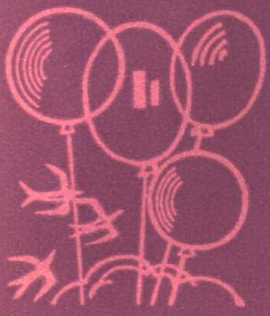
简易英汉对照科技丛书

地球
EARTH



空气
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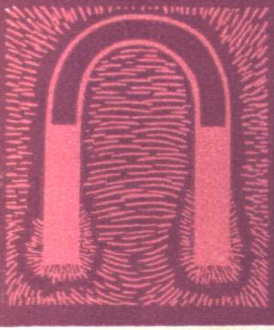
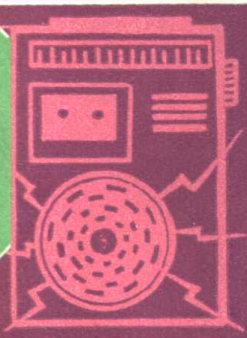


磁力
MAGNETISM



声音
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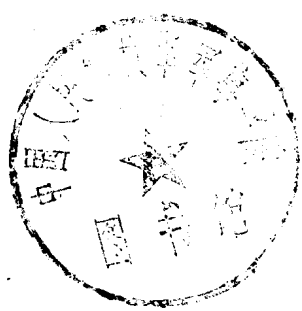
EARTH

地 球

解 琪 译



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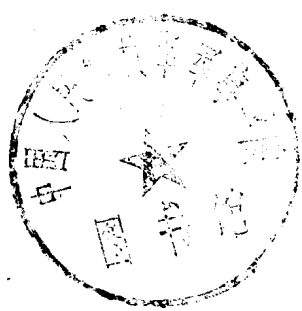

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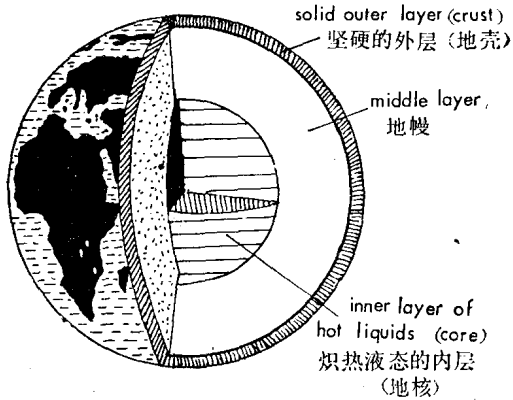
OUR PLANET EARTH

The Earth which we live on is a beautiful planet. It is made up of land and oceans, mountains and rivers, plants, animals and people. It is actually very, very old and was not always as beautiful as it is now. It is not certain how the Earth began. Probably it began as a huge globe of gas and dust. The globe became smaller and denser, and most of the gas drifted away leaving behind bodies of solid matter. These bodies eventually collected together to form solid Earth. Then the inside of the solid Earth became hot and molten causing certain materials to rise to the surface. This probably resulted in the formation of the Earth's layers. To-day the outer layer or crust is cool and hard, while the core is probably hot and molten.

Some of the materials which were pushed up to the crust from the molten core of the Earth formed water. Others formed the gases of the atmosphere. The water evaporated to form clouds. These rose into the sky to form rain. Soon rain fell down on the Earth's crust and filled all the valleys, cracks and hollows. In this way, rivers, lakes, oceans and seas were formed. Throughout the ages, Earth has received a lot of rainfall and now most of the Earth's crust is

我们的星球——地球

我们居住的地球是一颗美丽的星球。它由陆地、海洋、山脉和河流，以及植物、动物和人所组成。实际上，地球是非常非常之老的，而它在过去并不是总象今天这样的美丽。地球是怎样开始形成的，至今仍不明确。也许，它最初是一个由气体和尘埃所构成的巨大球体。后来这个球体体积缩小，密度增大。大部分的气体飘走了，剩下来的是很多固体状的物质。这些物质最后聚集在一起，形成了固态的地球。然后，这个固态地球的内部因变热而熔化，使得某些物质上升到地球的表面。这种变化很可能导致了地球地层的形成。今天，地球的外层即地壳是冷而坚硬的，而地核却很可能是热而呈熔化状态的。



