

TPO 28 – 1 Groundwater 地下水

Most of the world's potable water-freshwater suitable for drinking-is accounted for by groundwater, which is stored in the pores and fractures in rocks. There is more than 50 times as much freshwater stored underground than in all the freshwater rivers and lakes at the surface. Nearly 50 percent of all groundwater is stored in the upper 1,000 meters of Earth. At greater depths within Earth, **the pressure of the overlying rock** causes pores and cracks to close, reducing the space that pore water can occupy, and almost complete closure occurs at a depth of about 10 kilometers. The greatest water storage, therefore, lies near the surface.

问题 1: 询问作者为什么提及 (**the pressure of the overlying rock**);

问题 2: 询问 groundwater 与 water in rivers and lakes 的不同之处在于哪里;

世界上绝大部分饮用水----可以饮用的淡水----都是地下水,它们储藏在岩石孔隙和裂缝中。储藏在地下的淡水是地表淡水河流和湖泊中总水量的 50 倍。大约 50%的地下水存在于地下深 1000m 以内的地层中。随深度增加,上覆岩层压力使岩石孔隙和裂缝闭合,减少了水的储存空间,而超过 10 公里深的地下孔隙几乎全部闭合。因此绝大部分水储存于接近地表的地层中。

整段&前 4 句【多选题】

Groundwater is stored in a variety of rock types. A groundwater reservoir from which water can be **extracted** is called an aquifer. We can effectively think of an aquifer as a deposit of water. Extraction of water depends on two properties of the aquifer: porosity and permeability. Between sediment materials (such as sand or small rocks) that are deposited by water, wind, or glacial ice grains are spaces that can be filled with water. This pore space is known as porosity and is expressed as a percentage of the total rock volume. Porosity is important for water-storage capacity, but for water to flow through rocks, the pore spaces must be connected. The ability of water, or other fluids, to flow through the interconnected pore spaces in rocks is **termed** permeability. Fractures and joints have very high permeability. In the intergranular spaces of rocks, however, fluid must flow around and between grains in a tortuous path; this winding path causes a resistance to flow. The rate at which the flowing water overcomes this resistance is related to the permeability of rock.

问题 3: 询问单词意思 (**extracted**);

问题 4: 询问单词意思 (**termed**);

问题 5: 询问 porosity 决定了什么;

问题 6: 询问 porosity 和 permeability 之间的关系;

地层水储存在多种岩石中。可以取出的地下水的聚集层叫做含水层。我们可以认为含水层即水的聚集地层。从地层中取水取决于水层的两个因素:孔隙度和渗透率。沉积颗粒之间的空间可以储存水,这种孔隙空间由孔隙度表征。孔隙度是岩石孔隙体积与总体积的百分比。孔隙度对地层储水能力尤为重要,但欲使水从岩石中流出,孔隙之间必须相互连通。水或其它流体从相互连通的孔隙中流动的能力即为渗透率。裂隙和节理具有很高的渗透率。在岩石的粒间空隙中,流体必须在颗粒周围的曲折通道中流动;这种曲折通道会对流动产生阻力。水克服阻力流动的速率与岩石渗透率相关。

第3句【多选题】

Sediment sorting and compaction influence permeability and porosity. The more poorly sorted or the more tightly **compacted** a sediment is, the lower its porosity and permeability. Sedimentary rocks-the most common rock type near the surface-are also the most common reservoirs for water because they contain the most space that can be filled with water. Sandstones generally make good aquifers, while finer-grained mudstones are typically impermeable. Impermeable rocks are referred to as aquicludes. **Igneous and metamorphic rocks** are more compact, commonly crystalline, and rarely contain spaces between grains. However, even **igneous and metamorphic rocks** may act as groundwater reservoirs if extensive fracturing occurs in such rocks and if the fracture system is interconnected.

