

EST Reading Series

GRADE III BOOK I

Lucky Accidents in Science

(科学与偶然)



上海外语教育出版社

科技英语系列读物

第3级 第1分册

Lucky Accidents in Science

科学与偶然

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编写说明

为了开创公共外语教学的新局面，使理工科学生更快更好地掌握英语，机械工业部部属各院校，在机械工业部教育局的直接领导下，根据近年来教学的初步经验总结，经过调查研究，决定编写一套供全日制理工科大学及业余高等学校基础英语阶段使用的课外阅读教材。全书按照词汇量、语言结构和文体的难易分为四级，每级三个分册，共十二分册，分级编排，循序渐进。

本读物每册包括课文、注释、练习三部分：课文选自国外科普读物，选材原则强调思想性、科学性、知识性和趣味性；注释旨在帮助读者理解课文，掌握新的语言现象；练习力求多样化，以巩固所学的语言材料，提高英语实践能力。此外，每册之后附有词汇表，便于读者自学查阅。

本读物以培养学生阅读能力为主要目标。各分册根据选材内容，各有其书名；级与级之间，分册与分册之间，相互连贯呼应，成为一个系列，所以定名为《科技英语系列读物》。

本读物由机械工业部部属院校英语学科协作组统筹安排，组织部属院校分工负责选注，由马泰来、卢思源、李国瑞、柯秉衡、谢卓杰、戴炜华、戴鸣钟等同志（以姓氏笔划为序）组成的审编小组负责审

订，陈开明同志担任审编小组秘书。总审为戴鸣钟教授。由于编写时间匆促并受选材来源和编写水平的限制，全书未尽完善，希广大外语教学工作者和读者予以指正。

编 者

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1. Science and Serendipity^①

“Serendipity” sounds^② like a word from a gay, popular song. In recent years, however, it has become quite familiar to scientists and engineers. The word “serendipity” was first used in 1754 by Horace Walpole,^③ a famous author, to mean the ability to discover useful things without looking for them. Of course, discoveries by chance^④ occurred a long time before Mr. Walpole invented the word. From earliest times, men have made great discoveries by chance.

How many times did a log or round stone roll out from beneath some person's feet before he realized it would carry a load along as it rolled?^⑤ The wheel must have been a serendipitous discovery, and also the sail that men learned to put up on their boats.

Fire was first an accident of nature, and it is probable that the discovery of cooking was also

(1) serendipity [serən'dipiti]: 偶然或意外的发现; 偶然发现有价值事物的技能。 (2) sounds: 这里意为 *seems*。 (3) Horace Walpole ['hɒrəs 'wɒ:lpəʊl] 霍勒斯·沃波尔(1717—1797), 英国文学家。 (4) by chance = by accident: 偶然意外地。 (5) How many times ... it rolled?: 圆木或圆石从人们的脚下滚过多少次, 人们才意识到它滚动的时候还可以运载东西。

an accident. The growing of food was a serendipitous discovery. Someone probably dropped some grain near his home and the seed grew. Indeed, ancient men did not sit down one day and decide to invent the ax and the bow. Evidence seems to show that these men were not clever enough to do so. What probably happened is that they discovered them by chance. What is important, of course, is that the discoverer of such a thing must be able to realize what he has discovered.

The discoveries of most of us have little effect on our science. Only a small number of discoverers advance us along the scientific path to a better world. The events that occur are these: a scientist observes some happening;^⑥ he discovers the importance of the happening; he, or someone else, applies the new knowledge in a practical way.

It is not helpful to disregard serendipity by pointing to inventions like the airplane which we may think men patterned after the birds.^⑦ It is true that, in the early days of flying, people tried to fly by moving wings like those of birds up

(6) happening: 偶然发生的事(常用复数). (7) It is ... birds: 我们也许认为象飞机这样的发明是人们在模仿鸟的飞翔, 可是如果有人就此忽视发明中的偶然性, 那是无益的. point to: 指出, 针对. pattern after: 模仿, 仿制. We may think 在这里作为插入语.

and down. Nevertheless, the airplane does not move its wings up and down, and it has many features that a bird does not have. No, men needed serendipity in order to invent the airplane. Indeed scientists today make as much use of serendipity as ancient men^⑧ did hundreds of thousands of years ago!

