科技英语学习

EST
LEARNING

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《新编科技英语教程》（上、下）

戴炜华　主编

本书系根据理工科大学英语教学大纲规定的学习第一级和第二级的要求，用英文编写的一套综合性科技英语教材。全书以语言的功能描写为主，兼顾语言的结构，着重训练学生掌握科技英语的特点和表达方法，力求编排新颖、文字规范、练习形式丰富。全书分上、下两册，各有16篇分级的科普英语文章，课文、词汇和语言讲解要点均有大量的例句与练习。

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目　　录

科技英语的反译法

王养毅

由于英汉两大语言有不同的表达习惯，在英译汉时，为了符合汉语习惯，往往必须使用与原文相反的字样或句式才能确切地译出原文的含义。这种翻译方法称为"反译法"。科技文章要求逻辑严密，科学性强，表意精确，这种翻译方法也并不鲜见。下面分六个方面举例说明。

一、单词反译

按原文词义直译不符合汉语的表述方式和词汇搭配，或者含意曲折，令人费解，或者语句生硬，欠流畅感。若将原文中某个词用相反词义的汉语词译出恰巧能够表达原文的意思而又符合汉语的习惯，归为单词反译。

例：These experimental values agreed with the theoretical values within the accuracy of ±0.1%.

译文：这些实验数值与理论值相符，误差在±0.1%范围内。

（如果将 accuracy 译成"精确度"，则±0.1%如此小的范围岂不同前半句"与理论值相符"相矛盾。其实原文中±0.1%正是指误差的范围。）

例：Be sure the fluid temperature is controlled so that the minimum allowable viscosity at maximum operating temperature is not exceeded.

译文：一定要控制流体温度，使得在最高工作温度时的粘度不低于允许的最小值。）

（英语中 exceed 可与 maximum 搭配，也可与 minimum 搭配。但汉语却只能说"超过最大值"和"低于最小值"。）

例：This command must be preceded by the command HELP.

译文：此指令必须在"帮助"指令之后输入。

（precede 原义为"先于"。在被动句中，动作的主体，即居先者是介词 by 的宾语，现将英语中的主语译为汉语中的主语，precede 必须反译。类似的词还有 follow。）

二、添加否定词反译

为使译文通顺，翻译时需要使用同原文相反意义的词。这时前面可加否定词，便形成"否定词＋反义词"的翻译法。

例：Mechanical seal and ball bearing may be left assembled unless it is necessary to service them.

译文：机械密封和滚珠轴承若不需维修，就不必拆卸。

(left assembled 意为"让它装着"，此处译为"不必拆卸"更为通顺。)

例：After lubricating ball bearing, allow the pump to operate for 15 to 20 minutes with the lubrication plugs removed.

译文：在润滑滚珠轴承后，不安装润滑塞使泵运转 15 至 20 分钟。

(因为在加润滑脂时已将润滑塞卸下。原文意思是让泵运转使多余的润滑脂从润滑孔中溢出。因此，不能再译成"卸下"。)

例：There are many other energy sources in store.

译文：还有多种其他能源尚未开发。

(因为原文要说明的并不是"储存着"，而是还未能被利用。因此，将 store 译成其反义词"开发"，前面用否定词"尚未"，这样更确切地表达出原文的意思。)

例：Worm gear drives are quiet, vibration free, and extremely compact.

译文：蜗轮传动没有噪音，没有振动，而且结构紧凑。

(quiet 原义为"安静"，此处译为"没有噪音"主要是从修词角度考虑，使译文中三个并列的谓语结构整齐。)

三、删去否定词反译

这种翻译方法与上述的译法恰好相反，其作用也是为了使译文通顺，更主要的是能够译出原文所强调的含意。翻译时需要删去原文中的否定词，再将被否定的词反译，使原意不变。

例：Owing to rigidity of the spindle and bearings, the fluid bearings never lose their accuracy.

译文：由于主轴和轴承刚性良好，流体轴承能够永久保持精度。

(译文将 never 删去其否定意义，译成"永久"，将 lose 译成其反义词"保持"。这正是原文所要突出的意思。而且"永久保持精度"比"永不失去精度"更符合汉语习惯说法。)

例：Ice is not as dense as water and it therefore floats.

译文：冰的密度比水小，因此能浮在水面上。

(若译成"冰不如水密"，不符合汉语习惯。)

例: The set value is changeable at a rate of 0.5K to 0.1K per minute so as not to unbalance the temperature distribution of cavity.

