中等专业学校教学用书

石油地质专业英语

刘国范　主编

Professional English of Petroleum Geology

石油工业出版社

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内 容 提 要

本书按照地质学科的知识结构，选编了动力地质、矿物岩石、构造地质、古生物地层、石油地质以及油田勘探、开发方面的文章共37篇，既保持了原著的写作风格，又使全书内容有一定的连续性、系统性和可读性。本书以适于中专层次水平为原则，既是中专学校石油地质专业的教科书，也可作为其他专业人员学习英语的参考用书

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前　言

本书是根据中国石油天然气总公司1994年教材工作会议精神和石油中专地质专业指导委员会审定的中等专业学校《石油地质专业英语》教学大纲编写的。

《石油地质专业英语》是石油中专地质专业普遍开设的一门课，目的在于让学生尽可能多地掌握专业词汇、科技英语翻译常识。本书以提高学生地质专业英语水平为出发点，编写既考虑了英语知识的教学，图文并茂，课文后附有词汇、注释、思考题等内容，又考虑了专业知识的系统性，较好地实现了由基础英语到专业英语的过渡。全书按地质专业的知识结构分为十章，共选编了三十七篇课文。

本书由大庆石油学校、新疆石油学校、大港石油学校、中原石油学校联合编写。大庆石油学校刘国范任主编，大庆石油学院吕延防博士主审。第一章、第二章、第三章由刘国范编写；第四章、第五章、第六章由大庆石油学校窦同君编写；第七章由新疆石油学校黄卫编写；第八章由大港石油学校金一虹编写；第九章、第十章由中原石油学校贾随良编写。窦同君在统、改稿及微机录入中做了大量工作。

本书在编写过程中，承蒙大庆石油学院外语系王文明主任、华北石油学校王希峰主任和新疆石油学校沈建林等同志的大力协助，在此表示衷心的感谢。由于我们水平有限，在本书中一定还存在不少问题，敬请广大读者批评指正。

编　者

1996年3月

CONTENTS

CHAPTER ONE PARTS OF DYNAMIC GEOLOGY
(动力地质学)

Lesson One

The Earth
(地　球)

The Earth is a nearly spherical planet. It has a circumference of approximately 25000 miles (40000 km), a polar diameter of about 7900 miles(12714 km), and an equatorial diameter of 7927 miles (12756 km).

The three main units of the Earth's interior are core, mantle, and crust. The diameter of the core is about 4300 miles (6900 km), and iron is probably its chief ingredient. The core consists of an inner part that seems solid and an outer part that appears fluid[1]. The mantle is nearly 1800 miles (2900 km) thick and makes up about 84% of the volume of the Earth. Since the volume of the core is about 16%, the crust actually makes up a very small part of the earth as a whole. The mantle and crust are solid except for relatively small masses of magma that develop occasionally within a few tens of miles of the surface.

On the average, the crust beneath the continents is about six times as thick as beneath the ocean floors — approximately 20 to 25 miles (32 to 40 km) vs. 3 to 4 miles (5 to 6.5 km). However, the continental crust is much thicker than average beneath the great mountain belts[2]. As the term has been used recently, the lithosphere is the solid outer shell of the earth, about 35 to 60 miles (50 to 100 km) or more in thickness[3].

The rock most abundant in the upper part of the crust beneath the continents appears to be similar to granite in chemical composition and specific gravity(2.7)[4]. A heavier rock, probably similar to basalt in chemical composition and specific gravity (3.0), is thought to underlie the floors of the oceans and also the granitic rocks of the continents. Thus the two-part continental crust differs fundamentally from the one-part oceanic crust; in fact, the difference accounts for the existence of continents and ocean basins.

The upper surface of the crust may be covered by water, by unconsolidated sediments, by soil and vegetation, or it may be exposed at the surface.

