北京大学教学参考书

大学英语文选

（理工科）

（一）

北京大学公共英语教研室
沈一鸣　石春祯　彭瑞初

北京大学出版社

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编 者 的 话

为加强英语阅读实践，逐步培养学生阅读英语书刊的能力，我们配合北京大学公共英语教材编选了这本大学理科英语文选，供综合大学、师范院校和电视大学的理科学生，以及科技人员和自学者使用。

本书主要是物理类的科普文章，也包括部分数学、地质等方面的材料。文章按语言的深浅难易编排。每篇文章后附有较难语句的注释，书后有总词汇表，供阅读和翻译时参考。

本书由北京大学公共英语教研室王岷源、杜秉正两位教授审稿，并得到其他许多同志的协助，特此表示感谢。

由于我们水平有限，本书一定有缺点和错误。希读者批评、指正。

编 者

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Contents

1. The Basic Geometric Space Shapes

The most common space shape is the ordinary box. In mathematics it is known as a rectangular solid①. Your classroom probably has that shape. So do your books②. Name some other objects in the classroom that have this shape.

In the home, too, there are many objects that have the shape of a rectangular solid. The house you live in may have that shape. Building bricks also have it.

As you may know, there is a special rectangular solid in which the six sides or faces are all squares③. It is called a cube. Have you ever seen children playing with blocks④? Well, building blocks are usually cubes. What other familiar objects have the shape of a cube?

The next common space shape about us is found in the ordinary can. The mathematical term for it is cylinder. You also find this shape in all kinds of pipes, in most drinking glasses, in test tubes, and in storage tanks. What are some other familiar objects that have the shape of a cylinder?

[注]

①In mathematics it is known as a rectangular solid. 在数学上这(盒

子）叫做长方体。

known as 叫做，称作

②So do your books. = Your books probably have that shape.

③As you may know, there is a special rectangular solid in which the six sides or faces are all squares. 如你所知，有一种特殊的长方体，它的六个面都是方形的。

As 引导的是定语从句，修饰整个主句的内容。

in which 引导的定语从句，修饰 solid。

④Have you ever seen children playing with blocks? 你看见过孩子们玩积木吗？

playing with blocks 分词短语作宾语补语。

2. Vectors

We deal with① many different physical quantities in engineering. They can be divided into two groups — scalar and vector quantities. Both② have size, or magnitude, but only vector quantities possess direction. Mass, volume and length are scalar quantities. Force, which we measure in newtons③, possesses magnitude and direction. Force, then, is a vector quantity. Other examples are acceleration and velocity.

Any vector quantity can be represented by a vector. The straight line A $\xrightarrow[10\,N]{\qquad}$ B is a vector which represents a force④. If we calculate its length we find that it is proportional to⑤ the magnitude of the force. The direction of the line indicates the direction of the force. The line is horizontal because the direction of the force it represents⑥ is horizontal. It is important also to know in what sense of direction the force is acting⑦. The arrow-head on the line shows that the sense of direction of the force is rightwards.

[注]

①deal with 处理

②Both 代词，指 scalar and vector quantities。

③which we measure in newtons 我们用牛顿作单位量度力

which 引导非限制性定语从句，说明 force。

④10N 即 10 newtons　10 牛顿

⑤…a vector which represents a force　一个表示力的矢量

which 引导定语从句，修饰 a vector。

⑥proportional to　与…成比例

⑦it represents 是定语从句，省略关系代词 "that"，it 指 the line。

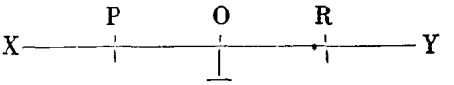
⑧It is important also to know in what sense of direction the force is acting. 知道力正朝什么方向起作用也是重要的。

in what sense…in acting 是 to know 的宾语从句。

in what sense of direction　朝什么方向

3. An Experiment Report

Aim To investigate the turning effect of a force



Report A meter stick was pivoted at its center point O so that it balanced. A cord was attached to a 1 kg mass and suspended from a point P on the side OX, 200 mm from the center point. It was noted that the meter stick turned in an anti-clockwise direction.

A second mass of 1 kg was suspended from a point on the side OY. The distance between O and the mass was adjusted until the stick remained in a horizontal position①. The distance between O and the second mass was measured and was found to be 200 mm②.