问题 7: 询问单词意思 (**compacted**);

问题 8: 询问 (**igneous and metamorphic rocks**) 什么时候可以成为 aquifer;

沉积物的分选性和压实程度影响其渗透率和孔隙度。岩石分选越差或压实越紧则其孔隙度和渗透率越低。沉积岩----地表最常见的岩石----也是最常见的水储集层,因为它们常带有最多的可以储水的孔隙空间。砂岩一般是最好的储水层,但小颗粒的泥岩则通常不可渗透。不渗透岩层都称为隔水层。火成岩和变质岩压实更紧,通常有结晶,并几乎没有粒间孔隙。但是即便是火成岩和变质岩也可因裂缝大量发育并相互连接而成为储水层。

整段【多选题】

The water table is the underground boundary below which all the cracks and pores are filled with water. **In some cases,** the water table reaches Earth's surface, where it is expressed as rivers, lakes, and marshes. **【】** Typically, though, the water table may be tens or hundreds of meters below the surface. **【】** The water table is not flat but usually follows the contours of the topographythe shape of a surface such as Earth's, including the rise and fall of such features as mountains and valleys . **【】** Above the water table is the vadose zone, through which rainwater percolates. **【】** Water in the vadose zone drains down to the water table, leaving behind a thin **coating** of water on mineral grains. The vadose zone supplies **plant roots** near the surface with water.

问题 9: 询问单词意思 (**coating**);

问题 10: 询问 plant roots 的 implies;

问题 13: 插入语的位置→ **【】**;

地下水位指地层岩石裂缝和孔隙充满水的上部边界。某些情况下,地下水位可能到达地表,在那里它以河流、湖泊或沼泽地的形式存在。但通常情况下地下水位位于地面数十或数百米以下。地下水位不是水平的,而是通常沿着地势起伏,包括山脉和山谷等地貌等起伏。地下水位以上称为包气带,在这里降水得以过滤。包气带中的水会沉降到地下水位,只在矿物颗粒表面留下一层水膜。包气带为地表附近植物根部提供水分。

整段&倒数第2句【多选题】

Because the surface of the water table is not flat but instead rises and falls with topography, groundwater is affected by gravity in the same fashion as surface water. Groundwater flows downhill to topographic lows. If the water table intersects the land surface, groundwater will flow out onto the surface at springs, either to be collected there or to subsequently flow farther

along a drainage. Groundwater commonly collects in stream drainages but may remain entirely beneath the surface of dry stream-beds in arid regions. In particularly wet years, short stretches of an otherwise dry stream-bed may have flowing water because the water table rises to intersect the land surface.

问题 12: 询问 level of water 暗示着什么:

因为地下水位表面并非水平，而是沿着地势起伏，地下水和地表水受到重力影响的模式相同。地下水沿着下倾地层流向地势低洼处。如果地下水位与地表相交，地下水将以喷泉的形式流出地面，要么就地聚集，要么沿排水通道流向更远的地方。地下水通常在小溪中聚集，但在干旱地区也可能全部停留在干涸河床下。在特定湿润的年月里，一段干涸的河床下游可能有水流动，因为地下水位抬升到了那里的地表以上。

TPO 28 – 2 Early Saharan Pastoralists
早期的撒哈拉沙漠的牧民

最后 1 句【多选题】

The Sahara is a highly diverse, **albeit** dry, region that has undergone major climatic changes since 10,000 B.C. As recently as 6000 B.C., the southern frontier of the desert was far to the north of where it is now, while semiarid grassland and shallow freshwater lakes covered much of what are now arid plains. This was a landscape where antelope of all kinds abounded—along with *Bos primigenius*, a kind of oxen that has become extinct. The areas that are now desert were, like all **arid regions**, very susceptible to cycles of higher and lower levels of rainfall, resulting in major, sudden changes in distributions of plants and animals. The people who hunted the sparse desert animals responded to drought by managing the wild resources they hunted and gathered, especially wild oxen, which had to have regular water supplies to survive.

问题 1: 询问公元前 6000 年的时候, Saharan region 的描述;

问题 2: 询问单词意思 (**albeit**); though

问题 3: 询问关于 **arid regions** 的陈述;

albeit

英 [ˌɔ:l'bi:t] 美 [ˌɔ:l'bi:t]

conj. 虽然, 尽管

尽管干旱, 撒哈拉是高度多样化的地区, 并自公元前 10,000 年前开始已经历了数次重大气候变迁。直到公元前 6,000 年前, 沙漠的南部边界比现在的位置要靠北很多, 那时半干旱的草原和浅淡水湖泊覆盖了现在干旱的平原。这里曾经是各种羚羊和一种已灭绝的野牛出没的地方。现在的沙漠地区, 像所有干旱地区一样, 对降雨量的变化周期极为敏感, 因而其动植物的分布变化巨大且迅速。依靠捕食稀少的沙漠动物的居民对待干旱的方式是管理他们捕捉和收集到的野生资源, 尤其是需要可靠水源维持生命的野牛。

最后几句【多选题】

Even before the drought, the Sahara was never well watered. Both humans and animals were constantly on the move, in search of food and reliable water supplies. Under these circumstances, archaeologist Andrew Smith believes, the small herds of *Bos primigenius* in the desert became smaller, more closely knit breeding units **as the drought took hold**. The beasts were more disciplined, so that it was easier for hunters to predict their habits, and capture animals at will. At the same time, both cattle and humans were more confined in their movements, staying much closer to permanent water supplies for long periods of time. As a result, **cattle and humans came into close association**.