In 1952, Dr. Irving Langmuir,^⑨ a scientist who won the Nobel prize^⑩ for his work in chemistry, wrote this on serendipity: "You can't plan to make discoveries. But you can plan work that will probably lead to discoveries." He also suggested a new meaning for serendipity: "the art of profiting from unexpected occurrence."^⑪ He continued, "... it seems to me a large part of the laboratory work is based on that. You do not know all the things that are going to happen: too many of them are unexpected. But it is these unexpected things that are going to be the most profitable—the most useful—things you do" He wrote also that it is impossible to know in advance^⑫ what ideas a person will have. There-

(8) make as much use of serendipity as ancient men: 正如古人...那样, 充分利用偶然的发现。 (9) Irving Langmuir ['ɔ:vɪŋ 'læŋmjuə]: 欧文·兰米尔(1881—1957), 美国化学家。 (10) the Nobel prize: 诺贝尔奖金。这一奖金系根据瑞典化学家诺贝尔(1833—1896)的遗嘱建立的。 (11) He also suggested ... unexpected occurrence: 他还为“serendipity”一词提出了一个新的含义, 即“从偶然发生的事物中获取益处的技能”。 (12) in advance: 事前, 预先。

fore, one cannot plan events in a laboratory. However, one can organize a laboratory so as to^⑬ make it more probable that useful events will happen there.

It would not be fair to claim that more accomplishments may have occurred by accident than as the result of planned work.^⑭ This claim would argue against^⑮ any sort of advance planning. Scientists would conduct experiments with no idea of what they were seeking or of what was needed.^⑯ True serendipity consists of being watchful and ready to profit from the serendipitous accident of discovery when—and if—it does come. In the chapters that follow, we shall see how scientists made 8 of the most important discoveries in history. They are 8 good reasons for keeping the eyes—and the mind—open!^⑰

Exercises

I. Tick off one of the following sentences that best expresses the correct idea of the text.

1. True serendipity consists of being watchful and ready to profit from the serendipitous accident of

(13) so as + 动词不定式: 以便, 为的是。 (14) It would ... of planned work: 如果说大多数的成就是偶发的, 而不是由于计划工作的结果, 那是不公正的。 (15) argue against: 反对, 辩驳。 (16) Scientists would ... was needed: 在进行实验时, 科学家并未想到他们要寻求什么或者需要什么。 (17) They are ... open: 它们是用来扩大眼界、开阔思路的八项很好的理由。

discovery when-and if-it does happen.

2. Scientists would conduct experiments with no idea of what they were seeking or of what was needed.
3. It would be fair to claim that more accomplishments may have occurred by accident than as a result of planned work.
4. It is unnecessary for scientists to make any sort of advance planning.

II. Mark T (true) or F (false) before each of the following statements according to the passage.

1. The word "serendipity" was first used by a famous writer.
2. Serendipity means the ability to discover something by chance.
3. Horace Walpole was the first person who used the word "serendipity".
4. A famous scientist plans to make discoveries in a laboratory.
5. In fact, serendipity is the art of profiting from unexpected occurrence.

III. Match the words in Column (A) with their equivalent expressions in Column (B).

- | (A) | (B) |
|----------------|--------------------------------|
| 1. serendipity | a. in a low place |
| 2. beneath | b. seem |
| 3. sound | c. a lucky accident in science |
| 4. ancient | d. happen |
| 5. occur | e. very old |
| 6. event | f. occurrence |
| 7. evidence | g. imitate |
| 8. pattern | h. proof |

9. drop

i. a happening, usually an important one

10. chance

j. cause to fall

2. Charles Goodyear^① and the Story of Rubber

Of all bad smells, that of burned rubber is one of the worst.^② In 1839, by accident, an experimenter dropped some rubber onto a hot stove and discovered the process of vulcanization.^③ This process has given us practical automobile tires, hot-water bottles, and thousands of other rubber objects. It would be difficult for us to live in a world with no rubber. If you do not believe it, try to imagine living without it.

