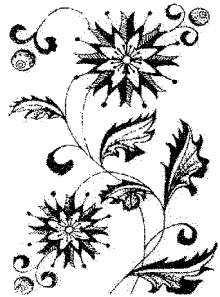
●听书虫·英汉平行对照有声读物

英汉平行对照趣味科普知识

到太空旅行

北京师联教育科学研究所　编译



学苑音像出版社

责任编辑：冯克诚　王　军
封面设计：师联平面工作室

英汉平行对照趣味科普知识

到太空旅行

北京师联教育科学研究所　编译

★

学苑音像出版社出版发行
2005 年 1 月印刷
开本：850 × 1168　1/32　印张：4.8　字数：124.8 千字

ISBN 7 – 88050 – 189 – 4
本书配碟发行全 12 册 153.60 元（不含碟）

Contents 目 录

注 :带‘☆’内容有录音

Escape from Gravity 脱离地球引力

Before we can travel in space men must escape from gravity. Outside the Earth's gravity we can enjoy the freedom of space until we pass into the gravity range of some other planet or satellite.

人类必须脱离地球引力,才能到宇宙空间去旅行。在地球引力之外,直到进入其他行星或卫星的引力范围之前,我们能够享受到宇宙空间的自由。

Gravity pulls us back to Earth whenever we try to leave it. This happens when we jump and it happens when we fly a plane. Most of the power used by a plane's engine is needed to keep the plane in the air, fighting against the power of gravity.

无论什么时候,只要我们想离开地球,引力就会把我们拖回来。当我们跳起或者驾起飞机时,这种事便发生了。飞机引擎所使用的动力的大部分,需要用来克服引力的力量,使飞机保持在空中不掉下来。

A plane also has to push

飞机还必须穿过

through the Earth's atmosphere. This too needs the strength of a powerful engine. We can't see the atmosphere but it is all around us. It pulls us back. Strong engines lose their strength as they push through the curtain of atmosphere. But at last the strongest engines push out of gravity and out of the atmosphere around us. They have reached freedom. Nothing holds them back. They can move on without engines. Their engines are needed only for changing direction.

There have been many plans for making this escape to the freedom of space. Scientists used to think that guns could shoot us into space. Jules Verne used this idea in the book he wrote with the title From the

大气层向前推进,这也需要大功率引擎的力量。我们不可能看到大气层,但它确实围绕在我们四周,它把我们拉回来。强功率的引擎穿越大气层时,力量消失了。然而,特强功率的引擎终于冲出了引力和包围着我们的大气层。他们到达了自由自在的天境,没有任何东西阻止他们前进了,没有引擎也能飞行。引擎只有在改变飞行方向时才用得上。

为了摆脱地球引力,到达宇宙空间这个自由天地,人们设想出了很多方案。科学家们过去一直认为炮能把我们射到宇宙中去。朱尔斯·弗恩在他著的

Earth to the Moon. But he forgot that the shock of the shot would kill the people in the spaceship.

《从地球到月亮》一书中就持这种观点。但他忽略了炮在震动时会把宇宙飞船中的人震死。

In about *1900* a Russian teacher called Konstantin Tsiolkovsky thought of something which made space travel possible. He had an idea for using rockets instead of familiar aeroplane engines. He proved, in fact, that this was possible. So Tsiolkovsky has the right to the title of "***father***" of space travel. In America another man won this title at the same time. This was Robert Goddard and he also worked with the same ideas. He proved that rocket travel was not an impossible dream.

大约 *1900* 年，一个名叫康斯坦丁·车尔库夫斯基的苏联教师想到了一种使宇宙旅行成为可能的办法。他的想法是使用火箭，而不是用熟知的飞机引擎。实际上，他证实了这是可能的。因此，他够格接受"宇宙旅行之父"的称号。在美国，另一个人同时赢得了这一称号，这就是罗伯特·戈达德。他也是以同样的想法进行工作的。他证实，火箭航行不是一场不可能实现的梦。

What was important about rocket? Why were they necessary for space travel?

The great power of a rocket comes from the fuel that it carries in its own body. The engine of a plane uses the Earth's atmosphere to help burn its fuel. A rocket doesn't need the Earth's atmosphere. Its fuel is made of several gases packed inside its body. These gases start burning inside the rocket. When they burn they try to push out. They look for a way of escape. The only way out is through a small hole in the back of the rocket. The mixed gas pushes through this hole with great force. It rushes out, burning with a fierce flame.