问题 4: 询问 wild oxen 相关的观点 (**as the drought took hold**);

问题 5: 询问 **what** 把 cattle 和 humans 的联系更加紧密的;

甚至在干旱之前, 撒哈拉地区也从未有充足的水分。人类和野生动物都不停的迁徙, 以寻找食物和可靠的水源。在这些情况下, 考古学家 Andrew Smith 认为随着干旱的持续, 沙漠中野牛群会变成更小, 组织更紧密的族群。兽群变得更加温顺, 因此猎人更容易预测他们的习性并随意抓捕。同时, 牲畜和人类的行动范围进一步靠近, 在固定水源附近长期更亲近地共

处。结果牲畜和人类形成了紧密的联合。

整段【多选题】

Smith believes that the hunters were well aware of the more disciplined ways in which their prey behaved. 【】 Instead of following the cattle on their annual migrations, the hunters began to prevent the herd from moving from one spot to another. 【】 At first, they controlled the movement of the herd while ensuring continuance of their meat diet. 【】 But soon they also gained genetic control of the animals, which led to rapid physical changes in the herd. 【】 South African farmers who maintain herds of wild eland (large African antelopes with short, twisted horns) report that the offspring soon diminish in size, unless wild bulls are introduced constantly from outside. The same effects of inbreeding may have occurred in controlled cattle populations, with some additional, and perhaps unrecognized, advantages. The newly domesticated animals behaved better, were easier to control, and may have enjoyed a higher birth rate, which in turn yielded greater milk supplies. We know from rock paintings deep in the Sahara that the herders were soon selecting breeding animals to produce offspring with different horn shapes and hide colors.

问题 6: 询问作者为什么提 (rock paintings deep in the Sahara);

问题 7: 询问新的家养动物的陈述, 哪一个不是真的; 【Except】

问题 13: 插入语的位置 → 【】:

Smith 相信猎人对猎物更加温顺的行为了然于胸。猎人们不再跟随牲畜进行每年一度的迁徙而是开始阻止兽群从一地到另一地的迁移。起初他们控制兽群的迁移以获得持续的肉食来源。但很快他们能够在遗传上控制动物, 使得兽群的体征迅速变化。南非牧养大羚羊(一种体型较大的非洲羚羊, 它们的角短且扭曲)的农民说如果不持续从野外引进公羚羊则其后代体型迅速变小。近亲繁殖的影响同样发生在控制的牲畜族群上, 带来某些额外的可能并未认清的优势。最新驯化的动物更易控制, 出生率也更高, 而反过来也会提供更多奶源。我们从撒哈拉腹地的岩石绘画可知牧民很快就选择一些动物进行繁殖以产生不同角形状和不同颜色兽皮的后代。

It is still unclear whether domesticated cattle were tamed independently in northern Africa or introduced to the continent from Southwest Asia. Whatever the source of the original tamed herds might have been, it seems entirely likely that much the same process of juxtaposition (living side by side) and control occurred in both Southwest Asia and northern Africa, and even in Europe, among peoples who had an intimate knowledge of the behavior of wild cattle. The experiments with domestication probably occurred in many places, as people living in ever-drier environments cast around for more predictable food supplies.

问题 8: 等价替换语句 (Sentences = which of the CHOICES)

我们仍无法知道牛是在北非独立驯化的还是从西南亚引入的。不管驯化的兽群起源何处, 西南亚和北非, 甚至是欧洲的那些对野生骆驼的行为了然于胸的人们都可能经过了同样的和他们的要驯化的动物毗邻而居并逐渐控制它们的过程。随着人们居住环境不断干燥和食物供给的可预测性更强, 驯化的尝试很可能发生在很多地方。

The cattle herders had only a few possessions: unsophisticated pots and polished adzes (cutting tools with blades set at right angles to the handle). They also hunted with bow and arrow. The Saharan people left a remarkable record of their lives painted on the walls of

caves deep in the desert. Their artistic **endeavors** have been preserved in paintings of wild animals, cattle, goats, humans, and scenes of daily life that extend back perhaps to 5000 B.C. The widespread distribution of pastoral sites of this period suggests that the Saharans ranged their herds over widely separated summer and winter grazing grounds.

