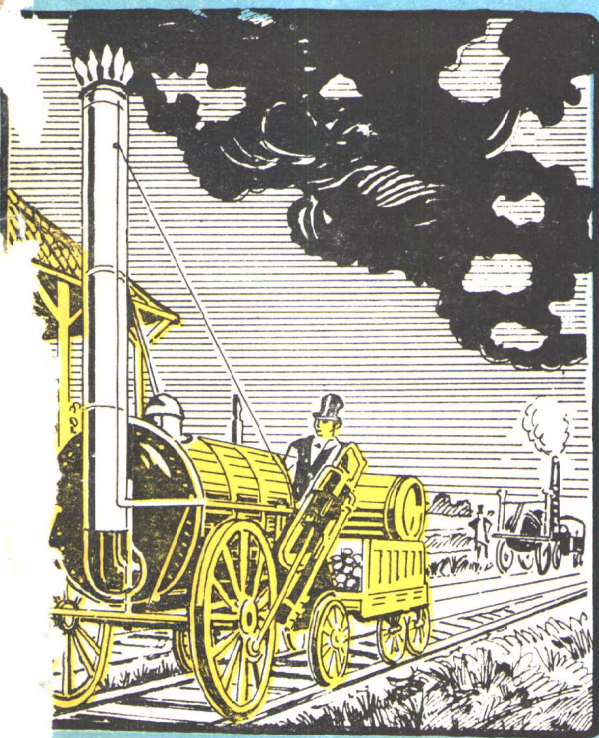


THE STORY OF TRAINS

火车的故事



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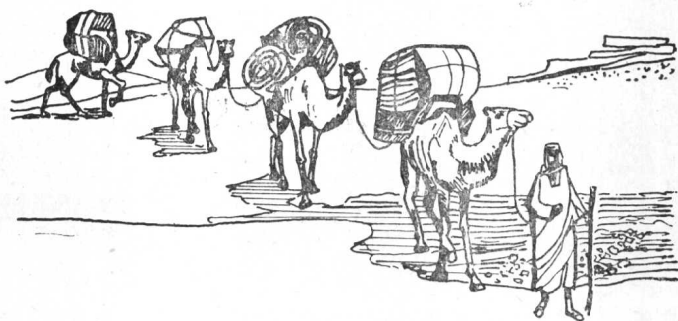
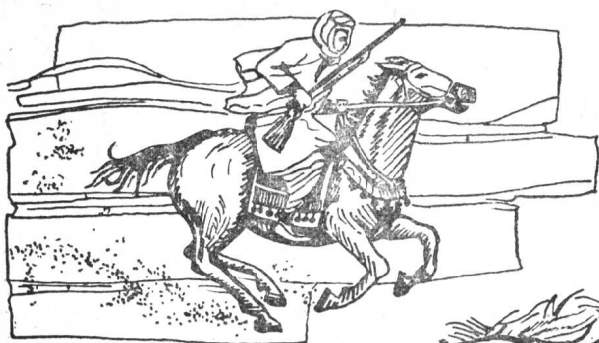
内 容 简 介

本书收集了《火车的故事》、《动物如何生活》和《你身体的需要》三篇科普文章。《火车的故事》叙述世界铁路运输业从二百多年前蒸汽机的发明、改良和应用发展到当代电气化铁路的简史。《动物如何生活》描述不同环境对动物的生理特征和生活习性所产生的影响，以及动物为生存下去而对环境形成的适应性。《你身体的需要》讲述人体对食物、空气和新陈代谢的需要，以及消化、呼吸和循环系统的构造和功能。

本书选自外国出版的英语简易读物，知识性强，语言通俗易懂。书中生词和语言难点加了汉语注释，并配有插图，可供高中一年级学生和具有同等英语程度的读者阅读。

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Animals help men to work and to travel.

THE STORY OF TRAINS

In these three pictures, animals are helping men to work or to travel. The first man has got¹ a horse. Horses travel much faster than men. The farmer in the second picture has got a cow. It is pulling his cart full of corn². The cart is too heavy for the farmer to pull³, but the cow pulls it for him easily. The third man has four camels. They are carrying his heavy bags, because he is not strong enough to carry them⁴.

In some places people have only their legs and their arms to help them to move from one place to another and to do their work. Everything is slow and difficult for them. Animals like horses, cows and camels help them to live more easily.

1. has got 有。 2. corn [kɔ:n] n. 谷物, 五谷。 3. The cart ... to pull. 牛车太重而农夫拉不动。 4. He is ... to carry them. 他没有那么大的力气来扛它们。

But animals are not strong enough or fast enough for us any more.¹ We need engines². Engines are stronger and faster than animals. People now have cars instead of horses, farmers often have trucks instead of carts, and people often put their bags and boxes in trains instead of on camels³. Cars, trucks and trains are strong and fast because they all have engines.