The backward kick of the flaming gas pushes the rocket

火箭的重要性是什么？为什么宇宙航行需要火箭呢？

火箭的巨大动力来自火箭本身装带的燃料。飞机的引擎是利用地球的大气来帮助燃料燃烧的，火箭则不需要地球的大气来帮助燃烧。火箭的燃料由几种气体组成，装在箭身里面。这些气体在火箭里面开始燃烧，一边燃烧，一边往外冲。它们在寻找出路，而唯一的出路是通过火箭尾部的一个小孔。混合气体穿过这个小孔以巨大的力量向前推进，火箭就带着熊熊的火舌冲了出去。

燃烧着的气体的后冲力把火箭推向前

forward as fast as the flash behind it. As the flame roars the rocket is lifted into the air. It is a grand and terrible sight.

进，跟火箭后面的闪光一样快。火舌咆哮时，火箭就被举到了空中，这是一个骇人的壮观景色。

Of course the first rockets were not very grand. They were small and weak, like Chinese fireworks, which were, in fact, the first real rockets. The burning fuel of these rockets gave a little flash and pushed them into the air. There was not enough fuel to send them far. As soon as the fuel was finished the rocket, turning down again, fell back to the ground.

当然，最初的火箭并不壮观，就像中国的鞭炮一样又小又弱。事实上，鞭炮是真正的最早期的火箭。这些火箭燃烧着的燃料发出的光很小，只把它们推进到空中，没有足够的燃料推进到远处。燃料一烧完，火箭就重新下落，掉回地面。

Rockets like this could never escape from gravity. The scientists knew that they needed bigger rockets carrying more fuel. But the rockets and their fuel cost a lot of money. No one

像这样的火箭是永不可能摆脱地球引力的。科学家们知道，他们需要能装载较多燃料的更大的火箭。但是，火箭及其燃料花

wanted to spend much money on these experiments. Few people believed rockets were going to be important one day.

A terrible war was necessary before the importance of rockets was understood. The Second World War (*1939 – 1945*) saw a new advance.

German scientists had been seriously working with rockets before the war. They believed that there were peaceful uses for rockets, particularly in space. But they could not finish their work because they lacked money. Then the German Government decided that the rockets could become useful and terrible instruments of war. Suddenly

费很大,没有人想在这些试验上花费很多的钱。只有极少数人认为火箭有朝一日会变得重要起来。

在火箭的重要性还没有为人们所理解之前,来一场可怕的战争是有必要的。第二次世界大战(*1939—1945*)期间,火箭就有了新的进展。

战前,德国科学家一直认真地研究火箭。他们相信火箭具有和平的用途,尤其是在宇宙空间。但是,他们无法完成这一工作,因为缺少钱。尔后,德国政府判定火箭可以成为有用而且厉害的战争器械,钱又突然不缺了。政府支付了这笔

there was no lack of money. The Government paid the money and the scientists began producing the rockets. Near the end of the war German scientists made the first important rockets – the V_1 and the V_2.

钱，科学家就开始制造火箭了。第二次世界大战快结束时，德国科学家制造出了首批重要的火箭——V_1 和 V_2。

London was under terrible fire for many months. The huge rockets were fired into the air from a place in Europe. They were packed full of explosives. They quickly crossed the sea between Britain and Europe. Then they turned and started falling on London. Nothing could stop them. They fell faster and faster until they hit the ground with a terrible explosion. Everything around them was destroyed. They left parts of London in ruins.

伦敦曾处于可怕的炮火之下达许多月。一枚枚巨型火箭从欧洲的某地发射到空中。火箭里装满了炸药，迅速穿过英国与欧洲之间的海洋，然后转向，朝伦敦下落，没有什么能阻挡它们。火箭越落越快，一直冲到地面，发生可怕的爆炸，周围的一切都被毁灭了，把伦敦的好些地区变成了一片废墟。

No one had known anything

这样的事情还没

like this. But the people of London were used to terrible explosives. They soon became used to rockets also.

The rockets did not change the history of the war. But they did change the history of space travel. As soon as the war ended most German rocket scientists went either to America or to Russia. They joined scientists of other countries who were working with rockets. Both the American and Russian Governments believed that space travel was going to be important. They agreed to plans for exploring space. They were ready to pay the cost. There was no lack of money.

Rockets like those used in the war were not strong enough to escape completely from gravity. They went higher than any-

有人领教过,而伦敦的人民已经习惯这种可怕的爆炸了,并且很快对火箭也习惯了。

火箭没能改变战争的历史,然而却改变了宇宙航行的历史。第二次世界大战一结束,大多数德国火箭科学家不是去美国就是去俄国,跟其他国家研究火箭的科学家进行合作。美国和俄国双方政府都认为,宇宙航行将会重要起来。他们赞同探索宇宙的一系列计划,愿意支付费用,钱也不缺了。

那些用于战争的火箭还不够强,还不能完全摆脱引力。它们比以前的任何东西都

thing before. But then their strength failed and they fell back to the ground. How could they be given another push, sending them out into space?

