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Grade

● 理工科英语分级读物

Stories and Anecdotes

About Scientists

# 科学家的故事和轶事

·王学铭·叶秀媛·选注



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## 主编者例言

一、这套读物主要供高等院校理工科各专业学生英语课外阅读之用，也可供自学英语的工程技术人员选用，以提高英语阅读与理解能力。

二、全套读物共分四级，按词汇量和语言难度分级。词汇量以Thorndike和Lorge所编 *The Teacher's Wordbook of 30,000* 为依据，但按我国具体教学情况作适当调整。每级读物分若干册。第一级到第三级为一般科普文章，包括科普知识、科学家传记和轶事、科技见闻、科学幻想等。第四级读物中一部分为一般科普文章，亦即一、二、三级的继续；另一部分为分大类读物，如：机械动力、电子电工、土建水利、交通运输等。

三、全套读物都选自英美原文。在编选过程中力求选文题材新颖、内容有趣、语言生动。

四、每册内容包括选文、注释和理解练习三个部分。书后附有该册词汇总表和练习答案，可供查阅。

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## CONTENTS

1. Archimedes and the Bath .....	1
2. Stories of Galileo .....	5
3. Some Interesting Stories about Darwin .....	18
4. Pasteur, Pasteurisation and Rabies .....	27
5. Some Episodes in Edison's Life .....	39
6. A Boy Who Was Traded for a Horse .....	55
7. Jenner Studies Smallpox .....	63
8. Isaac Newton .....	67
9. Pioneers of the Atomic Age .....	74
10. Alexander Fleming and the Discovery of Penicillin .....	85
11. The Story of Luther Burbank .....	92
12. Vincent Schaefer: the Rainmaker .....	102
13. The Story of Charles Babbage .....	113
14. Schoenbein and His Explosive .....	120
15. Dr. Parkes and the Freezing of Living Cells .....	124

## 1. Archimedes<sup>1</sup> and the Bath

One day the king of Syracuse<sup>2</sup> called Archimedes to him. 'Look at this crown, please,' he said. 'Is it made of gold? Or is it made of different metals? I want to know, because I paid a lot of money for it.'

Archimedes picked up the crown. It appeared to be made of gold. But perhaps there was a different metal inside the gold. How could he find out? 'Go home and think,' said the king. 'Make some experiments. People say that your experiments are very clever.'

He went home, and he thought very hard; but he could not find the answer. At last he was tired, so he went to the public baths.<sup>3</sup> He stood beside his bath and looked at it. It was not quite full. Then he got into it, and the water came up to the top.

While he was sitting in it, he suddenly had an idea. 'Eureka!<sup>4</sup>' he cried in Greek. 'I've found it!'

He ran out into the street and went quickly

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1. Archimedes: 阿基米德 (287?—212 B.C.), 希腊数学家、物理学家及发明家。2. Syracuse: 西那库斯, 意大利西西里岛东南部一海港, 公元前734年迦太基人建立的一座古城。3. public bath: 公共浴室。4. Eureka [juə'ri:kə]; *int.* = I have found it! 我找到了。

home. The people in the street were surprised, because he was not wearing any clothes. His thoughts were full of this wonderful idea, so he forgot to dress.

He made a few short experiments in his house, then he went straight to the king. 'Sir,' he said, 'I've found the answer to your question. Allow me to show you an experiment.'

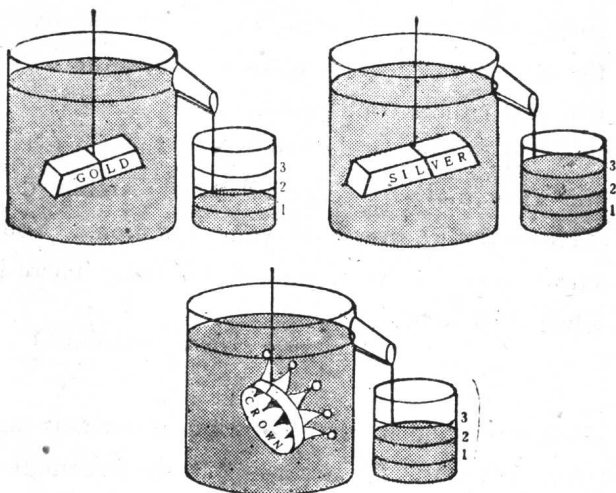
He put some gold and silver on the table, beside two pots. Then he began: 'Your crown weighs four pounds. This bar of gold also weighs four pounds, and this bar of silver weighs the same amount. But gold is heavier than silver, so the bar of silver must be larger. Is that correct?'

'Yes,' said the king.