从熔化状态的地核中被推到地壳上的物质中，有一部分形成了水。其余部分形成了大气层里的气体。水蒸发后变成了云。云升到空中又变成了雨。雨随即落到地壳上，使山谷、裂缝和洼地充满了雨

covered with water. About $\frac{7}{10}$th of the Earth's surface is covered with water while $\frac{3}{10}$th of it is covered with land.

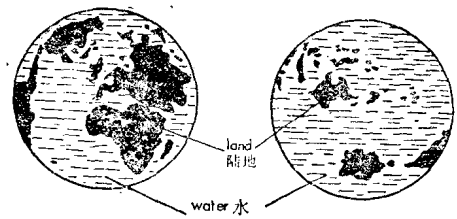
For a long time the Earth's atmosphere did not contain much oxygen. The oxygen was combined with the other materials in rocks. This oxygen was slowly freed and escaped into the atmosphere. After a very long time, as the amount of oxygen in the atmosphere increased, the Earth became a more suitable place for plants to develop. Plants produced more oxygen which was freed into the atmosphere. Later on animals developed.

SOIL FROM ROCKS

At first, the Earth's crust was made up of huge blocks of hard, solid rocks. The outer layers of these rocks slowly broke up into smaller and smaller pieces. Finally stones, pebbles and grains of sand were formed. Many sorts of plants and animals lived and died on the surface of the Earth. Their remains mixed up with the stones, pebbles and sand of the Earth's crust to form soil. The outermost layer of the Earth's crust is soil.

There are many ways in which large pieces of rock break into smaller pieces. Wind, water, heat and cold help to break up rocks. When

水。这样，河流、湖泊和海洋就形成了。经过若干年代，地球得到了大量的雨水，现在大部分地壳都布满了水。地球表面约十分之七的面积为水所覆盖，而十分之三的面积则为陆地。



在过去很长一段时间里，地球的大气层所含有的氧气并不多。氧气原来是和岩石中的其它物质结合在一起的。这部分氧气慢慢地分离出来，逸入大气层中。经过漫长的岁月，由于大气层里的氧气含量增加，地球就成为一个更加适于植物生长的地方。植物制造出更多的氧气，这些氧气也都跑进大气层中。后来，动物便发展起来了。

土壤是从岩石变成的

起初，地壳是由坚硬的岩石巨块构成的。这些岩石的外层慢慢地破裂脱落，变成越来越小的碎块。最后形成了石块、石砾和沙粒。许多种类的植物和动物在地面上生活和死亡。它们的残骸与地壳中的石块、石砾和沙粒混合起来，形成了土壤。现在，地壳的最外层就是土壤。

大块的岩石以很多方式破裂成碎片。风、水、炎热和寒冷都会促使岩石破裂。风卷起沙粒，不断

winds blow sand particles against a large rock for a long time, the softer layers of the rock are slowly worn away. These leave holes and cracks in the rock. The holes and cracks become bigger until finally the rock breaks up into smaller pieces.

The moving water of streams and rivers also helps to break large rocks into smaller pieces. As the water moves along, it carries with it small pieces of rock. These rub against the large rocks. As this happens, the larger rocks are worn down to smaller pieces. These smaller pieces are carried away and they in turn wear down other larger rocks.

The heat of the sun helps to break up rocks too. When the sun shines, the rocks become very hot. If these rocks are suddenly cooled they may crack. Therefore, a sharp change in temperature can cause rocks to break into smaller pieces.

Ice also helps to break up rocks. When it rains, water collects in the cracks of a rock. If the weather becomes very cold, this water will turn to ice. When water becomes ice, its volume becomes bigger. Therefore, the crack becomes wider. Soon the crack becomes so wide that the rock breaks into smaller pieces.

