当代
科技英语
教程

主 编 吴力新 陶亮采

A MODERN SCIENTIFIC
ENGLISH COURSE

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当代科技英语教程

主编　吴力新　陶亮采
编者　张　政　钟庆伦

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本书围绕当代科技发展主题，从最新国外原版材料中精选 60 篇文章，内容涉及领域包括人才、教育、医学、环境保护、工程技术、农业生产、科学珍闻和新课题等各个方面。全书共 20 个单元，每单元主课文一篇，附注释、生词表、词汇练习、语法学习、理解练习、翻译练习等。另有 B、C 课文及注释，书后附有练习答案及 20 篇主课文的参考译文。

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前　言

在科学技术高速发展的今天，新课题、新发现、新技术、新产品犹如雨后春笋，日新月异，层出不穷。然而，当前高校学生，尤其是理工科大学生，在从普通英语向专业英语过渡阶段，尚缺乏一套可以反映近年来世界科技信息的系统教材。为适应这一需要，我们编写了《当代科技英语教程》和《当代科技英语文选》。两书素材选自"美国之音"供国际交流的广播节目"科学报道"(Science Report)。《教程》按内容类别分 20 单元，共收入原文 60 篇，并配以注释、练习和主课文的参考译文等，可用作精读教材。《文选》则精选原文 100 篇，按照播出日期先后顺序排列，可作辅助性泛读材料。

该书语言地道，措辞简洁，深入浅出，内容广泛，涉及领域既包括工业、农业、教育、医学等方面的基础学科，又不乏环境保护、航天、遗传工程等新兴学科，同时编入部分最新科学珍闻，使该书融知识性与趣味性于一体。书中众多学说均具有科学启蒙意义，同样有助于广大科研人员和自学者提高阅读理解和翻译水平。

书中部分文章曾分别发表于 1988 至 1993 年的《世界科技译报》上。但在编写过程中，为配合教学特殊需要，该部分文章的参考译文一般采用直译，并对科技英语中常见术语与疑难点作了扼要的注释。

本书编写过程中，得到美籍语言专家埃弗雷斯特·梅茨勒(Everest Metzler)夫妇的热情帮助。他们精心审阅了全部书稿并提出了宝贵意见。同时，洛阳炼油设计院的徐海燕女士也参与了文字整理工作，在此一并致谢。

由于时间仓促，加以水平有限，书中不当之处仍在所难免，请读者不吝指教。

编　者

1993 年 7 月

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Unit One
Text A

Age and Creativity

Physicist Albert Einstein once made this comment about human creativity: A person who has not made an important scientific discovery before the age of thirty will never do so. Maybe he was right. Researchers are studying the idea. Einstein himself was just twenty-six years old when he published his theory of relativity[1]. Charles Darwin was in his late twenties when he developed his theory about the beginnings of all life forms, and Isaac Newton was twenty-four when he described the force of gravity.

Researchers repeatedly have found similarities among people in such fields as physics, mathematics, music and poetry. They say these people are most productive when they are between twenty and thirty years old. This is not necessarily true, however, for writers, engineers and medical researchers[2]. Studies show that they generally develop their best ideas when they are thirty-five to fifty years old.

Some scientists have attempted to explain why in some fields creativity drops with age[3]. More than one hundred years ago psychologist G. M. Beard argued that productivity was a mixture of energy and experience. He said people could reach a high point of creativity only when they had a lot of both. He said young people have a lot of energy, but they lack experience. Older people have more experience, but less energy. So, he said, creative work drops in later years.

Some modern psychologists believe Beard was wrong. They say a person's basic creativity really does not change much over the years, but for several reasons an older person may simply produce less.

University of California psychologist Dean Keep Saimonton has another explanation. He believes creative people are productive at different times because some ideas take longer to develop than others. For example, he says, a poet may need just five years to develop an idea, but a medical researcher may need twenty-five years. Mr. Saimonton's theory should give hope to many people who think they are too old to be creative. He says getting and developing ideas is a natural result of facing a new intellectual environment. So older people may do very well by changing to a different field of work.