How did men first⁴ learn to make an engine? How did engines take the place of animals⁵?

Sending Water Through a Pipe⁶

The story of engines began three hundred years ago. At that time there were no engines anywhere in the world. But people made many other clever things. They made round, wooden

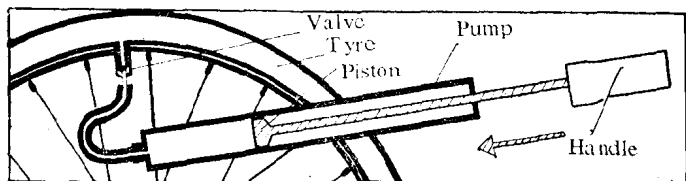
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1. But animals ... any more. 但是再使用牲畜，力气就不够大或者速度就不够快了。 2. engine ['endʒɪn] *n.* 引擎，发动机。 3. people often ... on camels. 人们常常把他们的行李和箱子放在火车里而不是放在骆驼背上。 4. first *adv.* 最初。 5. take the place of animals 代替牲畜。 6. Sending Water Through a Pipe 用管子送水。 pipe *n.* 管子，导管。

wheels, and iron pots for water.¹ They also made *pipes*, to carry water from one place to another. At first people made these pipes out of wood², but later they made them out of iron. They also found a way of pushing or pulling the water through the pipes with a *pump*.³

On page 5 you can see a picture of a bicycle-pump⁴. It pumps air into the tyres of your bicycle. Inside the pump there is a small *piston*⁵. When you push the handle of the pump in, the piston pushes the air out of the pump into the tyre.⁶ The *valve*⁷ in the tyre has a very small door inside it. The air from the pump pushes this door, and it opens. Then

-
1. They made ... for water. 他们制造出取水用的圆木轮子和铁罐。iron ['aɪən] *n.* 铁。pot *n.* 罐, 锅。 2. made these pipes out of wood 用木头制作这些管子。 3. They also ... with a pump. 他们还找到了使用泵把水压进或者抽出管子的办法。find a way of (doing) ... 找到(干)……的办法。push [puʃ] *v.* 推, 推进, 推动。pump [pʌmp] *n.* 泵, 抽水机, 打气筒。 4. bicycle-pump *n.* 自行车打气筒。 5. piston ['pɪstən] *n.* 活塞。 6. When you ... into the tyre. 当你向前推气筒的手柄时, 活塞就把气筒里的空气压进车胎里。handle ['hændl] *n.* 手柄, 把手。 7. valve [vɒlv] *n.* 阀, 气门。

the door shuts at once, so the air does not come out again.

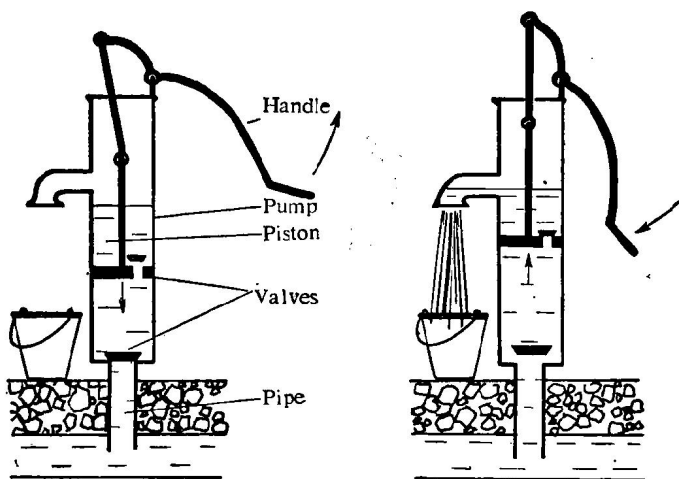


A pump pushes air into the tyres of a bicycle.

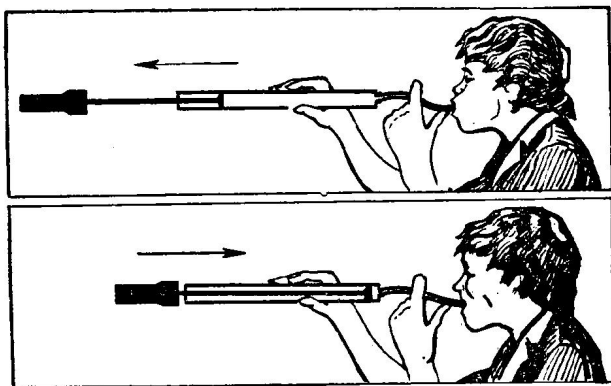
Have you ever filled a bicycle-pump with¹ water? Hold the end of the pump in some water, and pull out the handle.² This will pull water into the pump. Now hold the pump up and push the handle in. This will push the water out again.

