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当代科技英语阅读教程

Modern EST Reading

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经济管理出版社
ECONOMY & MANAGEMENT PUBLISHING HOUSE

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前　言

科技英语课程作为衔接基础英语和行业英语的桥梁性课程，强调了语言的职业性和应用性，有利于培养理工科专业学生和英语专业学生的实际英语应用能力和职场环境下的语言交际能力，有利于增强学生可持续发展能力，有利于培养复合型外语人才。要做到基础英语和行业英语的自然衔接，为理工科专业和英语专业学生开设科技英语课程是必要的。

随着当今世界科学技术的飞速发展与对外科技交流的增加，科技英语已成为我国科技工作者查询科技资料、撰写学术论文、进行对外学术交流的重要工具。对大学生（尤其是理工科专业和英语专业的大学生）而言，掌握科技英语使用技能的必要性和重要性正与日俱增。因此，越来越多的高校把科技英语课程作为公共英语和英语专业拓展教学的一个不可或缺的组成部分。

本书编者在多年进行科技英语教学的基础上，从当今世界上著名的科技期刊和网站中广泛搜集资料，力求使学生在系统掌握科技英语阅读技能的同时，也能够对最新科技成果及科技英语的发展趋势和特点有一个初步的认识。

本书可供本科理工科专业学生和英语专业学生使用，作为科技英语研究者的语料，教材具有如下特点：

1. 知识性

选材重视文章的知识含量，收录了反映当今科技动态和成果的文章，可以帮助读者提高英语阅读技能和科学素养。本书还结合文章内容，设计了形式多样的练习，以帮助读者充分理解、掌握、运用所学知识。

2. 广泛性

本书取材广泛，贴近现实，内容涉及生命科学、医学、环境科学、新能源、通信、计算机科学、工程学、生物学、太空科学等科技领域，展示了对当代和历史上影响较大的科技成果。

3. 趣味性

充分考虑读者心理需求，以培养能力为目标，以兴趣为引导。本书语言富有现代科技英语特色，含有较丰富的通用和专业科技英语词汇和语法结构，可读性强。

使用建议：本书分为15个单元，每个单元由两篇文章构成。

（1）课堂讲解以课文A为主，课文B作为学生自学材料。每周2~3学时，学习一个单元。

（2）课文涉及多个专业，教师可根据本校情况选择学习内容。

本书由华北水利水电大学韩孟奇、刘桂华、刘全勇、郭淑萍、陈青玲、王绚编写，由于编者水平有限，书中疏漏之处在所难免，敬请读者和专家不吝赐教。

编　者

2013年7月

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Unit 1 Life Science

Text A How Human Cloning Will Work

by Kevin Bonsor

Scientists in South Korea claim to have created human embryos via cloning. This could radically change the medical landscape—therapeutic cloning could be used to combat diseases like Parkinson's and Alzheimer's.

1 Nothing really prepared the world for the 1997 announcement that a group of Scottish scientists had created a cloned sheep named Dolly. Many folks believe that within the next decade, we will hear a more shocking announcement of the first cloned human. Scientists in South Korea have already created human embryonic stem cells through cloning.

2 Until now, the idea of human cloning has only been possible through movie magic, but the natural progression of science is making human cloning a true possibility. We've cloned sheep, mice and cows, so why not humans? Some countries have set up laws banning cloning, but it is still legal in many countries.

Me, Myself and My Clone

3 In January 2001, a small consortium of scientists led by Panayiotis Zavos, a former University of Kentucky professor, and Italian researcher Severino Antinori said that they planned to clone a human in the next two years. At about the same time, the New York Post reported a story about an American couple who planned to pay $500,000 to Las Vegas-based Clonaid for a clone of their deceased infant daughter.

4 These scientists may be chasing glory in the name of science. Whatever their motivation, it's likely that we will see the first cloned human baby appear on the

evening news in the next decade. Scientists have shown that current cloning techniques work on animals, but only rarely do they succeed in creating a cloned **embryo** that makes it through birth.

