英语科普短文选

〔英〕 G.C.索恩利 编
林金辉 胡 衡 胡永久等 注释
周叔平教授 审阅

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前　言

为了帮助具有一定英语基础的读者更好地巩固学过的知识和提高对原著的阅读能力，并在实践中进一步掌握科技英语的各种语言结构，我们对英国 G.C.THORNLEY 编的“Easier Scientific English Practice”作了注释，取名《英语科普短文选》。全书内容丰富有趣，语言生动活泼，对各种短语、词组和句子结构都作了详细注释，对难句做了翻译。可供大学一、二年级学生和具有一定英语程度的读者阅读。

参加本书注释工作的有：林金辉、胡　衡、胡永久、张晓岩和石东华等同志，并由华中师范学院外语系主任周叔平教授审阅。

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1 The Development of Rubber

Here is the story of rubber. From the earliest time it was common knowledge to the Peruvians[1] that[2] when a cut was made in the outside skin of a rubber tree, a white liquid like milk came out, and that[2] from this a sticky mass of rubber might be made. This rubber is soft and wax-like[3] when warm,[4] so that it is possible to give it any form.[5] The Peruvians made the discovery that[6] it was very good for keeping out the wet. Then in the early part of the eighteen-hundreds, the Americans made use of[7] it for the first time. First they made overshoes to keep their feet dry.[8] Then came a certain Mr. Mackintosh,[9] who made coats of cloth covered with natural rubber.[10] From that day to this[11] we have been coating cloth with[12] rubber as Mr. Mackintosh did, and our raincoats are still named after him.[13]

But these first rubber overshoes and raincoats were all soft and sticky in summer, and hard and unelastic[14] in the winter when it was cold. In fact, they might almost have been made of wax, only they were a bit stronger.[15] But the rubber we have today[16] is not sticky, but soft and elastic, though very strong—even in the warmest summer

and the coldest winter. There would be no automobiles such as we have today without it.[17] Long before the start of history, man made the discovery of how to make skins into good leather.[18] But every attempt to make rubber hard and strong[19] came to nothing.[20] The early overshoes and raincoats were simply not good enough, and their makers went out of business.[21]

Goodyear[22] was living near some of these poor men and he got to work on this question of making rubber or "gum" as the Americans say, hard and strong.[23] Once started on this work, he was the sort of man who simply had to go on till he had overcome the trouble.[24] First came the discovery that nitric acid (HNO_3) made the rubber much better,[25] and in a short time he was doing a small business in rubber shoes produced in this way.[26]

But when things were starting to go well with him, there came a time when business was bad.[27] Even a hundred years back[28] they had such times. After a little, Goodyear was without money or even food.

But then a strange thing took place.[29] A friend of his, Nicholas Hayward,[30] had the idea in his sleep that rubber might be made hard and strong if mixed with sulphur (S) and put in the sun.[31] Goodyear put this idea to the test,[32] and saw that it did have more or less the desired effect—though somewhat less than more.[33] The only effect it had was on the outside of the rubber. It is common knowledge now that the way to make rubber hard

and strong—to "vulcanise" it, as we say—is by heating it with sulphur.[34] If only Nicholas had had the idea of a simple oven, in place of the sun, how much less time it would have taken![35] Goodyear was another four years, in which things went very badly with him, before he made the discovery how to vulcanise rubber completely.[36] When at last he did it, he had nothing at all.[37] Everything of the smallest value had been used to get money, even his sons' school-books.

He did well in America, but chance had one more dirty trick in store for him.[38] He went to Paris to put his new vulcanised rubber[39] on view at the Exhibition, and took with him thousands of pounds for the purpose. But the money was not enough and he was put into prison for debt[40]—not for the first time.

Almost everything we make use of[41] in our complex existence has the same sort of story at the back of it.[42] Though they are not all quite such unhappy stories, they are generally about someone who went on working[43] night and day[44] to do something which no other person so far[45] had been able to do.

Notes 注 释

1. the Peruvians [pə'ru:vjənz] n. 秘鲁人.
2. 两个 that 引导的从句都是主语从句，而第一个主语从句还包含一个状语从句（when 引导）. 全句可译

为：自古以来秘鲁人都知道，在橡胶树的表皮上砍一刀，一种牛奶似的白色液体就会流出来，而且可以用它来做粘质橡胶. be made from 由…做成.

