地质地理

## 1. Artesian spring

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| One type of natural **spring**s geographers are interested in is **artesian spring**s. | n. 泉水<br>n. 自流泉 |
| **Hiking** through the woods, some of you may have been surprised to see water flowing from an opening in the ground that was nowhere near a **stream** or river. That may have been an artesian spring. To help you understand why water might flow like this from underground, I'd like to explain the two basic conditions that are necessary for their **formation**. The first condition is that water must be contained in an **aquifer**. | n. 徒步旅行<br>n. 溪、流<br>n. 形成<br>n. 含水土层 |
| An aquifer is an underground **layer** of rock or **sediment** that has **pore**s or holes in it. And this **porous** through rock allows water to flow through it freely. | n. 层/ n. 沉淀物<br>n. 小孔<br>adj. 多孔的 |
| The aquifer must be **inclined** so that the upper **end** of it is exposed to the air at the surface of the ground. Rain water enters it through the **expose**d end and travels downward to the lower portions of the aquifer. The second condition is that above and below the aquifer there must be layers of **nonporous** rock or **clay**. | adj.倾斜、有斜坡的<br>n. 端<br>v. 暴露<br>adj. 无细孔的<br>n. 粘土 |
| These are called **aquiclude**s and they will **block** or **hinder** the flow of water. | n. 隔水层<br>v. 阻塞/ v. 阻碍 |
| Aquicludes prevent water from **drain**ing out of aquifers. So let's go back to our artesian springs. They are usually located above ground, near the lower end of inclined aquifers. Artesian springs are those places where some hole or crack **extend**s from the ground surface down through the aquiclude and into the aquifer. Now the rain water that had drained into the aquifer from its exposed upper end created a **buildup** of pressure at the lower end. So if there is a crack in the rock, a crack that runs from the aquifer to the surface, then the pressure pushes the water up through it. And water comes **trickling** out of the artesian spring. | v. 流走，排出<br>n. 延伸<br>n.组织组成，加强<br>trickle: v. 滴流，细细地流 |

## 2. Earth's interior

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| I'm glad you brought up the question of our **investigation**s into the **makeup** of the Earth's interior. In fact, since this is the topic of your reading assignment for next time, let me spend these last few minutes of class talking about it. There were several important discoveries in the early part of this century that helped geologists develop a more accurate picture of the Earth's **interior**. | n. 调查、研究<br>n. 结构<br><br><br><br><br><br>n. 内部构造 |
| The first key discovery had to do with **seismic wave**s. Remember they are the **vibration**s caused by earthquakes. Well, scientists found that they traveled thousands of miles through the Earth's interior. This finding **enable**d geologists to study the inner parts of the Earth. You see, these studies **reveal**ed that these vibrations were of two types: compression or P waves and shear or S waves. And researchers found that P waves travel through both **liquid**s and **solid**s, while S waves travel only through solid matter. In 1906, a British geologist discovered that P waves slowed down at a certain depth but kept traveling deeper. On the other hand, S waves either disappeared or were reflected back, so he concluded that the depth marked the boundary between a solid **mantle** and a liquid **core**. Three years later, another boundary was discovered that between the mantle and the Earth's **crust**. There's still a lot to be learned about the Earth. For instance, geologists know that the core is hot. Evidence of this is the **molten lava** that flows out of **volcano**es. But we're still not sure what the source of the heat is. | n. 地震波<br>n. 震动、波动<br><br>v. 使能够<br><br>v. 显示、揭示<br><br>n. 液体<br>n. 固体<br><br><br><br>n. 边界、界限<br>n. 地幔/n.地核<br><br>n. 地壳<br><br>熔岩<br>n. 火山 |

## 3. Mineral Collection

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| I'd like to begin by thanking Dr. Kane for inviting me to be here today. Although I'm not a geologist, I have been collecting **mineral**s for years. | n. 矿石、矿物 |
| My collection is really **diverse** because I've traveled all over the world to find them. Today I've brought a few **specimen**s for you to see. After I discuss each one, I'll pass it around so that you can look at it more closely. As you know, **feldspar**s are the most **abundant** minerals and are divided into a number of types. These first samples are **orthoclase**s. Notice that they **vary** in color from white to pink to red. This **glassy** one is found in volcanic rock. In fact, I found it in New Mexico on a collecting trip. This next sample that I'll pass around is a **microcline** mineral, also called **amazonstone**. You can identify it by its bright green color. It's often used in **jewelry** and really is quite attractive. These final samples are all **plagioclase** feldspars. Many plagioclases are very **rare**, so I'm particularly proud of the **variety** in my collection. I've also brought a few **slide**s of some larger mineral samples, and if you'll turn out the light now, I'd like to show them to you. | adj. 多样的不同的<br>n. 样本<br><br>n. 长石<br>adj. 丰富的充裕的<br>n. 正长石<br>v. 不一样，变化<br>Adj.像玻璃的<br><br>n. 微斜长石<br>n. 亚马逊石<br>n. 珠宝<br>n. 斜长石<br>adj.罕见的<br>n. 多样性<br>n. 幻灯片 |

