通俗科技英语文选

南京大学外文系公共英语教研室编

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第六辑

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Contents

A Shooting Animal

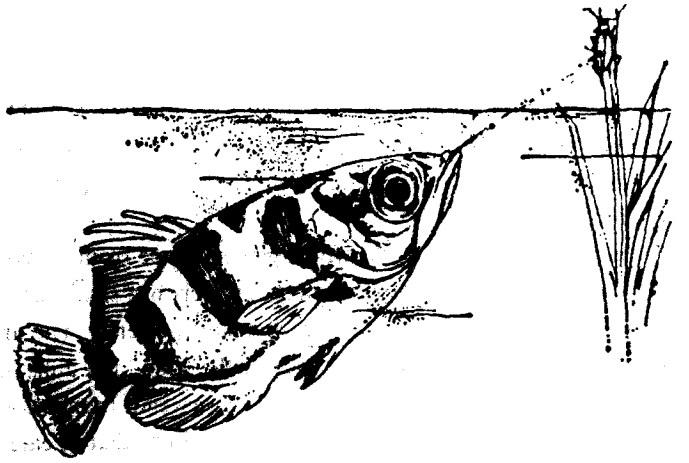
You know that human beings have shot their prey almost ever since they developed into human beings. But did you know that there is also a member of the animal world that captures its prey by shooting it down①?

It is in fact the archer fish, which gets its name from its skill in shooting. Its bullets are not arrows, however, but small drops of water aimed with remarkable accuracy and power②. The archer fish swims just beneath the surface of the water and aims its bullets at insects resting on overhanging leaves and branches③. The insects fall into the water and are of course immediately eaten up by the fish.

Archer fish are found in brackish (slightly salt) water in coastal areas from India to the Philippines. They vary in length from about 20 to 25 cm. At a distance of up to just over a metre they virtually never miss their target. They have been known to knock their prey into the water at a distance of three metres. On more than one occasion a man on a veranda overlooking water had his cigarette extinguished by a well-directed shot from an archer fish.

What is the explanation of this amazing ability? It depends on two features. The archer's tongue is looser than that of other fish, and the roof of its mouth has a groove in it. The groove and the tongue together form a sort of tube which it uses like a peashooter. By pressing its gills sharply inwards, it sends the drops of water through the tube under considerable pressure. But no one knows exactly how it achieves its accuracy, especially as it

aims from under the water and must allow for the refraction of light!



The archer fish can hit its target from a distance of three metres.

词　汇

prey [prei] *n.* 被捕食的动物
capture ['kæptʃə] *v.* 捕获
archer ['ɑ:tʃə] *n.* 弓箭手
　archer fish 射水鱼
arrow ['ærəu] *n.* 箭
remarkable [ri'mɑ:kəbl] *a.* 异常的，非凡的
accuracy ['ækjurəsi] *n.* 准确度
overhang ['əuvə'hæŋ] (overhung ['əuvə'hʌŋ]) *v.* 悬垂
brackish ['brækiʃ] *a.* 含盐的
slightly ['slaitli] *ad.* 稍微
coastal ['kəustl] *a.* 沿海岸的
Philippines ['filipi:nz] *n.* [the ～] 菲律宾
virtually ['və:tjuəli] *n.* 事实上
miss [mis] *v.* 未击中
veranda [və'rændə] *n.* 游廊
overlook [ˌəuvə'luk] *v.* 俯视，俯瞰
extinguish [iks'tiŋgwiʃ] *v.* 熄灭
well-directed ['wel'direktid] *a.* 准确瞄准的
amazing [ə'meiziŋ] *a.* 令人惊异的
feature ['fi:tʃə] *n.* 特征

loose [lu:s] *a.* 自由活动的，没加束缚的
roof [ru:f] *n.* 顶部
the roof of the mouth 口腔的上膛
groove [gru:v] *n.* 槽，沟
pea-shooter ['pi:ˌʃu:tə] *n.* 射豆枪，玩具枪
gill [gil] *n.* 鳃
sharply ['ʃɑ:pli] *ad.* 急剧地
considerable [kən'sidərəbl] *a.* 很大的
refraction [ri'frækʃən] *n.* 折射度

短　语

(to) develop into 发展成为
up to 达到
on more than one occasion 不止一次
(to) allow for 考虑到

注　释

① that captures its prey by shooting it down: 这是由关系代词 that 引导的定语从句，修饰前面的 a member of the animal world.

