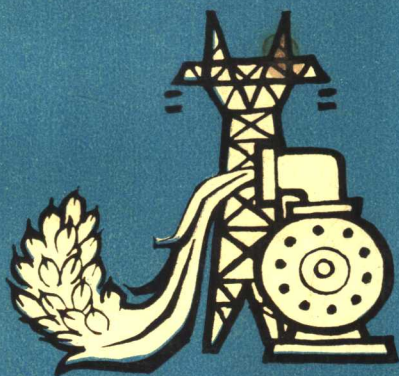


# 英 语

旧书

## 科普小品



(修 订 本)

# EVERYDAY SCIENCE

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EVERYDAY SCIENCE

# 英语科普小品

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## 主要编写者

魏树德 李鹏飞 李年祥 王 镁  
张志远 金会虎 尹家瑞 金志良

## 校 阅 者

胡 树 声

## 英语科普小品

北京工业学院外语教研室编

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## 编 者 的 话

为了适应大中学生和具有初级英语基础的其他读者提高英语阅读能力的需要,我们编写了这本《英语科普小品》。

本书内容包括化学、光学、声学、热学、电学、力学等方面的基础理论知识。全书共五十篇,分为十三个单元。每篇短文后面都附有词汇表、语法注解和参考译文,书末附有总词汇表,便于读者查阅。

参加过本书部分编写或修订工作的还有我室桂济世、王维镛、史润东、周辉武、杨洁、张家康、何中一和汤崇阶八位同志。

由于我们水平和经验的限制,书中一定有不少缺点错误,热忱地欢迎读者批评指正。

本书在编写过程中,承北京首都钢铁公司“七二一”工人大学师生提出许多宝贵的意见,深表感谢!

这次修订,换了六篇短文,增添了一篇短文,其他只是个别地方作了修改。

编 者

1981 年

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# Unit I

## 1. ENERGY

When a body is doing work, we say that it has energy. Very often a body possessing energy does not do any work at all; it only has the latent ability. So, energy of a body is nothing more than the ability to do work.① You can not do anything without it.

There are different forms of energy. They can all be changed from one form into another and used to do work in one way or another. When we use energy, we only change its form. It is never destroyed. The amount of energy remains constant at all times. Or to say, whenever a given amount of energy in one form is used, there is always an equal amount of energy in

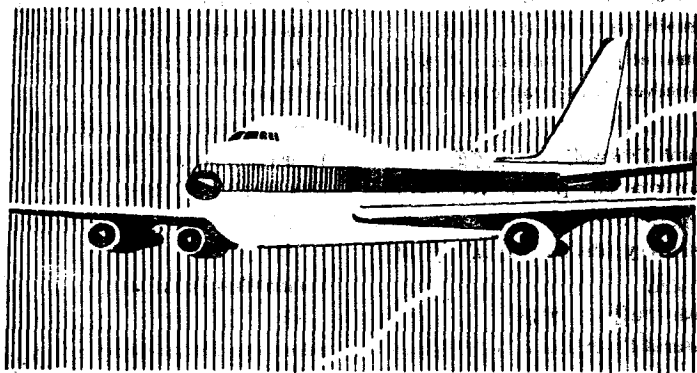


Fig. 1: Energy is invisible but it sure gets things done.

some other form in its place.② This important phenomenon is known as the law of conservation of energy. The discovery of this law has greatly pushed physics forward. "Natural science", as Chairman Mao said, "is one of man's weapons in his fight for freedom."

We have seen many cases of energy transformation. Here is an example. An airplane engine produces thrust when it transforms the chemical energy of the fuel into the kinetic energy of the combustion products. In this case, fuel combustion first transforms the chemical energy into heat. Then the moving combustion products go on transforming the heat energy into kinetic energy, producing thrust.③ To conclude, we may say that energy exists only in a few forms, but examples of its transformation are too numerous to list.

### New Words

latent ['leɪtənt] *a.* 潜在的  
nothing ['nʌθɪŋ] *n.* 什么也没有  
destroy [dis'trɔɪ] *v.t.* 消灭  
remain [ri'mein] *v.i.* 保持  
constant ['kɒnstənt] *a.* 不变的  
whenever [wen'evə] *conj.* 无论

什么时候

equal ['i:kwəl] *a.* 相等的  
conservation [kɒnsə'veɪʃən] *n.*

保存; 守恒

discovery [dis'kʌvəri] *n.* 发现,

发现

push [puʃ] *v.* 推进

natural ['nætʃrəl] *a.* 自然的, 生  
来的

fight [faɪt] *v., n.* 战斗, 争取

fought [fɔ:t], fought  
freedom ['fri:dəm] *n.* 自由  
case [keɪs] *n.* 事情, 情况, 例子  
transformation [trænsfə'meɪʃən]

*n.* 转变, 改造

airplane ['æəpleɪn] *n.* 飞机

engine ['endʒɪn] *n.* 发动机, 引擎

thrust [θrʌst] *n.* 推力

fuel [fjuəl] *n.* 燃料

kinetic [kaɪ'netɪk] *a.* 动力(学)  
的

combustion [kəm'bʌstʃən] *n.* 燃  
烧

numerous ['nju:mərəs] *a.* 众多  
的, 许多的

list [lɪst] *v.* 列举, 记入目录

## Phrases and Expressions

at all 全然, 究竟, 根本

nothing more than ... 不过是...

