **solutions** of **malt** and **hops** began the study of biotechnology. When the first bakers found that they could make a soft, **spongy** bread rather than a firm, thin **cracker**, they were acting as **fledgling** biotechnologists. The first animal breeders, realizing that different physical **traits** could be either magnified or lost by **mating** appropriate pairs of animals, engaged in the manipulations of biotechnology.

What then is biotechnology? The term brings to mind① different things. Some think of developing new types of animals. Others dream of almost unlimited sources of human **therapeutic** drugs. Still others **envision** the possibility of growing crops that are more nutritious and naturally pest-resistant to feed a rapidly growing world population. This question **elicits** almost as many first-thought responses as there are people to whom the question can be **posed**②. In its purest form, the term "biotechnology" refers to the use of living organisms or their products to modify human health and the human environment③. Prehistoric biotechnologists did this as they used **yeast** cells to raise bread **dough** and to ferment

alcoholic **beverages**, and bacterial cells to make cheeses and yogurts and as they bred their strong, productive animals to make even stronger and more productive **offspring**④. Throughout human history, we have learned a great deal about the different **organisms** that our ancestors used so effectively. The marked increase in our understanding of these organisms and their cell products gains us the ability to control the many functions of various cells and organisms. Using the techniques of gene splicing and recombinant DNA technology⑤, we can now actually combine the genetic elements of two or more living cells. Functioning lengths of DNA can be taken from one organism and placed into the cells of another organism. As a result, for example, we can cause bacterial cells to produce human molecules; cows can produce more milk for the same amount of feed, and we can **synthesize** therapeutic molecules6 that have never before existed.

Pamela Peters

NEW WORDS

beverage /ˈbevəridʒ/ n. 饮料
convert /kənˈvəːt/ vt. 转换
cracker /ˈkrækə/ n. 饼干
dough /dəu/ n. 生面团
elicit /iˈlisit/ vt. 引发，引出
envision /inˈviʒən/ vt. 想像，预见
ferment /fə(:)ˈment/ vt. 发酵
fledgling /ˈfledʒliŋ/ a. 缺乏经验的
hops /hɔps/ n. 啤酒花（复数）
malt /mɔːlt/ n. 麦芽
mate /meit/ vt. 使…交配

offspring /ˈɔ(:)fspriŋ/n. 后代，子孙
organism /ˈɔ:gənizəm/ n. 生物体
pose /pəuz/ vt. 提出
solution /səˈlju:ʃən/ n. 溶液
spongy /ˈspʌndʒi/ a. 海绵状的，多孔的
synthesize /ˈsinθisaiz/ vt. 合成
therapeutic /ˌθerəˈpju:tik/ a. 治疗的，药物的
trait /treit/ n. 特征，特性
yeast /ji:st/ n. 酵母
yogurt /ˈjəugə:t/ n. 酸乳酪

NOTES

1. bring ... to mind：想到…，使想起…
2. This question ... posed：对这一问题（何为生物技术）的回答，仁者见仁，智者见智。
3. to modify human health and the human environment：增强人类体质，改善人类生存环境
4. Prehistoric ... offspring：史前的生物技术专家利用酵母发面和酿酒，并且利用细菌来做乳酪和酸乳酪，他们还使健壮、多产的动物进行交配，从而繁育出更加健壮、多产的后代。
5. gene splicing and recombinant DNA technology：基因剪接和 DNA 重组技术
6. therapeutic molecules：药物分子

QUESTIONS

1. What is your first-thought response to the question "What is biotechnology?"
2. According to the author, what is biotechnology?
3. What are the examples given in the passage to show that the first human beings learned to use biotechnology?
4. Why is it possible that certain cows now can produce more milk for the same amount of feed?
5. What can be done by gene splicing and recombinant DNA technology?

2. Brief History of Biotechnology
生物技术简史

Biotechnology seems to be leading a sudden new biological revolution. It has brought us to the **brink** of a world of "engineered" products that are based in the natural world rather than on chemical and industrial processes①.