译文: 设定值的变换速率为每分钟 0.5K 至 0.1K，以保持空腔温度分布的平衡。

(删去 not，将 unbalance 译成反义词，这样比较简洁而直接了当。)

四、双重反译

有时使用双重反译可使汉语清晰、确切而严密地表达原文意思。

例: A silicon radiation pyrometer is the only available transfer pyrometer with a stability of better than ±0.1% annually.

译文: 硅辐射高温计是唯一可用的年不稳定性不超过 ±0.1% 范围的传热高温计。

(若译成"稳定性优于±0.1%"似乎也能理解，但严格说来是不科学的。必须把 stability 和 better 都译成其反义词才能清楚严密地译出原文的意思。)

例: There is no material but will deform more or less under the action of force.

译文: 在压力的作用下，任何材料或多或少都会变形。

(but 是含有否定意义的关系代词，等于 that not。把 no 和 but 都译成肯定，使译文比较简明。)

例: There is no law that has not exceptions.

译文: 凡定律都有例外。

五、固定结构反译

英语中有些固定结构形似否定意为肯定，或形似肯定意为否定。译成汉语时，往往以表意为主，也可算是一种反译法。

例: We cannot be too careful in doing experiments.

译文: 我们做实验要尽可能小心。

(cannot ... too 的结构是用否定的形式表示一种强意肯定，"无论怎样……也不过分"，而不是"不能太……。")

例: He has been studying electronics for no less than ten years.

译文: 他一直研究电子学已长达十年之久。

(no less than 的结构意在强调时间之长。)

例: Nothing but patient study can make one familiar with English

idioms.

译文：只有孜孜不倦地钻研才能使我们通晓英语的惯用语。

(Nothing but 在此处意在强调"唯一性"。不能译成"不过是"。)

例：Hardened steel is too hard and too brittle for many tools.

译文：淬火钢太硬、太脆，许多刀具不能用它制造。

(too ... for 是一个含有否定意义的结构。)

六、句式反译

句式反译指的是否定句和肯定句两种句式的转换翻译法。有时在翻译时必须使用与英语相反的句式才能确切地表达原文的意思。

例：Metals do not melt until heated to a definite temperature.

译文：金属加热到一定温度才会熔化。

(英语用 until 引导状语或状语从句时，如句中含有否定词，是用否定 until 所指某时间点之前来表达对该时间点之后的肯定。只有译成肯定句才能正确表达原文的意思。)

例：One body never exerts a force upon another without the second reacting against the first.

译文：一个物体对另一个物体施加作用力必然会受到这另一物体的反作用力。

(不能译成："没有第二个物体对第一个物体的反作用力，一个物体从不对另一个物体施加作用力。"这种译法从物理学知识来看是逻辑上的颠倒。这句话意在强调客观的必然，没有否定的意思。)

例：Don't start working before having checked the instrument thoroughly.

译文：要对仪器彻底检查才能开始工作。

(原文本意是强调在什么情况下才能开始工作。若译成："在……以前，不要开始工作"，形式上忠于原文，但恰恰不是原文本意。)

If error is corrected whenever it is recognized as such, the path of error is the path of truth. ——*Hans Reinchenbac*

如果错误一经发觉就被纠正，那么错误之路即为真理之路。

——汉斯·莱因纳巴克

怎样写得简洁

冯仪民

无论是作文章，还是写信，都要使自己的文字简明扼要，让读者一看就明白你的意思。任何人都喜欢读那种思路清晰、文字简洁的文章。有这样一个故事：一位报告起草人向经理提交一份报告时，歉疚地说："I'm sorry I've written such a long report but I don't have time to write a shorter one"。这说明写一篇精练的短文章比信手写一篇松散文章，要花更多的时间，费更多的思考。

欲达到行文的简洁须从两方面着手，一是文章的通篇结构，一是文中的句子结构和用词。此文暂不讨论通篇结构方面的问题，只谈谈遣词造句方面如何做到简洁的问题。

每一个句子都表达一个完整的意思，它是构成一篇文章的基础。我们在写文章时，常常由于在句中用了多余的词语和累赘的结构，而使文章显得枝蔓繁杂。因此，须要反复修改繁芜的句子结构，并删去使用不当或不必要的词语，才能做到行文简洁。具体来说，可以从以下几方面着手。

一、避免罗嗦，删掉多余的词语。

例如：In the case of the moonship, there is an uncertainty factor as to whether the data communicated from it will be satisfactory in respect of the aims of the experiment.

如果作为一个没有上下文的句子仅仅陈述一个事实，则应删去 in the case of, factor, as to, in respect of 等多余的词语，使句子简单明了。可改为：

It is uncertain whether the information sent from the moonship will satisfy the aims of the experiment.

