工程英语教程

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译者的话

1983 年至 1985 年间，英国广播公司录制了一套有关英语发展史的电视系列片，取名 *The Story of English*。1986 年，该电视系列片的文本问世。许国璋先生曾专门撰文，向我国学人推荐此书(见《外语教学与研究》1987 年第 3 期。)。《英语的故事》便是该文的汉译本。读者从中可了解：1. 英语在当今世界的地位和作用；2. 英语是如何从外族语言成为不列颠诸岛的母语；3. 苏格兰英语、爱尔兰英语乃至黑人的渊源和特点；4. 美国英语、加拿大英语、澳大利亚英语和新西兰英语是如何形成和发展的；5. 非洲、牙买加、太平洋地区以及新加坡、马来西来和印度等地的英语是如何成为各具特色的语言变体的。

与有关英语发展史的其它著作相比，本书至少具有两个鲜明的特点。首先，作者在叙述英语的演变和传播的过程中，始终坚持以共时描述为主的原则，强调语言的交际价值，将十几个世纪的英语变迁置于广袤的社会历史和文化背景之中，读者不仅可以从中了解英语发展和演变的概貌，而且可了解导致语言变迁的社会和文化史实。从这个意义上看，本书不仅是通俗易懂的语言史读本，而且是个很好的西方文化史读本。其次，作者坚持从动态角度观察语言，重视对语言变异形式的描述，采取了比较客观的立场评述各体英语。

由于本书的信息量大，所述之事的时空跨度大，在翻译过程中我们对读者可能感到陌生的人物及史地背景加作一些脚注。人名和地名的汉译均参照了国内通行的有关词典。原文中有一些引

自英美名家名著的语句和片段，我们多取用国内已有的权威性译本，以体现译事之严肃性，避免给读者制造混乱。在此，谨向原译者表示感谢。

参加本书翻译工作的有秦秀白（导言、第1、2、3章）、姬少军（第4、5、6章）和舒白梅（第7、8、9章及尾声）。译文若有不当之处，欢迎广大读者批评指正。

译书难，出书似更难。这部译作能够问世，应归功于暨南大学出版社的领导和编辑的大力支持。我们诚恳地向他们致谢。

译　者

1990年夏

前 言

1985年国家教委批转全国理工科院校的《大学英语教学大纲》中规定，“专业阅读课是必修课，安排在基础阶段结束后的第五至第七学期中进行”，同时又指出，“专业阅读阶段的任务是：指导学生阅读有关专业的英语书刊和文选，使其进一步提高阅读英语科技资料的能力，并能以英语为工具获取专业所需要的信息。”本教程就是遵循这一宗旨而为理工科院校机电专业三年级学生编写的一部专业英语阅读教程，也可供机电行业的科技人员作为自学读本。

工程英语（**English in Engineering**）是用于工程技术领域的一种英语功能变体。它和普通英语（**General English**）比较起来，无论在词汇和语法结构上，还是在功能意念的表达和语篇构成上都独具特色。在专业阅读阶段，学生应掌握一定数量的科技文献常用词语，准技术词和专业术语，熟悉这种语体的结构特点，从而提高专业阅读的能力。

从基础英语教学到引导学生阅读专业性较强的文献，中间需要有一个过渡。本教程所选用的阅读课文，内容基本上是机电专业的基础知识，并把机电两类结合在一起。这不仅出于当前“机电一体化”趋势的考虑，主要还是从语言教学的需要出发，使所谓的“代码转移”不致显得过于突然或生硬，使学生能有一个适应的过程。

不断积累和扩充英语词汇是这一阶段的英语学习者的一项重要而艰苦的任务。使用本教程的读者应当充分利用在基础阶段学习中所学得的构词法知识，在扩充自己的英语词汇方面狠下工夫。编者在本教程编写过程中力求做到在词汇选择方面侧重于专业文献常用词语和科技术语，基础英语中的基本词汇不再作为重点。另外，基础英语教学阶段全面讲授语法结构，而专业阅读中则侧重于科技文献中出现频率较高的语法现象的复习和巩固。为此本书中编写了一些语法项目，作为阅读课文的补充并配有练习，旨在体现科技语体的语法结构特点。