5 If human cloning proceeds, one method scientists can use is **somatic** cell nuclear transfer, which is the same procedure that was used to create Dolly the sheep. Somatic cell nuclear transfer begins when doctors take the egg from a donor and remove the nucleus of the egg, creating an **enucleated** egg. A cell, which contains DNA, is then taken from the person who is being cloned. The enucleated egg is then **fused** together with the cloning subject's cell using electricity. This creates an embryo, which is implanted into a **surrogate** mother through **in vitro fertilization.** If the procedure is successful, then the surrogate mother will give birth to a baby that is a clone of the cloning subject at the end of a normal **gestation period.** Of course, the success rate is only about one or two out of 100 embryos. It took 277 attempts to create Dolly. Take a look at the graphic below to see how the somatic cell nuclear transfer cloning process works.

6 Some scientists seem to think that human cloning is inevitable, but why would we want to clone people? There are many reasons that would make people turn to cloning. Let's explore a few of these reasons.

Who Will Clone?

7 Not all cloning would involve creating an entirely new human being. Cloning is seen as a possible way to aid some people who have severe medical problems. One potential use of cloning technology would involve creating a human **repair kit.** In other words, scientists could clone our cells and fix **mutated** genes that cause diseases. In January 2001, the British government passed rules to allow cloning of human embryos to combat diseases such as Parkinson's and Alzheimer's.

8 While it may take time for cloning to be fully accepted, **therapeutic** cloning will likely be the first step in that direction. Therapeutic cloning is the process by which a person's DNA is used to grow an embryonic clone. However, instead of inserting this embryo into a surrogate mother, its cells are used to grow stem cells. These stem cells can be used as a human repair kit. They can grow replacement organs, such as hearts, livers and skin. They can also be used to grow neurons to cure those who suffer from Alzheimer's, Parkinson's or Rett **Syndrome**.

9 Here's how therapeutic cloning works:

- DNA is extracted from a sick person.
- The DNA is then inserted into an enucleated donor egg.

- The egg then divides like a typical **fertilized egg** and forms an embryo.
- Stem cells are removed from the embryo.
- Any kind of tissue or organ can be grown from these stem cells to treat the sick.

10 Others see cloning as a way to aid couples with **infertility** problems, but who want a child with at least one of the parent's biological attributes. Zavos and Antinori say that helping these couples is the goal of their research. Zavos said that there are hundreds of couples already lined to pay approximately $50,000 for the service. The group said that the procedure would involve injecting cells from an infertile male into an egg, which would be inserted into the female's **uterus**. Their child would look the same as the father.

11 Another use for human cloning could be to bring deceased relatives back to life. Imagine using a piece of your great-grandmother's DNA to create a clone of her. In a sense, you could be the parent of your great-grandmother. This opens the door to many ethical problems, but it's a door that could soon be opened. One American couple is paying $500,000 to Clonaid to clone their deceased daughter using preserved skin cells.

To Clone or Not to Clone

12 Critics of cloning repeat the question often associated with controversial science: "Just because we can, does it mean we should?" The closer we come to being able to clone a human, the hotter the debate over it grows. For all the good things cloning may accomplish, opponents say that it will do just as much harm. Another question is how to regulate cloning procedures.

13 There is no federal law banning cloning in the United States, but several states have passed their own laws to ban the practice. The U.S. Food and Drug Administration (FDA) has also said that anyone in the United States attempting human cloning must first get its permission. In Japan, human cloning is a crime that is punishable by up to 10 years in prison. England has allowed cloning human embryos but is working to pass legislation to stop total human cloning.

14 While laws are one **deterrent** to pursuing human cloning at this time, some scientists believe the technology is not ready to be tested on humans. Ian, one of co-creators of Dolly, has even said that human cloning projects would be criminally irresponsible. Cloning technology is still in its early stages, and nearly 98 percent of cloning efforts end in failure. The embryos are either not suitable for implanting into the uterus or they die sometime during **gestation** or shortly after birth.

15 Those clones that do survive suffer from genetic **abnormalities**. Some clones have been born with defective hearts, lung problems, **diabetes**, blood vessel problems and **malfunctioning immune systems**. One of the more famous cases was a cloned sheep that was born but suffered from **chronic hyperventilation** caused by **malformed arteries** leading to the lungs.