New Words

creativity	n.	创造力
productive	a.	多产的，有成果的

productivity n. 生产率，生产能力
creative a. 有创造力的，创造性的
force of gravity 重力

Proper Names

Albert Einstein 阿尔伯特·爱因斯坦(1879－1955). German-born physicist.
Charles Darwin 查尔斯·达尔文(1809－1882). English naturalist; author of "The Origin of Species"《物种起源》.
Isaac Newton 艾萨克·牛顿(1642－1727). English natural philosopher; formulator of laws of motion and law of gravitation.

Notes

1. theory of relativity. 相对论
special theory of relativity (狭义相对论): theory, mainly due to Einstein, based on principle of constant velocity of light and showing that all motion is relative, treating space and time as four related dimensions and invalidating previous conceptions of geometry.
general theory of relativity (广义相对论): theory developed by Einstein in 1915 extending the special theory to include cases of acceleration and the phenomena of gravity.
2. This is not necessarily true, however, for writers, engineers and medical researchers.
The sentence means this judgment might sometimes prove to be wrong for those people.
3. Some scientists have attempted to explain why in some fields creativity drops with age.
We should be able to tell the exact meaning of a certain word from its context. In this context "fields"means"branches of knowledge or activity"and"with"means"because of (an old period of life)."

Exercises

I. Put suitable words or phrases in the blanks and make some necessary changes.
develop describe publish give hope to argue lack need produce
1. Can you ____ any proof that your theory is based on facts?
2. His optimistic idea ____ those who thought failure was inevitable.
3. I'd like to ____ this idea a little more fully before I go on to my next point.
4. I ____ words with which to express my thanks.
5. The human body ____ energy or fuel just as a motor does.
6. The scientist ____ that his discovery had changed the course of history, but nobody would accept his argument.
7. Words cannot ____ the beauty of the scene.
8. The University Press ____ educational books.

II. Choose the best answer.
1. The first paragraph is mainly about ____.

a. Einstein's comment about human creativity

b. examples to support Einstein's comment

c. three world-famous scientists

d. the relationship between age and creativity

2. The word"both"in paragraph three refers to ____.

a. creativity and productivity

b. productivity and energy

c. energy and experience

d. experience and creativity

3. The following is true except that ____.

a. a physicist may develop his best idea when twenty to thirty years old

b. a poet may get his best idea when thirty to forty years old

c. an engineer may make his most important discovery when twenty to thirty

d. a medical researcher may make his most important discovery at thirty to forty

4. The last paragraph mainly tells ____.

a. about Saimonton's explanation

b. that a medical researcher needs a longer time to develop an idea than a poet

c. that older people will for sure do well if changing to a different field of work

d. that some people are more creative and productive than others

5. We can infer that ____.

a. Einstein was right about his comment

b. Darwin studied the force of gravity

c. a person's basic creativity changes much in all fields when he is at a different age

d. a person's productivity drops with age

III. Put the first paragraph of the text into Chinese.

IV. Discussion Questions:

1. Who was Albert Einstein?
   What comments did he make about human creativity?
2. Tell what you know about Charles Darwin.
   When did he develop his theory about the beginnings of all life forms?
3. Give a brief account of Isaac Newton.
   What was he famous for?
4. Do you see any similarities among the three scientists?
   What are these similarities?
5. What ages are people most productive according to the opinions of the researchers?
   Does this have anything to do with people's professions?
6. What is Mr. Saimonton's theory about creativity?
   Do you agree with him?
   What is your idea about the relation between age and creativity?

Text B

Jack-of-all-trades[1] and Renaissance Man[2]

Jack-of-all-trades and Renaissance man are expressions that describe a person with many skills or educated about many subjects.

First, Jack-of-all-trades. A person who is a Jack-of-all-trades can do many different jobs. He can build a house for example, and repair a car and plant crops. Jack is an old word that means a worker, someone who does hard labour. Trade is well-known as a word for exchanging goods. But trade can also mean a kind of job. For example, someone who works at the newspaper trade has a job at a newspaper. A steel worker's trade is making steel. A Jack-of-all-trades is a jack or worker who is able to do many kinds of jobs or trades. The expression came into common use in the early days of the United States when men traveled from village to village looking for work. These men had many valuable skills. They knew how to help farmers build a house or repair farm equipment. They could build small machines or put new iron shoes on a horse. These Jacks-of-all-trades were welcomed by families living far from a city or town.

