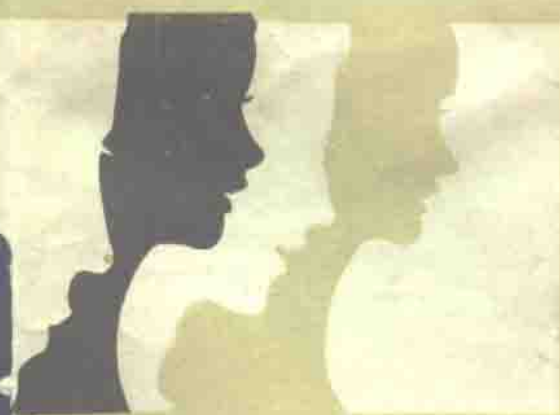


科技英语系列读物 EST Reading Series
第二级 第三分册 GRADE II BOOK 3

Frontiers of Science

(科学的新领域)



上海外语教育出版社

科技英语系列读物

第2级 第3分册

Frontiers of Science

科学的新领域

选注 汤克疆(主编) 陈照华 杨直夫

郑焕宇 胡奇枫 李傲慈

审订 柯秉衡 马泰来

总审 戴鸣钟

上海外语教育出版社

科技英语系列读物
第2级 第3分册
Frontiers of Science

科学的新领域

汤克璽 陈照华 杨直华 选注
郑焕宇 胡奇枫 李效慈

上海外语教育出版社出版
(上海西体育会路119号)
宜兴南漕印刷厂印刷
新华书店上海发行所发行

787×1092毫米 32开本 4 5/16印张 76千字
1985年1月第1版 1985年1月第1次印刷
印数: 1--31,000册
统一书号: 7218·135 定价: 0.70元

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外语，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

1983 年 7 月

Contents

1. Yet To Be Learned	I
2. Seeing in the Dark	9
3. A Modern Puzzle	20
4. Using the Sun	29
5. Danger ! Atomic Waste !	40
6. Save It—Use It	52
7. Trees That Tell Stories	65
8. Men Learn from Men	75
9. Operations Research	87
10. Can Machines Think ?	96
11. Winds and Storms	109
12. The World's First Completely Automatic Railway	122
13. Atom Weapons	134
14. Glowing for Science	142
15. Frontiers for Tomorrow	150
Glossary	155

1. Yet To Be Learned^①

Each new scientific discovery is like a stone thrown into a ~~pond~~^{well}. One wave forms and spreads out into a circle, creating another and another and another, until most of the surface of the pond is in motion—a scientific movement created by one stone dropped into the water.

We want to tell you a story about such a stone. The story begins in 1895, in Berlin, Germany. In a large room in the science building of Berlin University, a laboratory helper was arranging scientific machines on a huge table, connecting electric wires needed for the morning's experiment.

The floor of the big room was high at the back, with stairs coming down past the curved ^{弧形的} rows of seats.^② As the laboratory helper worked, the room filled rapidly. Students, professors, and guests from many countries, after looking in vain for seats,^③ finally sat on the steps. The

(1) Yet to be learned: 学无止境。 (2) The floor of the big room ... rows of seats: 这间大房间的地面后面高, 阶梯通过弧形的排椅拾级而下。 (3) after looking in vain for seats: 找不到座位。 in vain: 白白; 徒然。注意句中 in vain 的位置在 for 之前。

last people to come stood by the walls. A mixture of many languages was heard as people talked excitedly about the scientific experiment they had come to witness. ~~is~~ ~~the~~

When the professor came on the stage, the people all stood to show respect for an important German scientist.

The people sat down. There was no noise in the great room. The professor looked quickly around the room and began to talk.

In carefully chosen words he spoke for several minutes. He drew pictures on a large board of his scientific experiments and told his listeners the history of how he had discovered the things he was going to show them this morning.⁽⁴⁾

When he had finished talking the professor asked three workmen to help him. The room was darkened. The watching people leaned forward,⁽⁵⁾ trying to see what was happening.

Suddenly the lights became bright and the professor walked quickly out of the room. The students and visiting professors sat and waited. After a long time the professor returned. He

(4) He drew pictures ... this morning: 他先在一块大黑板上画了几个他的科学实验图形,并向听众讲述,他今天上午打算给大家演示的那些现象是怎样发现的。 (5) lean forward: 向前探身。

stood behind the table and held high, so that all could see^⑥ the first picture made by X-rays.

