<<美国学生科学读本（上下册）>>

图书基本信息

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前言

内容概要

作者简介

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书籍目录

章节摘录

CHAPTER 1THE EARTH AND ITS NEIGHBORS地球和它的邻居们1. The Evening Sky. —As the light of the sun fades in the evening, we see the stars coming out one by one until at last the sky is studded with them. We notice, too, that the brighter the star is, the sooner it appears. In the morning, just the reverse of this takes place, the stars begin gradually to fade, and the brightest stars are the last to disappear.We know how brilliant the light of a match or candle appears in a dark room, and how a light of this kind seems to fade out when it is brought into the presence of a strong electric light. It would seem quite probable that the vast light of the sun might have the same effect upon the light of the stars. This supposition is also supported by the fact that when the sun is covered in an eclipse the stars begin to appear as in the evening. Astronomers are all agreed that if it were not for the greater brilliancy of the sun we should see the heavens full of stars all the time.In the northern hemisphere the stars, except those at the north, which seem to go around in a circle, appear to rise in the east and to set in the west, just as the sun does. If we observe the stars which rise to the east, southeast, and northeast of us, we shall find that these are above the horizon for different lengths of time.The ancients noticed these facts, and explained them by saying that the earth was at the center of a hollow sphere, upon the inner surface of which were the stars, and that this sphere was continually revolving about the earth and also slightly changing its position in respect to the earth. We of the present day know that it is the earth that is turning around on an imaginary axis, and also gradually changing its position in relation to the stars. We also know that this axis, if extended far enough, would almost strike a star in the center of the northern heavens, which we call the North Star. The points on the surface of the earth through which the axis passes are called the poles.2. The Earth as one of the Planets. —If we carefully observe the bright points which appear in the sky at night, we shall see that almost all of them shine with a twinkling light. There are, however, three of the brightest which give a steady light like that of the moon. When the positions of these three bodies are carefully observed for some time, it will be seen that they are continually changing their places among the stars, whereas the positions of the stars do not appear to change in relation to each other.One of these three brightest points has a reddish brown color and has been named Mars, from the Roman god of war. The other two bear the names Venus and Jupiter, one named from the goddess of beauty and the other from the king of the Roman gods. Astronomers call the earth and these three bodies, together with four others, planets, and tell us that they revolve around the sun as a center. They have no light of their own as do the true stars, but the light which comes to us from them is a reflection of the light of the sun.The unaided eye is able at some times to see five of these planets. Astronomers tell us that their change of place in relation to the stars is due to their motion about the sun. If we could stand upon one of these visible planets, our earth would appear to us like one of them. But the surface of some of these planets, like Jupiter or Saturn, is not solid like that of the earth. Our sun, if seen from the distance of one of the stars, would appear like a star.The list of the planets in the order of distance from the sun is: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, and Neptune. The sun, with the bodies revolving about it, is called the solar system. There is reason to believe that ours is only one of many similar solar systems that exist throughout space.The planets are by far the nearest of all the starlike bodies, although the distance from the sun to the farthest of the planets is some 2700 million miles greater than the distance from the earth to the sun. The distance of the nearest of the stars however, is probably about 25,000,000,000,000 miles. This distance is so great that it takes light, which travels at the inconceivable rate of 186,000 miles in a second of time, over four and a half years to come to us from this star. From Arcturus, another of the stars, it takes light about 180 years to reach us, and from others very much longer. Sometimes from this outer space comets visit our solar system. Thus we see that our little earth is only a speck in the universe.In the space between the planets Mars and Jupiter, there has been found a group of small bodies which are called planetoids or asteroids. The brighest of these is Vesta, not more than 250 miles in diameter.A famous theory, called the Nebular Hypothesis, was suggested many years ago to account for the formation of our solar system. This theory supposes that the materials of which the members of the solar system are composed once formed a cloud or nebula of finely divided matter filling an enormous space, and that this matter, by reason of the mutual attraction of the particles, gathered together into what is now our sun with its planets and