The expression Renaissance man is similar in meaning to Jack-of-all-trades, but it deals with the person's education and knowledge, not so much with his skills. A Renaissance man is very well-educated in the arts, music, language, science, math, history and international affairs. He is curious about everything and blind to nothing. Renaissance man gets its meaning from the fourteenth century. This was when Europe began to awaken from the long historical period known as the Middle Ages[3]. People became more interested in learning, in new forms of expression and in science. Many of the great thinkers of the Renaissance period did not limit themselves to a single subject like music or history. They were interested in everything. Leonardo da Vinci[4] was the perfect example, mixing art with science and religion in new ways. This kind of person is not so common in today's busy world. However, when someone does take the time to learn about many subjects, we call that person a Renaissance man or a Renaissance woman. Like Leonardo or Thomas Jefferson[5] or Benjamin Franklin[6], this is a person whose creativity and imagination are not limited by the borders of a single subject. Jack-of-all-trades and Renaissance man, at a time when the world is full of specialists, their specialty is the whole world.

Notes

1. Jack-of-all-trades　能做各种事情的人，可译成多面手。
2. Renaissance man　文艺复兴时期式的人，可译成博学多才的人。

3. Middle Ages (中世纪), period of history intermediate between ancient and modern times.

Proper Names

4. Leonardo da Vinci 达·芬奇(1452－1519). Italian painter, sculptor, architect, engineer, man of science, and writer of prose and verse.
5. Thomas Jefferson 托马斯·杰斐逊(1743－1826). American statesman, the third president of U. S. (1801－09).
6. Benjamin Franklin 本杰明·富兰克林(1706－1790). American publicist and popular scientist; inventor of the lightning conductor.

Answer the following questions.

1. What is meant by "Jack-of-all-trades"?
2. Who is a Renaissance man or a Renaissance woman?
3. Describe the similarities and differences between a Jack-of-all- trades and a Renaissance man.
4. Who is a specialist?
5. Which people are more common nowadays, Renaissance men or specialists?

Text C

A Teen-age Science Contest

A high school student from Chicago, Illinois, has won first prize in the Yearly Westinghouse Electric Company Teen-age Science Contest[1]. He is seventeen-year-old Matthew Hedrick. His prize is twenty thousand dollars. Matthew's winning project involved a gene in freshwater blue-green algae plants. He separated the gene needed to change nitrogen in the air into ammonia fertilizer[2]. Experts say his research could lead to improved crop development.

The Westinghouse teen-age science contest began in 1942. Its purpose is to honor student scientists in the United States. It provides winners with money to help pay for a university education. This year 1431 students took part in the contest. That is about 30 less than last year.

The second prize winner was sixteen-year-old David Lew of Riverside, California. He received fifteen thousand dollars. David developed computer pictures of nerves in the eyes and brain. These nerves work together to create the sense of sight[3].

Third prize, also fifteen thousand dollars, went to David Shew of Tacoma, Washington. He developed the way to place the genetic directions for part of a molecule into white blood cells[4]. Experts say his work provides a new way to study diabetes and similar diseases.

Other winning projects involved the body's defence system against disease and mathematical computer programs, also relationships between parent and child and possible new ways to build cars and planes[5].

The Westinghouse Electric Company began its science contest during World War II. The company wanted to support high school students who were interested in science. More than 95 percent of the winners complete university studies in science, mathematics or engineering. About 70 percent complete higher education programs. That is twenty-five times greater than the usual percentage of American high school students. Several winners have won the Nobel Prize[6] for scientific research.

Students competing in the Westinghouse contest are not judged only for their science projects. They are judged on a more general level too. They must demonstrate great skill in solving all kinds of scientific problems.

