

科技英语 理解与翻译

Scientific English:

Understanding and Translation

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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⁽ⁿ⁾. 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。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 Gravity 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. Balloons, 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⁽⁶⁾. 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)⁽⁸⁾; 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.

一些比较复杂的原子

氢原子是最简单、最轻的原子。其他元素的原子比较复杂，也比较重。当然，原子的实际重量是极小的。需要 754×10^{24} 个氢原子才有一磅重。

从最简单到最复杂的元素的顺序来看，氢之后的元素是氦。氦和氢一样，也是气体。氦比氢重，因为氦原子中所包含的粒子比氢原子中所包含的多。然而，氦是世界上已知的仅次于氢的最轻的物质了。

氦原子核内含有两个质子，有两个电子绕氦核旋转。但是，除两个质子外，氦原子核还包含其他两个粒子。虽然这两个粒子的质量与重量和质子相同，但它们不带电荷。这两个粒子由于是电中性的，所以被称为“中子”。中子，对原子来说，是至关重要的，因为中子克服了质子相互排斥的自然倾向。

正象两个不同的电荷之间总是存在着强大的吸引力一样，两个相同的电荷之间，也存在着强大的排斥力。置于一起的两个电子会飞离开去。置于一起的两个质子，如果没有中子把它们维持在一起的话，也会飞离开去。中子提供了一种束缚力，或称核“粘胶”，把氦原子核里的两个质子维持在一起。

中子的重量和质子大体相同。氦原子由于有着两个中子和两个质子，所以重量是氢原子的四倍。因此说，氦的原子量为4。在这种计算中，电子的重量总是略而不计的，因为1,840个电子的重量才相当于一个质子或一个中子的重量。

如果一个原子核，不是含有两个而是三个质子的话，就正常情况而言，我们就会在这个原子核中发现四个中子。这种组合向我们呈现的就不是—种气体，而是一种固体——金属锂了。

在正常情况下，有三个电子围绕锂核旋转。锂原子因为含有三个质子和四个中子，它的原子量就是7。

锂以下的元素顺序为铍(原子量为9)；硼(原子量为10)；碳(原子量为12)；氮(原子量为14)；氧(原子量为16)等等。在正常情况下，每个原子中围绕原子核旋转的电子数目，与原子核中的质子数目相同。

注 释

语 法

1. 本文标题 More Complex Atoms 中的 more 是副词，修饰 complex, more complex 是形容词 complex 的比较级，这种用法的 more 可以译为“比较”，也可以译为“更加”，这里宜译为“一些比较复杂的原子”。从形式上看，more 也可用作形容词，修饰 atoms，似乎也可译为“更多复杂的原子”，但是，从文章内容来看，应是“一些比较复杂的原子”，例如本文第一段中的第二句 The atoms of other elements are more complex...，即说明这点。

2. It would take 754 million billion billion atoms of hydrogen to weigh a pound. 这句中的 it 是形式主语，真正的主语是 to weigh a pound，全句也可改为 To weigh a pound would take...hydrogen.

3. The next element above hydrogen... is helium. 这里的 above 不能译为“以上”，因为本文说氢是最轻的元素，句中 above hydrogen 的意思是“比氢更重的”，所以从元素表上最轻到最重的元素来看，这句应译为“氢下面的元素是氦”，或“氢之后的元素是氦”。

4. The nucleus of a helium atom contains 2 protons, while 2 electrons circle about it, ... These other particles, while they have ... have no electric charge. 连词 while 可作“在……同时”解，但这两句中的两个 while 都不作“在……同时”解。第一句中的 while 作“而”解，根据行文需要，也可以不译；第二句中的 while 作“虽然”解。

5. Just as there is always... so there is...electric charges. As...so...是个关联连接词，不作“因为……所以……”解，而作“象……一样”解，这里的 just 用来加强语气，just as ... so ... 可译为“正如……一样，……也……”。

6. Thus, with 2 neutrons and 2 protons, the helium atom weighs four times as much as a hydrogen atom. 介词 with 的含义很多，在这句中用来表示原因，所以译为“氦原子由于有两个中子和质子……”。本文最后第二段中还有类似的一句 The lithium atom, with 3 protons and 4 neutrons, has an atomic weight of 7, 这里的 with 也作“原因”解，译为“锂原子因为含有……”。

7. On this account helium is said to have an atomic weight of 4. 这句中的 is said 是被动语态，如果改为主动语态，全句相当于 On this account people say that helium has an atomic weight of 4, 所以译为“因此（我们）说，氦的原子量为4”。英语原文中 is said 后面的 by people 可以省略，译成汉语，“人们”、“我们”也可以从略。

8. If, instead of 2 protons, the nucleus of an atom should contain 3 protons... 这句中的 instead of 作 in place of 解，但是往往可译成汉语“不”。即使有时可译为“代替”，也可译为“不”，如 I will go instead of