16 Opponents of cloning point out that while we can **euthanize** the defective clones of other animals, it's much more morally problematic if this happens during the human cloning process. Advocates of cloning respond that it is now easier to pick out defective embryos before they are implanted into the mother. The debate over human cloning is just beginning, but as science advances, it could be the biggest ethical dilemma of the 21st century.

New Words

1. embryo /'embriəu/	n.	胚胎，胎儿，胚芽
2. somatic /sə'mætik/	adj.	肉体的，身体的
3. enucleate /i'nju:klieit/	v.	［生］从……摘除细胞核
4. fuse /fju:z/	v.	使融合，合并，结合一起
5. surrogate /'sʌrəgeit/	adj.	代理的，代用的
6. mutate /mju: 'teit/	v.	变异
7. therapeutic /ˌθerə'pju:tik/	adj.	治病的；治疗术的；治疗学的
8. syndrome /'sindrəum/	n.	综合病症
9. infertility /ˌinfə'tiliti/	n.	不肥沃，不孕症
10. uterus /'ju:tərəs/	n.	子宫
11. deterrent /di'terənt/	adj.& n.	阻碍的，制止的；制止物，威慑物
12. gestation /dʒe'steiʃən/	n.	怀孕，妊娠
13. abnormality /ˌæbnɔ: 'mæləti/	n.	畸形，异常性
14. diabetes /ˌdaiə'bi:ti:z/	n.	糖尿病
15. malfunction /ˌmæl'fʌŋkʃən/	n.	故障；障碍
16. chronic /'krɔnik/	adj.	慢性的，延续很长的
17. hyperventilation /ˌhaipə(:)venti'leiʃən/	n.	［医］换气过度，强力呼吸
18. malformed /'mæl'fɔ:md/	adj.	畸形的；残缺的
19. artery /'ɑ:təri/	n.	动脉
20. euthanize /'ju:θənaiz/	v.	使安乐死，对……无痛致死术

Phrases and Expressions

1. in vitro fertilization	人工授精
2. gestation period	妊娠期
3. repair kit	（全套）维修工具
4. fertilized egg	受精卵
5. immune system	免疫系统

Notes

1. **DNA:** 英文 Deoxyribonucleic acid 的缩写，又称脱氧核糖核酸，是染色体的主要化学成分，同时也是组成基因的材料。有时被称为“遗传微粒”，因为在繁殖过程中，父代把它们自己 DNA 的一部分复制传递到子代中，从而完成性状的传播。
2. **U.S. Food and Drug Administration (FDA) :** 美国食品药品管理局，隶属于美国卫生教育福利部，负责全国药品、食品、生物制品、化妆品、兽药、医疗器械以及诊断用品等的管理。FDA 下设药品局、食品局、兽药局、放射卫生局、生物制品局、医疗器械及诊断用品局和国家毒理研究中心、区域工作管理机构，即六个局（有的刊物也称 6 个中心）、一个中心和一个区域管理机构。
3. **New York Post:** 《纽约邮报》，创刊于 1801 年，是美国连续出版时间最久的报纸。

Exercises

I. Building up Your Word Power

Directions: *Each of the following phrases paraphrases a word you have learned in the text of this lesson. Read each of them and then write the word it represents on the line provided.*

1. of, relating to, or affecting the body, especially as distinguished from a body part, the mind, or the environment _____
2. acting as a substitute _____
3. undergoing a change; becoming different in essence; losing one's or its original nature _____
4. having or exhibiting healing powers _____
5. a group of symptoms that collectively indicate or characterize a disease, psychologi-

cal disorder, or other abnormal condition _____

6. the persistent inability to conceive a child _____
7. a hollow muscular organ located in the pelvic cavity of female mammals in which the fertilized egg implants and develops _____
8. the condition of not being normal _____
9. faulty or abnormal functioning _____
10. lasting for a long period of time or marked by frequent recurrence, as certain diseases _____