Notes

1. the Yearly Westinghouse Electric Company Teen-age Science Contest　威斯汀豪斯电气公司青少年科学竞赛年会
2. Matthew's winning project involved a gene in freshwater blue-green algae plants. He separated the gene needed to change nitrogen in the air into ammonia fertilizer.　马修的获奖项目涉及淡水兰绿藻体内的一种基因。他将这种能用于将大气中 的氮转化为氨肥的基因分离出来。
3. David developed computer pictures of nerves in the eyes and brain. These nerves work together to create the sense of sight.　戴维设计出可显示眼的神经组织与脑神经是怎样互相配合从而产生视觉功能 的电子计算机图象。
4. He developed the way to place the genetic directions for part of a molecule into white blood cells.　他研究出一种基因位置排列法，可将分子成份引入白细胞中。
5. Other winning projects involved the body's defence system against disease and mathematical computer programs, also relationships between parent and child and possible new ways to build cars and planes.　其它获奖项目还包括人体的防御系统、数字计算机程序、亲代与子代的关系 以及制造新型飞机和汽车的蓝图等。
6. Nobel Prize　诺贝尔奖金

Answer the following questions.

1. When did the Westinghouse teen-age science contest begin?
   What is the purpose of this yearly activity?
2. Give a brief account of the winning projects of 1990.
3. How are students competing in the Westinghouse contest judged?
4. What is the influence of the contest on education and science?

Unit Two
Text A

Is Your Child in Good Health?

Some medical problems in children are easy to see. If a child is bleeding severely, for example, you should take the child to a doctor. Other medical problems are not easy to see. They may affect the child's ability to hear, walk or talk. Such problems may develop over a long time.

The office of United Nations Children's Fund[1] in Nepal has published a series of books to help families recognize disabilities in children. The books list important warning signs for several common medical problems.

One problem is poor hearing. Families should watch for the following warning signs: A child does not turn its head in the direction of sounds. A child talks very softly or very loudly. A child says its ears hurt. A child always turns the same ear toward sounds.

Another medical problem is poor eyesight. There are several warning signs. A child's eyes are always red or filled with water. A child has trouble finding small objects that have fallen to the ground. A child walks into doors or furniture.

When children are a little older, they may show signs of bone or muscle disorders. For example, a one-year-old child cannot sit up by itself. A four-year-old child cannot stand a short time on just one foot. A five-year-old child cannot throw an object easily.

Difficulties in speaking can be a medical problem too. The UNICEF[2] books list the kinds of things children should be able to say, and it says when children should be able to say them. A child one and one half years old should be able to say a simple form of mother and father. In English these would be mama and dada. A two-year-old should be able to say the names of several other persons as well as some objects, and a four-year-old should be able to speak in short sentences.

Recognizing mental disabilities is as important as recongnizing physical disabilities. A mentally healthy child should be able to do the following things: At one year it reacts when someone says its name. At three years it understands simple stories. And at four years it can answer simple questions.

Children develop at different rates. Recognizing a problem early can help cure the problem or prevent it from becoming worse.

New Words

medical	a.	医学的，医疗的
bleed	v.	流血
disability	n.	伤残，没有能力
muscle	n.	肌肉
mental	a.	脑力的，精神的
physical	a.	体力的

Notes

1. United Nations Children's Fund　联合国儿童基金会
2. UNICEF—Abbreviation for the United Nations International Children's Emergency Fund(即 United Nations Children's Fund)　联合国儿童基金会(曾用名)

Exercises

I. Put suitable words or phrases in the blanks and make some changes if necessary.

affect　fill with　throw　react　cure　prevent　warn　recognize

1. Smoking ____ health.
2. Cancer a long time ago was deadly but now it is ____.
3. The old books are worthless so why not ____ them away?
4. He has changed so much that I can hardly ____ him at first glance.
5. "If you come late again, you will be dismissed. "the boss ____ his secretary.
6. My first ____ was to step back.
7. His best friend died last night and he ____ sorrow.
8. If the fire engine had come earlier, it would ____ it from spreading.

II. Choose the best answer.

1. Which of the following may be least found in the books published by the UNICEF?
   a. A child's eyes are filled with water.
   b. A child says that his ears hurt.
   c. A child's finger is bleeding.
   d. A child speaks very softly.
2. Which of the following is considered normal?
   a. A one-year-old child can not sit by itself.
   b. A four-year-old child can not stand a short time on one foot.
   c. A four-year-old child can not speak in short sentences.
   d. A two-year-old child can not answer simple questions.
3. The word"disabilities"in paragraph 2 means ____.
   a. medical problems　b. physical disorders
   c. mental difficulties　d. all of the above
4. The phrase"walks into"can be best replaced by ____.
   a. goes into　b. bumps into
   c. breaks into　d. looks into
5. The purpose of the books is to ____.
   a. tell parents that medical problems are easier to see than mental problems
   b. warn families that a child when bleeding can become seriously ill
   c. help parents cure the disabilities in children
   d. help families to recognize disabilities in children

III. Translate paragraph 6 into Chinese.

IV. Questions:

1. What kind of problem may develop over a long period of time?
2. What are warning signs for hearing problems?
3. At what age should a healthy child throw an object easily?
4. What are the speaking problems for a child?
5. What is the difference between mental and physical disabilities ?

