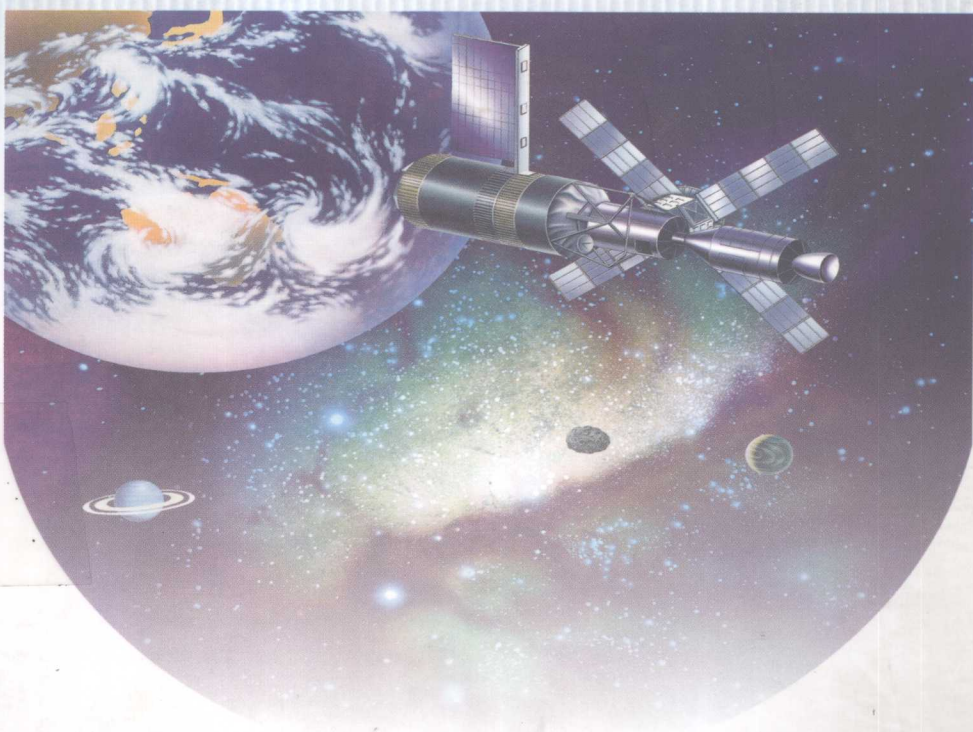


A Course in Scientific English

科技英语 教程

程明 主编

安徽大学出版社



科技英语教程

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前 言

根据原冶金部教育司高教处关于开设科技英语课程作为大学英语基础阶段学习向专业阅读阶段过渡的意见,我们按照《大学英语教学大纲》对专业阅读的要求,编写了《科技英语教程》,该书已在安徽工业大学本科生中试用多年。为正式出版,我们对其中的一些内容进行了修订。

本书注重选编新兴学科和内容新颖的文章,其目的旨在培养学生科技文章的阅读能力与翻译能力,力求通过本教材的学习以增长语言知识,扩大科技英语的词汇量,为下一步的专业阅读打下基础。

本书以我校外语系部分教师选编的文章为基础,对其中的一些内容进行了增删,以便使语言规范,易于理解。

本书由程明主编,刘爱萍、尹富林、李庆厚、朱瑜等同志参加编写。全书共 15 个单元。每单元包括:课文、生词、课文注释、翻译技巧和练习。由于时间仓促,水平有限,疏漏之处恳请专家及同行批评指正。

编 者

2001 年 6 月于安徽工业大学

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Unit 1

The Use of Abbreviation in Scientific Literature

Abbreviations, the shortened forms of words or word groups used in place of the whole, are in wide use in every variety of English. As we all know, contractions such as isn't, didn't, haven't, shouldn't, etc. are heard everywhere. They are in reality abbreviations formed by the omission of a sound or letter. Though such contractions are allowable in a conversational or informal style, in more formal writing the full forms should be used. In a formal literary style no abbreviations are used except conventional forms of address, like Mr, Mrs; honorary titles, like Dr, Ph D. For lack of space we will only deal with the use of abbreviations in scientific literature here.

Abbreviations play an essential part in scientific writing. Scientists and engineers constantly need and use abbreviations to save time in writing and space in drawing. Especially in tabular matter^[1], specifications and descriptions of technical apparatus, products and processes as well as titles of journals, abbreviated words are much more freely used than in ordinary technical writing. When using abbreviations, however, one must bear in mind that any writer is under obligation to make himself easily understood instead of being misunderstood by the readers. He has to be fully aware that only if they are widely accepted will abbreviations contribute to an economy of words^[2]. When they do, they become part of the common language used by scientists. It is no accident that many new abbreviations are short-lived because they serve no useful purpose, or because of misuse, or because they are not used in an acceptable way. Here in lies the trouble at present: abbreviating is usually done too often by mere chance. This contradicts the very purpose of abbreviating because unauthorized or unusual abbreviations only puzzle the reader.