问题 9: 询问 Saharan 的 people 不对的陈述: 【Except】

问题 10: 询问单词意思 (**endeavors**);

牧牛人的财产很少: 一些并不精致的罐子和磨光的斧子(锋刃安装在手柄垂直角度的砍伐工具)。他们也利用弓箭捕猎。撒哈拉人在撒哈拉腹地洞穴的墙壁上留下了很重要的关于他们生活的记录。他们的艺术创作保存了大量关于野生动物、牛、山羊、人类及其日常生活的各种场景的绘画。这些场景可能追溯到公元前 5,000 年前。这一时期田园画古迹的广泛分布表明撒哈拉人曾在广泛且独立的牧场上放牧。

整段【多选题】

About 3,500 B.C., climatic conditions again **deteriorated**. The Sahara slowly became drier and lakes vanished. On the other hand, rainfall increased in the interior of western Africa, and the northern limit of the tsetse fly, an insect fatal to cattle, moved south. **So the herders shifted south**, following the major river systems into savanna regions. By this time, the Saharan people were probably using domestic crops, experimenting with such summer rainfall crops as sorghum and millet as they **moved out of areas** where they could grow wheat, barley, and other Mediterranean crops.

问题 11: 询问单词意思 (**deteriorated**);

问题 12: 询问 what 使得 herders 可以 shift into savanna regions: 【争议】

大约公元前 3,500 年, 气候条件又一次恶化。撒哈拉沙漠渐渐地更加干旱, 湖泊相继干涸。另外, 西非内陆降雨增加, 并且舌蝇, 一种对牛群致命的昆虫, 的北部边界向南移动。所以骆驼牧民也追随大平原区域的主要河流系统向南迁徙。此时, 随着撒哈拉人从原本可以种植小麦、大麦和其它一些地中海农作物的区域中迁出, 他们可能依靠当地的农作物, 例如像高粱和小米一类的依靠夏季降雨的作物。

TPO 28 – 3 Buck Rubs and Buck Scrapes
巴克摩擦，巴克刮

A **conspicuous** sign indicating the presence of white-tailed deer in a woodlot is a buck rub. 【】 A male deer makes a buck rub by stripping the bark (outer layer) of a small tree with its antlers. 【】 When completed, the buck rub is an obvious visual signal to us and presumably to other deer in the area. 【】 A rub is usually located at the shoulder height of a deer (one meter or less above the ground) on a smooth-barked, small-diameter (16–25 millimeters) tree. 【】 The smooth bark of small red maples makes this **species ideal for** buck rubs in the forests of the mid-eastern United States.

问题 1: 询问单词意思 (**conspicuous**);

问题 2: 询问 why (**species ideal for buck rubs**); 【关注句子主要成分：主、谓、宾】

问题 13: 插入语的位置 → 【】;

一个表示白尾鹿在小树林中存在的显著标志是雄鹿擦痕。雄鹿利用鹿角剥除小树的树皮以制造雄鹿擦痕。完工后，雄鹿擦痕对我们来说是一道明显的标志，对当地的其它鹿来说也可能如此。擦痕常与鹿肩齐高（距地面一米或不到一米），并位于树皮光滑、树径较细（16-25cm）的树上。美国中东部森林中的树皮光滑的红色小枫树是雄鹿擦痕的理想树种。

整段【多选题】

Adult male deer usually produce rubs in late summer or early autumn when the outer velvet layer is being shed from their antlers. Rubs are created about one to two months before the breeding season (the rut). Hence for a long time biologists believed that male deer used buck rubs not only to clean and polish antlers but also to provide practice for the ensuing male-to-male combat during the rut. However, biologists also noted that deer sniff and lick an unfamiliar rub, which suggests that this visual mark on a small tree plays an important communication purpose in the social life of deer.

