

# EST



## 科技英语文选



上海外语教育出版社

# 科技英语文选

SELECTED ENGLISH READINGS  
OF SCIENCE AND TECHNOLOGY

冯玉桐 等 编注



上海外语教育出版社

053069

## 科技英语文选

冯玉桐等 编注

---

上海外语教育出版社出版

(上海西体育会路 119 号)

江苏大丰印刷厂印刷

新华书店上海发行所发行

---

787×1092 毫米 1/32 4 印张 83 千字

1985 年 9 月第 1 版 1985 年 9 月第 1 次印刷

印数 1—19,000

统一书号: 7218·154 定价: 0.65 元

## 编 者 的 话

本书是为具有基础英语知识的理工科院校高年级学生和工矿企业工程技术人员编写的科技英语读物。本书中的文章均选自当代国外科技书刊，体裁多样、内容新颖，有一定的趣味性。本书对每篇文章中的语言难点作了较详尽的注释或翻译对照，书后附有词汇表，有助于读者巩固已学过的语法知识，扩大词汇量，进一步提高阅读科技英语原著文献的能力。

本书由冯玉桐、冯永复、朱曼华主编，胡盛职、曹洪举、王维义、于三民、廖发扬、许玉华等同志参加编注工作。一九八一年于湖南大学召开的机械工业部部属院校第二次英语协作会的代表共同审定了这本读物。美国语言教师索尼娅·马尔丁博士对部分注释条目提出了宝贵的意见。谨在此向他们表示最诚挚的谢意。

限于编者水平，本书难免有错漏和不妥之处，希望读者批评指正。

一九八四年六月

## CONTENTS

1. What Is Technical English? .....	1
2. Landing on the Moon .....	4
3. Digital Computers .....	7
4. Multimeter .....	10
5. What Are Magnets? .....	13
6. Electrical Current .....	17
7. The Three States of Matter .....	20
8. Heat Treatment .....	24
9. Amplifier Design .....	27
10. Some New Units .....	30
11. Friction .....	34
12. Metals and Their Properties .....	37
13. Franklin and Electricity .....	41
14. Transformer .....	44
15. Transistor .....	47
16. What Is Electronics? .....	50
17. What Is Temperature? .....	53
18. Temperature and Heat .....	56
19. Correct Choice of Fuse .....	59
20. The Nature of Magnetic Materials .....	64
21. Conductors .....	67
22. The Nature of Plastics .....	70

23. Corrosion .....	73
24. How to Transform Energy into Work .....	76
25. Ohm's Law .....	80
26. Engineering Materials .....	84
27. Work .....	88
28. Boiling Point and Freezing Point .....	92
29. Expansion and Contraction .....	96
30. How Solids Transmit Sound .....	100
Vocabulary.....	104

## 1. What Is Technical English?

When you read a piece of technical writing<sup>①</sup> in English for the first time, or when you first hear scientists or engineers talking in English, you may find it very difficult to understand what is written or spoken, particularly if you have learned English as a language of everyday conversation and of literature.<sup>②</sup> You may think that there is a special kind of English which is used only in science and technology and which has to be learned as a separate language. You may also feel that somehow the English of science and technology is much more difficult than everyday English. In fact, technical English does differ from<sup>③</sup> everyday English, because of the specialized contexts in which it is used and because of the specialized interests of scientists and engineers. But the differences do not present any great problems once<sup>④</sup> they have been recognized.

The following passage illustrates some of the features of technical English:

(Mr. Smith enters Dr. Brown's office.  
Dr. Brown is a consultant. Dr. Brown  
speaks.)

**DR. BROWN**      Good morning, Mr. Smith. Can I take

your coat? Awful weather, isn't it?  
Do sit down.<sup>⑤</sup> Cigarette?

MR. SMITH No, I don't smoke, thanks very much.

DR. BROWN Well, I've been looking into your inquiry about the corrosion trouble you've been getting in the control valve.<sup>⑥</sup> I'm sorry you've had trouble—quite unexpected—but I think we have the answer. The most probable cause of corrosion at a metal-to-metal junction immersed in an ionized fluid is electrolytic.<sup>⑦</sup>

In this passage, Dr. Brown begins by talking informally to his visitor, but when he talks as an expert about his specialized subject—corrosion—his way of talking changes. His statements are impersonal, his style of speech is formal and he uses many technical terms.

## Notes

- ① a piece of technical writing: 一篇科技文章
- ② You may find it very difficult to understand what is written or spoken, particularly if you have learned English as a language of everyday conversation and of literature.

句中, it 是形式宾语, = to understand what ..., 而 difficult 为 it 的补足语。



③ does differ from ... : 的确不同于...

这里 does 为助动词, 起加强语气的作用, 表示强调。

④ once: 一旦...(就...)

这里 once 为连接词, 引导时间状语从句。又如:

Once you begin the work, you must carry it on.

工作一经开始, 就得做下去。

⑤ do sit down: 见注③

⑥ I've been looking into inquiry about the corrosion trouble you've been getting in the control valve.