本教程中的英语部分经美籍教师 **Bob Bacon** 和加拿大籍教师 **Nancy Goodsell** 审阅，在此顺致谢意。

编　者

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CONTENTS

Unit 1

Reading

Twentieth-Century Technology

As the twentieth century came into being, a number of inventions emerged that were destined to have far-reaching effects on our civilization. The automobile began to be more widely used as better roads were made available. The inventions of electrical equipment and electron tubes started the widespread use of power systems and communication networks. Following the demonstrations by the Wright brothers that man could build a machine which would fly, aircraft of many types developed rapidly.

These inventions, typical of many basic discoveries that were made early in the century, exemplify the spirit of progress of this period. ① So fast has been the pace of discovery, with one coming on the heels of another, that it is difficult to evaluate properly their relative importance, although we certainly can realize their impact on our way of life. However, in a number of instances, the practicality of an engineering invention has been demonstrated many years in advance of its implementation.

An outstanding characteristic of this century is the increased use of power. Albert Einstein was one of the world's most acclaimed physicists. His statement of the equivalence of mass and energy, $E=mc^2$, made possible the emergence of nuclear power. In 1940, it was estimated that the total energy generated in the United States would be the equivalent in "muscle-power energy" of 153 slaves working for every American man, woman, and child in the country. Today a similar calculation would show that about 500 "slaves"are available to serve each person. This is a considerable advance from the days of Egyptians and Greeks.

In modern times, engineering endeavors have changed markedly from procedures used in the time of Galileo, or Ampere. Formerly, engineering discoveries and development were accomplished principally by individuals. ② With the increased store of knowledge available and the widening of the field of engineering to include so many diverse branches, it is usual to find groups or teams of engineers and scientists working on a single project. Where formerly an individual could absorb and understand practically all of the scientific knowledge available, now the amount of information available is so vast that an indivdual can retain and employc, at best, only a part of it.

Since 1900, the ratio of engineers and scientists in comparison to the total population has been steadily increasing.

For example, in the United States the ratio has been reported as follows:

YEAR	RATIO OF U. S. ENGINEERS SCIENTISTS TO POPULATION
1900	1 to 1800
1950	1 to 190
1960	1 to 130
1980	1 to 65

If this is the case, there will be an even greater increase in technological advances in the nest 20 years than there has been in the past 20 years.

Within the past two decades, four technological developments have produced profound changes in our way of life. These developments are nuclear power, the electronic digital computer, interplanetary space navigation, and microelectronics. These concepts are still in their early stages of development, but historians of the future may well refer to our time by such terms as the nuclear age, the computer age, or the age of space travel. The engineer has been a principal developer of these concepts because of the need for their capabilities. The ocean offers great possibilities for technological exploration and perhaps even greater rewards for civilization than has space exploration.

In this age, as in any age, the engineer must be creative and must be able to visualize what may lie ahead. He must possess a fertile imagination and a knowledge of what others have

done before him. As Sir Isaac Newton is reputed to have said, "If I have seen farther than other men, it is because I have stood on the shoulders of giants." The giants of scienece and engineering still exist. All any person must do to increase his field of vision is to climb up on their shoulders.

New words

1. destine 〔'destin〕 v. t. 注定(通常用被动语态)
2. far-reaching 〔'fa:'ri:tʃiŋ〕 adj. 影响深远的
3. exemplify 〔ig'zemplifai〕 v. t. (illustrate by example; be an example). 以实例说明,以实例表明
4. heel 〔hi:l〕n. back part of the human foot 脚后根
5. practicality 〔prækti'kæliti〕 n. 实用性
6. implementation 〔ˌimplimen'teiʃən〕 n. (carrying (an undertaking, agreement, promise) into effect) 实现;履行
7. acclaim 〔ə'kleim〕 v. t. (welcome with shouts of approval) 欢呼,称赞 acclaimed adj. 备受称赞的
8. equivalence 〔i'kwivələns〕 n. (being equivalent) 等值(价量);当量
9. emergence 〔i'mə:dʒəns〕 n. 出现
10. Egyptian 〔i'dʒipʃən〕 n. 埃及人
11. Greek 〔'gri:k〕 n. 希腊人

