科技英语理解与翻译

Scientific English: Understanding and Translation

林相周　　周国珍

上海科学技术文献出版社

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——对照与注释——

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前　言

本书共收英语一般科技和科普文章十篇，内容包括物理、化学、生物、科学研究的态度和方法、科学家传记等各个方面。

本书采用对照加注释这一形式。注释分语法和翻译两部分，重点放在原文中某些容易引起理解错误的语法结构和常用的翻译方法和技巧。最后将每篇注释中的语法问题和翻译方法加以分类归纳，供复习巩固用。

本书以学过大学理工科英语两年左右的科技人员为主要对象。从选材、注释到分类归纳，都从教学实际出发。编者根据近几年来多次讲授这些材料的经验，针对学员在语法分析和翻译表达中最易产生的问题进行注释。希望读者通过对照阅读（或将各篇原文先译成汉语）并借助注释提高理解英语的能力，掌握英汉翻译一些基本的方法和技巧。这本小书就算是这方面的一个小小尝试。在编写过程中承杨昇鸿同志提出不少宝贵意见，谨在此表示感谢。

编者一九八一年国庆前夕

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第一部份：英汉对照与注释

GRAVITY

If the earth is a ball, why don't we fall off? If you put a marble or a pebble or anything else on the ball you play with, it will surely fall off. Why, then, don't we fall off the earth? The answer is that gravity keeps us from falling off.

Gravity is the strange force that makes us fall down if we trip when we go roller skating or play football or run or skip[1]. When you slip on something you never fall up in the air —— you always fall down on the ground. Everything that is loose and not held up by something will fall down and not up. Balloons, being lighter than air, are held up by the air[2] —— they float on air the way a boat floats on water[3].

Things fall to the earth because the earth pulls them to it, the way a magnet pulls needles and carpet tacks. This pulling of the earth is called gravity. You may throw a ball into the air, and if you are very strong, it will go up high. But it won't stay there because gravity pulls it and

it comes falling right back to the earth again. So wherever you and I and all the rest of the people on the earth go there is always gravity to keep us from falling off.

Gravity is what makes you weigh what you weigh[4]. When we say that a thing is heavy we mean that the earth pulls strongly to it. It is easy to lift a kitten because the kitten is light —— the earth does not pull the kitten to it nearly as much as it pulls a big rock which is much too heavy to lift[5]. We shall see later on, when we travel to other worlds, that there are stronger and weaker gravities. Some worlds have very little gravity and you would weigh only ten or fifteen pounds if you were there; others have strong gravity and you would weigh ten or twenty times as much as you do now if you visited them[6].

If there were no such things as gravity, you could not do lots of things that you do now. You could not run or jump rope or swim or drink an ice cream soda[7]. Why, you could not even walk[8]. If there were no gravity you would not be able to talk or shout or hear anything at all[9]. That's because all the sounds that you make and hear must be formed by air, and it clings to the earth just the way everything else does. Without gravity there would be no air and no sound of

any kind[8]. You would be floating all alone away up in the vast, cold, inky blackness beyond the blue sky.

地心引力

如果地球是一个球体，我们为什么不会掉下去呢？要是你把一粒弹子或者石子，或者任何其他东西放在你玩的皮球上，它是肯定要从皮球上掉下去的。那么，我们为什么不从地球上掉下去呢？答案是地心引力使我们不掉下去。

地心引力是一种奇怪的力量，我们溜冰、踢足球、奔跑或跳绳时稍一失足，它就叫我们跌倒。你在一样东西上面滑倒时，从不向上掉进空中，而向下倒在地上。一切没有缚牢的东西和没有托住的东西，总是落下来，而不是升上去。气球因为比空气轻，由空气托住，所以能在空中飘浮，正象一只船在水面上漂浮一样。

一切东西都向地球落下来，是由于地球把它们吸了过来，正象磁铁把针和地毯按钉吸住一样。地球的这种吸力就叫做引力。你可以把一只皮球抛向空中，如果你力气大，皮球就可以抛得很高。但它决不会在空中停留，因为地心引力在吸它，它还是要落回到地球上。所以不论你，我和地球上其他的人，无论走到什么地方，总是地心引力把我们吸住，使我们不致掉下去。