② aimed with remarkable accuracy and power: 过去分词短语作定语，修饰前面的 small drops of water.

③ resting on overhanging leaves and branches: 现在分词短语作定语，修饰前面的 insects.

练　习

下列问题，你认为是正确的，就在 A,B,C,D 英文字母上打圈。

1. Who are able to shoot their prey apart from the archer fish?
   A men. B apes. C any animals. D monkeys.
2. The archer fish shoot its prey with
   A bullets. B arrows. C rain. D water.
3. What does the archer fish do when it wants to aim its bullets at insects?
   A It swims on the surface of the water. B It swims under the surface of the water. C It swims in the deep water. D It comes near the surface of the water.

4. What does the archer fish do after the insects fall into the water?

A It wants to eat them. B It catches and eats them very soon. C It closely looks at them and wants to eat them. D It lets them go.

5. Where does the archer fish live?

—— It lives

A in a river. B in a lake. C in the salt sea water. D in some areas of some seas.

6. How long is the archer fish?

—— It is

A very long. B very short. C as long as a new pencil. D as long as a man's leg.

7. The archer fish will not miss its target

A at a very long distance. B at a distance of about 100 cm. C at a distance of two to three metres. D at a distance of no more than three metres.

8. Why did the man stop smoking?

A He had no match. B He did not want to smoke. C His fingers were wet. D His cigarette was not dry.

9. Why can the archer fish shoot?

—— Because

A its tongue is very strong. B it has a pea-shooter. C it knows the refraction of light. D it is an extremely strange fish.

10. How can the archer fish use the refraction of light?

A It can calculate. B It knows something about physics. C It has got its ability through practice. D It has learned its skill from men.

(答案: 1. A; 2. D; 3. D; 4. B; 5. D; 6. C; 7. B; 8. D; 9. D; 10. C)

参考译文

会射击的动物

你们都知道，人类差不多自出现以来，便一直用射击的方法猎取动物。然而，你们可曾知道动物界中还有一种动物也是用击落对方的方法进行捕食的吗？

实际上那是一种以其射击技能而得名的射水鱼。但是它的弹丸并不是箭，而是以惊人的准确性和力量击发出去的小水珠。射水鱼紧靠着水面底下游动，并以其弹丸射击停在悬垂枝叶上的昆虫。昆虫一掉落水中，自然便立即被射水鱼吞食掉。

射水鱼生活在从印度到菲律宾沿岸一带稍含盐分的海域里。它们的身长约为20到25厘米。在一米多一点的距离内，它们实际上弹无虚发。人们知道它们曾从距离三米的地方，把要捕食的动物击落水中。不止一次，当游廊上的人们俯视海水时，他们的香烟被射水鱼准确地击灭。

怎么解释这一惊人的技能呢？射水鱼依赖两个特征，其舌子比别种鱼的舌子伸缩性大，而且口腔的上膛有条槽。槽和舌一起构成一种管子，使用起来就象一枝射豆枪。射水鱼往里猛然压腮，在很大的压力下，它就能通过这种管子将水射出。但是没人确切知道它怎么能瞄得那么准，尤其是因为它是从水底下射击的，还必须考虑到光的折射呢！

（王承康译注）

Light And Color

What Is "White Light"?

It was not until about 300 years ago that man began to unravel the mysteries of nature's colors.① The experiments of the fa-

mous English scientist, Sir Isaac Newton, performed in 1655, are the bases for much of our knowledge of color. He found that when he passed a narrow beam of sunlight or "white light" through a triangular prism, the white light split into a multi-colored beam. This colored beam, consisting of violet, indigo, blue, green, yellow, orange and red, is known as SPECTRUM.

Newton also discovered two other important facts about light and color. First, he found that he could not break any of the colors of the spectrum down into another group of colors as he had done with white light②. He also found that he could pass the color spectrum through another triangular prism and produce white light. Thus, it was Newton who first discovered that white light is a combination of all the colors.