Special Words

1. spherical ['sferikəl] *a*. 球形的
2. planet ['plænit] *n*. 行星
3. circumference [sə'kʌmfərəns] *n*. 圆周
4. polar ['poulə] *a*. (南北)极的
5. diameter [dai'æmitə] *n*. 直径
6. equatorial [ˌekwə'tɔ:riəl] *a*. 赤道的
7. interior [in'tiəriə] *n*. 内部
8. core [kɔ:] *n*. 地核
9. mantle ['mæntl] *n*. 地幔
10. ingredient [in'gri:diənt] *n*. (混合物的)成分
11. inner ['inə] *a*. 内部的
12. magma ['mægmə] *n*. 岩浆

13. continent ['kɔntinənt] *n*. 大陆
14. belt [belt] *n*. 带,地带
15. lithosphere ['liθəˌsfiə] *n*. 岩石圈
16. granite ['grænit] *n*. 花岗岩
17. basalt ['bæsəlt] *n*. 玄武岩
18. unconsolidated [ʌnkən'sɔlideitid] *a*. 未固结的
19. sediment ['sedimənt] *n*. 沉积物

Special Phrases

specific gravity 相对密度

Notes to the Text

1. the core consists of an inner part that seems solid and an outer partthat appears fluid.

地核由内外两层组成,内层看来是固体,外层似乎是流体。

本句是一复合句,其中 that seems solid 和 that appears fluid 是两个定语从句,分别修饰前面的 an inner part 和 an outer part;而 an inner part 和 an outerpart 为动词短语 consists of 的宾语。

2. However, the continental crust is much thicker than average beneath the great mountain belts.

但是,在高山地带下面的大陆地壳,其厚度要比平均厚度大得多。

本句中, beneath the great mountain belts 是说明全句的地点状语。

3. As the term has been used recently, the lithosphere is the solid outer shell of the earth, about 35 to 60 miles (50 to 100 km) or more in thickness.

根据岩石圈这个术语最近使用的情况,它指的是厚度约为 35～60 英里(50～100 公里) 或更厚的地球固体外壳。

As the term has been used recently 作插入语。

4. The rock most abundant in the upper part of the crust beneath the continents appears to be similar to granite in chemical composition and specific gravity (2.7).

在大陆地壳的上部,数量最多的是化学成分和相对密度(2.7)类似于花岗岩的岩石。

most abundant in the upper part of the crust beneath the continents 是形容词短语,作定语,修饰主语 the rock。

形容词短语作定语时,常位于被说明的名词(或代词)之后。例如:

Geologists have gained information useful in interpreting the geologic history of ancient sedimentary rocks.

地质学家获得了有助于解释古沉积岩地质史方面的知识。

Answer the following questions according to the text

1. What are main units of the Earth's interior ?
2. Which unit is the smallest in the volume of the earth ?
3. What is the core's chief ingredient ?
4. What are the differences among the crust, the mantle and the core ?
5. How do you understand "the lithosphere"?

Lesson Two

Movements of the Earth's Crust

(地 壳 运 动)

We have seen that such denuding agents as rivers and streams, ice, wind, and the atmosphere are continually wasting away the present land surface and transporting the material to the sea. Now it is obvious that if nothing occurred to upset this arrangement the land would be worn down to sea－level, the sea would be filled up, and all erosion and deposition would cease; but we know that this has not been the case. In studying, for example, Hutton's unconformities we see that areas of land have been worn down on several occasions during their history. Moreover, we know that material has been deposited up to several miles in thickness. Such planed－down surfaces, called "peneplains", do occur in several places, and they have been produced many other times in earth－history[1]. It seems, therefore, that there has been an intermittent uplift of the land and subsidence of the sea going on. As one land surface is worn away new lands are elevated, so that they in their turn will be eroded and carried into the sea.

What evidence have we that such elevations and subsidences have actually taken place?[2] Let us first consider those movements which we know have occurred within our own times. Admittedly such movements will be very small — in fact, beside the gigantic movements we have come to expect in geology, almost negligible[3]. However, it must be remembered that nearly all geological processes are the result of an "infinity of increments".

There are two kinds of movement, fast and slow. Fast earth movements which have taken place within our own lifetime are well known mainly because of their spectacular results. They are called earthquakes. The earth is a rotating globe, and as such is in a state of delicate equilibrium[4]. Periodically there occurs a movement, perhaps a slipping, within the earth's crust, and vibrations are set up which run across and through the crust as a series of waves, frequently leaving devastation behind them. After such an earthquake, rents and cracks of great length may develop, and there can be no doubt that a large number of such movements would have a considerable effect on the earth's surface.

