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通晓科技英语

文选

南京大学外文系公共英语教研室编

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第十辑

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商务印书馆

1982年·北京

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商务印书馆出版

(北京王府井大街36号)

新华书店北京发行所发行

民族印刷厂印刷

统一书号: 9017·1211

1982年5月第1版

开本 787×1092 1/32

1982年5月北京第1次印刷

字数 31 千

印数 21,300 册

印张 1⁸/₁₆

定价: 0.19 元

Contents

1. Amusing Experiments	1
(有趣的实验)	
(1) The Egg and Friction	1
(蛋与摩擦)	
(2) Bernoulli's Principle	1
(伯努利定理)	
(3) Pascal's Law	2
(帕斯卡定律)	
2. Echo-location	5
(回声定位)	
3. Environmental Problems Global—Acid rain, carbon dioxide ignore borders	9
(环境问题是全球性的——酸雨、二氧化碳没有国界)	
4. Gold	14
(黄金)	
5. Some of That Oil Pollution in the Sea Is Natural	19
(部分海洋石油污染是天然的)	
6. The Underworld	23
(大地)	
7. Journey to the Moon (2)	29
(飞向月球(2))	
8. 是同位语从句,还是定语从句?	36

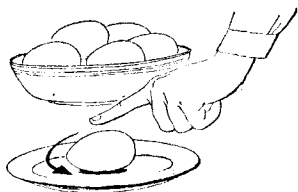
Amusing Experiments

The Egg and Friction

Imagine somebody has given you a number of eggs on a plate and said, "One of these eggs is hard-boiled. The rest are raw. Can you find the hard-boiled egg if you don't break any of them?"

You will be able to do that if you know the law of friction.

Put only one egg on the plate and try to spin it. The only egg that will spin well is the hard-boiled egg. The raw egg will not



spin well because the friction between the layers of its liquid and the friction between the liquid and the shell kill the spin.

Bernoulli's Principle

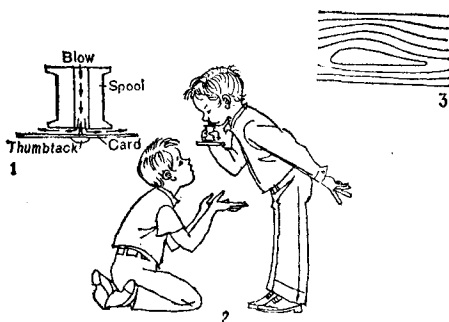
Bernoulli's principle says that when a gas or liquid is moving, its pressure becomes lower. When it moves faster, its pressure becomes still lower. Here is how you can demonstrate this principle at home.

You push a thumb-tack through the centre of a small piece of cardboard and put a spool over the thumb-tack, as shown in the picture. You hold the spool in one hand and the cardboard in the other.①Then you raise the spool to your mouth and blow down through it as hard as you can. At the same time you let the piece of cardboard go. Do you think it will fall down on the

floor? No, it will not. It will stay at the other end of the spool when you are blowing.

Now that you know Bernoulli's principle, you can explain why your piece of cardboard doesn't fall down. When you are blowing into the spool, the air moves faster over the top of the cardboard and the air pressure becomes lower. The air pressure under the cardboard is greater, and the cardboard does not fall down.

The same principle explains why an airplane does not fall down when it flies. They make its wings in such a way that the



air moves over the tops of the wings faster than it moves under the wings. So the air pressure on the tops of the wings becomes lower than the pressure under the wings, and the airplane

does not fall down. It flies. If it stops moving, it will fall down.

Pascal's Law

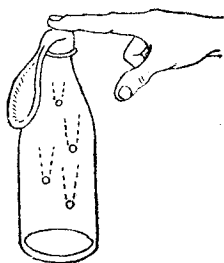
Pascal's law tells that if you apply pressure to a confined gas or liquid, the gas or liquid transmits the pressure undiminished in all directions and the pressure acts on all parts of the liquid.

You can demonstrate this with the help of lemonade bottle, some matches and a balloon. You cut off the heads of the matches and then drop the heads into the bottle. Then you fill the bottle to the opening with water and tie the mouth of the balloon

tightly over the opening. The heads of the matches will be on top of the water, but when you press your finger on the balloon (as shown in the picture), they will go down slowly to the bottom. When you raise your finger, the heads go up again.

The explanation is this.

The pressure, which you transmit through the water, makes a very small part of water get into each head of the match. Then the head of the match becomes heavier and goes down. When you raise your finger, there is enough air pressure in the heads to make the water come out of them. So the match heads go up again.



