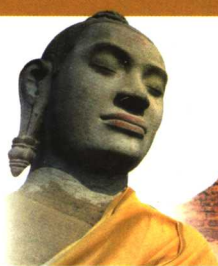


科学就是力量 ▼ 知识就是财富

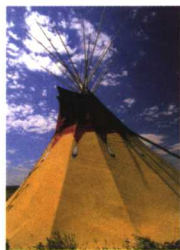
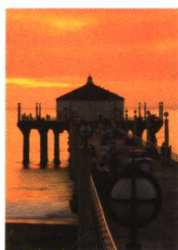
Geography
地理卷

双语 十万个为什么

BILINGUAL SO MANY WHY



► 主编 / 谢志敏 ◀



- Why to build up waves?
- 为什么会形成海浪?
- Why is the oceans very important for the earth?
- 为什么海洋对地球很重要?
- Why could tential plates drift?
- 为什么大陆板块会漂移?
- Why is the sea water salty?
- 为什么海水是咸的?
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- 为什么气候变暖使阿卑斯山面临灾难?



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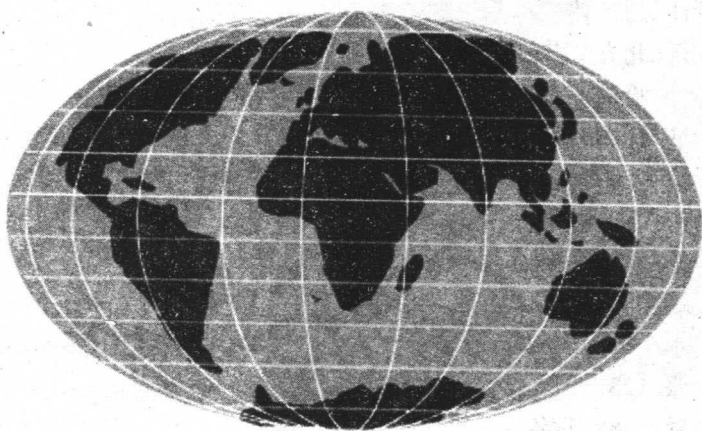
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□主编 / 谢志敏



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图书在版编目(CIP)数据

双语十万个为什么/谢志敏 主编. —哈尔滨:北方文艺出版社, 2006. 5

ISBN 7 - 5317 - 1991 - 6

I. 双... II. 谢... III. 科学知识—青少年读物—英、汉 IV. Z228. 1

中国版本图书馆 CIP 数据核字(2006)第 044817 号

双语十万个为什么

作 者/谢志敏

责任编辑/陈颖杰 张远超

封面设计/刘 玮

出版发行/北方文艺出版社

地 址/哈尔滨市道外区大方里小区 105 号楼

网 址/<http://www.bfwy.com>

邮 编/150020

电子信箱/bfwy@bfwy.com

经 销/新华书店

印 刷/北京铁建印刷厂

开 本/960 × 640 1/16

印 张/128

字 数/1488 千字

版 次/2006 年 5 月 1 版

印 次/2006 年 5 月 1 次

印 数/5000

定 价/456.00 元(全十六册)

书 号/ISBN 7 - 5317 - 1991 - 6/I · 1942

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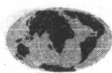
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Why to Build Up Waves

为什么会形成海浪?



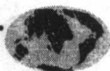
Waves are beautiful to look at, but they can destroy ships at sea, as

well as houses and buildings near the shore. What causes waves? Most waves are caused by wind blowing over the surface of the water. The sun heats the earth, causing the air to rise and the

winds to blow. The winds blow across the sea, pushing little waves into bigger and bigger ones.