There would be no rubber covering for electric wires, no rubber balls or other such toys, no rubber heels, no rubber tips on pencils. True, there are synthetic rubber products, but natural latex rubber, the kind made from the liquid produced by rubber trees, still provides for two-thirds of our needs.^④ And even synthetic rubbers require the important vulcanizing process to make

(1) Charles Goodyear [tʃɑ:lz 'gudjiə]: 查尔斯·古德伊尔 (1800—1860), 美国发明家。 (2) of all ... the worst: 在所有难闻的气味中, 橡胶烧焦的气味是最难闻的一种。 (3) the process of vulcanization: 橡胶硫化过程。 (4) True, ... of our needs: 这句句首的 true, 接下面有 but 的分句, 意为“固然...但是...”, “不错...但是...”。 provides for: 提供, 保证。

them useful under great temperature ranges. Thus, rubber is important. A serendipitous discovery changed it from an interesting but not very practical substance to an important and very useful one.

Rubber as a substance is centuries old. At least 600 years ago, the natives of South and Central America played games with rubber balls and used the hardened juice of a kind of grass for other purposes, including containers and even footwear! The latter was cleverly done by putting the foot into liquid latex and allowing the rubber to become solid. This resulted in a fit that could not be equalled in the best shoe store today.^⑤

Writings as early as 1511 tell of Cortez's men^⑥ watching the Aztecs^⑦ play games using a solid rubber ball that bounded and flew through the air better than the air-filled balls in Spain.^⑧ Herrera's *General History of the Vast Continent and Islands of America*^⑨ describes the ball "made of

(5) This resulted ... today: 结果是这样的合脚，就是今天最佳的制鞋店也比不上。this resulted in: 结果是…，结果成为…。(6) Cortez's men: Cortez ['kɔ:tez] 指埃尔南多·柯尔特斯 (Hernando Cortez, 1485—1547)，西班牙探险家，曾征服阿兹台克人。Cortez's men 指他的部队。(7) Aztecs ['æzteks]: 阿兹台克人 (墨西哥中部印第安人)。(8) Spain [speɪn]: 西班牙。(9) *General History of the Vast Continent and Islands of America*: 书名，可译为《美洲大陆及诸岛通史》，为西班牙历史学家 Antonio de Herrera y Tordessilas (1559?—1625) 所著。

the gum of a tree that grows in hot countries.” Holes are made in the tree. From the holes flow large white drops that soon harden. After the drops are rubbed and rolled together, they become very black. Another report mentioned that the gum was hardened with heat, a very interesting fact to remember.

The men of Spain brought home not only rubber balls, but also shoes and toys made of rubber. The Indians⁽¹⁰⁾ of South America produced many articles of solid rubber. For about 200 years, however, Europeans⁽¹¹⁾ did not regard the rubber things brought from the New World⁽¹²⁾ as useful. In 1735, French scientist Charles Marie de la Condamine visited Peru⁽¹³⁾ and became interested in two trees. From one tree came a substance used in treating a dangerous illness. From the other came natural latex. A friend of Condamine's who lived in Guiana⁽¹⁴⁾ was also interested in rubber and made some articles like rubber coverings, bags that would keep food dry, and divers' clothes.

Rubber was not yet called by this name.⁽¹⁵⁾

(10) Indians ['indjənz]: 这里指印第安人(复数)。 (11) Europeans [juərə'pi:ənz]: 欧洲人(复数)。 (12) the New World: 新世界, 西半球; 指美洲大陆。 (13) Peru [pə'ru:]: 秘鲁。 (14) Guiana [gai'ænə]: 圭亚那(拉丁美洲一地区)。 (15) Rubber was not yet called by this name: 橡胶当时还没有叫这个名称。

At first, it was either “gum” or an Indian name for the stuff. In the 1760’s, a man named Mr. Nairne, who sold instruments to students of mathematics, introduced half-inch squares of gum to be used in rubbing unwanted pencil marks so that they would disappear. Here was a good name for a material that seemed for a long time to be useful only in rubbing mistakes away.⁽¹⁶⁾ Mr. Nairne claimed that his square of “India rubber” (because the stuff was generally believed to come from the West Indies⁽¹⁷⁾) would last for several years. Its actual life perhaps depended on how often the rubber square was used.