The second 1 kg mass was replaced with③ a 0.5 kg mass. It was noted that the meter stick turned anti-clockwise①. The 0.5 kg mass was moved along OY until the stick again balanced. The distance between O and the point S where the 0.5 kg mass was suspended was measured and was found to be 400 mm.

Conclusions

(1) The turning effect of a force depends on the magnitude of the force.

(2) The turning effect of a force depends on the perpendicular distance between its line of action and the point about which the body turns ⑤.

[注]

①The distance between O and the mass…in a horizontal position. 调整O点和这个重物间的距离，直至刻度棒仍处于水平状态。

②to be 200 mm 动词不定式作主语补语。

③be replaced with 用…取代…

④It was noted that…

It 作形式主语，that 引入的从句作实际主语。

⑤the point about which the body turns 物体围绕它转动的支点

about which…是定语从句，修饰 the point。

4. Sound

What happens if you throw a stone into a pond or a pool of water?

First of all, you see the stone strike the water.① Then, you see waves and waves spreading out all over the pond.② These waves do not go in one direction only; they travel in all directions, in the form of circles. These circles go on getting wider and wider③, till at last they reach the edge of the pond.

You will notice another thing about these waves. They are big close to the centre of the circle④ and they gradually get smaller and smaller, as the circle grows wider and wider.

The size of these waves depends on the size of the stone If it is a big stone, you will get big waves. If it is a small stone, you will get only little waves.

When you speak, waves of sound go out from your mouth in very much the same way⑤. They travel in circles, just like the waves in the pond. And that is why everyone round you can hear you when you speak.

You cannot see the waves of sound, but they are none the less⑥. Your ears can catch them, and that is why you hear when anyone near you speaks.

[注]

①…you see the stone strike the water. 你看见这块石头打击水面。
strike the water 动词不定式短语，作宾语补语。在 see 后不带 to。

②spreading out all over the pond 在整个池塘里扩展开来
分词短语，作宾语补语。

③…go on getting wider and wider 继续变得越来越大
getting wider and wider 是分词短语，作状语。

④They are big close to the centre of the circle…
它们（波）在紧接圆中心的地方是大的。
close to the centre of the circle 介词短语，作地点状语，说明 are big。

⑤in very much the same way 以非常相似的方式

⑥none the less 仍旧，依然

5. How Oil Was Formed

Oil was formed in ancient swamps and seas. People believed that oil was made out of the bodies of sea animals and plants that died and became covered with sediments. As the sediments became thicker and heavier, the pressure and heat may have melted and squeezed out the oil in these animals and plants. Then the oil gradually soaked into the sediments, which later became covered with more sediments.

It has been found that all animals, no matter where they live or what their size, have oil in their bodies.①

Have you seen melted fat running out of a broiling lamb chop or a piece of bacon②? Fat is a solid form of oil. You know both seal fat and whale blubber can be melted into oil. And you have certainly heard about fish oils and duck fat. You, too, have a supply of fat under your skin.

Plants also have oil, although you do not usually notice it.

[注]

①It has been found that all animals, no matter where they live or what their size, have oil in their bodies. 据发现，所有的动物，无

论它们生活在哪里，无论它们有多大，它们身上都有油。

1) it 是形式主语，that 引导的从句作实际主语。从句中的主语是 animals，谓语是 have，被 no matter 引入的从句所分隔。

2) no matter where…or what… 让步状语从句，their size 后省略了系词 is。

②Have you seen melted fat running out of a broiling lamb chop or a piece of bacon? 你看见过从煎羊排或煎腌肉里流出来的油吗？

melted 过去分词作定语，说明 fat。

running out of…bacon 现在分词短语，作宾语补语。

6. How Coal Was Formed

Coal has been formed at many different times in the earth's history. Most hard coal is more than two hundred million years old.

When the Coal Age began, many parts of the earth were low and swampy. Forests grew up in the swamps. They were very big forests, for the climate was mild, and the air and the ground were both very moist. When the trees died and fell into the swamps, they did not rot away entirely. Under the water a thick layer of plant material was formed.

In many of the swamps the water gradually grew deeper. Perhaps some of the land was slowly sinking. Perhaps the seas were rising and overflowing into the swamps. The change was very slow, but finally the forests were drowned. The drowned trees fell down on top of the trees that had died before.①

Later much of the water that covered the old swamps drained away. Perhaps the land rose, or perhaps the level of the sea became lower. Again there were many swamps, and again forests grew in them. In time these forests, too, were buried under layers of mud. Again and again the same changes took place. Finally