二、避免同义反复。

例如：This plastic adhesive will bind the components together and make them completely united.

可删去意义重复的 together and make them united 部分（而且 united 的意思也欠明确），改为：

This plastic adhesive will bind the components completely.

三、多用含义具体的词，慎用含义抽象的词。

例如：A sudden increase in the availability of telephones to household subscribers will be accomplished only with extreme penalties in the form of an increase in the cost and complexity and unreliability of the whole system.

这是一个很典型的结构冗长而含义模糊的例子，句中用了过多的抽象名词，如 increase in availability, penalty, increase in cost and complexity and unreliability, 从而使句子费解，而且 A sudden increase... 与动词 accomplish 的搭配也不当。若改用含义确切而具体的词，这个句子便会清楚易懂。如可改为：

If more telephones are made available to household subscribers all at once, the whole system will suffer for higher cost, increased complexity and reduced reliability.

四、可用短语代替从句，简化句子结构。

例如：After we have considered the structure of the transistor, which is a versatile device, we shall discuss its many applications.

可改为：With the structure of the transistor explained (或 After considering the structure of the transistor), we shall discuss the many applications of this versatile device.

五、避免不必要的重复。

例如：In general conception the scheme was satisfactory, but in detail the scheme was perhaps less satisfactory.

宜删去句中重复的 the scheme was, 并用 so 代替第二个 satisfactory。改为：

In general conception the scheme was satisfactory, but perhaps less so in detail.

六、有时使用主动语态比被动语态更直接、更生动和简练。

例如：The design was discussed by the management and was approved immediately.

改为主动语态更好：The management discussed the design and

approved it immediately.

根据以上各点要求，试做下面的练习。

Rewrite the following sentences:

1. As far as our electrical appliances are concerned, we intend to improve the safety factor.

2. By using a patient's own blood (taken from him in advance and refrigerated until needed) it can eliminate the danger factor in connections with blood transfusions.

3. In the modern world of today, everywhere we look, we can observe the widespread benefits of science.

4. Automation was again made the subject of another attack at the union conference.

5. Your invention will be a great contribution to plant efficiency.

6. In the absence of an investigation of the totality of the facts there can be no expectation of an early decision.

7. After the manager had repeated the instructions, he stressed the importance of safety.

8. Stories which are about great inventors always interest me.

9. I was more upset by the misunderstanding than I was embarrassed by it.

10. I do not want to check the catalogue but I will check it if you think it is necessary to check the catalogue.

11. Your case is being investigated by us and you will be informed of the result.

12. Many modern plays are being performed by amateur companies and their audiences are being delighted.

(答案见第18页)

Answer to *MAKE THIS EQUAL* 100 (See page 29)

123+4−5+67−89=100

英语科技报导中动词时态的呼应

张万方

收听和阅读英语科技报导是了解科技发展情况的一个重要途径。了解和掌握其中动词时态的呼应有利于提高我们的听读效果。我们在同一段报导，甚至同一句子中，可以见到几种时态，例如：

1. The two American scientists *say* the earthquake *will happen* between August 10th and August 15th of next year. They *said* the quake *will begin* off the Peruvian coast, just south of the capital city of Lima, and *travel* 2,000 km south along the Atacama Trench (亚塔卡马深谷).

2. One report *has said* these low tar and nicotine cigarettes *may be* less of a cancer danger, but it *said* they *might cause* other health problems.

从以上二例可看出，由 say, report, note 等"报导动词"(也称"传达信息的动词" — verb of communication) 引出的从句，往往表达可通称为"科学事实"的新发现、新成果，或新推测，因此从句中的动词时态不受主句动词时态的影响。

另一种不受主句动词时态影响的是表示"可能"、"预测"的情态动词。例如：

3. Now a report by the World Bank *says* India *may* soon *produce* enough grain for all its people, and *could* someday *export* wheat and rice to other countries.

但是，由 think, believe, hope, know 等"静止性认识动词"的过去时作主句谓语时，从句的动词时态往往要与之呼应。例如：

4. How does the human personality develop? For many years people *believed* that the environment *was* the most important factor. They *thought* that the home, family life and parents *formed* a child's personality. This idea is changing.

5. Before the discovery, scientists *had believed* that most X-rays *came* from huge clouds of hot gas in space.

Anode——阳极?