扑打在巨大的岩石上，久而久之，比较松软的岩石表层就慢慢地脱落，使岩石上出现了很多小孔和裂缝。这些小孔和裂缝逐渐变大，使岩石最终破裂成为碎块。

溪流和江河里的流水也会促成岩石的破裂。水流动的时候，带走了岩石的小碎块，这些碎块摩擦着大的岩石。这样，较大的岩石便被磨成了碎块。这些碎块也被水带走了，又同样在磨碎其它较大的岩石。

太阳的热也促使岩石破裂。当阳光照射的时候，岩石变得很热。如果岩石突然冷却，就可能破裂。因此，温度的骤变会使岩石破裂成小石块。

冰同样能促使岩石破裂。下雨的时候，水便积存在岩石的裂缝中。如果天气变得很冷，岩石缝中的水就结成冰。当水变成冰的时候，体积就要变大，因而裂缝也随之胀大。不用多久，裂缝就变得很宽，以致整个岩石破裂成为碎块。

Things to Do

(i) Let's find rocks. We can find rocks if we go into the open fields, or near the sea-shore. Collect as many rocks as you can. Take a bag or box along to put your rocks into. Write down where you found each rock and what you found near it.

(ii) Now look at your rock collection. Wash each rock with water and examine it. Is it large or small? Touch each rock to find out whether it is smooth or rough. Look at its edges. Are they rounded or jagged? Scratch each rock with a blade or pen-knife. Is it hard or soft? Describe the colour of the rock.

(iii) Let's look inside our rocks. Try to break each rock up with your hands. If the rock is too hard, use a hammer. What do you see inside the rock? Is the colour inside the rock the same as the colour outside? Do small pieces of sand fall out?

(iv) Use a hammer to pound each rock up into small pieces. Pound the pieces until they become very small. Now pour water on them and mix them with the water. Do you get sticky mud? What colour is the mud? Now you have made mud from rocks.

做实验

(1) 让我们去寻找岩石。如果走到野外或海岸附近，我们就可以找到岩石。把你能找到的都收集起来。随身带一个口袋或一个盒子，把采得的岩石装在里面。并且把你找到的每块岩石的地点以及你在岩石附近所发现的东西都记录下来。

(2) 现在来看看你收集的岩石。用水把每块岩石都洗干净，然后细心地进行观察。它是大块的还是小块的？摸摸每一块岩石，看它是光滑的还是粗糙的。再看看它的边缘，是滚圆的还是齿状的？用刀片或者铅笔刀把每一块岩石刮一刮，它是坚硬的还是松软的？描述一下岩石的颜色。

(3) 让我们来看看岩石的内部。试用手把每一块岩石掰开。如果岩石太硬，就用铁锤来敲。你看见岩石的内部是怎样的？内部的颜色和外面的一样吗？有细沙落下来吗？

(4) 用一把铁锤把每块岩石都敲碎，然后再把这些碎块砸得很细。倒一些水在上面，混合起来。它们变成了粘糊糊的泥浆吗？泥浆是什么颜色？现在你已经把岩石变成了泥浆。

SOIL EROSION AND CONSERVATION

Look at the slopes of a hill on a rainy day. You will see many streams of muddy water running down the slopes. The water is muddy because it washes away soil from the hill slopes. Sometimes soil is blown away by strong winds. When the soil is carried away by water or wind we say that the land is eroded. This is known as soil erosion.

Soil erosion takes place most easily on hill slopes. Rain water runs down slopes quickly and carries plenty of soil with it. Erosion can also take place on flat, open land. Heavy rain can quickly wash away the rich top soil on flat, open land.

Plants cannot grow on eroded land. There is not enough soil on eroded land to give them the things they need. Plants need water and salts from the soil.