是地心引力，使我们具有我们所秤得的重量。我们说一样东西很重，指的是地球对它的引力很强。把一只小猫举起来之所以容易，是因为小猫很轻，换句话说，地球对小猫的引力根本不象对一块重得举不起的大石头那么大。以后我们到其它星球去旅行时，将会碰到各种强弱不一的引力。有些星球的引力很小，假使你到了那儿，你只有十磅或十五磅重；有些星球的引力却很大，要是你到那儿旅行，你将会比现在重十倍或二十倍。

要是没有地心引力的话，那么你现在做的许许多多的事，你就无法再做了。你不能奔跑，不能跳绳，不能游泳，也喝不成一杯冰淇淋苏打。还有，你连路也走不成了！要是没有地心引力，你也根本讲不出话，叫喊不出，也听不到任何声音。这是因为你所发出的和听到的任何声音，必须由空气形成，而空气也和其他一切东西一样，紧紧地附着在地球上面。没有地心引力，就没有空气，也就没有任何声音。那时就你会独个儿飘浮到九霄云外茫茫无际、寒冷漆黑的一片浑沌之中。

注　　释

语　法

1. Gravity is the strong force that makes us fall down if we trip when we…skip. 这句中的主句是 Graitvy is the strong force; that makes us fall down 是个定语从句，修饰force; if we trip when we … skip 是个条件状语从句，修饰主句中的谓语动词is，其中 when we …skip 也是个状语从句，修饰 trip。

2. Baloons, being lighter than air, are held up by the air …. 这句中的分词短语 being lighter than air 作原因解，与其译为"比空气轻的气球……"，不如译为"气球因为比空气轻，由空气托住……"。

3. …they float on air the way a boat floats on water. 这句中的 the way 用作状语，它的前面省略了in，而the way 后面又省略了 in which，所以如果把省略成分补齐，则为…in the way in which a boat floats on water。本文中还有两句里的the way 也是这种用法，如第三

段中的…because the earth pulls them to it, the way a magnet pulls…；第五段，也是最后一段中的…and it clings to the earth just the way everything else does。

4. Gravity is what makes you weigh what you weigh. 句中的 you 不是特指“你”或“你们”，而是泛指“人们”，相当于 people，因此本文中这类用法的 you 有时译为“我们”，有时译为“你”，也可以译为“人们”，“大家”。其次，这句中有两个what，都用作关系代词，这种用法的what作 that which 解；第一个泛指 the thing which，第二个具体指 the weight which，此句在意义上相当于 Gravity is the thing which makes you weigh the weight you weigh，所以译为“是地心引力，使我们具有我们所秤得的重量”。

5. …the earth does not pull the kitten to it nearly as much as it pulls a big rock…，nearly 在肯定句中作 almost 解，它和 not 连用作 far from，not at all 解，用来加强语气。如果把这句译为“地球对小猫的引力没有近乎象对一块……大石头那么大”，那就对not…nearly…的确切含义没有真的理解。这里的not…nearly…可译为“根本不”，译文应改为“地球对小猫的引力根本（或“远远”）没有对一块……大石头那么大。不过 not … nearly…和 not…at all…在用法上是有区别的：not…nearly 后接副词（或形容词），如本句中的（as）much(as)；而not…at all一般修饰动词，如本文第二段中的…you would not be able to talk or shout or hear anything at all。

6. …you would weigh ten or twenty times as much as you do now if you visited them. 这句中的

do 代替 weigh，以避免重复，语法上称为“代动词”，所以译为“比现在重”。其次，if you visited them 不可能修饰它贴近的 you do now，因为 visited 是过去时，表示虚拟语气，而 do 则是现在时；if you visited them 修饰 would weigh。

7. You could not run or jump rope or swim or drink an ice cream soda. Or 用在 not 后面，相当于 and not；这里的三个 or 都相当于 and could not，所以不能译为“你不能奔跑，或者跳绳，或者游泳，或者喝一杯冰淇淋苏打”，应重复“不能”，译为“你不能奔跑，不能跳绳，不能游泳，也喝不成……”。与此句同一段落中有 Without gravity there would be no air and no sound of any kind 这一句，这里的 no air and no sound 相当于 no air or sound，而 or 用在肯定句里仍可译为“或者”，如本文第一段中的 If you put a marble or a pebble or anything else…，译为“要是你把一粒弹子或者石子，或者任何其他东西……”。