Tsiolkovsky and Goddard had both thought of an answer to this question. One rocket can't be packed with enough fuel to reach space. But it can carry other smaller rockets. As soon as the first rocket's fuel is finished it can be dropped. It is not needed any more. Then the engine of the second rocket starts. It is smaller and lighter than the parent rocket. So it travels further and faster. As soon as its fuel is finished it is also dropped. Then the next rocket engine starts. It is travelling very fast, and at last it will break out into space. Gravity will not hold it back any more.

要飞得高,但接着力量减弱,又落回到地面。怎样能再给它们一次推力,一直送入宇宙空间呢?

车尔库夫斯基和戈达德对这个问题都找到了一个答案。一枚火箭不可能装载足够的燃料抵达宇宙空间,但是它可以携带其他较小的火箭。第一节火箭的燃料一燃烧完,火箭就可以甩掉,不再需要了。接着第二节火箭的引擎发动。这节火箭比其母体火箭小而轻,所以飞得更远更快。等到它的燃料烧尽,也同样给甩掉。然后,发动下一节

It does not now need much fuel. Its engine will only be used to alter its direction. It will travel on in a straight line forever.

火箭的引擎。这节火箭飞得很快——最终将冲出地球进入宇宙空间。引力便不再阻挡火箭了。这时,它已不再需要很多的燃料了,其引擎仅仅用来改变飞行方向。火箭将永远不停地作直线运行。

It was time for great excitement among scientists. Every day they made more improvements to the new rockets. They knew that success was near as they worked eagerly to perfect them. All over the world people were asking who would be the first man in space and what he would find there.

科学家们极其激动的时刻到来了。他们对这些新式火箭所作的改进一天比一天多。他们知道,由于他们热切的工作,使火箭日臻完善,胜利已经不远了。全世界的人都在打听谁将成为第一个到达宇宙空间的人,他到那儿后又将会发现些什么。

Rockets 火　箭

A rocket is the only vehicle which can journey into the vacuum of space—that is, the vast part of space that has no air. Other means of transport require friction (as do the wheels of a train) or air for "*lift*" (as required by a balloon), while all need air to burn their fuel whether it is the petrol in a motor-car or the oil in a ship.

火箭是能飞入太空中真空地带的唯一的一种飞行器。太空的真空地带是无边无际没有空气的外层空间。在其他的交通工具中，有的需要摩擦（像火车的车轮需要摩擦一样）；有的需要空气，以便"升起"（如气球就需要空气）。然而所有交通工具都需要空气来燃烧燃料，不管这种燃料是汽车中的汽油也好，还是轮船上的燃油也好，都是如此。

A rocket is independent of

火箭飞行不依靠

air because it contains an explosive mixture which consists both of a fuel to be burned and a supply of oxygen. When these are burned, the resulting thrust caused by the intensely hot and expanding gases can be controlled and directed to push the rocket in the required direction. The power got from some of the chemicals is enormous, which is just what is required to overcome the pull of the earth's gravity. Which would otherwise bring the rocket back to the earth's surface again.

空气,因为火箭内装有爆炸混合剂。这是由待燃烧的燃烧剂和氧气供应装置组成的。混合剂在燃烧时,由非常灼热的膨胀气体所产生的推力,可加以控制和引导,从而推动火箭朝着预定的方向发射出去。从某些化学燃烧剂所得到的功率十分巨大,这是克服地球引力的吸引作用所需要的。否则的话,火箭会被拉回地球表面。

Although explosives were probably known to the Egyptians *3,000* years ago, the rocket itself was invented in China in the *12*th century. There is a record of it being used in the siege of Bianjing in A. D.

虽然发射剂(即炸药)可能早在 *3000* 年前就为埃及人所知道了,但是火箭本身却是 *12* 世纪在中国发明的。文献记载表明:公元 *1232* 年,在汴京围

1232, and there is even a story of a Chinese mandarin of the *15*th century who harnessed *47* large rockets to a chariot, though this brought him to an untimely end.

By the *17*th century rockets were used in many countries as weapons of war. They were similar to the present-day firework, consisting of a cylindrical tube into which were pressed the chemicals to be burned, i. e., the propellants. Usually this mixture was gunpowder.

As the rocket propellants burn, they make vast quantities of gas, which press outwards against the tube in all directions. This gas escapes freely through the nozzle, so there is no pressure there, but the gas

攻战中曾经使用过火箭。甚至有这样一个故事，说 *15* 世纪时有一个中国高级官员在一辆战车上装了 *47* 支大型火箭，虽然这造成他过早的死亡。

到 *17* 世纪的时候，许多国家都已把火箭当作作战武器。那时的火箭与现在的爆竹相似，由一个圆筒形的管子构成，里面塞了待燃的化学剂，即推进剂。这种药剂通常就是黑色炸药。

火箭推进剂一经燃烧，便产生大量的气体。气体施压于圆管内的各个方面，并通过喷管不受阻碍地喷出。由于在喷管出口处没有压力，所以作用在与