The natural latex was thickened by adding acid, and Europeans did not know how to make it liquid again. In 1763, some Frenchman discovered that a liquid taken from pine trees would make the rubber liquid, but when it hardened again, it remained sticky and was not very useful for many purposes. Italians⁽¹⁸⁾ in 1790 caused rubber to become a liquid by placing it in oil, but this was not good either.⁽¹⁹⁾ The chemical ether⁽²⁰⁾ could be used also, but it was so expensive that it was said

(16) Here was ... mistakes away: 长期以来似乎只是用来擦掉书写错误的那个东西,这才有了一个合适的名称。 (17) the West Indies [ðə west 'indiz]: 西印度群岛。 (18) Italians [i'tæljənz]: 意大利人(复数)。 (19) but this was not good either: 但是这也不行。 (20) ether ['i:θə]: 醚, 乙醚。

only Frederick the Great⁽²¹⁾ was able to afford a pair of rubber boots made by using ether.

In 1820, a Scottish scientist named Charles Macintosh found himself with a useless product from his factory that made coloring substances.⁽²²⁾ This was naphtha, and Macintosh wanted to find a way to use it. He did—to make rubber liquid.⁽²³⁾ It was so much better than other materials that he began making waterproof cloth. To guard further against any stickiness, Macintosh decided to stick two gummed pieces of cloth together, with the rubber sides inside.⁽²⁴⁾ The result was the “Macintosh” raincoats still well known today.

At the time Macintosh was starting in the rainclothes business, an Englishman named Thomas Hancock set up the world's second rubber factory. (A factory in Vienna⁽²⁵⁾ had been started in 1811, but it was Hancock's business that really began the rubber industry.) Hancock's factory produced rubber printing equipment, shoes, and articles that were needed in hospitals. Hancock

(21) Frederick the Great ['fredrik ðə greit]: 腓特烈大帝 (1712—1786), 普鲁士国王。 (22) In 1820 ... coloring substances: 1820 年, 有一位名叫查尔斯·麦金托什的苏格兰科学家发现他生产染料的工厂有一种无用的产品。 Charles Macintosh (1766—1843), 苏格兰化学家和发明家。 (23) He did — to make rubber liquid: 他确实找到了一种利用的方法——使橡胶液化。 (24) with the rubber sides inside: 把有橡胶的一面朝里。 (25) Vienna [vi'enə]: 维也纳(奥地利首都)。

also invented a machine that worked in a different way than he had expected. It was intended to tear rubber into small bits, but instead, it put together pieces of rubber into one solid ball that could be used again! He also learned he could add various elements to his rubber and thus make other compounds.

Americans were familiar with rubber articles, but only in 1823 did rubber products of a practical quality become a reality. Thomas C. Wales introduced gum shoes. By 1835, Edwin Chaffee had established a rubber factory in Roxbury,^② Massachusetts,^② a town on the northeast coast of the United States. He began producing large, square thin pieces of rubber by means of rolls that pressed the rubber together.

Chaffee found that, if he mixed the black carbon made from lampsmoke with the natural rubber, he could make it liquid with the substance the French had tried. In only a few years, the company had increased its value from 30,000 to 300,000 dollars, and, like Hancock's company in England, it was making a variety of products. Orders came in for all kinds of articles, including mailbags for the U. S. Post Office. Other com-

(26) Roxbury ['rɒksbəri]: 罗克斯伯瑞, 美国旧城市名, 今已并入波士顿。(27) Massachusetts [mə'sə'tʃu:sets]: 马萨诸塞(美国州名, 旧译麻省)。