而已

at all times 随时

to be known as ... 称为

in this case 在这种情况下

to go on ... 继续

too ... to ... 太...而不能(做)

## Notes

- ① ... is nothing more than the ability to do work.

句中动词不定式短语 to do work 作 the ability 的定语。全句可译为: “因此, 一种物体的能量不过是作功的能力而已。”

- ② Or to say, whenever a given amount of energy ... in its place.

or to say “或者说”, 作插入语用。whenever 引出的为时间状语从句。in its place 可译为“代替”。还有一些不定式如 to conclude 等也可用作插入语。

- ③ ... producing thrust

现在分词短语 producing thrust 在句中作状语, 表示结果。

## Translation

### 能

当一个物体作功时, 我们说它具有能。一个具有能的物体通常并没有做功, 只是它具有这种潜在的能力。因此, 物体的能无非是做功的能力而已。没有能你就什么也干不了。

有各种不同形式的能。它们可以由一种形式变成另一种形式, 并以某种方式用来做功。当我们使用能时, 我们只是改变它的形式。能永远不会被消灭。能的量永远不变。换言之, 每当一定量的能被

用掉时，就有等量的某种其他形式的能来代替它。这一重要现象就称为能量守恒定律。这一定律的发现大大推动了物理学的发展。正如毛主席所说的：“自然科学是人们争取自由的一种武装”。

我们看到过许多能量转换的情况。这里就是一个例子。一架飞机的发动机当它把它的燃料的化学能变为燃烧产物的动能时就产生推力。在这种情况下，燃料的燃烧首先将能量由化学能变为热能，然后运动的燃烧产物继续将热能转化为动能，从而产生推力。总之，我们可以说能量存在的形式虽然不多，然而其转换的例子则是多得不胜枚举的。

## 2. ENERGY CONVERSION

The conversion of mechanical energy to heat is by no means new to us.<sup>①</sup> We are also familiar with other transformations of energy. Chemical energy is converted into heat when fuel burns. Electrical energy is transformed into heat and light in electrical lamps and electrical stoves. Radiant energy turns into heat when sunlight strikes an object which absorbs it. “All contradictory things are interconnected; not only do they coexist in a single entity in given conditions, but in other given conditions, they also transform themselves into each other.”<sup>②</sup> In a word, all energies may be converted from one form to another and what is more,<sup>③</sup> they all can transform into heat by themselves. Heat is an energy of irregular motion of particles in a substance, at ordinary temperature it is less usable than any of the other energies.

However, at high temperatures heat energy may be converted into energy of more usable forms. Some people have made different kinds of machines to convert heat into mechanical

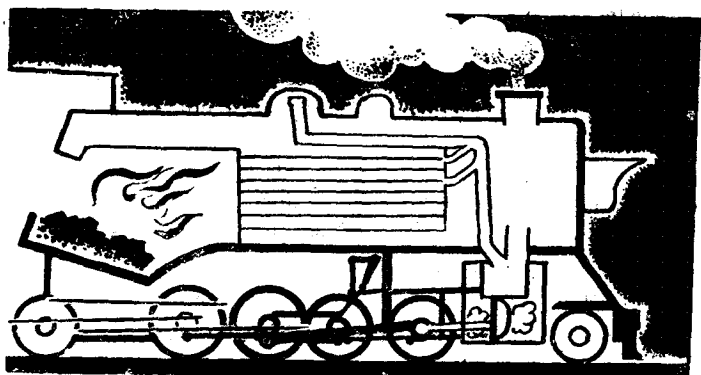


Fig. 2: Coal makes trains go, can you tell how many energy conversions are involved here?

energy.④ Diesel and gasoline engines are designed to convert heat that is developed by the burning of fuel into mechanical energy for running tractors, trucks, and cars. The mechanical energy transformed from heat in a steam turbine is made to operate generators. And the generators, in turn, convert the mechanical energy into electrical energy. All these transformations are taking place every minute and everywhere in our daily life and production.