词 汇

hard-boiled ['hɑ:d'boild] *a.* 煮熟的 (作定语时读 ['hɑ:dboid])

raw [rɔ:] *a.* 生的

layer ['leɪə] *n.* 分层

Bernoulli [bənu:'li:] *n.* 伯努利 (Daniel Bernoulli, 1700—1782, 瑞典人, 以对流体动力学的研究成就著称. Bernoulli's principle 伯努利定理)

thumb-tack ['θʌmtæk] *n.* 图钉 = drawing-pin

cardboard ['kɑ:dbɔ:d] *n.* 卡片纸

板

spool [spu:l] *n.* 线轴

Pascal [pɑ:'skɑ:l] *n.* 帕斯卡 (Blaise Pascal, 1623—1662, 法国科学家. Pascal's law 帕斯卡定律, 这是各种液压机的工作原理)

confined [kən'faɪnd] *a.* 限定范围的; 密闭的

undiminished ['ʌndɪ'mɪnɪʃt] *a.* 没有减少的; 不变的

lemonade [ˌlemə'neɪd] *n.* 柠檬水

短 语

now that 既然, 由于
(to) **push ... through** 把...穿过

such ... that 如此...以致
(to) **apply ... to** 把...施加于

in all directions 朝各个方向 *(to) cut off* 切下
(to) act on 作用于

注 释

- ① and the cardboard in the other: (here) = and hold the cardboard in the other hand.

参考译文

有趣的实验

蛋与摩擦

假使有个人把几个鸡蛋放在一个盘子里端给你，对你说：“这些鸡蛋中有一个是煮熟了的，其他都是生鸡蛋。你能不能不把蛋敲开就找出那个煮熟了的蛋？”

如果你知道摩擦定律，你就能办到。拿一个蛋放在盘子里，然后旋转它。哪一个蛋转得最好，它就是那个煮熟了的蛋。生鸡蛋不可能转得好，因为蛋内两层液体之间的摩擦以及液体与蛋壳之间的摩擦会破坏旋转。

伯努利定理

伯努利定理告诉我们，当气体或液体流动的时候，它的压力就变得低些。它流动得快些，压力就更低。用下述的方法你可以在家里验证这个定理。

你在一小块卡片纸板的中心按上一个图钉，图钉上再放上一个线轴，如图所示。你一只手捏住线轴，另一只手拿住纸板。然后把线轴放到嘴边尽量用力向线轴的孔中吹气。同时你就放开那块卡片纸板。你想它会掉到地板上吗？不，不会掉的。你吹气的时候纸板就会停在线轴的另一端。

既然你知道伯努利定理，你就能解释为什么那块卡片纸板不会掉

下去。当你往线轴孔里吹气的时候，卡片纸板上面的空气就流动得快些，空气压力也就变得低些。卡片纸板下面的空气压力则比上面大，于是卡片纸板就掉不下去了。

也是这个定理可以解释为什么飞机在飞行的时候不会掉下来。人们把机翼制成这种样式：使机翼上面的空气比机翼下面的空气流动得快。因而机翼上面的空气压力变得低于机翼下的空气压力，飞机就不会掉下来而能飞行。如果飞机停止飞行，它就会掉下来。

帕斯卡定律

帕斯卡定律讲的是，如果你把压力施加给一个密闭的气体或液体，这个气体或液体就将这压力朝各个方向传递而大小不变，于是压力会作用于液体的所有部分。

你可以用一个柠檬水瓶、几根火柴和一个气球来验证这个定律。你把火柴头切下来，并把这些火柴头扔进瓶里。然后你用水灌满瓶子，一直到瓶口，并且把气球的口紧紧地扎在瓶口上面。这时火柴头都会飘到水面上。但是当你用手指往气球上压的时候（如图所示），火柴头会慢慢向下落到水底。而你抬起手指时，火柴头就又上来了。

解释是这样的：

你通过水所传送的压力使得很少量的水进到每个火柴头里。火柴头变得重了些，就沉下去了。当你抬起手指的时候，火柴头里有足够的空气压力把水从它们里面压出来。这样火柴头就又飘上来了。

（丁振琪、林棣）

Echo-location

Not all sounds made by animals serve as language, and we have only to turn to that extraordinary discovery of echo-loc-

tion in bats to see a case in which the voice plays a strictly practical role.