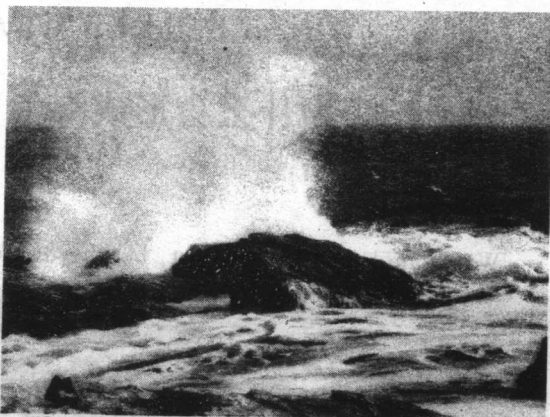
海浪观赏起来很美,但它们能摧毁海上的船只以及海岸附近的房屋建筑。海浪是由什么引起的呢?多数海浪是由在海水表面上方的风引起的。太阳使地面受热,造成空气上升并形成风。风吹过海洋,使小浪变成越来越大的大浪。

The size of a wave depends upon how strong the wind is, how long it blows, and how large the body of water is. In a small bay big waves will never build up. But at sea the wind can build up giant, powerful waves.



海浪的规模取决于风力的强弱、刮风时间的长短,以及水量的大小。在小海湾,永远不会形成大浪,但在海上,风能形成巨大的、有威力的大浪。

A rule says that the height of a wave (in meters) will usually be no more than one-tenth of the wind's speed (in kilometers). When the wind is blowing at



120 kilometers per hour, most waves will reach 12 meters. Of course, some waves may combine to form giant waves that are even higher. In 1933 the United States Navy reported the largest measured wave in history, it rose in the Pacific Ocean to a height of thirty-four meters.

有一条规律是说海浪的高度(按米计)通常不超过风速(以公里计)的1/10。当风以每小时120公里的速度刮起时,多数海浪会是



12米左右的高度。当然,有些海浪会汇聚成更高的巨浪。1933年,美国海军报告了历史上测量到的最大的海浪,它兴起于太平洋,浪高为34米。

海浪的规模取决于风力的强弱、刮风时间的长短,以及水量的大小。在小海湾,永远不会形成大浪,但在海上,风能形成巨大的、有威力的大浪。



Why to Create Tides

为什么会产生潮汐?

Tides are created mainly by the pull of the moon on the earth. The moon's pull causes water in the oceans to be a little deeper at a point closest to the moon and also at a point farthest from the moon.



潮汐主要是由月球对地球的吸引产生的。月球的吸引力使得离月球最近和最远地区的海水变得多一些。

These two tidal "waves" follow the apparent movement of the

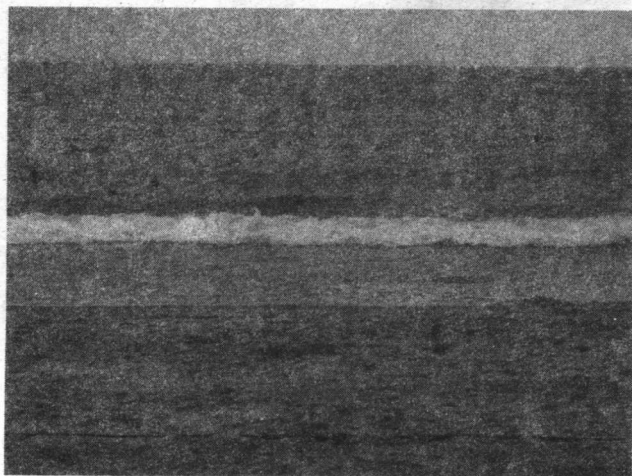
moon around the earth and strike nearly every coast line at intervals of about twelve hours and twenty-five minutes. After reaching a high point, the water level goes down gradually for a little more than six hours and then begins to rise toward a new high point. Hence, most coast lines have two tides a day, and the channels in the ocean bottom may change



the times that the tidal wave reaches different points along the same coast line. The difference in water level between high and low tide varies from day to day according to the relative positions of the sun and the moon because the sun also exerts a pull on the earth, although it is only about

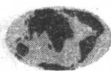


half as strong as the pull of the moon. When the sun and the moon are pulling along the same line, the tides rise higher; and when they pull at right angles to one another, the tide is lower.