'Good. Would you like to help me?' asked Archimedes. 'This big pot is full of water. If you put the gold in, some water will go out into the small pot. Measure this amount of water. A mark inside the pot will be enough. That's right.'

Archimedes took out the gold. Then he filled the big pot again and emptied the small one. 'Next, put the silver in. When some water goes out, measure it in the same way.'

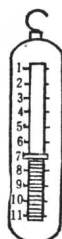
The king did this. 'And now,' Archimedes



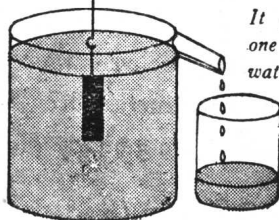
*There is the answer to your question*



*The bar weighs 8  
pounds in the air*



*It only weighs 7  
in the water*



*It pushes out  
one pound of  
water*



continued, 'we shall put the crown in. If it is completely made of gold, the water will reach the first mark. If it is made of silver, the water will reach the second mark.'

They watched, and the water came between the two marks. "There!" cried Archimedes. "There is the answer to your question. Your crown is not completely made of gold. There is silver in it also.'

*from* GALILEO

Indicate whether the following statements are true (T) or false (F) according to the information given in the passage:

1. The king of Syracuse sent for Archimedes, asking the great scientist to find out whether his new crown was made of gold and silver or other metals through his clever experiments. (     )
2. The king suggested that Archimedes take a bath before he started to work out the answer. (     )
3. The crown being larger than it should have been, Archimedes drew the conclusion that the crown was not made of pure gold. (     )

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5. there: *int.* 意为“好啦，你看”。这里用以引起注意或加强语气。

4. Reading between the lines, we may as well say that even in ancient Greece, the experiment was an important means which Archimedes often resorted to while trying to solve scientific problems. (     )
5. Archimedes' bath has been well-known to everybody through all ages ever since because it is from this bath that he drew the inspiration which led to the discovery of the famous Archimedes Principle, i.e. the law of buoyance. (     )

## 2. Stories of Galileo<sup>1</sup>

### I. A Student Full of Questions

Galileo had one real friend, the teacher at the Pisa<sup>2</sup> school. With this man's help he was able to go to Pisa university. He was now seventeen years old. Soon every teacher in the university knew him. Some did not like him, because he was too clever for them.

'You ask too many questions,' they said. 'You're only a boy. You must listen to us and you must accept our ideas.'

'Some teachers have wrong ideas,' replied

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1. Galileo: 伽利略 (1564—1642), 意大利物理学家及天文学家。 2. Pisa: 比萨, 意大利西北部一城市, 以其斜塔著称于世。

Galileo. 'They say that Aristotle<sup>3</sup> was always right. But Aristotle lived two thousand years ago. Many things have changed since then.'

'True things do not change.'

'I know. But Aristotle made mistakes. He only knew a small corner of the world. Men are always finding out new facts. For example, Francis Drake<sup>4</sup> has just sailed round the world; he returned to England last year.'

'Do you think that Drake is cleverer than Aristotle?'

'No. But men like Drake and Columbus<sup>5</sup> have taught us new facts. We must learn from life; we can't learn from books alone. Some things in Aristotle's books aren't true.'

Many teachers were angry because he talked like this. Their answer was always the same: 'The leaders of the Church<sup>6</sup> say that his books are true. If you don't accept the Church's ideas, you'll soon be in trouble.'

But Galileo did not think that this was a good answer. 'The Church gives orders,' he said, 'but it doesn't give reasons. In these days men are beginning to think for themselves. You can't

---

3. Aristotle: 亚里士多德 (384——322 B. C.), 希腊哲学家。

4. Francis Drake: 弗朗西斯·德雷克 (1540?——1596), 英国航海家。 5. Columbus [kə'lambəs]: 哥伦布 (1446?——1506), 意大利航海家。 6. Church: 教会, 这里指天主教会。

order them to accept ideas. You must explain your ideas to them, and you must be ready to answer their questions properly.'

Galileo's life was full of questions. He tried to answer them himself. If possible he liked to find the answers by experiment. He liked to weigh things and to measure them.

'Archimedes is my teacher,' he used to say. 'He lived a long time ago, like Aristotle; but he made experiments and he tested his ideas properly. He wasn't just a writer. He was a real scientist.'

Galileo always wanted to test his own ideas. 'I test them with numbers first,' he said. 'Then I test them with my hands and eyes. If they give the same answer, it will usually be correct.'

'For example, look at that pot and that box. One is round and one is square. Which holds the bigger amount of sand? We can measure them with a ruler and find the answer with numbers, but men make mistakes with numbers. We can weigh them with sand and without sand, but we use numbers for that too.'

'What can we do next? We can fill the pot with sand and empty it into the box. That will give a clear answer without numbers<sup>7</sup>.'