3. wax-like [wæks] a. 似蜡的. 这是合成形容词，由名词＋形容词构成.
4. when warm＝when it is warm 当它变热时.
5. so that 引导结果状语从句，从句中不定式短语 to give it any form 作真正主语. 本句可译为：所以能够把它（橡胶）做成任何形状.
6. that 引导同位语从句，说明 discovery 的具体内容. 全句可译为：秘鲁人发现橡胶用于防湿非常好. make discovery 发现. keep out 把…挡在外面，不让…入内.
7. make use of 使用，利用.
8. to keep their feet dry 使脚不打湿. 这是不定式短语作目的状语. “keep＋宾语＋形容词”意为“使…保持着某种状况”，在这里形容词作宾语补足语.
9. Mr. Mackintosh ['mækintɔʃ] 麦金托什先生，胶布雨衣的发明人，因此 raincoat 也称 mackintosh，是以他命名的.
10. who 引导非限定性定语从句，修饰 Mackintosh. 此句可译为：他用涂上天然胶的布做成外套. make . . . of 用…做成…. covered with 涂上. 这是过去分词短语作定语，修饰 cloth.
11. from that day to this (＝to this day) 从那时候起到现在.
12. coat . . . with 用…涂…；把…涂上一层….
13. be named after 以…命名.
14. hard and unelastic 坚硬而无弹性.

15. In fact . . . stronger. 实际上，它们也许差不多和蜡做成的一样，只不过稍微结实一点罢了. "might + have + 过去分词" 表示现在对过去事物的判断.

16. we have today 我们今天所有的. 这是定语从句，修饰 rubber, 省略了关系代词，关系代词在从句中作宾语时常常省略.

17. There . . . it. 要是没有橡胶就不会有今天的汽车. such as 引导定语从句，修饰 automobiles. such as 在从句中作宾语.

18. how to make skins into good leather 如何把兽皮加工成好的皮革. 这是 "how + 不定式短语" 结构，作介词 of 的宾语.

19. 不定式短语 to make rubber hard and strong 作 attempt 的定语. 意为：要使橡胶变成坚固结实的任何尝试. "make + 宾语 + 形容词" 意为 "使…变成…". 这里形容词作宾语补足语.

20. come to nothing 毫无结果.

21. go out of business 停业，歇业，破产.

22. Goodyear 古德伊尔 (1800—1860). 他发现改进橡胶性能的方法，虽然搞得很苦，但为橡胶发展作出了巨大贡献.

23. he . . . strong, 他着手研究如何使橡胶，即美国人所说的 "树胶" 变得坚固结实. get to (+动词) 着手.

24. Once . . . trouble. 一旦开始了这项研究，他就成为不解决问题不罢休的人. 在 once started 中省略了 he (got).

25. that 引导的从句作 discovery 的同位语. nitric acid

['naitrik 'æsid] 硝酸. 全句可译为：首先发现硝酸可以大大改善橡胶的性能.

26. in this way 用这种方法. produced in this way 是过去分词短语作定语，修饰 rubber shoes.

27. when 引导定语从句，修饰 time. 全句可译为：但正当他的情况开始好转时，就碰到生意萧条的年代.

28. back (=before) 以前.

29. take place 发生.

30. Nicholas Hayward 尼古拉斯·海华德. 是古德伊尔的朋友，在梦中得到橡胶硫化的方法.

31. if mixed with sulphur (S) and put in the sun 如果加上硫磺并在太阳底下晒. 这是条件状语从句，省略了 it was.

32. put . . . to the test 把…试验一下.

33. it did have more or less the desired effect—though somewhat less than more 它确实或多或少地收到了所期望的效果，虽然并不那么理想. (直译：虽然"少"比"多"的程度稍大) did 是用来加强动词 have 的肯定语气. more or less 或多或少.

34. 不定式短语 to make rubber hard and strong 作 way 的定语. 全句可译为：现在大家知道，要使橡胶变得坚硬结实(即我们所说的橡胶硫化)的方法是掺硫加温.

35. If only . . . taken. 要是尼古拉斯的办法是用普通的炉烤而不是晒太阳，那么花的时间就要少得多了. 谓语用虚拟语气，表示与过去事实相反的假设. in place of 代替.

36. how to vulcanise rubber completely 作 the discovery

的定语．全句可译为：又过了4年，古德伊尔才发现橡胶硫化的完善办法，而那4年他的情况非常糟糕．

37. have nothing at all 一无所有．

38. in store for 等待着．本句可译为：但是恶运又一次等待着他．dirty trick 卑鄙手段．

39. vulcanised rubber 硫化橡胶．本句可译为：他去巴黎把新的硫化橡胶拿到展览会上展出．

40. be put into prison for debt 由于负债而坐牢．

41. we make use of 是定语从句，省略了作 of 宾语的关系代词 that.

42. at the back of 在…背后．全句可译为：在我们复杂的生活中所使用的每件东西，差不多在其背后都隐藏有类似的故事．

43. go on working 继续不断地工作．

44. night and day = day and night 日以继夜．

45. so far 迄今；到此．全句可以译为：虽然并不全是像这样不幸的故事，但故事总是讲到某些人为了做出别人当时做不到的事情而在日夜不停地工作着．

Questions 问 题

1. What used to happen when a Peruvian cut the outside part of a rubber tree?
2. What did the Peruvians discover about the usefulness of rubber?
3. What two sorts of things were made from rubber in the early days?