潮水因月球围绕地球运转而发生两次变化,其间隔时间为12小时25分钟,海平面在涨到最高点之后的六小时以后开始逐渐下降,

然后又开始回升。因此,海边的海水一天有两次潮汐,而且海底状况

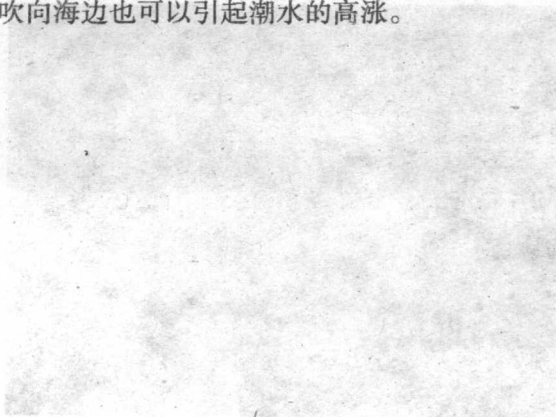


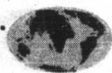
的不同会影响每次潮汐到达的领域和时间。尽管太阳对地球的吸引力只有月球对地球吸引力的一半,但是潮汐引起海平面的变化因太阳与月球的位置不同而不同。当太阳、月球沿着同一方向互相吸引时,潮水则高涨;当它们以直角关系相互吸引时,潮水则低落。



The formation of the coastal line and variations in the weather are additional factors that can affect the height of tides. Some sections of the coast are shaped in such a way as to cause much higher tides than those in other areas. A strong wind blowing toward the shore may also cause tides to be higher.

海岸线的走向,以及天气的变化也可以影响潮水的涨落。某一地区的海岸线形状与其他地区的不同,就可以引起潮水的高涨,强风吹向海边也可以引起潮水的高涨。





Why Are the Oceans Very Important to the Earth

为什么海洋对地球很重要？

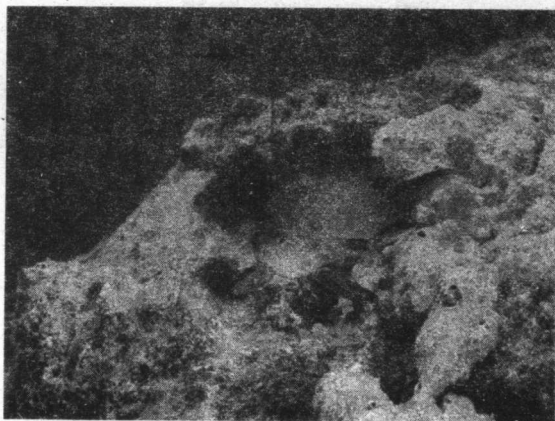
The size of the oceans dominates the view of earth from space. So



vast are the oceans, in fact, that they take up almost 71% of the entire surface of the globe (139 million square miles) . The oceans have an average depth of 12, 230 feet and reach the deepest

point in the Mariana trench of the northwest Pacific Ocean, at 36,204 feet below sea level.

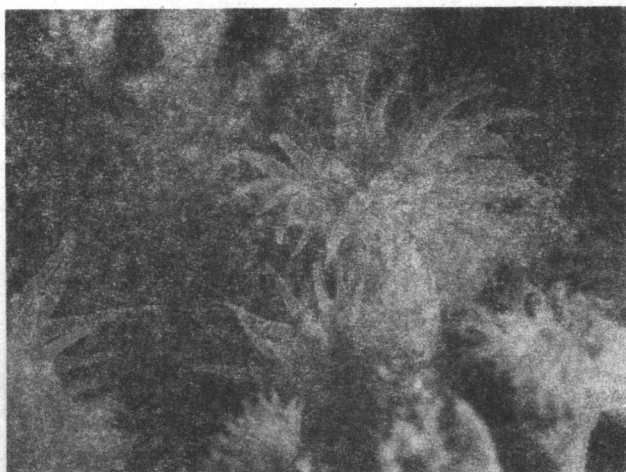
The ocean basins hold at vast quantity of water, over 285 million cubic miles of water.