For a moment the people stared at the picture, which showed the bones of a hand. Then there was a human storm.^⑦ The watching people shouted, cheered, and crowded forward to shake the professor's hand and examine his X-ray machine.

This man was William Conrad Roentgen,^⑧ who in 1901 was given the important Nobel Prize for his discovery of X-ray.

On the day following the experiment with X-ray, the picture was displayed in the window of a book-store in Berlin. A scientist said, as he looked at the X-ray picture, "Today we have reached the end of scientific discovery. There is little yet to be discovered."^⑨

A man standing beside him nodded. "Yes, that is true. To me this brings sadness, because there is nothing remaining for our children to learn."

What they said sounds unbelievable to us.

(6) So that all could see: 此句系目的状语从句, 插在句中。picture 是 held 的宾语。 (7) Then there was a human storm: 接着, 群情激昂。 (8) William Conrad Roentgen ['wɪljəm 'kɒnrəd 'rɒntʃən]: 威廉·康纳德·伦琴(1845—1923), 发现X射线的德国科学家。 (9) There is little yet to be discovered: 再也没有什么可发现的了。

We know how wrong the two men were. However, there are always people who are certain that each new discovery will be the last, that the limits of scientific knowledge have been found.⁽¹⁰⁾ Scientific books and stories are full of things like the two men in Berlin said in 1895.⁽¹¹⁾

You and I know that such thinking is wrong. Roentgen's discovery was a start. Men of science at once hurried to study the X-ray to improve the invention, to put it to work.

Some scientists discovered that the X-ray led them to new discoveries. It made possible experiments they had never imagined could be done.⁽¹²⁾ Doctors used X-ray to study the inside of the human body. Their findings led them to new knowledge and new areas of the science of medicine. Other scientists used X-ray in experiments in many different sciences and discovered facts that told them where other experiments were needed. X-ray has been increasingly useful in many ways in art, science, industry, and police work.

(10) However, there are always people ... have been found: 然而, 总有人认为每一项新的发现就是最后的一次发现了, 科学知识的顶峰已经到达。 (11) Scientific books and stories ... said in 1895: 类似这两个人1895年在柏林所说的话在科学书籍和故事传说中是屡见不鲜的。like 是连接词, 相当于 as, 例如: Tell it like it is. (12) It made possible ... could be done: 这就使得他们能够去做他们过去认为绝对做不到的实验了。

Roentgen's discovery was a stone with its waves.^⑬ Since 1895 other developments have continued to increase scientific knowledge. The X-ray story shows the exciting fact that each new discovery leads to many more, and each of these leads to yet others. The spreading-out^⑭ causes science to move ahead more rapidly each year toward helping us to understand the sun, moon, stars, and our own world, the earth. And there always will be new facts to be learned!

When we began to think about the stone and its waves, we became curious. We began to look for other discoveries or inventions that today are new but that tomorrow may lead to more new discoveries and inventions.

To discover what we wanted to know, we talked with scientists, read their books, attended their meetings, visited their laboratories. We gathered facts concerning today's science, especially where the new facts might lead and what opportunities there may be for the future.^⑮

How many opportunities for new discoveries there are and will be! We discovered that scienti-

(13) Roentgen's discovery ... its waves: 伦琴的这项发现, 一石激起了千层浪。 (14) the spreading-out: 这种扩散。
(15) We gathered ... for the future: 我们搜集了有关现代科学的资料, 特别是有关这些新的资料今后会把科学引向何方, 并给我们提供什么机会。

fic discoveries must be made a long time before they are needed. They must be made by people with active minds who can imagine the future needs of the people of the world.

Many people are planning to cross one of the greatest and most exciting of all frontiers—the one called “outer space,” between our world and the distant stars.

Guided missiles[®] have already crossed this frontier, carrying devices that send messages to the scientists on the earth. Each year more and more guided missiles are sent up from earth, and some of them are now circling the earth just like the moon does.

Books and radio programs are always telling us what is new concerning the outer-space frontier. Going into outer space is exciting and important, but there are many other unknown things too. So in this book we shall stay on the earth. We will examine a few of the many scientific frontiers to be crossed here—frontiers where much scientific study is needed if we are to continue to learn more about the mysteries of science that affect the lives of each of us.

We shall learn of new scientific developments.