Therefore it is important that every technical writer(should) know how to use abbreviations correctly and at the proper time.

Although there are apparently no basic principles governing the formation of abbreviations as a whole, the following rules adopted by engineering and scientific societies may be of some help to beginners.

1. Apart from quite a number of commonly agreed-upon abbreviations any essential term should be written in full the first time it is used and then abbreviated in parentheses. This is because abbreviations which are commonly used in one country may not be understood in another. Also, one abbreviation may have several meanings and even after referring to a dictionary of abbreviations the reader may still not know which meaning the writer intends.
2. Authors should be consistent in using abbreviations and their punctuation.
3. An "s" should not be added to an abbreviation, except for nos, which is the short for numbers, hrs, the short for hours, and figs, which is in the sense of illustration^[3]. In addition, the plurals of p. (page), l. (line) and chap. (chapter) are pp, ll, and cc respectively.
4. Abbreviations of units of measurement should be used only with exact figures, never with approximations, and never without any figures at all.

For instance it is wrong to say: "He was almost six ft tall." Instead we should say: "He was about six feet tall" or "He was six ft tall."

Likewise, the following abbreviations are incorrect as there are no figures before them: "Acceleration is expressed as ft per sec per sec." Rather, we should write: "Acceleration is expressed as feet per second

per second. ^[4]”

5. A sentence should never begin with an abbreviation. One exception to this rule is the abbreviation “fig”, which is properly abbreviated at the beginning of such a sentence as “Fig. 1 shows a right triangle.”

6. Capitalization of abbreviations must follow the rules of English grammar. All proper nouns are capitalized; all common nouns are written in their usual small form. Units of weight, measure, and velocity, such as kg, in., cm, mm, rpm, etc. appear in small form to avoid confusion with other letter combinations they resemble. Many writers have a marked tendency to capitalize everything they think is important. If this tendency goes unchecked, confusion follows; all abbreviations and acronyms look alike. So follow the common sense rules of good grammar and correct usage.

7. Although many writers prefer to end an abbreviation with a stop, modern practice is to avoid all punctuation unless the form is taken from Latin or there is some conventional use demanding punctuation. For instance, U. S. A. is the country, USA is the army. D. C. is the District of Columbia; DC is direct current. Similarly, fig., figs., and no. require periods to keep readers from thinking they may be words instead of abbreviations for figure, figures, and number. The suggestion is: To save ever more space, drop out abbreviation period wherever you can.

Words and Expressions

abbreviation	[əbri:vi'eɪʃən]	<i>n.</i> 缩写; 缩略词
contraction	[kən'trækʃən]	<i>n.</i> 缩写; 缩写形式

in reality 实际上

omission [əu'miʃən] *n.* 省略

allowable [ə'laʊəbl] *adj.* 可以容许的

literary ['litərəri] *adj.* 文学(上)的

apparatus [æpə'reitəs] *n.* 仪器,设备

tabular ['tæbjulə] *adj.* 表格式的

obligation [ɒbli'geɪʃən] *n.* 义务;责任

be under obligation to do... 有责任去做...,有履行...的义务

short-lived *adj.* 暂时的;短命的

acceptable [æk'septəbl] *adj.* 可接受的

contradict [kəntre'dɪkt] *vt.* 同...矛盾;同...抵触

unauthorized [ˈʌn'ɔ:θəraɪzd] *adj.* 未经公认的;未经许可的

agreed-upon *adj.* 意见一致的;公认的

parenthesis [pə'renθɪsɪs] *n.* 圆括号 (常作 *pl*) parentheses

consistent [kən'sɪstənt] *adj.* 一致的;始终如一的

in the sense of... 表示...

illustration [ɪləs'treɪʃən] *n.* 实例;例证

approximation [əprɒksi'meɪʃən] *n.* 近似;近似值

acceleration [ækselə'reɪʃən] *n.* 加速;加速度

triangle ['traɪæŋgl] *n.* 三角(形)

right triangle 直角三角形

velocity [vi'lɒsɪti] *n.* 速度

unchecked [ˈʌn'tʃekt] *adj.* 不加制止的

acronym ['ækrənɪm] *n.* 首字母缩略词

period ['piəriəd] *n.* 句号,句点

Notes

1. ...in tabular matter,

“tabular matter” refers to the written material in a table.