Text B

Dyslexia[1]

Many children have trouble learning to read. They suffer a learning disability called dyslexia. For these children, letters in words seem to jump and move. Sometimes the order of letters in a word seems to change.

Dyslexia is not connected to intelligence. These people are not mentally slow or disabled. Such persons as American inventor Thomas Edison, Britain's World War Two leader Winston Churchill, and the great thinker and scientist Albert Einstein are believed to have had dyslexia.

Experts also say dyslexia is not a disease. They say it is just a condition caused by differences in development of brain tissue before a baby is born. The left and right sides of the brain do not work together in a normal way[2].

The right side of our brain controls such activities as arts, music and mathematics. The left side controls such activities as writing and reading. Language areas are found in both sides, but usually the language area on the left side is larger. However, in persons with dyslexia the language areas in the right side of the brain are as large as those on the left. And the right side of the brain has a larger than normal number of brain cells[3].

Researchers believe the more developed right side of the brain fights the left side for control of language. They believe this creates conflicts and tension in the brain that make reading more difficult[4]. Researchers believe the difference in brain tissue happens before the child is born. They say it could be caused by a minor disease, a disease suffered by the mother or changes in hormones[5] that affect the development of brain cells.

One scientist is studying the brain's electrical activity. He found differences in the electrical activity of children with dyslexia. The differences were not only in the left part of the brain where they were expected. He also found differences in the front of the brain and in the part of the brain involved in seeing[6]. He believes this shows that dyslexia involves many areas of the brain. The discoveries have greatly increased our understanding of dyslexia. It is

not clear that this can lead to treatments for reading disorders. But experts say the findings will help doctors to recognize a child with dyslexia at an early age when special teaching is most effective.

Notes

1. Dyslexia　诵读困难
2. Experts also say dyslexia is not a disease. They say it is just a condition caused by differences in development of brain tissue before a baby is born. The left and right sides of the brain do not work together in a normal way.　专家又说，"诵读困难"不是什么疾病。它的起因是孩子在出生前，脑组织生长发育差异，即左、右半脑间不能正常协调功能。
3. However, in persons with dyslexia the language areas in the right side of the brain are as large as those on the left. And the right side of the brain has a larger than normal number of brain cells.　然而，诵读困难者的右半脑语言区跟左半脑的一样大，而且其右半脑的脑细胞多得出奇。
4. Researchers believe the more developed right side of the brain fights the left side for control of language. They believe this creates conflicts and tension in the brain that make reading more difficult.　科研人员认为，发育较快的右半脑跟左半脑争夺主管语言的职能，形成中枢神经内部的矛盾与紧张气氛，导致阅读不易进行。
5. hormones　荷尔蒙(激素)
6. One scientist is studying the brain's electrical activity. He found differences in the electrical activity of children with dyslexia. The differences were not only in the left part of the brain where they were expected. He also found differences in the front of the brain and in the part of the brain involved in seeing.　一位从事人脑电活动研究的科学家发现，诵读困难的孩子存在电活动异常现象。这些差异不但存在于意料中的左半脑内，还出现在脑的前部和专司视觉的部位。

Answer the following questions.

1. What problems do those suffering dyslexia have when they read?
2. Is dyslexia a disease ?
3. Are those who have dyslexia mentally slow?
4. Why do some people suffer dyslexia?

Text C

Lead Level in the Blood

Medical researchers say they have found that small amounts of the element lead can affect a developing foetus. The American researchers said this exposure to lead seems to limit a child's ability during the first few years of life. They said they found this danger even at lead levels scientists had thought to be safe. The study is said to be the first to observe the