But there is also evidence that certain regions are undergoing, at the present time, a very gradual uplift or subsidence. For example, Scandinavia is undergoing a slow tilting movement. The investigation of this change was started by Linnaeus in 1749, when he measured the distance between a large stone and the sea at Trelliborg. When examined 87 years later the distance had decreased by 100 foot[5]. At Malna, in the south of Sweden, an old street was found below sea－level. Investigations and measurements have been continued, and it is now decided that the movement is not simply a sinking, but rather a tilting, for it has been found that Stockholm is rising 6 inches per 100 years, and the coast still farther north is rising 3 foot per 100 years.

Other examples of such variation of sea－level have been found in other parts of the world, perhaps the most famous being the pillars of the Temple of Serapis in Naples Bay[6], which must have undergone a very gradual sinking, followed by an uplift.

Geologically there is abundant evidence that the earth has never been still, but has for ever been either undergoing elevation or subsidence. Since the earliest geological inquiries it has been known that marine fossils have been found distant from any sea. They have been found at 16000 foot above sea－level in the Himalayas, and there is no doubt that these fossils, and the rocks that buried them, were once below the sea.

Special Words

1. denude [di'nju:d] *v*. 剥蚀
2. upset [ʌp'set] *v*. 打乱
3. wear [wɛə] *v*. 磨损
4. unconformity ['ʌnkən'fɔ:miti] *n*. 不整合
5. planed－down ['pleind'daun] *v*. 被剥平
6. peneplain ['pi:niplein] *n*. 准平原
7. subsidence ['sʌbsidəns, -si] *v*. 下沉
8. elevation [eli'veiʃən] *n*. 上升
9. gigantic [dʒai'gæntik] *a*. 巨大的
10. rotate [rəu'teit] *v*. 旋转
11. globe [gləub] *n*. 球体
12. equilibrium [ˌi:kwi'libriəm] *n*. 平衡
13. vibration [vai'breifən] *v*. 震动
14. devastation [ˌdevəs'teiʃən] *n*. 毁坏，成为废墟
15. rent [rent] *n*. 断口
16. bay [bei] *n*. 海湾

Geographical and Biographical Names

1. Hutton 郝屯(地名)
2. Scandinavia 斯堪的那维亚
3. Linnaeus 林奈(人名)
4. Trelliborg 特雷勒堡(地名)
5. Malna 马拉(地名)
6. Stockholm 斯德哥尔摩(地名)
7. Naples 那不勒斯(地名)

Notes to the Text

1. Such planed－down surfaces, called "peneplains", do occur in several places, and they have been produced many other times in earth－history.

这种被削平的陆地表面叫作准平原，它在一些地方确实存在，而且在地史上也多次产生过。

do 在这里为助动词，起加强语气的作用，带有"确实"等强调意思。例如：

He does look well. 他看上去确实很健康。

2. What evidence have we that such elevations and subsidences have actually taken place?

我们有什么证据可以证明确实发生过这种上升和下降呢？

that such elevations and subsidences have actually taken place. 为同位语从句，说明 evidence。本课中还出现几个同位语从句，例如：

1) But there is also evidence that certain regions are undergoing, at the present time, a very gradual uplift or subsidence.

2) … there is no doubt that these fossils, and the rock that buried them, were once below the sea.

(注意:前一个 that 引导的是同位语从句,后一个 that 引导的是定语从句。)

3. Admittedly such movements will be very small — in fact, beside the gigantic movements we have come to expect in geology, almost negligible.

无疑,这些运动总是非常小的,而且实际上跟我们现在所能预料的地质上那些巨大的运动比较起来,几乎是微不足道的。

we have come to expect in geology 为定语从句,省略了关系代词 that,修饰 the gigantic movements.