A long time ago, people learnt to pump water out of the ground in the same way. They made pumps out of wood or iron. The pump stood at the top of a long pipe, and the pipe went down into the water. When somebody pushed the handle up and down, water

-
1. fill ... with ... 用(把)……灌(充, 注)入…… 2. Hold the end ... the handle. 把打气筒的末端放在水里, 然后拉出手柄。



A pump brings water up through a pipe.



The air from the boy's mouth is pushing and pulling the handle of the pump. An engine works in the same way.

came up through the pipe. You can see all this in the picture.

A pump is not an engine, because it does not work alone¹. People make it work by pushing the handle. But look at the next picture. This boy is blowing air from his mouth into a bicycle-pump. The handle is going out, although nobody is pulling it. Instead of making the piston push air, the boy is making air push the piston.² When he pulls the air back into his mouth³, the handle comes back in again. In this way, the boy makes the handle go in and out, in and out quite easily.⁴ An engine works in the same kind of way. It has a piston, and the piston moves in and out, in and out all the time, because something like air⁵ is pushing it or pulling it.

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1. because it does not work alone 因为它独立工作不了。 alone [ə'loun] *adv.* 独自, 单独地。 2. Instead of ... push the piston. 这个男孩正在让空气推动活塞,² 而不是让活塞推动空气。 3. When he ... into his mouth ... 当他把空气吸回到他的嘴里时…… 4. In this way ... easily. 用这个办法, 这个男孩使手柄很容易地一进一出, 一进一出。 5. something like the air 象空气的东西。

Pumps with Steam Inside Them¹

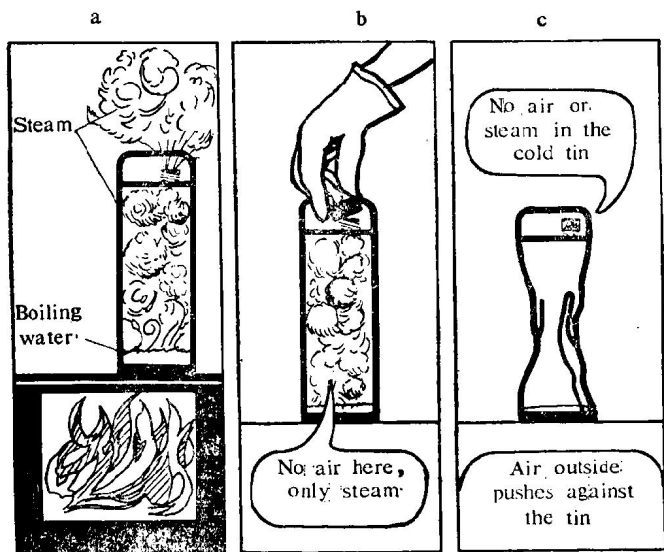
About three hundred years ago, clever men started to study pumps and air very carefully. They pumped air out of one bottle or pot and into another.² When there was not much air in a pot, it was very difficult to pull the lid off.³ Why? Because the lid and the air outside it were trying to get into the pot, to fill the empty space inside.⁴

There is another way of getting the air out of a pot. We do not need a pump. We only need steam. We make steam from very hot water. It looks like white smoke, but it is really a cloud of water⁵. Take an empty oil-tin, pour⁶ a little water into it, and put the tin on the fire (picture a) . When the

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1. Pumps with Steam Inside Them 里面有蒸汽的泵。
2. They pumped ... into another. 他们用气筒把空气从一个瓶子或者罐子里抽出来又打入另一个(瓶子或者罐子)中。 pump *vt.* (用泵)抽、吸、压(气、水、油等); (用气筒)打、抽气。 3. pull the lid off 打开盖子。 4. Because the lid ... space inside. 因为盖子和它外面的空气极力要进入罐子里, 去填充里面真空的(无空气的)空间。 5. a cloud of water 一团水汽。 6. pour [pɔː, pɒə] *v.* 灌, 注, 倒。

water boils¹, take the tin off the fire and put the lid on very hard² (picture b). Now watch. As the tin gets colder, the sides will move in³ (picture c). The air is pushing them in. It is like a strong man, pushing the tin between his two hands.⁴

Why do the sides of the tin go in like



Air is strong enough to push the sides of a tin.