Biotechnology has been described as "Janus-faced②". This implies that there are two sides. On one, techniques allow DNA to be manipulated to move genes from one organism to another. On the other, it involves relatively new technologies whose consequences are untested and should be met with caution. The term "biotechnology" was **coined** in 1919 by Karl Ereky, a Hungarian engineer. At that time, the term meant all the **lines** of work by which products are produced from raw materials with the aid of living organisms. Ereky envisioned a biochemical age similar to the Stone and Iron Ages.

A common **misconception** among teachers is the thought that biotech-nology includes only DNA and genetic engineering. To keep students abreast of③ current knowledge, teachers sometimes have emphasized the techniques of DNA science as the "**end-and-all**" of biotechnology. This trend has also led to a misunderstanding in the general population. Biotechnology is NOT new. Man has been manipulating living things to solve problems and improve his way of life for **millennia**. Early agriculture concentrated on producing food. Plants and animals were selectively bred, and **microorganisms**

were used to make food items such as beverages, cheese, and bread.

The late eighteenth century and the beginning of the nineteenth century saw the **advent** of **vaccinations** and crop **rotation** involving **leguminous** crops④. The end of the nineteenth century was a milestone of biology. Microorganisms were discovered. Mendel⑤'s work on genetics was accomplished, and institutes for investigating fermentation and other microbial processes were established by Koch, Pasteur, and Lister⑥.

Biotechnology at the beginning of the twentieth century began to bring industry and agriculture together. During World War I, fermentation processes were developed that produced **acetone** from **starch** and paint solvents⑦ for the rapidly growing automobile industry. Work in the 1930s was geared toward⑧ using surplus agricultural products to supply industry instead of imports or petrochemicals. The advent of World War II brought the manufacture of penicillin. The biotechnical focus moved to **pharmaceuticals**. The "cold war⑨" years were dominated by work with microorganisms in preparation for biological warfare, as well as antibiotics and fermentation processes.

Biotechnology is currently being used in many areas including agriculture, **bioremediation**, food processing, and energy production. DNA **fingerprinting** is becoming a common practice in **forensics**. Similar techniques were used recently to identify the bones of the last **Czar** of Russia and several members of his family. Production of **insulin** and other medicines is accomplished through **cloning** of **vectors** that now carry the chosen gene. **Immunoassays** are used not only in medicine for drug level and pregnancy testing, but also by

farmers to aid in detection of unsafe levels of **pesticides, herbicides, and toxins** on crops and in animal products[10]. These **assays** also provide rapid field tests[11] for industrial chemicals in ground water, **sediment**, and soil. In agriculture, genetic engineering is being used to produce plants that are resistant to insects, weeds, and plant diseases.

A current agricultural controversy involves the tomato. A recent article in the New Yorker magazine compared the discovery of the **edible** tomato that came about by early biotechnology with the new "Flavr-Savr" tomato brought about through modern techniques. In the very near future, you will be given the opportunity to bite into the Flavr-Savr tomato, the first food created by the use of recombinant DNA technology ever to go on sale[12].

What will you think as you raise the tomato to your mouth? Will you hesitate? This moment may be for you as it was for Robert Gibbon Johnson in 1820 on the steps of the **courthouse** in Salem, New Jersey. Prior to this moment, the tomato was widely believed to be poisonous. As a large crowd watched, Johnson consumed two tomatoes and changed forever the human-tomato relationship. Since that time, man has sought to produce the supermarket tomato with that "backyard flavor." Americans also want that tomato available **year-round**.

New biotechnological techniques have permitted scientists to manipulate desired traits. Prior to the advancement of the methods of recombinant DNA, scientists were limited to the techniques of their time-**cross-pollination**, selective breeding, pesticides, and herbicides. Today's biotechnology has its "roots" in chemistry, physics, and biology. The explosion in techniques has resulted in three major branches of