4. The earth is a rotating globe, and as such is in a state of delicate equilibrium.

地球是一个旋转的球体,因而处于一种微妙的平衡状态。

as such 照这样;因此;因而。

5. When examined 87 years later the distance had decreased by 100 foot.

87 年后加以检查时,此距离缩短了 100 英尺。

when examined 87 years later 是分词短语,作时间状语。

"by + 数字或倍数" 表示净增减的数或净增减的倍数。例如:

A is by 3 times longer than B. A 比 B 长三倍。

6. … perhaps the most famous being the pillars of the Temple of Serapis in Naples Bay, …

最有名的也许就是那不勒斯海湾塞拉皮斯神庙的几根柱子。

此为分词 being 构成的独立主格结构。独立主格结构是一个独立主格的名词或代词(作为逻辑主语)加上一个分词、形容词、副词、不定式或介词短语。其作用相当于状语从句,用来表示行为、伴随、时间、原因、条件等。例如:

1) Our work having been finished, we went home.

2) It being Sunday, the library was closed.

3) Time permitting, we'll visit the Summer Palace.

4) The children were making a snowman, hand red with the cold.

Answer the following questions according to the text

1. What happens to the land if nothing occurred to upset the arrangement (for example, weathering, erosion and transportation, etc.) ?

2. What is a peneplain ?

3. Why is the earth in a state of delicate equilibrium ?

4. Who started the investigation that certain regions are undergoing a very gradual uplift or subsidence ?

5. What does that marine fossil have been found distance from any sea mean ?

Lesson Three

Weathering

(风 化 作 用)

Weathering is the breakdown of solid rock. Once a rock has been exposed on the surface of the earth, no matter how hard it is, it will eventually be broken into particles or dissolved by the forces of weathering[1].

Mechanical weathering involves physical forces that disintegrate the rock. For example, many rocks have minute cracks or fractures in them. When water in the cracks freezes, the ice expands in volume and exerts enormous pressure. This process, called ice wedging, fractures the rock. Dust, soil, seeds, or pollens are often blown into the exposed natural cracks in the rocks, and plants start growing. As the plant grows larger, roots extend downward, enlarging the crack and fracturing the rock in a process called root wedging. Rocks are composed of many mineral grains. When the rock is exposed to the sunlight during the day, each mineral grain heats up and expands. At night, each mineral grain cools and contracts. These daily cycles of expansion and contraction exert enormous stresses between the individual mineral grains, and the grains eventually break out of the rock. These are just some of the many processes that weather a rock mechanically.

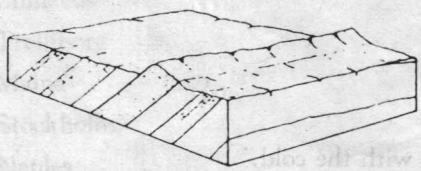

Figure 3－1 A cuesta formed by the outcrop of a resistant rock layer

Chemical weathering is the chemical breakdown of rocks. Most surface and subsurface waters are slightly acidic. As rainwater falls through the atmosphere, it absorbs carbon dioxide gas to form a weak acid (carbonic acid). Rainwater is weakly acidic. Carbon dioxide gas in soil causes rainwater percolating through the soil to become even more acidic in the subsurface. Limestone, a very common sedimentary rock, readily dissolves in weak acids[2]. Not all rocks, however, are as susceptible to chemical weathering as limestones. Most sandstones are composed of quartz sand grains that are very resistant to chemical weathering. Chemical weathering is promoted by water, and when the temperature is raised, chemical reactions are accelerated. Because of this chemical weathering is more effective in warm, humid climates.

Some rocks are very resistant to weathering(sandstones or even limestones in arid climates), whereas others, such as shales, readily break down. Where a resistant rock layer crops out of the ground, a ridge, called a cuesta, is formed (Figure 3－1). Cuestas reveal the orientation of the subsurface rocks in that area.

Special Words

1. weathering ['weðəriŋ] *n*. 风化作用
2. disintegrate [dis'intigreit] *v*. 分解
3. exert [ig'zə:t, eg-] *v*. 施加
4. pollen ['pɔlin] *n*. 花粉

5. mineral ['minərəl] *n*. 矿物(的)
6. atmosphere ['ætməsfiə] *n*. 大气(层)
7. percolate ['pɜ:kəleit] *v*. 渗滤
8. limestone ['laimstəun] *n*. 石灰岩
9. dissolve [di'zɔlv] *v*. 溶解
10. sandstone ['sændstəun] *n*. 砂岩
11. quartz [kwɔ:ts] *n*. 石英
12. cuesta ['kwestə] *n*. 单斜(面)山

Special Phrases

1. mechanical weathering 物理风化作用
2. ice wedging 冰劈作用
3. root wedging 根劈作用
4. mineral grain 矿物颗粒
5. chemical weathering 化学风化作用
6. sedimentary rock 沉积岩

Notes to the Text

1. Once a rock has been exposed on the surface of the earth, no matter how hard it is, it will eventually be broken into particles or dissolved by the forces of weathering.