(16) guided missiles: 导弹。

We shall learn of new products for use in our homes. We shall talk of machines that seem to have brains, and we will discuss the human brain. We shall experiment with darkness and also look up at the bright sun. We shall learn how all men will benefit from today's science when it is put to use tomorrow.

Because our first stone-and-waves story was about the X-ray, we shall talk first about pictures. We shall begin our study of the future of science with peoples' search for methods of making pictures⁽¹⁷⁾ in the dark.

Exercises

I. Fill in the blanks with the proper prepositions.

1. We want to tell you a story about such a stone.
(of, about, from)
2. The professor looked quickly into the room and began to talk. (at, around, into)
3. Since 1895 other developments have continued to increase scientific knowledge of X-rays. (in, after, since)
4. When we began to think about the stone and its waves, we became curious. (with, for, about)
5. Books and radio programs are always telling us what is new about the outer-space frontier. (for,

(17) making pictures: 拍照, 摄象。

concerning, of)

II. Answer the questions according to the passage.

1. When and where did the story begin?
2. Where was the picture displayed on the day following the experiment with X-ray?
3. What does the X-ray story show?
4. What should we do to discover what we wanted to know?
5. Why did the book talk first about pictures?

2. Seeing in the Dark

For centuries people have wanted a machine that would make pictures in the dark. Modern men have searched for such a machine.

A general in Europe wished for a machine that could take pictures of the enemy in the darkness to help him win a battle and finish a war.

An American scientist wished for such a machine to take pictures in the dark and help him to learn more about the mysteries of earth and space.

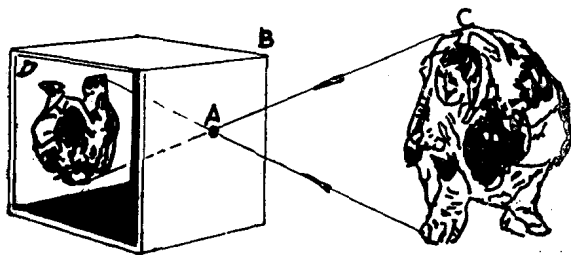
Similar wishes have been repeated by men of many occupations in many countries. Scientists have experimented with many machines that make pictures, called cameras, some large, some small. Many of the cameras were simple and easy to use, a few very difficult;① none would make pictures in the dark.

You can see the problem of those who searched for a camera that would make pictures at night. You must have light to make the picture you want. Such a picture is called a photograph.

(1) a few very difficult: 此系省略句, 省略了谓语动词 were.

“Photograph” comes from two Greek words, *phos* and *graphos*, which in English mean “painting with light.”

Nine hundred years ago an Arab teacher named Alhazen^② described for the first time the principle of what we call a camera. Five hundred years ago an Italian Giambattista della Porto,^③ invented the first camera. He discovered that a small window (A) in one side of a closed box (B) would make an upsidedown picture of an outside object (C) on the inside of the box (D).



After Della Porto's invention, many cameras were made. But none of these cameras can take a picture in the dark.

While scientists were searching for a camera with which to “see” in the dark, other picture-making discoveries were being made. X-ray

(2) Alhazen [ælhə'zen]: 阿尔哈曾, 阿拉伯人名。(3) Giambattista della Porto [ˌdʒɑːmbɑːtɪˈstaː ˌdeilaː ˈpɔːtuː]: 贾姆巴蒂斯·戴·波托。意大利人名。

was one. X-rays are a kind of light that cannot be seen but that can go through a person's body and through many other materials. When the rays pass through the body, a shadow is produced of the bones, heart, and other parts of the body.

The X-rays are directed so that the shadow of the object falls on special paper, and a picture is made. But the result is a shadow picture, not what we call a photograph. The scientists continued to work with the X-ray, but they could not make pictures with it in complete darkness. Also, they wanted to be able to take pictures of a near or faraway object at night, and X-ray shadow pictures can be made only of near objects.

As we begin to see how pictures may be made in the dark, we want to remember one word, *radiation*. This is the most important word to solve the scientists' problems.

Radiation is energy that escapes and shoots forth from an object. It has been studied for many years. Scientists have known that energy (radiations of many kinds) is sent out by all things—metal, stone pieces of ice, and the human body. This energy is a form of heat produced by rays of light that cannot be seen. It is called infrared radiation and can be discovered by scientific instruments.