## 4. Earthquake Prediction

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| Now, you've been reading articles about the **tremendous** damage done to life and **property** by earthquakes. That's why **seismologists** have been working so hard to develop methods of earthquake prediction. We can now **predict** earthquakes fairly well, but the predictions only **locate potential** areas of danger. They don't predict the specific time and location at which an earthquake is likely to **occur**. Today I want to introduce to you three **prediction model**s that have been developed. | adj. 巨大的<br>n. 财产<br>n. 地震学家<br>v. 预报<br>v. 定位在<br>adj. 可能的<br>v. 发生<br>n. 预测模式 |
| The first prediction model looks along **earthquake faults**, those cracks in the Earth's **crust**, to find what are known as **seismic** gaps. Seismic gaps are places where the fault has shown little or no seismic activity for a long time. This theory **postulate**s that such places are due for a major shock. | n. 地震断层<br>n. 地壳<br>n. 断层<br>adj. 地震的<br>v. 假定 |
| The second model relies on **phenomena**, like ground flit. Using long **cylindrical** tubes containing water, observers noted that ground **tilt** tended to occur before major earthquakes. That led them to correctly predict the big Haicheng **quake** of 1975, the first successful earthquake prediction scientists have ever made. A million people were **evacuate**d from that Chinese city before the earthquake **struck**. Unfortunately, this method hasn't worked **consistently**, so we can't say it's been perfected. | n. 现象<br>adj. 圆柱的<br>n. 倾斜、摆动<br><br>n. 地震<br><br>v. 撤离、疏散<br>v. strike. 侵袭<br>adv. 始终如一地 |
| The third model is based on the theory that major earthquakes closely follow **a series of** minor ones. Starting with the **measurements and timing** of the smaller quakes, a complex formula **calculate**s the "times of increased **probability**" of a much larger quake. Right now, this method, like the first method, cannot predict **specific** times and places, but that may change as it is further developed. For the moment, none of these models can predict with reasonable **levels of** confidence. | 一连串一系列的<br>测量和确定时间<br>v 计算出<br>n. 概率，可能性<br>adj.明确的具体的<br><br><br>程度的 |

## 5. The depth of the ocean

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| One reason **oceanographer**s analyze the **sediment** on the ocean floor is to see how long-term changes in Earth's temperature have affected the depth of the ocean. | n. 海洋学者<br>n. 沉积物 |
| By analyzing the **remains** of sea animals in old layers of ocean sediment, oceanographers can determine the depth of the ocean in the past. They've analyzed hundreds of such **layer**s, including some from the coldest periods of Earth's history—**the ice ages**. What they've found is that during the ice ages, the amount of water in the oceans **decrease**d. Water levels in the ocean **drop**ped by about four hundred feet. Water from the ocean **evaporate**d and became frozen in continental **glacier**s, so it didn't **drain** back into the ocean. When temperatures eventually **rose** again, the glaciers **melt**ed, and the oceans returned to their former depths. Analysis of **sedimentary** data indicates that periods of **glacial freezing and melting** occurred in regular cycles of twenty thousand, forty thousand, and one hundred thousand years. Oceanographers are interested in the history of **seawater level**s because they hope to use this historical data in order to predict the possible effect that **global warming** could have on seawater levels. If industrial **pollutant**s are capable of **heating** global temperatures to the point that glaciers begin to melt, it is **urgent** for us to know precisely how high sea levels will rise as a result. | n. 残余、遗体<br>n. 层<br>n. 冰川期<br>v. 下降、减少<br>v. 下降<br>v. 蒸发<br>n. 冰川/ v. 排水<br>rise:上升<br>v. 融化<br>adj. 沉积的<br>adj. 冰川的<br>冰冻与融化<br>n. 海平面<br>n. 全球变暖现象<br>n. 污染物<br>n. 加热、提高<br>adj. 急迫紧急的 |

## 6. The Great Plains

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| Look at our **topographical** map and you'll see that the middle third of the North American continent from the **Rocky Mountains** almost to the Mississippi River is pretty flat. This is the Great **Plain**s. This kind of area is sometimes called a **prairie**, sometimes a **steppe**. That's s-t-e-p-p-e. The defining features are **level terrain**, dry climate, and **an absence of trees**. | adj. 地形学的<br>落基山脉<br><br>n. 平原、草原<br>n. 大草原/大草原<br>Adj.平坦的/n.地形<br>缺少树木 |
| The Great Plains are actually the former bed of a **shallow inland sea**. Over millions of years, sediment left by glaciers, water, and wind **smooth**ed out the dry sea bed. As I said, the Great Plaints are **border**ed on the west by the Rocky Mountains. And it's really the Rockies that **are responsible for** the formation of the **grassland**s. The mountains are so high that they **block** the heavy **moist** air traveling eastward form the Pacific Ocean. Lighter, drier air passes over the mountains. Until people **intervene**d with **irrigation** and farms, only grass could grow on the dry, windy plain. In fact, we can divide the Great Plains into three zones. In the west, where it's driest and windiest, the grass is very short. In the eastern zone, there's more rain and grass grows as high as 360 centimeters. In the middle third, there's a **mix** of grass species that grow to an **intermediate** height. | adj. 浅的<br>n. 内海<br>v. 使平滑<br>v. 接壤<br>致使<br>n. 牧草地、草原<br>v. 阻塞<br>adj. 潮湿的<br>v. 干预、介入<br>n. 灌溉<br><br><br><br><br>n. 混合<br>adj. 中等的 |