范翔生

在国内出版的绝大多数英汉词典中，anode 一般被译注为"阳极"、"正极"或"板极"。在许多场合，如电子管、电解槽、电镀槽中，接电源正端的汉语称"阳极"或"正极"，英语即为 anode。

然而，涉及化学电源(即电池)，情况就不同了。干电池外壳锌筒在汉语中称负极，而在英语中称 anode。在锂电池中，相当于锌极作用的锂负极，在英语中也称 anode。此外，铝一空气电池中的铝负极，英语中也称 anode。总之，凡涉及化学电源，anode 就不能译成"阳极"或"正极"。

要弄清这个问题，我们可用电解槽与干电池为例加以说明。在电解槽中，接电源正极的一端汉语习惯上称为"阳极"，工作时该极发生氧化反应，反应物放出电子。而在锌一二氧化锰干电池中，锌负极发生氧化反应，即外壳锌筒放出电子。可见，anode 指的是发生氧化反应的极，也称"氧化极"。

我们可以看一看英英词典中对 anode 的注释：

Oxford Advanced Learner's Dictionary of Current English: 1. positive charged electrode, 2. negative terminal of a battery

Glossary of Chemical Terms: The positive electrode in an electrolytic cell ... In a primary cell (battery), the anode is the negative terminal.

可见，anode 有时要译成"负极"。

另外，在说明科研人员做了什么样的实验，用了什么方法、仪器时，动词用一般过去时。例如：

6. One group *was placed* in a large cage with many different exercise devices. The mice *were permitted* to run as much as they *wanted*. The other group of mice *was placed* in a small cage. These mice *were not able* to move around very much.

After 34 days the two scientists *examined* the brains of the mice. ...

Bone Breakthrough

Every year around the world, doctors perform hundreds of thousands of orthopedic operations① to repair broken bones and replace portions of diseased ones. Bone grafts②, in which bone is typically taken from the iliac crest of the pelvis③ or from cadavers④, is a common treatment, as is the use of metal pins to repair tubular bone fractures⑤. Both are generally effective, but they have liabilities⑥. With grafts, removing bone from the pelvis can be painful, and the supply of bone from cadavers is uncertain and subject to disease. With pins, there must be a second operation to remove them from the body, and they're also hard to fit precisely within bones. Now, Western countries are set⑦ to exploit a putative breakthrough in orthopedic repair that doctors in the Soviet Union have been using for several years.

BOP pins: The Russians make pins made from a Biocompatible Reconstructive Orthopedic Polymer (BOP)⑧ — a copolymer reinforced by synthetic fibers and calcium gluconate⑨. According to the International Journal of Medical Research, BOP pins are comparable in strength to metal pins yet more flexible — and easily can be trimmed and inserted in bones during surgery. They're also nontoxic. Perhaps most important, the copolymers dissolve over time, obvi-

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① orthopedic operation: 矫形手术。 ② graft: 移植物。 ③ the iliac crest of the pelvis: 骨盆的髂骨嵴。 ④ cadaver: 尸体。 ⑤ as is ... bone fractures: 就象用金属销钉修复管状骨的骨折一样；这是倒装句。 ⑥ liability: 不利条件。 ⑦ set: *a.* 决心（的）。 ⑧ Biocompatible Reconstructive Orthopedic Polymer (BOP): 生物适用再生性矫形聚合物。 ⑨ calcium gluconate: 葡萄糖酸钙。

ating the need for surgical removal, and leave a fibrous "scaffolding⑩" within which bone regeneration can occur. "From the standpoint of osteogenesis⑪, it's the only product that regenerates bone, says Frank Weinstock, an executive of Salt Lake City-based Diversified Tech, Inc.⑫, which holds the right of first refusal⑬ to market Soviet medical technology in the West.

Diversified Tech has developed five BOP products from the original Russian technology, says Weinstock — including "block spacers" for spinal fusions⑭ and filler for hip revision prostheses and cranial reconstruction⑮, in addition to orthopedic applications. Weinstock says BOP has been tested and approved for use throughout Europe, with the exception of the United Kingdom. One U.S. orthopedic specialist said the material "could have a place in orthopedics, but we don't know how effective it will be yet." Weinstock said the product will be submitted to the U.S. Food and Drug Administration⑯ for its approval soon.