II. Terms Matching

Directions: *Match the Chinese terms with their English equivalents.*

1. 使融合	A. gestation
2. 代理的	B. malfunction
3. 变异	C. uterus
4. 治疗学的	D. abnormality
5. 综合病症	E. euthanize
6. 不孕症	F. therapeutic
7. 子宫	G. diabetes
8. 妊娠	H. mutate
9. 畸形	I. syndrome
10. 糖尿病	J. infertility
11. 故障	K. chronic
12. 慢性的	L. malformed
13. 畸形的	M. artery
14. 动脉	N. vitro fertilization
15. 使安乐死	O. fertilized egg
16. 人工授精	P. surrogate
17. 受精卵	Q. fuse

III. Questions for Discussion

Directions: *Work in groups and discuss the following questions.*

1. What shocked the world in 1997 and in later years?
2. Brief the procedure of somatic cell nuclear transfer, which was used to create Dolly the sheep.
3. Why do some people think human cloning is inevitable?

4. Try to tell the potential risks of human cloning at present.
5. Do you think human cloning can be achieved? What is your opinion about it?

IV. Multiple Choices

Directions: *Choose the best answer for each item.*

1. Scientists in South Korea have already created _____ through cloning.
   A. human B. mice C. cow D. embryonic stem cells
2. One method scientists can use for human cloning is _____.
   A. to create stem cell B. to implant somatic cell
   C. cell nuclear transfer D. to implant fertilized egg
3. In therapeutic cloning, a patient's DNA is used to grow _____.
   A. organs B. tissues C. an embryonic clone D. hearts
4. _____ can be used as a human repair kit in therapeutic cloning.
   A. Neurons B. Tissues
   C. An embryonic stem cells D. Organs
5. Stem cells have the potential to grow _____.
   A. liver B. skin C. any organ or tissue D. heart
6. The couples with infertility problems can have a child with _____ of the parent's biological attributes.
   A. only one B. two C. none D. not mentioned
7. What prevents human cloning from being produced at present?
   A. Laws. B. Technology. C. Moral problem. D. All of them
8. Supporters of cloning insist that cloning problems can be solved by avoiding defective _____ before being implanted.
   A. embryos B. stem cells C. fetuses D. enucleated eggs
9. Opponents of cloning point out that while we can <u>euthanize</u> the defective clones of other animals, it's much more morally problematic if this happens during the human cloning process. The underlined word has the same meaning with _____.
   A. eulogize B. euthyrox
   C. to subject to a pleasant death D. euthyroid
10. With the development of science, _____ could be the biggest ethical issue of the 21st century.
    A. stem cell cloning B. growing stem cells from embryo
    C. implanting embryo D. human cloning

V. Sentence Translation

Directions: *Translate the following Chinese sentences into English.*

1. 如果克隆技术能够得以继续下去，科学家们可能采用的方法就是体细胞核移植，即培育多利羊所采用的方法。
2. 若这一过程成功，代孕母亲足月后就可分娩出一婴儿，即被试者的克隆体。
3. 克隆技术被人们完全接受尚需时日，但用于治疗目的的克隆技术有可能被人们首先接受。
4. 有人把克隆技术看做不育夫妇的补救措施，这些夫妇希望孩子至少含有他们其中一人的生物学特性。
5. 目前对于克隆人来说，法律是一道屏障，一些科学家认为这个技术不够成熟，还不能用来克隆人类。

VI. Passage Translation

Directions: *Translate the following passage into Chinese.*

If human cloning proceeds, one method scientists can use is somatic cell nuclear transfer, which is the same procedure that was used to create Dolly the sheep. Somatic cell nuclear transfer begins when doctors take the egg from a donor and remove the nucleus of the egg, creating an enucleated egg. A cell, which contains DNA, is then taken from the person who is being cloned. The enucleated egg is then fused together with the cloning subject's cell using electricity. This creates an embryo, which is implanted into a surrogate mother through in vitro fertilization. If the procedure is successful, then the surrogate mother will give birth to a baby that is a clone of the cloning subject at the end of a normal gestation period. Of course, the success rate is only about one or two out of 100 embryos. It took 277 attempts to create Dolly. Take a look at the graphic below to see how the somatic cell nuclear transfer cloning process works.

Text B Stem Cells

by Stephanie Watson

Do you know anything about stem cells? In this article, we will look at stem cells, find out how they work, discover their potential to treat disease and get inside the fierce debate surrounding their research and use.