1. boil [bɔɪl] v. 达到沸点, 沸腾。 2. put the lid on very hard 把盖子盖得非常严实。 3. the sides will move in 四壁将瘪进去。 4. It is ... his two hands. 好象一个有力气的人, 在他的两手之间挤压这个罐子。

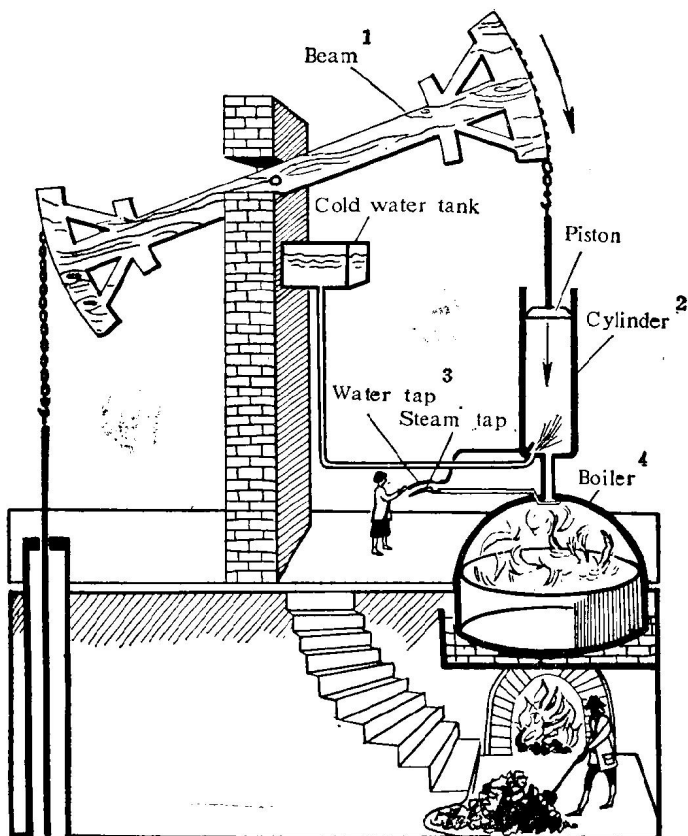
this? When you put the lid on, the tin is full of steam instead of air¹. Then when the steam grows cold, it becomes water again.

That leaves no steam or air inside the tin. The air outside tries to get in, but the lid stops it, so the air pushes hard all round², and pushes the sides of the tin together. Pour cold water over the tin, and then this will happen more quickly.

Three hundred years ago, some clever people learnt to do interesting things like this with steam and air. They thought, 'Air and steam are very strong. Let us try to make them work for us. Perhaps air and steam will push water through a pipe like a pump.'

For a long time they tried to find a way of making steam or air push water through a pipe, and at last one man found a good way of doing it. His name was Thomas Newcomen³. Newcomen made a big iron pump and

1. the tin... of air 罐里充满了蒸汽而不是空气。 2. all around 四面八方, 四周围。 3. Thomas Newcomen ['təməs 'nju:kəmən] 托马斯·纽科曼(1667—1729)英国发明家, 1705年与科里(John Cawley)和萨伐里(Thomas Savery)发明蒸汽机, 获专利权。六年之后, 这一发明用于矿山的抽水机上。



The world's first engine. When the steam inside the cylinder became cold, the piston moved down.

1. beam *n.* (杠)杆, (横)梁。 2. cylinder ['silində] *n.* 汽(气)缸。 3. water-tap *n.* 水旋塞, 水龙头。 4. boiler ['boile] *n.* 锅炉。

filled it with steam. Then he poured cold water over it, and almost at once¹ the piston started to move down, although nobody was pushing it. It moved to fill the empty place under it, because there was no more steam or air there. When more steam came into the pump, the piston moved back again.

The steam came from a *boiler*. The boiler was a big iron pot with a fire under it². The *pump* stood on top of the boiler, and a boy sat near it. First, the boy turned a tap³ to let the steam go into the *cylinder* of the pump. Then he turned another tap to let cold water into the cylinder. In this way the boy made the piston inside the cylinder move down, then up, then down again, then up again. It moved slowly up and down all the time. When people saw the fire and the steam, they said, 'It's a "fire-engine"⁴.' Men built 'fire-engines' like this in a lot of places to pump water out

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1. almost at once 几乎立刻。 2. with a fire under it 在它(锅炉)下面有一炉火。 3. turned a tap 拧开一个旋塞。
4. fire-engine 救火机。这里是“火引擎”，指用火将水烧成蒸汽而推动引擎。