4. Why is a raincoat often called a mackintosh?
5. What is leather made from?
6. Which acid was useful in improving rubber?
7. What did Hayward think of in his sleep?
8. How is rubber vulcanised?
9. Why had Goodyear nothing left when he at last discovered how to vulcanise rubber?
10. Why was Goodyear imprisoned in France?

2 Weight on and off the Earth[1]

We are so used to[2] our life on the surface of the earth that it can be quite an effort for our minds to break free of all the ideas[3] that we take for granted.[4] We talk about "up" and "down", but we know that what is "down" for us is "up" for someone on the other side of the world.[5]

Because we can feel that things are heavy, we think of "weight" as being a fixed quality in an object,[6] but it is not really fixed at all. If you could take a one-pound packet of butter[7] 4,000 miles out from the earth, it would weigh only a quarter of a pound.

Why would things weigh only a quarter as much as they do[8] at the surface of the earth if we took them 4,000 miles out into space? The reason is this: All objects have a natural attraction for all other objects; this is called gravitational attraction.[9] But this power of attraction between two objects gets weaker as they get farther apart. When the butter was at the surface of the earth, it was 4,000 miles from the centre (in other words[10] the radius of the earth is 4,000 miles). When we took the butter 4,000 miles out, it was 8,000 from the centre, which is twice the distance.[11]

If you double the distance between two objects, their gravitational attraction decreases "two times two".[12] If you treble the distance, it gets nine times weaker (three times three). If you take it four times as far away, it gets sixteen times weaker (four times four) and so on.[13]

So this is one of the first things we need to remember[14]: that the weight of an object in space is not the same as its weight on the surface of the earth.

What about[15] the weight of our pound of butter on the surface of the moon? At that distance the pull of the earth is about 4,000 times smaller than it is here on the surface, so we can forget all about the earth-pull on[16] our butter.

On the other hand,[17] on the moon there will be an attraction between the butter and the moon: but the butter will weigh only about one-sixth as much as it does on the earth. This is because the moon is so much smaller than the earth. The amount of gravitational pull that a body produces depends on[18] the amount of material in it. A packet of butter has a gravitational pull of its own; but this is very small in relation to the pull of something as large as the moon, or the earth, or the sun.[19]

Notes 注 释

1. （物体）在地球上的重量和离开地球后的重量. 这里 on 和 off 都是介词，即 on the earth and off the earth.

2. be used to （＋名词或动名词）习惯于….
3. it... ideas 是结果状语从句，由 so...that 引导. 从句中 it 作形式主语，不定式短语作真正主语. break free of 摆脱；不受…束缚.
4. that we take for granted 认为理所当然；坚信无疑. 这是定语从句，修饰 ideas. 全句可译为：我们是很习惯于地球上面的生活，所以要改变我们头脑中一切理所当然的概念是相当费劲的.
5. We talk...world. 我们经常讲“上”和“下”.但我们知道，我们所认为的“下”对于地球另一面的人来说却是“上”. 本句中 up 和 down 都是名词.that 以后部分为宾语从句，从句中的主语是 what is “down” for us. 即宾语从句中包含有一个主语从句.
6. we think of “weight” as being a fixed quality in an object 我们认为“重量”是物体中固定不变的质量. think of...as 认为…是；把…当做.
7. a one-pound packet of butter 一包1磅重的黄油.
8. as much as they do... 这里的 do 是代替上文出现过的动词 weigh. as much as 同样之多；和…一样多. 前一个 as 是副词，后一个 as 是连词. 又如 as many as, as large as 等.
9. gravitational attraction 地心吸力；万有引力.
10. in other words 换句话说.
11. which is twice the distance 它是这个距离的两倍. which 引导的是非限定性定语从句，修饰 8,000 (miles). 从句中 twice the distance 作表语.
12. ... decreases “two times two” 减少到四分之一. times

是名词复数，作“乘；倍”讲．又如 Three times three is nine (3×3)=9. 那么 two times two (2×2) 应该是four. 但在汉语中不说“减少4倍”，而是说“减少到四分之一”或“减少了四分之三”．同样道理，下文中的 it gets nine times weaker 应译为：它（引力）减弱到九分之一．

13. and so on 以此类推．
14. we need to remember 是定语从句，省略了关系代词 that 或 which. 冒号以后部分进一步具体说明one of the first things, 起同位语从句作用．全句可译为：这是我们需要记住的头一件事：即物体在宇宙中的重量与在地球表面上的重量是不一样的．
15. What about （＋名词、代词或动名词）？怎么样？这是用来询问对方的一种省略句．
16. the earth-pull on (=the pull of the earth on) 地球对…的引力．
17. on the other hand 另一方面．
18. depend on 依赖；取决于．
19. but . . . sun. 但是相对于象月亮、地球或太阳那么大的东西所具有的引力来说，这是微不足道的． in relation to （＋名词）相对于…． as large as the moon, or the earth, or the sun 这整个短语作定语，修饰 something.

Questions 问 题

1. What makes it difficult for our minds to break free from ideas connected with living on the surface of the earth?