We must try to stop soil erosion. We can do this in a number of ways. This is known as **soil conservation.** One way of stopping soil erosion on flat, open ground is to grow small plants such as grasses. These plants are called **cover crops.** Their roots hold the soil tightly together. The rain water cannot wash away the soil. When trees and tall bushes are plant-

土壤侵蚀和保持

在下雨天观察一下小山坡，你会看见许多浑浊的水顺着山坡流下来。水冲走了山坡上的土壤，因而变得浑浊起来。有时候，大风也会把土壤刮走。当土壤被水冲走或被风刮走的时候，我们说土地受到了侵蚀。这种现象叫做土壤侵蚀。

土壤侵蚀最容易在山坡上发生，雨水迅速地流下山坡并带走大量的泥土。在平坦开阔的土地上也会发生土壤侵蚀，大雨会把这些土地上的肥沃表土很快地冲走。

植物不可能在受到侵蚀的土地上生长。受侵蚀的土地没有足够的土壤来供给它们所需要的东西。植物需要从土壤中吸取水分和盐类。

我们必须设法防止土壤侵蚀。我们可以采取一些措施来做到这一点。这叫做土壤保持。要防止平坦开阔的土地上的土壤侵蚀，种植象草这类矮小的植物就是一个办法。这些植物叫做覆盖植物。它们的根把土壤紧紧抓在一起，雨水就没法把土壤冲走了。如果在开阔田野的边缘上种上树和灌木丛，大

ed at the edges of an open field, soil erosion by strong winds cannot take place. The trees and bushes protect the open land from the winds. They act as a very big wall.

Soil erosion on slopes can be stopped in a number of ways. One way is to cut a slope into "steps" called **terraces**. Water carrying soil cannot run straight down the slope now. It has to run down the terraces. This slows down the flow of the water. Most of the soil in the water is left behind on the terraces. Water can carry away the soil only if it is flowing fast. In this way, the soil washed away from the upper part of the slope will be left on the terraces. The edges of the terraces can also be raised. The raised edges are called **bunds**. These will hold back the rain water and the soil it carries. Sometimes trees are planted in narrow steps cut into the hill slopes. These steps which are called **contours** slow down the flowing rain water. Cover crops growing on contours or the slopes between terraces also help to stop soil erosion.

Things to Do

(i) We can make our own rain and see what happens when it falls on different types of land. Take a big tin and make a

风所引起的土壤侵蚀就不会发生了。这些乔木树和灌木保护旷野，使它不受风吹，起着一堵堵高墙的作用。

山坡上的土壤侵蚀可以通过很多办法来防止。一个办法是把山坡改成“台阶”形状，我们把它叫做梯田。这样，夹带着泥土的水就不能直接流下山坡了。它不得不流经梯田。水的流速因之减慢，水中的大部分土壤便沉积在梯田里了。水只是在流得很快的时候才能带走泥土。这样一来，从山坡上部冲刷下来的土壤就沉积在梯田里了。我们还可以把梯田的田边加高，加高了的田边叫做埂。这些埂可以阻挡雨水和雨水中夹带的土壤。有时，我们在山坡上挖一些很窄的阶梯，把树种植在阶梯上。这种阶梯叫做等高台阶，也能使雨水的流速变缓。长在等高台阶和梯田与梯田之间的斜坡上的覆盖植物，同样起着防止土壤侵蚀的作用。

做实验

(1) 我们可以为我们的实验造雨，看它降到不同类型的土地上时会出现什么现象。拿一只大

number of holes in the bottom. Prepare a mound of loose earth. Next, find a mound of earth covered with grass or other plants. Finally find a mound of hard, dry earth. Put up a line of small sticks in the form of a fence at the bottom of each mound of earth. Now hold your tin over the mound of loose earth and with a smaller tin, pour some water into it. The water will pass through the holes at the bottom of the tin like rain. Watch it falling on the loose earth. You will see that some soil is washed away. The water flowing down the mound is not clean but brownish. This is because it is carrying away some soil. As it flows past the fence it slows down and some soil is caught by each stick. The water is eroding the mound while the fence is helping to conserve the soil. Now do the same thing with the mound covered with plants and the other made up of hard ground. See what happens and explain. Do soil erosion and soil conservation occur like before?

(ii) You can find out more about soil erosion on slopes in this way. Make two long narrow wooden boxes, both open at one