我一直在探究你们在控制阀里所碰到的腐蚀问题。

⑦ The most probable cause of corrosion at a metal-to-metal junction immersed in an ionized fluid is electrolytic.

沉浸在电离液体中金属与金属连接处发生腐蚀的最可能的原因是电解。

## 2. Landing on the Moon

On July 20, 1969, at least a half billion people in 49 countries kept their eyes fixed on television screens. Three American astronauts were waiting in a spaceship, Apollo II, sitting on top of a rocket that was 36 stories high. Their destination: the moon.

All those who were watching knew that the landing of men on the moon would be a tremendous achievement. They knew also that something might go wrong<sup>①</sup> at any time. When the men got to the moon, would they be able to land? Would the surface be smooth enough? Would it be strong enough to hold them? Would they be able to walk around on the moon? If so,<sup>②</sup> what would they find there? And would the rockets on the spaceship fire so that the astronauts could return to earth?

The final countdown came. Five ... four ... three ... two ... one ... fire rockets!

Just 76 hours after they had left the earth's surface, they were orbiting the moon. A short time later two of the astronauts left their spaceship in a lunar landing craft and prepared to land on the surface of the moon. While millions of people back on earth<sup>③</sup> watched on television, the first astronaut climbed out of the landing

• • •

craft and stepped down. As his left foot touched the dusty surface, he said, "That's one small step for a man, one great leap for mankind." At last man was walking on the moon!

The second astronaut followed twenty minutes later. Together they explored the surrounding area. Then they took pictures, set up scientific instruments, and gathered sixty pounds of moon rocks and moon soil to take back to earth with them. They also set up a television camera so that the whole world could watch.

While they were exploring the moon, the third astronaut was flying the main ship in lunar orbit waiting for the other two men to return. The total time of the lunar visit was 20 hours and 37 minutes. Then they boarded their lunar landing craft and lifted off. After returning safely to their spaceship, all three astronauts rocketed out of lunar orbit and headed back to earth.<sup>④</sup> On July 24, Apollo II returned to earth safely. At that moment, people all over the world hailed the three heroes.

Each expedition has paved the way for the next. Now that man has left his footprints on the moon, where will he go next?<sup>⑤</sup> Will it be to even more distant planets beyond the solar system?<sup>⑥</sup>

## Notes

① go wrong: 出毛病。这里的“go”是连系动词。

② If so: 这里的 so 用来代替从句, 代表前边句子里提到的那些设想。

③ millions of people back on earth: 地球上的千百万人。

这里 back on earth 为形容词短语, 作 people 的后置定语。

④ headed back to earth: 朝返回地球的方向飞行。

⑤ Now that man has left his footprints on the moon, where will he go next?

既然人类已把自己的足迹留在月球上, 那末下一步, 他们将去向何方?

句中 Now that 为复合连词, 意为“既然”、“因为”。

⑥ Will it be to even more distant planets beyond the solar system?

人们将会到甚而更遥远的太阳系之外的行星上去考察吗?

这里的 it 是指上句的 expedition。

### 3. Digital Computers

The most common type of computer is the digital computer. This machine is often referred to as a "data-processing machine"<sup>①</sup> because it is able to take a great deal of data and "process" them mathematically. It is probable that you have come in contact with a digital computer recently.<sup>②</sup> Have you seen cards with rectangular holes punched in them? Or have you seen bank checks with numbers printed on them with special ink?<sup>③</sup> Or have you taken a test in which you were required to mark your answers on a special sheet of paper with a certain type of pencil? All of these pieces of paper are processed by digital computers.

How can a machine do all of these complicated jobs? Actually, the basic idea of a digital computer is not very complex. When you were younger, you probably added numbers by counting on your fingers. When you did this, you were using a very simple digital computer. And this is a good way to remember the name of this machine, since the word "digit" can mean a finger as well as one of the ten Arabic numerals that we use in our system of arithmetic.

But you have 10 fingers to count on, and our Arabic

system has ten numerals: 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9. The digital computer has only an electric circuit on which to count,<sup>④</sup> and there can be only two conditions — off and on. For this reason, the digital computer **can count** on only two “fingers”.

Therefore, a different system of arithmetic is used. It is called “base 2”.<sup>⑤</sup> (Our Arabic system is called “base 10”. Can you see why?) Perhaps you have studied base-2 mathematics in school. If not,<sup>⑥</sup> you may want to read more about it in an encyclopedia or other reference book.

The base-2 system is shown below, using the numerals 1 through 10. In a digital computer the symbol “0” can mean that a particular circuit is “off”, and “1” can mean that the circuit is “on”.

## Notes

- ① This machine is often referred to as a “data-processing machine” ....

这种机器通常指的是“数据处理计算机”……

句中 as a “data processing machine” 为主语 “this machine” 的补足语。

- ② It is probable that you have come in contact with a digital computer recently.

可能近来你已接触过数字计算机。

句中 it (形式主语) = that you have come in contact with...

- ③ ... have you seen bank checks with numbers printed on them with special ink?

你见到过号码用特种油墨印刷的银行支票吗?