their satellites. Man is unable to comprehend how matter originated or how matter can either be created or destroyed. But we do know many of the properties of matter.【中文阅读】1. 傍晚的天空——到了傍晚，夜幕开始降临，太阳的光芒便在大地上渐渐消褪，我们看见星星一颗一颗地眨着眼睛出现了，最后整个天空布满了繁星。
这时我们发现越亮的星星出现得越早，而到了早上，整个过程则正好相反。
星星开始按部就班地逐渐隐没于黎明的天空，最亮的星星也在最后消失于天际。
我们都有这样的经验，一根火柴或蜡烛的光亮在黑暗的房间里会显得很亮，而在电灯泡面前，它们就黯然无光了。
看起来，太阳的万丈光芒对星星的光亮很可能有同样的效应，这个看法也可以从日食的时候星星也像傍晚那样出现得到印证。
天文学家们也一定会同意一个结论：要是没有太阳耀眼的光芒，我们便会随时看见满天的星星。
在我们地球的北半球，除了在北极我们看见星星在天空似乎以划圈的方式运动以外，其他任何地方我们都看见星星像太阳一样，东升西落，永不停息。
如果注意观察这些从我们的东方、东南方、东北方升起的满天星斗，我们还会发现它们是在不同的时间在地平线上升起的。
我们的先民们也注意到了这一点，他们富有创意地解释说，地球处于一个空心天球的中心，星星就布满在这个天球的内表面上，这个天球还围绕着地球不停地旋转，并轻微改变着它与地球的相对位置。
而今天我们已经知道，地球是在沿着一条假想的轴线自转，并不断地改变着与星星的相对位置。
而且如果这根自转轴延伸得足够长，它便正好可以穿过在北边天空中心的一颗星星，这就是北极星。
地球表面上与这跟轴线的交点就是我们熟悉的南北极。
2. 作为行星之一的地球——如果我们仔细观察夜空中的满天星光，就会发现它们几乎都在不停地闪烁，但有三颗最明亮的亮点像月亮一样发着稳定的光芒。
如果我们再对这三个亮点的位置做长时间的仔细观察，便可以发现它们在星空中不断地变换着位置，而其他星星相互之间的相对位置却从不会发生变化。
这三个亮点的其中一个有着暗红褐的颜色，它就是火星，它的英语名字Mars来源于罗马神话中战神的名字。
另外两个，即金星和木星，在英语中它们分别被叫做Venus和Jupiter，前者是罗马神话中闻名遐迩的美丽女神，后者就是大名鼎鼎的众神之王，即宙斯。
天文学家们把它们三个和地球，以及其他四颗类似的星都叫做行星，并且告诉我们，它们也以太阳为中心转动。
其实它们并不能像其他星星一样自己发光，我们看见的光亮不过是太阳光通过它们的反射罢了。
有时候肉眼可以看见它们中的五个。
天文学家告诉我们，它们相对其他星星的位置改变其实是因为它们围绕太阳的运动造成的。
如果站在这些可见行星的其中一个上面，我们的地球看起来也就好像它们中的一个那样。
而我们的太阳，如果从其他星星的距离上来看，也像是一颗普通的星星。
我们周围离太阳的距离从近到远的行星依次是：水星、金星、地球、火星、木星、土星、天王星、海王星。
太阳连同围绕它转动的所有星球与物体就被叫做太阳系。
且有理由相信，我们的太阳系可能在遍布宇宙的所有类似的星系中独一无二。
即使这些行星中最近的一颗，与太阳的距离也比地球到太阳的距离远了27亿英里，虽然这听来很远，但和天上其他星星离太阳的距离相比起来，已经非常近了。
最近的星星离太阳的距离大致是25000000000000英里。
这个距离非常之远，以至于以光线的不可思议的每秒186000英里的速度从那颗星发出来，到我们这里也要经过4年半的时间。
从另一颗叫做大角星发出的光，需要180年才能到达我们这里。
而从其他星星发出的光则需要比这长得多的时间，有时彗星也会从外太空造访我们的太阳系。
这样看起来，我们渺小的地球在浩瀚的宇宙中真只不过是一粒埃尘而已。

人们发现在火星和木星之间存在许多小的天体，叫做小行星。
其中最亮的一颗叫做灶神星，直径还不到250英里。
有一个著名的理论叫做星云假说，它在多年前被科学家们提出来解释太阳系是如何形成的。
根据这个理论的假设，最早组成我们太阳系的物质是一些宇宙星云，这些星云在巨大空间中逐渐细微分化，最后在某些相互作用下慢慢形成了今天的太阳，以及行星和它们的卫星。
人们还不知道物质到底是如何形成的，或者说还不知道物质是如何被制造又如何被毁灭的，但是对物质的许多特性我们倒是已经知道得很清楚了。

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