一旦岩石暴露于地表,无论它怎样坚硬,最终将被风化作用的外力破碎成颗粒或溶解。

no matter …, 不管 ……, 不论 ……,后面还可接 what、who、when、where 、which、how 等,引导让步状语从句。例如:

Every substance, no matter what it is, is made up of atoms.

每种物质,无论它是什么,都由原子构成。

No matter who takes up the matter for me, I shall be very grateful.

不管谁替我处理这件事,我都将非常感激。

2. Limestone, a very common sedimentary rock, readily dissolves in weak acids.

石灰岩,极普通的一种沉积岩,很容易溶解于弱酸中。

limestone, a very common sedimentary rock, 在本句中指同一事物,而又处于同一语法地位,反映的是同位关系,它们互为同位语。例如:

Jane Simpson, the author of "The Bridge", is a friend of mine.

简·辛普森——《桥》的作者,是我的一个朋友。

Answer the following questions according to the text

1. What is weathering ?
2. What is called ice wedging ?
3. Which stone readily dissolves in weak acids ?
4. What does cuesta reveal ?
5. What is the difference between ice wedging and root wedging ?

Lesson Four

Erosion

(剥 蚀 作 用)

Erosional processes involve the transportation of the weathered products to a depositional site. These processes include gravity, wind, glaciers, waves, and rivers. Gravity is effective in moving material downslope. The most common gravity movements are landslides, of which there are two common types. Slumps are landslides that are easily identified as the slump moves downslope in a coherent mass (a single block) (Figure 4－1) . Earthflows move as an incoherent (jumbled) mass (Figure 4－2). If the earthflow contains considerable water, it is called a mud flow.

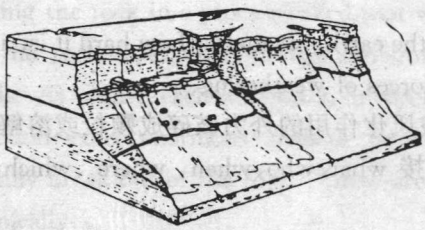

Figure 4－1 A slump type of landslide

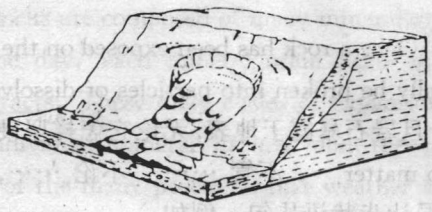

Figure 4－2 An earthflow type of landslide

Mudflows are relatively common in submarine environments. There, a considerable amount of loose sediment occurs on submarine slopes, such as on deltas. Deltas are formed by the deposition of loose sediments by rivers entering an ocean. During a large hurricane off the Mississippi River delta in 1969, several offshore oil platforms failed[1]. At first it was thought that the large hurricane waves and high winds were directly responsible for the failure of the rigs. It was later shown, however, that the hurricane waves caused large submarine mudflows that flowed down the Mississippi River delta bottom, knocking the legs out from under the rigs (Figure 4－3). Since that time, it has been discovered that mudslides off the Mississippi River delta often begin without initiation by a triggering event such as a hurricane. Because of the instability of the sea bottom off the Mississippi River delta, a total of 23 rigs have failed and, in an average year, 110 pipeline failures occur.