### New Words

**convert** [kən'və:t] *v.t.* 转变, 变换

**transform** [træns'fɔ:m] *v.t.* 转变

**lamp** [læmp] *n.* 灯

**stove** [stəuv] *n.* 火炉

**radiant** ['reidjənt] *a.* 辐射的

**sunlight** ['sʌnlait] *n.* 日光, 阳光

**strike** [straik] *v.t.* 打击, 碰撞

**struck, struck** [strʌk]

**absorb** [əb'sɔ:b] *v.t.* 吸收, 吸

引

**contradictory** [kɒntrə'dɪktəri] *a.*

矛盾的, 相反的

**interconnect** [ˌɪntəkə'nekt] *v.*

互相联系

**coexist** ['kəʊɪg'zɪst] *v.i.* 共处,

共存

**entity** ['entɪti] *n.* 实体, 总体,

统一体

**themselves** [ðəm'selvz] *prep.* 他

(她、它)们自己

**irregular** [ɪ'regjulə] *a.* 不规则

的, 无规则的

**particle** ['pɑ:tɪkl] *n.* 粒子, 微粒

**substance** ['sʌbstəns] *n.* 物质

**ordinary** ['ɔ:dɪnəri] *a.* 普通的, 一般的

**usable** ['ju:zəbl] *a.* 可用的, 合用的

**diesel (engine)** ['di:zəl] *n.* 柴油发动机

**gasoline (engine)** ['gæsəli:n] *n.* 汽油(发动机)

### Phrases and Expressions

to be familiar with ... 熟悉

in a word 总之

### Notes

① ... is by no means new to us.

by no means 为一个成语, 意为“决不”、“一点也不”。全句可译为:

机械能转换为热能对我们一点也不生疏。

② not only do they coexist ..., but in other given conditions, they also transform themselves into each other.

1. 当并列连词 not only ... but also 位于句首表示强调时, not only 后面的句子中, 如果谓语由两个或两个以上的词组成, 则把第一个词移到主语的前面。如果谓语只是一个词, 则在主语前加助动词 do, 本句就是这种情况。

2. 介词短语 in other given conditions 在该句中作条件状语, 说明谓语 transform。

3. themselves 为自身代词, 代替本句句首的 all contradictory things。

③ ... what is more 起插入语作用,意为“而且”,“更有甚者”等。

④ ... to convert heat into mechanical energy.

动词不定式短语 to convert heat ... 在句中作目的状语,说明谓语 have made。

## Translation

### 能 量 转 换

机械能转换为热能对我们一点也不生疏。我们也熟悉其他的能量转换。燃料燃烧时,化学能就转换成热能。在电灯及电炉中,电能转换为光能和热能。太阳光照到吸收光的物体上时,辐射能就转换为热能。“一切矛盾着的东西,互相联系着,不但在一定的条件之下共处于一个统一体中,而且在一定条件之下互相转化”。总而言之,一切能都可以从一种形式转换成另一种形式,并且它们自己都能转换成热能。热能是物质微粒无规则运动的能量,在常温下它比其他各种能的用处都小。

然而在高温下,热能可转换成更有用的能。人们已经制造出一些能够把热能转换为机械能的机器。柴油发动机和汽油发动机把燃烧燃料产生的热能转换成机械能,用来开动拖拉机、卡车和汽车。蒸汽涡轮机把热能转换为机械能,机械能使发电机运转,而发电机又把机械能转换为电能。这些能量转换在我们的日常生活和生产中时时处处都在发生着。

### 3. CONSERVATION OF ENERGY

In any energy transformation, there is some loss, but no energy is destroyed. The part that is lost is simply wasted. If all of the energies that are wasted were added to that used, the



total would be found to be equal to the total supplied.<sup>①</sup> The form may be changed, but the amount remains unchanged. The fact that energy can be changed from one form to another, but can neither be created nor destroyed, constitutes one of the most important laws in science, the law of conservation of energy.<sup>②</sup> No one form of energy can be long conserved, but the total is conserved at any time. A machine may be designed to lift a much larger weight than the force that is applied, but it can never produce more work than was supplied to it.<sup>③</sup> In other words,

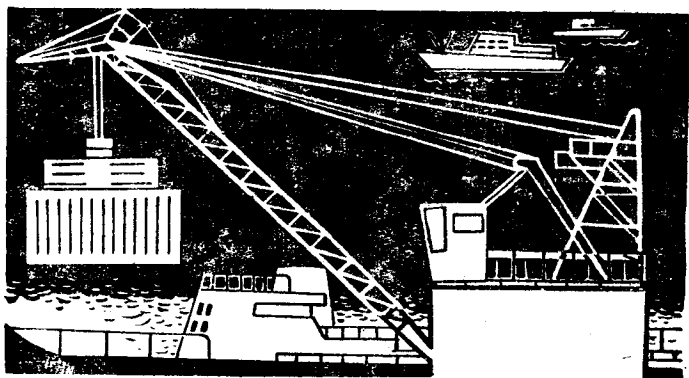


Fig. 3: The law of lever basing on the conservation of energy is being put into practice.

a machine cannot have an efficiency greater than one. Since man cannot create or destroy energy, he must use the energy that is available to him.

Some devices were designed for the purpose of doing work without the need of supplying energy. These are the so-called perpetual-motion machines. We say that such machines are impossible because they violate the law of conservation of energy.