How Are White Light And Color Related?

When Newton first found that white light was composed of different colors, he believed that the colors were produced by different types of light "corpuscles" or "bullets." One type of bullet produced red light, another blue light, another green light, and so forth. His light theory became known as the corpuscular theory of light.

At about the same time that Newton lived, a Dutch scientist, Christian Huygens, was also studying light. It was he who originated the idea that light is a series of waves (much the same as those created by throwing a stone into a pond of water), with every point on a wavefront of light being a new source of wavelets and thus creating an indefinite number of wavefronts.

For many years, scientists studying light and color were divided into two groups; one group favored Newton's theory of light and the other favored Huygen's theory of light. However, there

were some scientists who were not fully satisfied with either theory since neither could be proven true under all conditions. Many modifications of both theories were suggested, but none of these modifications was acceptable since scientists sought a theory that applied at all times to all conditions.

In describing what is light, we noted that light is a form of energy that radiates in all directions from its source. This idea that light is a form of energy was formulated by the German scientist, Max Planck in 1900 in his new famous QUANTUM THEORY. He said that radiant energy such as light is composed basically of tiny irreducible bits of energy called QUANTA which travel or radiate from the light source.

Five years after Planck announced his theory, Albert Einstein proposed a more exact definition of the energy that causes light. While studying the composition of the atom, Einstein came to the conclusion that light, in spite of its wave nature, must be composed of an energy particle of the atom which he called a photon.

Today, despite the recognition of the greatness of the inventors of these various theories, scientists still are unable to decide upon a single theory of light. They accept the idea that light is a form of energy or radiation produced by the photon, but they also know that light travels like a wave. Thus, they accept the concept that light has two different disguises: first, when light travels from one place to another—from the sun to the earth or from an electric bulb to this page—the light travels as if it were a wave;⑧ secondly, when light is emitted by an object—such as light leaving the sun or leaving an electric bulb—or when light is absorbed by an object—such as a leaf taking in the light to produce its own food from carbon dioxide and water—the light acts as if it were a stream of

"bullets" or photons.

Actually, no one today is certain exactly what light is. We know how it works and we have certain rules to govern its behavior under certain conditions, but it will be up to the scientists of tomorrow—maybe one of you—to come up with the answer to: "What is light?"④

词　汇

unravel [ʌn'rævəl] *v.* 阐明,解开
Sir Isaac Newton ['aizək 'nju:tn] 艾萨克·牛顿爵士(人名)
beam [bi:m] *n.* 束,道
triangular [trai'æŋgjulə] *a.* 三角形的
a triangular prism 三棱镜
split [split] *v.* 分裂,分解
multi-colored [ˌmʌlti'kʌləd] *a.* 有多种颜色的
violet ['vaiəlit] *n.* 紫色
indigo ['indigəu] *n.* 靛蓝色
orange ['ɔrindʒ] *n.* 橙色
spectrum ['spektrəm] *n.* 光谱
related [ri'leitid] *a.* 有联系的,有关系的
corpuscle ['kɔ:pʌsl] *n.* 微粒,粒子
corpuscular [kɔ:'pʌskjulə] *a.* 微粒的
Dutch [dʌtʃ] *a.* 荷兰的
Christian Huygens 克里斯琴·惠更斯(人名)
originate [ə'ridʒineit] *v.* 发源,产生
wavefront ['weivfrʌnt] *n.* 波前,波阵前
wavelet ['weiflit] *n.* 小波,子波
indefinite [in'definit] *a.* 不确定的,无限的
favour ['feivə] *v.* 赞成,支持
modification [ˌmɔdifi'keiʃən] *n.* 修改,更改
acceptable [ək'septəbl] *a.* 可接受的,合意的
radiate ['reidieit] *v.* 发射,辐射
formulate ['fɔ:mjuleit] *v.* 提出
Max Planck 马克斯·普朗克(人名)
quantum ['kwɔntəm] (复数 quanta ['kwɔntə]) *n.* 量子,量 **Quantum Theory** 量子论
radiant ['reidjənt] *a.* 辐射的
irreducible [ˌiri'dju:səbl] *a.* 不能分解的,不能分割的
Albert Einstein 艾伯特·爱因斯坦(人名)
propose [prə'pəuz] *v.* 提出