12. endeavor [in'devə] n. effort, attempt 努力,力图

13. markedly ['ma:kidli] adv. in a clear manner 显著地

14. profound [prə'faund] adj. 深刻的

15. interplanetary [ˌintə'plænitəri] adj.
(between planets) 星际的

16. microelectronics ['maikrəuile k'trɔniks] n. 微电子学(技术)

17. historian [his'tɔ:riən] n. 历史学家

18. developer [di'veləpə] n. 开发者,研制者

19. capability [ˌkeipə'biliti] n. 能力

20. creative [kri(:)'eitiv] adj. 有创造力的;有创造精神的

21. visualize ['vizuəlaiz] v. t.
(bring (sth) as a picture before the mind)
想象出

22. fertile ['fə:tail] adj. (创造力,想象力)丰富的

23. repute [ri:'pju:t] v. t. (通常用被动语态)被当做,据认为

24. vision ['viʒən] n. 视力,洞察力

New phrases

come into being 开始,出现

come on the heels of 接踵而来,紧随……之后而来

in advance of 在……之前

in comparison to 与……相比

the Wirght brothers 莱特兄弟(美国两位飞机发明家)

Notes to the Reading

①一个又一个发明接踵而来，尽管我们确实意识到它们对现代生活方式的影响，但还难以恰当地评价其重要意义。主句 so fast has been ……是倒装语序 the pace 作主语，that 引出结果从句。这个从句本身还带一个 although 引出的让步从句。这个复合句由三个分句构成。

②由于现有知识的大量积累以及因工程领域扩大而形成如此繁多的分支，通常由某些工程师和科学家通力协作来完成一个研制项目。

介词 with 带两个宾语 the increased store …… 和 the widening ……构成一个较长的介词短语，表示原因。主语是 to find groups or teams 这是一个简单句。

Reeding Comprehension Check

Ⅰ. Circle the correct answer according to the reading passage.

1. Electrical equipment and electron tubes started the development of ______
   a. the automobile.
   b. the airplane.
   c. the train.
   d. power and eommunications.
2. Many inventions at the beginning of this century ______
   a. came rapidly.
   b. can be evaluated easily as to their significance.

c. had minimal impact on the way of life.

d. were impractical.

3. Calculations complied on total energy generated in the U. S. in 1940 would be eqvivalent in 'muscle-power energy' of _____

Slaves working for each American individual.

a. 500

b. 135

c. 153

d. 315

4. Engineering developments are now accomplished by _____

a. individuals.

b. teams of engineers.

c. groups of scientists.

d. teams of engineers and scientists.

5. The greatest possibilities and rewards for technological exploration may be affected by _____

a. outer space.

b. nuclear power.

c. inner space.

d. the ocean.

Ⅱ. Translate the following word groups into Chinese.

1. the pace of discovery
2. to examplify the spirit of devotion
3. the impact on our way of thought

4. to increase the field of vision

5. the world's most acclaimed scientist

Ⅱ. Translate the following sentences into Chinese.

1. In a number of instances, the practicality of an engineering invention has been demonstrated many years in advance of its implementation.

2. The ocean offers great posibilities for technological exploration and perhaps even greater rewards for civilization than has space exploration.

Unit 2

Reading

Efficiency in Engineering Operations

Unlike the scientist, the engineer is not free to select the problem which interests him; he must solve the problems as they arise, and his solutions must satisfy conflicting requirements. Efficiency costs money, safety adds complexity, performance increases weight.[①] The engineering solution is the optimum solution, the most desirable end result taking into account many factors. It may be the cheapest for a given performance, the most reliable for a given weight, the simplest for a given safety, or the most efficient for a given cost. Engineering is optimizing.

To the engineer, efficiency means output divided by input. His job is to secure a maximum output for a given input or to secure a given output with a minimum input. The ration may be expressed in terms of energy, materials, money, time, or men. Most eommonly the denominator is money; in fact, most engineering problems are answered ultimately in dollars