To get a full appreciation of what this means we must turn first to some recent human inventions. Everyone knows that if he shouts in the vicinity of a wall on a mountainside, an echo will come back. The further off this solid obstruction, the longer time will elapse for the return of the echo.^① A sound made by tapping on the hull of a ship will be reflected from the sea bottom, and by measuring the time interval between the taps and the receipt of the echoes the depth of the sea at that point can be calculated. So was born the echo-sounding apparatus, now in general use in ships.^② Every solid object will reflect a sound, varying according to the size and nature of the object. A shoal of fish will do this. So it is a comparatively simple step from locating the sea bottom to locating a shoal of fish. With experience, and with improved apparatus, it is now possible not only to locate a shoal but to tell if it is herring, cod, or other well-known fish, by the pattern of its echo.^③

A few years ago it was found that certain bats emit squeeks and by receiving the echoes they could locate and steer clear of obstacles—or locate flying insects on which they feed.^④ This echo-location in bats is often compared with radar, the principle of which is similar.^⑤

词 汇

extraordinary [ˌɪkstrəˈɔːdnri] *a.*

非凡的, 特别的

echo ['ekəʊ] *n.* 回声, 反响

location [ləuˈkeɪʃən] *n.* 位置, 地点

bat [bæt] *n.* 蝙蝠

appreciation [əˌpriːʃi'eɪʃən] *n.*
判断, 评价

vicinity [vɪ'sɪnɪti] *n.* 邻近, 附近

mountainside ['maʊntɪnsaɪd] *n.*

山腰
obstruction [əb'strækʃən] *n.* 障碍物
elapse [i'læps] *v.* (时间)过去
tap [tæp] *v.* 叩击, 轻拍, 轻敲
hull [hʌl] *n.* 壳, 船身
interval ['intəvəl] *n.* 间隔
receipt [ri'si:t] *n.* 收到
calculate ['kælkjuleit] *v.* 计算, 推算
echo-sounding ['ekəu saundɪŋ]
a. 回声测深的
apparatus [ˌæpə'reitəs] *n.* 仪器, 设备

shoal [ʃəʊl] *n.* 鱼群
comparatively [kəm'pærətɪvli]
ad. 比较地
herring ['herɪŋ] *n.* 鲱鱼
cod [kɒd] *n.* sing. or pl. 鳕鱼
pattern ['pætən] *n.* 模型, 样式, 图
emit [i'mit] *v.* 发射, 发出
squeak [skwi:k] *n.* 尖叫, 哇哇叫, 咕咕声
obstacle ['ɒbstəkl] *n.* 障碍物
insect ['ɪnsekt] *n.* 昆虫
feed [fi:d] *v.* 喂, (饲)养

短 语

(to) *serve as* 充当
 (to) *turn to* 求助于
in the vicinity of ... 在...一带, 靠近...

in general use 得到广泛应用
 (to) *steer clear of* 避开
 (to) *feed on* 以...为食
compared with 和...相比

注 释

- ① The further ... the longer ... for the return of the echo.
 The further ... the longer 引导比较状语从句, 意思是“越远……越长”。
- ② So was born ... in ships.
 本句是倒装句, 正常语序应是 So the echo-sounding apparatus was born; now ... in ships 是介词短语作定语, 修饰 apparatus. 如果不倒装, 句子主语就太长, 倒装使句子平衡。
- ③ With experience, and with improved apparatus ... by the pattern of its echo.
 it 为先行代词作形式主语, 代表后面的 not only ... but 连接的

to locate a shoal 和 to tell; if ... well-known fish 为 if 引导的名词从句作 tell 的宾语。if = whether.

- ④ A few years ago ... on which they feed.

it 是先行代词作形式主语, 实际主语为 that 引导的名词从句: "that ... on which they feed." 在主语从句中又有由 and 连接的两个并列句。第二个并列句中 "on which" 引导限制性定语从句, 修饰 insects.

- ⑤ This echo-location ... of which is similiar.

"the principle of which is similiar" 是非限制性定语从句, 修饰 radar, which 指 radar.

参考译文

回 声 定 位

动物发出的声音不都充当语言, 我们只需借助蝙蝠回声定位这个奇特的发现就可以看到声音是如何起作用的了。

为了对这种概念作出全面评价, 我们首先必须看一下人类最近的一些发明。大家都知道如果在山腰一堵墙的附近大声呼叫, 就会有回声。这个固体障碍物离得越远, 声音返回所需要的时间就越长。敲击船身, 这样产生的声音就会从海底反射回来, 通过测量敲击和收到回声相隔的时间就可测出该点上海底的深度。这样, 现在船上广泛使用的回声测深仪就问世了。所有的固体障碍物都能反射声音, 反射出来的声音随障碍物的大小和性质而变化。鱼群也一样。因此从测定海底的深度转到测定鱼群的位置这个步骤是较为简单的。借助先进的仪器设备加上经验, 目前已完全有可能根据回声的类型来确定鱼群的位置, 而且还能辨别出究竟是什么鱼群: 是鲱鱼、鳕鱼还是其它有名的鱼类。