definition [ˌdefiˈniʃən] *n.* 定义
photon [ˈfəutɔn] *n.* 光子
recognition [ˌrekəgˈniʃən] *n.* 承认,公认
inventor [inˈventə] *n.* 发明者
radiation [ˌreidiˈeiʃən] *n.* 辐射,放射
concept [ˈkɔnsept] *n.* 概念,观念
disguise [disˈgaiz] *n.* 假象,伪装
bulb [bʌlb] *n.* 灯泡
emit [iˈmit] *v.* 放射,散发
govern [ˈgʌvən] *v.* 控制,支配
behavior [biˈheivjə] *n.* 行为,活动方式

短　语

(to) break down 分解,分裂
and so forth 等等
a series of 一系列的
much the same as 和……差不多
(to) be fully satisfied with 对……非常满意
in all directions 向四面八方
(to) come to the conclusion 得出结论
(to) take in 吸收
under certain conditions 在一定的条件下
(to) be up to 轮到,该由
(to) come up with 提出,提供

注　释

① It was not until about 300 years ago that man began to unravel the mysteries of nature's colors.
这是强调句型。这种句子的结构是 It + is (was) + 强调成份 + that (who) .... 本文中有几句这样的强调句。本句强调时间状语。

② First, he found that he could not break any of the colors of the spectrum down into another group of colors as he had done with white light. 这是主从复合句。that 引导的是宾语从句,其中又包含了一个由 as 引导的方式状语从句。to do with 表示"对付,处置"的意思。

③ the light travels as if it were a wave; 这是主从复合句。as if 是起连接作用的词组,表示"似乎,好象",由它引导的状语从句的谓语动词须用虚拟语气,表示这里所讲的并非是真实情况而是一种假设。

④ We know how it works and we have certain rules to govern its behavior under certain conditions, but it will be up to the scientists of tomorrow-maybe one of you—to come up with the answer to: "What is light?" 这是并列复合句，前面分句中的 it 指 light，后一个分句中的 it 是形式主语，其真实的主语是移至后面的不定式短语 to come up with ....

参考译文

光 和 颜 色

"白光"是什么？

直到大约 300 年前人类才开始解开自然界颜色的奥妙。我们对于颜色的认识多半是以著名的英国科学家艾萨克·牛顿爵士在 1655 年进行的实验作基础的。他发现当他让一束细长的日光或"白光"通过三棱镜时，白光便分解成多种颜色的光束。这种带色的光束由紫色、靛蓝色、蓝色、绿色、黄色、橙色和红色组成，称为光谱。

牛顿还发现了其他两种关于光和颜色的重要事实。首先，他发现不能象处理白光那样把光谱中的任一种颜色再分解为另一组颜色。他也发现让颜色光谱通过另一个三棱镜便能产生白光。因而，正是牛顿第一个发现了白光是由所有颜色组成的。

白光和颜色的关系如何？

当牛顿首先发现白光是由不同的颜色组成时，他认为颜色产生于不同类型的光"粒"或"微粒"。一种微粒产生红光，另一种微粒产生蓝光，又一种微粒产生绿光等等。他的光学理论被称作光的微粒说。

大约与牛顿同时代的荷兰科学家克里斯琴·惠更斯也在研究光学。正是他首创了这样的概念：光是一系列的波（很象一块石头投入池中产生的波），光的波前上的每一点是新的小波的来源，因而产生无穷尽的波前。

多年来，研究光和颜色的科学家分为两大派：一派支持牛顿的光学

理论，另一派则赞同惠更斯关于光的学说。然而，也有一些科学家并不尽然同意这两种学说，因为无法证明这两种学说在任何情况下都是正确的。自从科学家们寻求一种在任何时候和任何情况下都能应用的学说以来，对于这两种学说曾经提出过多种修正意见，但是没有一种是可以接受的。