- ④ on which to count: 可供计算的

这里 which 指 electric circuit.

- ⑤ base 2 = binary system 二进制。

- ⑥ If not = If you have not studied base-2 mathematics in school ...

## 4. Multimeter

The basic moving-coil ammeter arrangement that we have just described forms the basis of a number of other meters. By suitable modification it can be used to measure voltages and resistances. And its range as a current measuring meter can be greatly extended so that it will measure a number of different current ranges.

If a special low-resistance shunt is placed across the meter—see Fig. 1 (a)—a certain current—depending on the resistance value of the shunt<sup>①</sup>—will flow through the shunt. The meter will then take only a proportion of the total current flowing through the whole arrangement. Thus a meter movement which is fully deflected when 1 mA flows through it can be made to deflect fully when 10 mA flows through the circuit, 9 mA going through the shunt.<sup>②</sup> By arranging for shunts of various values to be placed across the meter, the meter will indicate currents of widely different magnitudes. Selection between different current ranges is easily effected by switching. The dial of the meter will usually have the same number of scales calibrated on it as there are ranges in the meter.

So far we have been considering the measurement of direct current. To measure alternating current a recti-



ifying diode is connected in series with the meter to turn the a.c. into d. c.

To measure voltage, the meter is connected to the circuit under test via<sup>③</sup> a series resistor—see Fig. 1 (b)—of appropriate value. A small current will flow through this series resistor, and as, in accordance with Ohm's law, this current is proportional to the voltage across the resistance,<sup>④</sup> the scale of the meter can be calibrated in volts.

Including a battery in the meter enables it to measure resistance. Fig. 1 (c) shows the arrangement. The

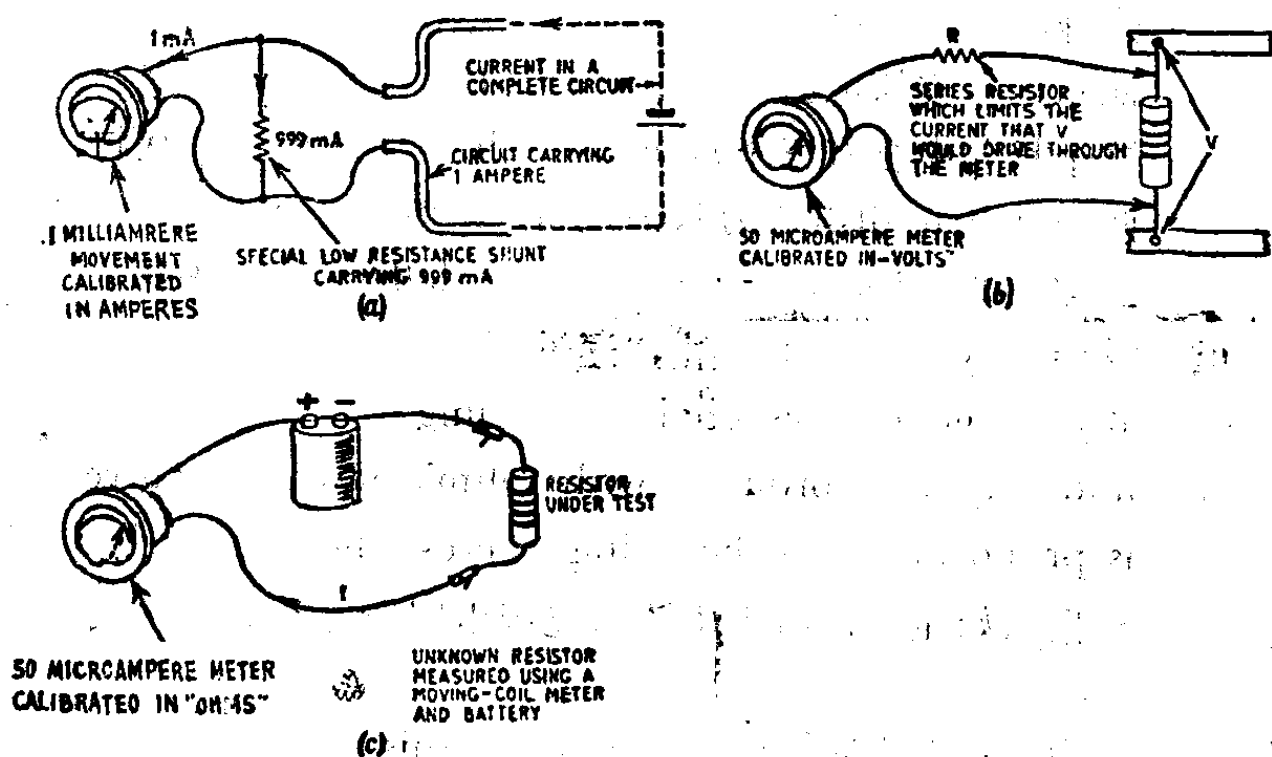


Fig. 1 Tests using a multimeter.

battery current flows through the resistor under test and the meter: once more, following Ohm's Law, the meter can be calibrated in ohms.