Windblown sand dune deposits are extremely well sorted and have formed some of the best gas and oil reservoir rocks. Wind is effective as an erosional process only in arid areas where there is little moisture to hold soil in place. Of all grain sizes, fine sand is the easiest for wind to pick up as it blows across the desert floor[2]. The larger－ sized particles (coarse sand and granules) are too heavy, and the finer－sized particles (silt and clay) do not protrude above the desert surface enough for the wind to have impact upon them. The fine sand is not suspended in the air; it moves along the desert surface by a series of small hops called saltation. The fine sand is blown up into the air about 1 to 2 feet above the desert surface and moves several feet in the direction of the

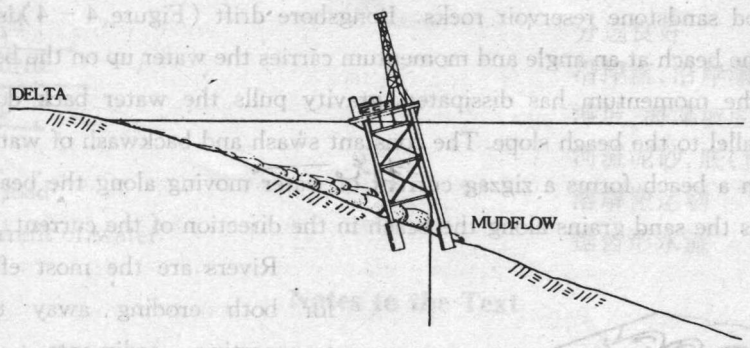

Figure 4－3 Submarine mudflows causing failure of a Mississippi River delta offshore rig

wind. As the sand grain falls back to the desert surface, it dislodges other fine sand grains that saltate in the direction of the wind. Any silt－or clay－ sized particles hit by the saltating sand and propelled into the air are suspended in the wind and carried for great distances as dust storms. Therefore, silt and clay are removed by wind storms, coarse material stays in place, and only fine sand saltates in the desert, which results in the formation of extremely well sorted sand dune deposits.

Glaciers are downslope flows of solid ice. Ice flows much like a viscous liquid when pressure is applied to it. Several other materials, such as tar and salt, also behave like a solid in the short term and flow like a viscous liquid in the long term. In cold climates, snow instead of rain falls on mountains. As the snow builds up, the weight of the overlying snow compresses underlying snow into ice. Gravity pulls the ice downslope, forming glaciers. Glaciers are extremely powerful and carry enormous loads of sediments, with particles ranging up to boulders in size[3]. The glacial sediments often work their way through the glacial ice by gravity and blanket the surface of the ground under the glacier with a thick deposit of loose sediment of widely ranging grain sizes called a moraine. Today, glaciers cover only limited, rather remote, polar areas such as Antarctica, Greenland, and mountain tops in Alaska. As recently as 10000 years ago, however, during a colder period of time called the Pleistocene, or Ice Age, glaciers covered up to one－ third of the land area of the world. Enormous glaciers flowed across Europe, Asia, and North America. Glaciers that formed in Canada flowed southward into the United States. As a result of this, much of northeastern and north central portions of the United States are covered with 50 to 100 feet of loose glacial sediments. These moraines make petroleum prospecting difficult in such places as the Michigan peninsula. Glacial debris covers rock outcrops and does not conduct sound for seismic prospecting into the deeper, underlying sediments.

Waves occur on the surface of the ocean and are caused by wind. Because waves are surface features, they are effective in eroding sediments only along beaches where they wash ashore. As waves break on a beach, water agitation suspends finer－grained silts and clays in the water to be washed offshore where they are deposited in deep water. The sand is too coarse to be suspended in

the water and is retained on the beach. Beaches are composed of well－sorted sands, and ancient beaches make good sandstone reservoir rocks. Longshore drift (Figure 4－4) is formed when waves approach the beach at an angle and momentum carries the water up on the beach (swash) at an angle. After the momentum has dissipated, gravity pulls the water back down the beach (backwash), parallel to the beach slope. The constant swash and backwash of water produced by waves breaking on a beach forms a zigzag current of water moving along the beach. Longshore drift of water rolls the sand grains along the beach in the direction of the current.