从太空看，海洋的大小主宰着地球的外观。海洋是



如此巨大,事实上大约占据了地球表面积的 71% (1.39 亿平方英里)。海洋平均深度为 12230 英尺,最深处在西北太平洋的马里亚纳



海沟,在海平面以下 36204 英尺。洋盆包容了大约 2.85 亿立方英里的庞大水体。

The oceans are the largest repositories of organ-

isms on the planet. Life is extremely abundant in the sea, from the obvious large whales, fish, corals, shrimp, krill and seaweed, to the microscopic bacteria floating freely in the seas. The bacteria are so abundant that just one spoonful of ocean water contains 100—1,000,000 bacteria cells per cubic centimeter.

海洋是地球上最大的生命储藏库。海洋里的生命,从明显可见的大鲸鱼、鱼类、珊瑚、虾、磷虾和海藻,到微小的自由漂浮的细菌,十分丰富多样。细菌非常多,在一茶匙海水中间,每立方厘米就含有 100—100 万个细菌细胞。

All the organisms in the ocean are subject to the properties of the seawater surrounding them. Water surrounds all marine organisms, composes the greater bulk of their bodies, and is the medium by which various chemical reactions take place, both inside and outside of their bodies.



海洋中所有的生命都被海水包围着,并受到海水性质的影响。海水环绕着海洋生物体,使它们体形变得庞大,同时海水也是各种海洋生物体内、体外的化学反应发生的媒介。

Seawater is pure water plus dissolved solids and gases. The dissolved solids come from "weathering" processes of the continental rocks being dissolved by rain and flowing out to sea with the rivers. The gases come from the atmosphere. As water is a universal solvent, many different compounds

are dissolved in it. A 1-kg sample of salt-water contains 35 g of dissolved compounds, including inorganic salts, organic compounds from



living organisms. The solid substances are known as "salts" and their total amount in the water is referred to by a term known as salinity (expressed as parts per thousand). Oceanic salinity generally has a range from 34 to 37 parts per thousand. Variations from place to place are due to factors such as rainfall, evaporation, biological activity and radioactive decay. Salinities are higher in the tropics due to high evaporation rates. Fresh supplies of salts are now being added to the oceans from the rivers at roughly the same rate of their being removed by various physical, chemical and biological processes.

海水里面溶解着固体和气体。溶解的固体源于陆地岩石的“风



化作用”过程,它们溶解在雨水里,并且由河流带入海洋。气体来自大气。因为水有着很强的溶解力,很多不同的成分都溶于了海水中。1 千克海水里有 35 克溶解物体,包括无机盐和来自生命体的有机物。海水中的固体物质被称为盐,通常用盐度这个术语来表示海水中所含盐的总量(表示成千分之几)。海洋中海水的盐度通常为 34‰ ~ 37‰。由于受降雨、蒸发、生物活动以及放射性衰变等因素的影响,



不同的海区海水盐度也不同。在热带地区,由于蒸发速率大,海水盐度较高。从河流带来的新鲜盐

分的输送速率大致与被各种各样的物理、化学和生物作用消耗的盐分相当。

The vast quantity of water arose from the Earth's interior as it cooled. The origin of the oceans goes back to the time of the earth's formation about 4.6 billion years ago, when our planet was forming through the accumulation of smaller objects, called planetesimals. There are basically three possible sources for the water. It could have separated out from the rocks that make up the bulk of the earth; or arrived as part of a late-accreting veneer of water-rich meteorites, similar to the carbonaceous chondrites that we see today; or arrived as part of a late-accreting



veneer of icy planetesimals, that is, comets.

海洋中的巨量海水源自于地球的内部,经过逐渐冷却而形成。海洋的起源得追溯到地球形成时,大约 46 亿年以前。那时地球正由

许多被称为小行星体的物体聚集在一起增生而成。水的来源基本上有三种可能。一种是从组成地球的岩石里分离出来;另一种是来自一种



后期聚集增生的富水陨星块体,与今天看到的碳质陨石相似;或者是来自于后期增生的冰质小行星体——彗星。