8. Why, you could not even walk! 这不是一个问句，而是感叹句；句中的 why 不是用作疑问副词，因此不能译为“为什么”，而是感叹词，所以译为“还有，你连路也走不成了！”。

9. … you would not be able to talk or shout or hear anything at all，这句中的 not…at all 不但修饰 hear，也修饰 talk 和 shout，所以不能译为“…你就不会说话，叫喊，也根本听不到任何声音”；其次，句中的两个 or 在 not 之后，又相当于 and not，译成汉语宜重复“不”，译文应改为“你也根本讲不出话，叫喊不出，也听不到任何声音”。译文中将“根本”移在“讲不出话”之前，表示“根

本”也同样修饰“叫喊”和“听到”；此外，在“叫喊”后面重复“不”，否定的含义比较明确。

10. Without gravity there would be no air and no sound of any kind .这句中的 of any kind 只修饰sound，不可能也修饰 air，因为声音可以有各种各样的声音，而空气只有一种。因此，一个修饰语是否修饰与它有关的一个成分，或者几个成分，主要根据上下文和句子的含义，当然有时某些语法现象或词与词的搭配习惯也有助于作出正确的判断，这在以后再作讨论。

翻　译

某些带有否定意义的词的翻译

先看本文第一段中 a big rock which is much too heavy to lift 这句，如果译为肯定句“石头举起来太重”，似乎也未尝不可，但是 too…to…这种结构的确切含义相当于 so (heavy) that (one) can't (lift the rock) ,所以这里与其译为“举起来太重”，不如译为“重得举不起来”更为明确达意。

其次，本文第一段中还有这样一句 Some worlds have very little gravity，其中的 little 可译为“小”，但是它也作 not much 解，有时也可译为“没有多少”，如 He knows little Latin，可译为“他不懂多少拉丁语”。所以，Some worlds have very little gravity 也可译为“有些星球没有什么引力”。英语句子中不带否定词而含有否定意义者，远远不止 too…to…和 little，其他一些同类的例子在以后各篇中出现时再作介绍。

MORE COMPLEX ATOMS[1]

The hydrogen atom is the simplest and lightest of atoms. The atoms of other elements are more complex and heavier. The actual weights are, of course, exceedingly small. It would take 754 million billion billion atoms of hydrogen to weigh a pound[2]!

The next element above hydrogen, as we go from the simplest to the most complicated elements, is helium[3]. Helium, like hydrogen, is a gas. It is heavier than hydrogen because its atoms have more particles in them than the hydrogen atoms do. Next to hydrogen, however, it is the lightest substance known on the earth.

The nucleus of a helium atom contains 2 protons, while 2 electrons circle about it[4]. But the helium nucleus contains two other particles besides the 2 protons. These other particles, while they have the same mass or weight as the protons, have no electric charge. Because they are neutral electrically, they are called "neutrons." Neutrons are of vital importance to atoms, since they overcome the natural tendency of the protons to

fly away from one another.

Just as there is always a powerful attraction between two unlike electric charges, so there is a powerful repulsive force between two like electric charges[5]. Two electrons brought closely together will fly apart. Two protons brought together will also fly apart——if neutrons are not present to hold them together. The neutrons supply a sort of binding force, or nuclear "glue" to hold the two protons together in the nucleus of the helium atom.

A neutron has approximately the same weight as a proton. Thus, with 2 neutrons and 2 protons, the helium atom weighs four times as much as a hydrogen atom[6]. On this account helium is said to have an atomic weight of 4[7]. The weight of the electrons is neglected in this calculation, since it takes 1, 840 electrons to weigh as much as one proton or one neutron.

If, instead of 2 protons, the nucleus of an atom should contain 3 protons[8], we would normally find 4 neutrons in that nucleus. This combination gives us, instead of a gas, a solid——the metal lithium. Three electrons normally circle the lithium nucleus. The lithium atom, with 3 protons and 4 neutrons, has an atomic weight of 7.

Next come the elements beryllium (atomic weight 9); boron (atomic weight 10); carbon (atomic

weight 12)[9]; nitrogen (atomic weight 14); oxygen(atomic weight 16); and so on. Each atom normally has the same number of electrons revolving about the nucleus as it has protons in the nucleus.