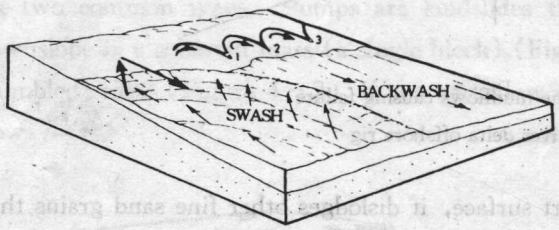

Figure 4－4 Longshore drift caused by the swash and backwash of waves on a beach

Rivers are the most effective process for both eroding away the land and transporting sediments. Rivers carry sediment by three processes. Turbulence in flowing water carries the suspended load, usually clay, silt, and fine sand. Coarse sediments, such as coarse sand and pebbles, are rolled or bounced along the river bottom in the bed load. Salts produced by chemical weathering are carried in the dissolved load of the river. Rivers transport most of their sediments during floods, when the water turbulence is the greatest. Rivers erode canyons down into solid rock, as fine sand suspended in river water effectively abrades and sandblasts the underlying rock.

Special Words

1. erosion [i'rəuʒən] *n*. 侵蚀,风化,冲蚀,冲刷
2. glacier ['glæsjə,'gleiʃə] *n*. 冰川
3. landslide ['lændslaid] *n*. 塌方,山崩,地滑,滑坡
4. slump [slʌmp] *n*. 滑坡,滑陷构造
5. earthflow ['əːθfləu] *n*. 泥石流
6. delta ['deltə] *n*. 三角洲
7. hurricane ['hʌrikən,-kin] *n*. 飓风
8. rig [rig] *n*. 钻机
9. granule ['grænjuːl] *n*. 细砾
10. silt [silt] *n*. 粉砂
11. suspend [səs'pend] *v*. 使悬浮
12. hop [hɔp] *v*. 跳跃
13. dislodge [dis'lɔdʒ] *v*. 移动,撞击,驱逐
14. tar [taː] *n*. 焦油,沥青
15. boulder ['bəuldə] *n*. 巨砾
16. moraine [mə'rein] *n*. (冰)碛,冰堆石
17. agitation [ædʒi'teiʃən] *n*. 搅动(作用)
18. longshore ['lɔŋʃɔː] *n*. 沿岸
19. abrade [ə'breid] *v*. 磨蚀
20. sandblast ['sænd'blaːst] *v*.*n*. 砂磨蚀,喷砂
21. pebble ['pebl] *n*. 中砾,卵石

Special Phrases

1. weathered product 风化产物
2. coherent mass 连续体,粘结物
3. mud flow 泥流
4. dust storm 尘暴
5. wind storm 风暴
6. ice flow 冰流,浮冰

7. Ice Age 冰期
8. well－sorted 分选良好
9. longshore drift 沿岸流，沿岸漂砂
10. beach slop 滩坡，海滩坡度
11. bed load 河流泥砂，底(负)荷，河床负载
12. dissolved load 溶解搬运物
13. zigzag current of water 锯齿形水流

Notes to the Text

1. During a large hurricane off the Mississippi River delta in 1969, several offshore oil platforms failed.

1969年，在密西西比河三角洲附近的一次大的飓风期间，几个海上石油平台遭到破坏。

off，海上距……不远处，在 …… 附近。例如：an island off the Cornish coast. 康瓦耳海岸外的一个岛。

2. Of all grain sizes, fine sand is the easiest for wind to pick up as it blows across the desert floor.

当风吹过沙漠表面时，所有粒度的颗粒中，细砂最容易被风吹起。

of all…，从所有的……之中。例如：Why ask me to help, of all people? 天下那么多人，为什么偏偏要我帮忙？

3. Glaciers are extremely powerful and carry enormous loads of sediments, with particles ranging up to boulders in size.

冰川是极其强大的，它携带巨大的沉积载荷，其颗粒大小可达巨砾。

with particles ranging up to bounders in size. 是表示伴随的独立主格结构，相当于状语从句。这类独立主格的结构是用 with＋宾语＋分词(形容词、介词短语)。例如：

He wore a shirt with the neck open, showing his bare chest.

He sat there thinking, with his head on his hand.

up to 直到，以至，达到。例：count from one up to twenty 从一数到二十。

Answer the following questions according to the text

1. What is the relationship between slump and earthflow ?
2. Why did several offshore oil platform fail off the Mississippi River dalta in 1969 ?
3. Where is that wind is effective as an erosional process only ?
4. What time is that glaciers covered up to one－third of the land area of the world ?
5. Which weathering is the most effective process in warm, humid climate ? Why ?