几年前, 人们发现某些蝙蝠先发出咕咕声, 然后通过收到其回声, 便能确定障碍物的位置因而可设法避开; 还能确定它们赖以生存的飞虫的位置。人们常把蝙蝠的这种回声定位法和原理与其相类似的雷达相比。

(黄成凤)

Environmental Problems Global

— Acid rain, carbon dioxide ignore borders

The environmental problems of the next decade may prove more challenging than those of 10 years ago. Increasingly, they will be global in scope and involve difficult questions of relations among nations.

World population is expected to grow by 50 per cent, or two billion people, in this century. Almost all this increase will occur in the less-developed countries, which will then contain about four-fifths of Earth's inhabitants.

Unless other factors intervene, this planetary majority will see themselves growing worse off compared with those of us living in rich nations.^① Per capita income in the more developed countries is already ten times that in the less developed countries, and the next two decades could see it increasing \$10 to \$20 in the more developed countries for every \$1 it increases in the less developed ones.^②

About 800 million people now live in conditions of almost total deprivation, their lives dominated by malnutrition and disease.^③ Their number could easily grow.

These pressures of population and production will place unprecedented strains on the Earth's natural systems and resources. The capacity of some regions to support human populations is already being seriously damaged by efforts of present populations to meet immediate needs.^④

The spread of desert-like conditions because of over-grazing

and other factors now claims an area about the size of Maine each year.

Desertification and erosion could destroy a significant portion of the world's cropland by the year 2000. As much as 40 per cent of our tropical forests may be gone by then, and with them, hundreds of thousands of irreplaceable plant and animal species.^⑤

Also troubling is the accumulation of carbon dioxide in the Earth's atmosphere because of the burning of fossil fuels and perhaps due to global loss of forests as well. Its possible impacts on climate are not well understood, but they could be seriously disruptive to world agriculture.

Successfully responding to these global challenges will demand all the attention, generosity and ingenuity of which we are capable.^⑥

We must also move to protect our agricultural base. Three million acres of farmland disappear each year because of urban sprawl, highways and other development. More than four billion tons a year of North America's productive soil are now being lost to erosion.

Better measures to protect the countryside are being considered, but land-use controls have been difficult to establish in the past. Somehow, together, we must forge a stronger consensus behind the need to protect our land resources from the escalating pressures they will face in the 1980s.^⑦

词 汇

environmental [in,vaɪərən'mentl]

a. 环境的

global ['gləʊbəl] *a.* 全球的, 世

界的

ignore [ɪg'nɔ:] *v.* 不顾, 不理

challenging ['tʃælɪndʒɪŋ] *a.* 挑

战的,引起争论的
scope [skəʊp] *n.* 范围
involve [in'vɒlv] *v.* 包括,包含
population [ˌpɒpjə'leɪʃən] *n.* 人口
billion ['bɪljən] *num.* 十亿
less-developed ['less dɪ'veləpt] *a.* 不发达国家,发展中国家
intervene [ˌɪntə'veɪn] *v.* 介入,干预
planetary ['plænɪtəri] *a.* 地球的,行星的
per capita ['pə: 'kæpɪtə] 按人口计算
deprivation [ˌdepri'veɪʃən] *n.* 丧失,剥夺
dominate ['dɒmɪneɪt] *v.t.* 支配,控制
malnutrition ['mælɪnju'trɪʃən] *n.* 营养不良
unprecedented [ʌn'presɪdəntɪd] *a.* 空前的,史无前例的
strain [streɪn] *n.* 紧张
immediate [ɪ'mɪ:dʒət] *a.* 直接的
over-graze ['əʊvə 'greɪz] *v.* 放牧过度
claim [kleɪm] *v.* 需要
Maine [meɪn] *n.* 缅因(美国州)