1 Inside an embryo no bigger than the period at the end of this sentence are dozens of stem cells. Initially, these cells are **blank slates**, meaning that their fate is undecided. But they have great potential. Stem cells are **pluripotent**, which means that they can develop into every cell, every **tissue** and every organ in the human body.

2 Their almost limitless potential has made stem cells a significant focus of medical research. Imagine having the ability to return memory to an **Alzheimer's** patient, replace skin that was lost during a terrible accident or enable a wheelchair-bound person to walk again. But before scientists can use stem cells for medical purposes, they must first learn how to harness their power. They can't treat disease until they learn how to manipulate stem cells to get them to develop into specific tissues or organs.

Stem Cell Basics

3 A stem cell is essentially the building block of the human body. The stem cells inside an embryo will eventually give rise to every cell, tissue and organ in the **fetus's** body. Unlike a regular cell, which can only replicate to create more of its own kind of cell, a stem cell is pluripotent. When it divides, it can make any one of the 220 different cells in the human body. Stem cells also have the capability to **self-renew**—they can reproduce themselves many times over.

4 There are two types of stem cells: **embryonic stem cells** and **adult stem cells**. Embryonic stem cells come from an embryo—the mass of cells in the earliest stage of human development that, if implanted in a woman's **womb**, will eventually grow into a fetus. When the embryo is between three and five days old, it contains stem cells, which are busily working to create the various tissue and organ that will make up the fetus.

5 Adults also have stem cells in the heart, brain, bone marrow, lungs and other organs. They are our built-in repair kits, regenerating cells damaged by disease, injury and everyday **wear and tear**. Adult stem cells were once believed to be more limited than stem cells, only giving rise to the same type of tissue from which they originated. But new research suggests that adult stem cells may have the potential to generate other types of cells, as well. For example, liver cells may be coaxed to produce **insulin**, which is normally made by the **pancreas**. This capability is known as **plasticity** or **transdifferentiation**.

6 So where do scientists get the stem cells they use in their research? We'll look at two ways—reproduction and cloning—in the next section.

Acquiring Stem Cells for Research

7 In the early 1980s, scientists learned how to pull embryonic stem cells from a mouse and grow them in a laboratory. In 1998, they first reproduced human embryonic stem cells in a lab.

8 Where do researchers get human embryos? Embryos can either be made via reproduction—merging sperm and egg—or by cloning. Researchers aren't likely to create an embryo with sperm and egg, but many use **fertilized embryos** from **fertility clinics**. Sometimes, couples who are trying to have a baby create several fertilized embryos and don't implant them all. They may donate the ones that are left over to science.

9 Another way to create an embryo is via a technique called **therapeutic cloning**. This technique merges a cell (from the patient who needs the stem cell therapy) with a **donor egg**. The nucleus is removed from the egg and replaced with the nucleus of the patient's cell. This egg is stimulated to divide either chemically or with electricity, and the resulting embryo carries the patient's genetic material, which significantly reduces the risk that his or her body will **reject** the stem cells once they are implanted.

10 Both methods—using existing fertilized embryos and creating new embryos specifically for research purposes—are controversial. But before we get into the controversy, let's find out how scientists get stem cells to replicate in a laboratory setting in order to study them.

Replicating Stem Cells in a Lab

11 An embryo that has developed for three to five days is called a **blastocyst**. A blastocyst is a mass of about 100 or so cells. The stem cells are the inner cells of the blastocyst. They will ultimately develop into every cell, tissue and organ in the body.

12 Scientists remove stem cells from the blastocyst and **culture** them (grow them in a nutrient-rich solution) in a **Petri dish** in the laboratory. After the cells have replicated several times and are becoming too numerous for the culture dish, they are removed and placed into several other dishes. In just a few months, several stem cells can become millions of stem cells. Embryonic stem cells that have been cultured for several months without **differentiating** are referred to as a **stem cell line**. Cell lines can be frozen and shared between laboratories.

13 Adult stem cells are much harder for scientists to work with because they are more difficult to extract and culture than their embryonic counterparts. Stem cells not