在描述什么是光时，我们注意到光是能量的一种形式，这种能量从光源向四面八方辐射。光是能量的一种形式的概念是德国科学家马克斯·普朗克于1900年在其新的著名的量子学说中提出来的。他说：象光这种辐射能基本上是由微小的不能分割的称为量子的能量粒子所组成的，这些量子是从光源发出或辐射出来的。

在普朗克宣布他的学说之后五年，艾伯特·爱因斯坦对产生光的能量下了更精确的定义，在研究原子的组成时，爱因斯坦得出的结论是：尽管光有波性，但光必定是由原子的能量粒子所组成。爱因斯坦称这种能量粒子为光子。

今天，尽管科学家们承认这些不同学说的创立者是伟大的，但仍然不能选定单一的光学理论。他们接受光是由光子产生的一种能量形式或辐射形式这个概念，但是他们也知道光象波一样地传播。因而，他们接受光有二重性的概念。首先，当光从一个地方传到另一个地方，例如从太阳传到地球或从电灯泡传到这页书上时，光的传播就象波一样；其次，当光从某个物体上放射出来时——例如光离开太阳或离开电灯泡——或者当光被某个物体吸收时——例如叶子吸收光并从二氧化碳或水中制造自己的食物——光的活动方式就象是一股"粒子"流或称光子流。

事实上，今天没有人确切知道光是什么。我们了解光是怎样作用的，并掌握了在一定条件下控制其活动方式的某些规律，但是对于"光是什么？"这个问题还有待于未来的科学家——也许是你们之中的某一位——作出回答。

（巴庆芳译注）

Tobacco Protein May Lead to Heart Disease

Health officials have known for years that smoking cigarettes plays a major role in progressive heart disease. Comparisons of case histories have shown that heavy smokers run a much higher risk of sustaining heart attacks than non-smokers. More recently, autopsies have revealed that persons with long smoking histories tend to have more severe arteriosclerosis, a hardening and thickening of the arteries,① than the general population. But these strong statistical implications only raise more questions: How do molecules found in smoke act to alter tissues? What is the physiochemical mechanism that induces pathogenic changes?

Now, two American reserachers may have isolated the first substantial clue. They report in the August issue of the Journal of Experimental Medicine that they have identified a small protein, rutin, that triggers the body's blood-clotting system. In so doing, rutin may be the catalyst in a chain of metabolic events that leads to the scarring and occlusion of arteries, both of which represent prime characteristics of heart disease.②

According to experimental pathologists rutin is found in both tobacco leaves and cigarette smoke. The researchers say their tests show that rutin activates a blood component called Factor XII, which in turn initiates a series of enzyme reactions that cause blood platelets to coalesce, or clot.③

Exactly how blood clotting may affect artery walls and heart muscle is not well understood, but one of the researchers suggests one possible mechanism. Clotting may lead to a built-up of clot-

ted blood that adheres to artery and heart walls. Blood platelets may form a matrix for connective tissue cells to grow on.④ This process, called "organization," may serve to partially block vascular passage ways—raising blood pressure and increasing the work load on the heart.

Another possibility is that activation of the blood-clotting system may trigger Brady-kinin, which is to alter membrane permeability, cause physical pain and attract macrophage activity, thereby creating a pathological condition that could alter artery efficiency. The researchers came upon the discovery of rutin while testing the long-standing theory that chemicals in the tobacco leaf might cause chronic allergic reactions that then lead to heart and lung diseases⑤. The researchers isolated a complex sugar-protein, or glycoprotein, that caused allergic reaction in 12 of 31 volunteers who were injected with it.

Closer chemical analysis revealed that the rutin protein was attached to the glycoprotein found in the leaf, and was also present in cigarrette smoke. Rutin can be found in several vegetables, including egg plant, green peppers, potatoes and tomatoes. Investigators doubt that its existence in these foods is dangerous, however, more likely, the protein gains entry into the blood stream by means of the oxygen-transfer system in the lunge rather than through intestinal absorption.⑥

The results indicate that rutin could damage the heart and blood vessels by initiating blood clotting. In steady doses, such as those that occur with habitual smoking⑦, the foreign protein could also aggravate continuous antigen-antibody formations in the lungs. The end result would be clotting, harmful, fibrous growth and perhaps mutant cells.