名)
desertification [ˌdezətɪfɪ'keɪʃən] *n.* 沙漠化
erosion [ɪ'rəʊʒən] *n.* 腐蚀,侵蚀
portion ['pɔ:ʃən] *n.* 部分
cropland ['krɒplənd] *n.* 作物地
tropical ['trɒpɪkəl] *a.* 热带的
irreplaceable [ˌɪrɪ'pleɪsəbl] *a.* 无法补偿的
species ['spi:ʃi:z] *n.* 种类
troubling ['trʌblɪŋ] *a.* 麻烦的
accumulation [əˌkjʊ:mju'leɪʃən] *n.* 积聚
fossil fuel ['fɒsl fjuəl] *n.* 化石燃料(指煤、石油等)
impact ['ɪmpækt] *n.* 影响
climate ['klaɪmɪt] *n.* 气候
disruptive [dɪs'rʌptɪv] *a.* 破坏性的
generosity [ˌdʒenə'rɒsɪti] *n.* 慷慨
ingenuity [ˌɪndʒɪ'njuɪti] *n.* 独创性
urban sprawl ['ɜ:bən sprɔ:l] *n.* 城市无计划的延伸
forge [fɔ:dʒ] *v.* 锻造
consensus [kən'sensəs] *n.* 舆论
escalate ['eskəleɪt] *v.* 逐步上升

短 语

worse off 每况愈下;变坏
compared with 与...相比
(to) meet immediate needs 满足

直接的需要
as much as 相当于
hundreds of thousands of 数十

万,成千上万,无数
capable of 能够

(to) *protect ... from* 制止,阻止

注 释

- ① Unless other factors intervene, ... in rich nations.
see 后常跟宾语和宾语补足语: 反身代词 *themselves* 为宾语, *growing worse off* 为宾语补足语; *those = those people, living in rich nations = who are living in rich nations*, 这里为现在分词短语作 *those* 的定语。
- ② Per capita income in the more ... in the less developed ones.
在第一分句中主要结构是 *Per capita income ... is ten times that ...*; *that* 指 *per capita income*, 这句型常用来表示“是...的...倍”。例如: *The grain produced this year is 3 times (as much as) that in 1949.* 在第二分句中, 两个 *it* 均指 *per capita income*, 在 *for every \$1 ... ones* 中, *it increases ... ones* 是省略 *which* 的定语从句, 修饰 *\$ 1, ones = countries*, 为避免前面出现过的名词, *one* 常用来代替单数, *ones* 代替复数。
- ③ About 800 million people now live ... by malnutrition and disease. *their lives ... disease* 为独立结构在句中作状语, 说明伴随情况。
- ④ The capacity of some regions ... to meet immediate needs.
不定词短语 *to support human population* 及 *to meet immediate needs* 均作定语, 分别修饰各自前面的 *The capacity* 和 *efforts*; *is already being seriously damaged* 为被动语态进行时。
- ⑤ As much as 40 per cent of our tropical forests ... and animal species.
gone 意思是“用光的”; *with them* 中 *with* 的意思是“随着”, *them* 指前面讲的森林的消失; *hundreds ... species* 后省略 *may be gone too*.
- ⑥ Successfully responding to ... we are capable.
responding to ... challenges 是动名词短语在句中作主语; (*of*) *which we are capable* 是定语从句, 作介词 *of* 的宾语, 修饰 *atten-*

tion, generosity and ingenuity; capable of 是搭配, 亦可把 of 放在句后, 即 which we are capable of.

- ⑦ Somehow, together, we ... in 1980s.

不定词短语 to protect our land resources from the escalating pressures 在句中作定语, 修饰 the need; to protect ... from 的意思是“制止”“阻止”; they will face in the 1980s 为省略 which 的定语从句, 修饰 escalating pressures, they 指 land resources.

参考译文

环境问题是全球性的 ——酸雨、二氧化碳没有国界

下一个十年的环境问题可能查明要比前几个十年更为严重。这些全球性问题的范围在逐渐扩大, 越来越涉及难以解决的国与国之间的关系问题。

预料本世纪内世界人口将增加 50%, 即二十亿, 而且增加的人口几乎都是在约占世界人口五分之四的不发达国家中。

除非有别的因素介入, 否则我们这个地球上的大多数人将发现与富国的人相比, 自己越来越贫困了。按人头计算发达国家的收入已是不发达国家的十倍, 而在今后的二十年内不发达国家中每人收入增加一美元, 则发达国家每人要增加十至二十美元。

目前大约有八亿人民生活在极度贫困之中, 他们营养不良, 处于疾病包围之中。这类人的人数还可能不断增加。

人口和生产的这些压力, 将给地球上的自然系统和资源造成极度紧张的局面。为了有效地满足当前人口的直接需要, 一些地区对人口供给的能力, 已经受到严重的破坏。

过度放牧和其它因素使沙漠状土地迅速扩大, 每年沙漠化的土地相当于美国缅因州的面积。

到 2000 年时土地沙漠化和侵蚀将破坏很大一部分世界作物地。到那时大约 40% 的热带森林会消失掉, 数十万种无法补偿的动植物也可