表格中的文字说明部分。

2. only if they are widely accepted will abbreviations contribute to an economy of words.

缩略词只有被大家所公认,才能写成缩略形式。

only 位于句首,主句语序倒装。

economy 意为“节省”、“节约”。例如:

to practise economy 厉行节约

economy of water 节约用水

3. ...which is in the sense of... 表示...之意

4. Acceleration is expressed as feet per second per second.

加速度表示为:英尺/秒²。

Translation Skill

动作名词的译法

由动词派生而来的名词称作动作名词,如本课课文中出现的

abbreviation, contraction, omission, description, approximation, formation, capitalization 等分别由动词 abbreviate, contract, omit, describe, approximate, form, capitalize 派生而来。

动作名词仍含有动作意义,属抽象名词,词尾一般不加“S”。有些动作名词的词尾可加“S”,意指动作的具体结果,成为普通名词,例如:

abbreviations (缩略词)

approximations (近似值)

descriptions (说明书)

developments (建筑物,住宅区)

动作名词+of结构的译法可视具体语境分别用下列方法处理。

1. 译为动宾结构。如:

These abbreviations are formed by *the omission of a sound or letter*.

这些缩略词是由省略某音素或字母而形成的。

There are no basic principles governing *the formation of abbreviations*.

如何形成缩略词,没有基本的原则规定。

2. 译为“…的…”。如:

Capitalization of abbreviations must follow the rules of English grammar.

缩略词的大写必须符合英语语法规则。

The translations of British literature are popular among the

students.

英国文学的译著深受学生们的欢迎。

3. 译为“对…”或“把…”。如：

The trial of the suspected criminal is over.

对嫌疑犯的审问结束了。

His analysis of this article gave rise to wide argument.

他对这篇文章的分析引起了广泛的争论。

有些名词既可作动作名词,也可用作一般的抽象名词或普通名词,其含义各不相同,如:

The sight of the picture makes her cry.

看到这张照片,她就哭了(动作名词)。

She lost her sight at the age of ten.

她在10岁时就失去了视力(抽象名词)。

Let's go and see the sights of the West Lake.

让我们去看看西湖的风景吧(普通名词)。

注意所有格+动作名词的主动意义与被动意义。例如:

the president's speech 总统的演说(主动意义)

the president's overthrow 总统被推翻(被动意义)

Exercises

I. Multiple choice.

1. Proper use of abbreviations in scientific literature _____ to an economy of time in writing and space in drawing.
A. leads B. adds C. tends D. contributes
2. Such contractions as isn't, didn't are _____ in a conversation or in an informal style.
A. possible B. allowable C. agreeable D. avoidable
3. Sometime we _____ abbreviation period in order to save more space.
A. drop out B. drop away C. drop off D. drop down
4. Many unacceptable abbreviations often _____ the readers.

- A. confuse B. puzzle C. trouble D. embarrass
5. Figs is the shortened form of figures which is _____ illustration.
- A. in the place of B. in the sense of
C. instead of D. in common with
6. As a writer, you are under obligation to make yourself easily understood instead of being misunderstood by the readers.
- A. have the duty B. must remember
C. obey the rule D. must do your best
7. Abbreviating is sometimes done by mere chance, which contradicts the very purpose of abbreviating.
- A. is consistent with B. is harmful to
C. is opposite to D. has nothing to do with
8. There is a marked tendency to capitalize everything the writers think is important.
- A. common B. essential C. similar D. noticeable
9. It is important to follow the common sense rules of good grammar and correct usage.
- A. widely used B. generally accepted
C. consistently demanded D. constantly shortened
10. Apart from a number of commonly accepted abbreviations, any essential term should be written in full the first time it is used.
- A. besides B. except C. except for D. except that

II . Translate the following into acceptable Chinese.

1. Rockets have found application for the exploration of the universe.
2. Archimedes first discovered the principle of displacement of water by solid bodies.

3. The elimination of moving mechanical parts in fluidic devices results in simplicity, high reliability and unlimited life.
4. The injection of water into bedrock in the areas of potential earthquake might provide a gradual release for stress in the crust.
5. The cost of the machine tools is increased in meeting the requirements of the automatic control system.
6. Those who make investment monitor the progress of the business by analyzing the company's financial statements and by keeping up with its developments in business press.

Unit 2

Cars of the Future

Practical, clean, efficient, alternative-fuel vehicles are closer to car dealers lots than consumers may think. Some cars have already arrived, and a few years from now, buyers may be able to choose from three or four alternative-fuel engines, just as they now choose between standard and manual transmissions.