Of course his questions were harder than

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7. without numbers; 无需进行数字运算。

that. Why do things fall to the ground? Why do they not fall up to the sky? Why can heavy ships sit in the water<sup>8</sup>? The cleverest teachers in the state could not tell him. He had to look for his own answers.

He did not always find them, but the questions themselves were important. Scientists were still looking for the answers to some questions a hundred years later.

## II. Galileo and the Pendulum

Galileo often visited the big church in Pisa. He was not a very good artist himself, but he loved its pictures and its sculptures. It was quiet there, too, so he could think.

One day, when he was sitting in the church, he noticed a lamp. It was hanging on a long cord. While he was looking at it, a boy came and lit it. Then the boy went away, but the lamp was still moving. It was swinging from side to side.

That was not unusual.<sup>9</sup> Things will often swing, if they are hanging on a cord. But he was watching the swings with special care. 'That's strange,' he thought. 'Every swing takes the same amount of time.' He pushed the lamp

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8. sit in water: 停在水面。sit 指静止地停着。9. not unusual: 双重否定, 意为“常见的, 普通的”。



and watched again. At first it made long swings. Then they grew shorter. But the short swings and the long ones took the same time.

Galileo wanted to be certain. He wanted to test the time of every swing. 'There isn't a clock in the church,' he said to himself, 'but I don't need one. I can feel my pulse.'

He was learning to be a doctor, so he knew the use of a pulse. 'Hold your arm, just above

your hand,' his teacher used to say, 'and you'll feel the pulse. It is pumping your blood. If you're sitting, it will pump slowly. If you're running, it will pump quickly. Also if you're ill, it will usually pump your blood quickly.'

So Galileo felt his pulse and watched the swings of the lamp. Yes. Every swing was taking the same time.

Then he went home. He got a cord and a heavy piece of iron. He fixed the iron to the end of the cord, and he allowed it to swing. Then he tested the swings, and they were slower than his pulse. 'My pulse pumps seventy-two times in a minute,' he said. 'If I use a shorter cord, perhaps the swings will be quicker.'

He tested this idea and it was correct. Now the swings were quicker than his pulse; so the cord was too short. He tried again and again. At last the swings were just right. The cord was swinging seventy-two times in a minute.

'This idea could help doctors in their work,' he thought. He made a small machine, and he showed it to his teachers. They were pleased.

'You wind<sup>10</sup> this cord round the top of the machine,' he told them. 'You fix this iron to the bottom of the cord, and you allow it to swing.

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10. wind [waɪnd]; v. 绕, 卷绕.

If you want a shorter cord, you wind it up. If you want a longer cord, you wind it down.'

'There's a mark on the cord, and there are numbers on the machine. When the mark is beside number 72, the cord will swing seventy-two times in a minute. When it's beside number 80, it will swing eighty times. This cord is the *pendulum* of the machine. It must hang freely and swing freely. Don't move the machine while the pendulum is swinging.'

With this machine a doctor could measure a man's pulse quickly and correctly. Galileo made many copies of it, and he sold them to doctors. In 1607 a doctor at Padua<sup>11</sup> university wrote a book about his own work, and he showed pictures of Galileo's machines. There were three kinds. The best one had a face like a clock.

### III . Galileo and the Tower of Pisa

Galileo wrote a report, *About the Centre of Gravity*. His friend Ricci showed it to the Grand Duke<sup>12</sup> Ferdinand I. The Grand Duke read it and liked it very much. 'This young man is clever,' he said, 'we must use him. We need a Professor of Mathematics at Pisa University, and he is clearly the right person for this work.'

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11. Padua: 帕度亚, 意大利东北部一城市。 12. Grand Duke: 大公。



It was now 1589. Galileo gladly accepted the offer. The university paid him £ 13 a year. It was not much, but it allowed him to continue his experiments. Some teachers at Pisa still did not like him, but this was not important. The Grand Duke liked him, and the students liked him. The cleverest students often helped their professor with his experiments.

The next year he wrote a longer report, *About Gravity*. His fellow teachers were angry, because this report questioned Aristotle's ideas,

'Aristotle was a great man, but he was wrong about some things,' said Galileo. 'For example, he said that "heavy objects fall quickly but light objects fall slowly". This isn't true. Take two pieces of any one material—a light piece and a heavy piece. If you drop them together, they will land together.'

'Prove it!' shouted the angry teachers.

'Certainly, I'll prove it,' he answered quietly. 'Come to the tower at noon tomorrow.'

There is a famous tower at Pisa. It has been there since 1173, and it is a hundred and seventy-nine feet high. But the ground under it was too soft, so it does not stand straight. Galileo often went to the top of this tower, because it was a good place for experiments.