(From *Newsweek*, Oct. 12, 1987)

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⑩ scaffolding: 脚手架。 ⑪ osteogenesis: 骨生成。 ⑫Salt Lake City-based Diversified Tech, Inc.: 总行在盐湖城的综合技术公司。 ⑬ the right of first refusal: 优先权。 ⑭ "block spacers" for spinal fusions: 脊柱融合术用的"垫块"。 ⑮ filler for hip revision prostheses and cranial reconstruction: 髋部修正假体和头盖骨修复用的填料。 ⑯ the U.S. Food and Drug Administration: 美国食物与药品管理局。

(杨顾行 注)

Answers to *Cloze Test* (*see pages* 30-31)

1. b	2. c	3. a	4. d	5. b	6. a	7. b
8. c	9. a	10. b	11. a	12. b	13. d	14. c
15. a	16. b	17. b	18. d	19. c	20. a	

身体不舒服的英语表达

译 云 杰

医生问病人哪里不舒服，常说 "What's the trouble?", "What's wrong with you?", 或者 "What is worrying/troubling you?"。我们说自己不舒服或究竟哪里不舒服，常说 "I don't feel quite well.", "I'm not quite myself today." 或者 "I have got a pain in my stomach/back/chest ....", "I have a terrible toothache/headache ...". 然而，现实生活中，询问别人是否舒服和诉说自己怎样不舒服的英语表达却是多不胜数的。下面从部位、病因和程度等角度介绍若干表达法。

(一) 表部位和病因：

My throat is sore. 我喉部疼痛。

I seem to be chilly all over. 我全身发冷。

He had a high fever. 他发高烧。

I have a bad stomachache. 我肚子痛得厉害。

She has had a cold. 她感冒了。

I just have a bit of stomach/heart/liver/eye trouble. 我有点胃(心脏，肝，眼)病。

(二) 表程度

I. 一般性的不舒服(身体不适、精神不佳、气色不好等)：

1. to be below par

   I'm afraid the weather here caused your daughter to be below par. 恐怕是这里的天气让你女儿不舒服。

2. to be/look/feel off colour

   You look a little off colour today, are you ill? 你今天气色不太好，是病了吗?

3. to be out of sorts

   Why are you out of sorts today? 你今天怎么精神欠佳?

4. to be/feel poorly

   Tom's feeling rather poorly today. 汤姆今天感觉身体不舒服。

5. to feel off

She is feeling rather off this evening. 今晚她感觉很不舒服。

6. to feel seedy, to feel queer

I'm feeling queer, I think I'll go home. 我觉得不舒服，我想回家。

II. 很不舒服(身体颇感不适、精神疲惫、突然生病、病重等):

1. to be in a bad way

Mary told the manager that she was in a bad way and asked for a week's leave. 玛丽告诉经理她要请假一周，因为她病情较重。

2. to be taken bad

She was taken bad during the night. 她夜里突然病了。

3. to be/feel/look run down

Jack was run down after twelve hours' work. 杰克在工作了十二小时后筋疲力尽。

Betty felt run down when she was taking the final exam. 在参加大考时贝蒂感到疲惫不堪。

III. 病后体虚、头晕目眩或步履艰难等"很不舒服"的表达:

1. to be groggy

When she left her bed after her long illness, she felt too groggy to stand. 久病以后头次下床，她感到头晕目眩站不起来。

2. to be wonky

The little girl still feels a bit wonky after that attack of flu. 得过流感后那小女孩感到有点虚弱。

3. to be wobbly

He's still a bit wobbly on his legs after his long illness. 久病以后他还站不稳。

4. to be weak

She was weak in the legs (Her legs felt weak). 她两腿无力。

阅读技能训练练习答案(见第 15—16 页)

1. c 2. c 3. b 4. a 5. d

Of Mighty Falls and the Fallen Mighty①

Isaac Newton's *Principia*②, which was first published 300 years ago next month, is best known for the three laws of motion. These laws say that an object will move at a constant speed in the same direction unless acted on by a force; that the said force is simply the product of the object's mass and its acceleration; and that for every action there is an equal and opposite reaction. So far, so good③.

From these three principles, Newton derived the law of universal gravitation, which says that the gravitational attraction between two objects is proportional to the mass of each object, and decreases with the square of the distance between them. This allowed him to work out the details of planetary motion and to give a theoretical basis to what Galileo had observed, that things fall just as fast whatever they weigh. Unfortunately, it now turns out that Galileo was wrong.

Heavier things do fall faster, whatever you were taught at school. So argues a paper in the *European Journal of Physics* by Dr John Donoghue and Dr Barry Holstein of the University of Massachusetts at Amherst. The difference in rates of fall is explained by thermodynamics, the study of heat and motion. Every object in the universe has a temperature and there are various measures of an object's energy that depend on that temperature. One of these measures is internal energy, which is the total energy contained in the object. Another is free energy, which is the total amount of energy that can be converted to work.

① 标题意思是：奇妙的物体下落和逝去的伟人。 ② *Principia*：指牛顿于1687年发表的 "Mathematical Principles of Natural Philosophy"（自然哲学的数学原理）一文。 ③ So far, so good.：到目前为止，一切顺利。