Battery-electric cars are the most familiar of the alternative-fuel lot. They have been around for years, but are limited by short range and long charge time.

General Motors Corp's EV1 coupe illustrates both the problems and promise of the newest battery-electric breed. Already leased to consumers, the EV1 is powered by a battery 24 times the size of a standard car battery. The two-seat coupe has a range of 140 miles and a top speed of 80 miles per hour.

"We have EV1 drivers who put 30,000~40,000 miles on their cars in a year and they spend less than \$ 10 a month charging them," reports GM's Jeff Kuhlman.

Fuel savings are offset by the high cost of an EV1 lease—from \$ 450 to \$ 500 a month – and the inconvenience of recharging. It takes six to eight hours to recharge the EV1 with the charger that comes with the vehicle, and more than 10 hours to recharge it from a 110-volt outlet.

Moreover, the lead-acid batteries of the EV1 lose power in cold weather, one reason why the cars are offered only in California and Arizona. Nickel-hydride batteries, an option in the EV1s and other electric vehicles, perform well in cold weather but poorly in warm conditions.

Finally, battery-electric vehicles are only as clean as the power source that supplies their electricity. Recharge a car with electricity from a coal-fired plant, for instance, and you're still polluting the air.

Rechargeable electric cars make sense as fleet vehicles or in-town runabouts^[1]. Ford Motor Co. offers an electric Ranger pickup for use in government and business fleets. Ford's Think line is aimed at consumers who need a vehicle in small towns or retirement communities. The line includes Think City, a small hatchback with a range of 55 miles; Think Neighbor, a kind of golf cart; and two electric bicycles.

Two other alternative technologies promise practicality and longer range with no recharging time.

Hybrid gas(electric) vehicles have two power sources, one from a gas or diesel engine and the other from an electric motor. Toyota's hybrid, Prius, will be sold in the United States beginning this summer. In Japan, where the car is already on the market, the Prius gets 66 mpg in stop-and-go traffic^[2].

At high speeds and under heavy loads, both the gas engine and electric motor drive the Prius. At low speeds, the electric motor alone runs the car. The battery charges during deceleration and braking, eliminating the need to recharge the vehicle in overnight. GM will unveil demonstrator models of full-size hybrid pickups this year.

Fuel-cell vehicles—electric cars that use fuel cells rather than batteries for their power—hold perhaps the greatest promise for a clean car of the future. In the fuel cell, hydrogen and oxygen mix in the presence of a catalyst to create electricity that powers the car's engine. Water vapor is the only emission.

Obstacles remain in fuel-cell technology. Storing hydrogen onboard a vehicle requires either a huge, pressurized tank or a cryogenic system capable of maintaining compact liquid hydrogen at extremely cold temperatures. Hydride storage is a promising alternative. The method involves a hydrogen-absorbing alloy that stores hydrogen among its crystals at 1/1000th of the volume of hydrogen gas. However, until the advent of hydrogen-supplied filling stations, pure hydrogen won't be a practical fuel source.

fuel-cell vehicles with onboard processors that “reform” or break off the hydrogen from a substance and emit the rest offer an interim solution^[3]. Currently, the three most practical fuels for reforming fuel cells are natural gas, methanol and gasoline. “All three burn cleaner than current gasoline engines,” says GM’s Kuhlman. “But honestly, the processor system is more of a step toward the future than an end in itself^[4].”

Meanwhile, research and development continues in an effort to build more efficient gasoline engines. Direct fuel injection—in which gasoline is injected straight into the cylinders—could result in cars running on fuel mixtures nearly twice as clean as conventional engines, improving mileage and reducing emissions. But direct-injection engines require low sulphur gasoline, which is currently unavailable in U.S.

The challenge of developing alternative-fuel vehicles lies in making them affordable. With low gasoline prices in the U.S., fuel economy alone is not yet a compelling reason for consumers to spend more on an alternative-fuel vehicle.

“There’s no enforcement on the government side to make consumers buy alternative fuel cars,” says Toyota’s Wade Hoyt. “Some people will buy a cleaner car because it fits their environmental beliefs, but until we can sell alternative-fuel vehicles for the same price as conventional cars, there won’t be a large market for them.”

Words and Expressions

alternative-fuel 可替代性燃料, 非传统性燃料

lots *n.* 份额; 总量

transmission 传动装置; 传递, 传送

range *n.* 行程, 航程

coupe [ˈku:pei] *n.* 双门箱式小汽车(可坐两人)

promise [ˈprɒmɪs] *n.* 希望