成年雄鹿通常在夏末或秋初当它们的鹿茸上的外皮脱落时制造擦痕。雄鹿差不多在它们交配期（发情期）的前一到两个月制造擦痕。因此长期以来，生物学家们认为雄鹿擦痕不仅可以清除并磨光鹿茸，还可以借此练习发情期时雄鹿之间的角斗。然而，生物学家们也认识到鹿会嗅和舔舐陌生的擦痕，这表明这种小树上的视觉记号在鹿群社会生活中起到重要的交流目的。

整段【多选题】

Buck rubs also have a scent produced by glands in the foreheads of deer that is transferred to the tree when the rub is made. These odors make buck rubs an important means of olfactory communication between deer. The importance of olfactory communication (using odors to communicate) in the way of life of deer was documented by a study of captive adult mule deer a few decades ago, which noted that males rubbed their foreheads on branches and twigs, especially as autumn approached. A decade later another study reported that adult male white-tailed deer **exhibited** forehead rubbing just before and during the rut. It was found that when a white-tailed buck makes a rub, it moves both antlers and forehead glands along the small tree in a vertical direction. This forehead rubbing behavior coincides with a high level of glandular activity in the modified scent glands found on the foreheads of male deer;

the glandular activity causes the forehead pelage (hairy covering) of adult males to be distinctly darker than in females or younger males.

问题 3: 询问 study show what (forehead rubbing by deer);

问题 4: 询问单词意思 (exhibited);

雄鹿擦痕都有一种由雄鹿前额上的腺体分泌的气味，它在制造擦痕时涂抹到树上。这些气味使得雄鹿擦痕成为鹿与鹿之间重要的嗅觉交流方式。嗅觉交流（利用气味交流）在鹿群生活中的重要性可以通过几十年前一项对圈禁的雄鹿的研究得以印证。研究发现，特别是当秋天将近时，雄鹿就将其前额在树枝上蹭来蹭去。十年后的另一项研究发现成年雄性白尾鹿在其发情期或发情期前会摩擦其前额。当白尾鹿制造擦痕时，它将其鹿茸和前额腺体在小树上垂直磨蹭。这种前额的磨蹭行为和雄鹿前额上散发气味的腺体的异常活跃一致。该腺体活动导致成年雄鹿的前额皮毛比雌鹿或未成年鹿的暗很多。

整段【多选题】

Forehead rubbing by male deer on buck rubs presumably sends a great deal of information to other members of the same species. First, the chemicals deposited on the rub provide information on the individual identity of an animal; no two mammals produce the same scent. For instance, as we all know, **dogs recognize each other via smell**. Second, because only male deer rub, the buck rub and its associated chemicals indicate the sex of the deer producing the rub. Third, older, more dominant bucks produce more buck rubs and probably deposit more glandular secretions on a given rub. Thus, the presence of many well-marked rubs is indicative of older, higher-status males being in the general vicinity rather than simply being a **crude** measure of relative deer abundance in a given area. The information conveyed by the olfactory signals on a buck rub make it the social equivalent of some auditory signals in other deer species, such as **trumpeting by bull elk**.

问题 5: 询问为什么提到 (**dogs recognize each other via smell**); 【定位关键词，找观点】

问题 6: 询问单词意思 (**crude**);

问题 7: 询问关于 (**trumpeting by bull elk**) 的 inference; 【定位关键词，找信息】

问题 8: 询问给定区域出现了 buck rubs 揭露了什么信息; 【Except】

雄鹿前额在擦痕上的摩擦很可能向同类中的其它成员发出了大量信息。首先擦痕上残留的化学物质提供了一只动物的个体信息。没有两只气味相同的哺乳动物。就如我们熟知的那样，狗就是通过气味区别彼此的。第二，因为只有雄鹿制造擦痕，所以擦痕及其携带的化学物质表示了制造擦痕的鹿的性别信息。第三，年龄更大、更具统治地位的雄鹿制造的擦痕更多，而且其分泌在特定擦痕上的气味分泌物很可能也更多。因此大量的标记得很好的擦痕的出现表明年龄较大、地位较高的雄鹿就在附近，而不仅仅是粗略的说明了该区域鹿群的相对丰度。雄鹿擦痕上的气味记号所携带的信息使它成为与其它种类鹿群中的某些声音信号，比如雄性麋鹿的叫声，同等重要。

整段【多选题】

Because both sexes of whitetails respond to buck rubs by smelling and licking them, rubs may serve a very important additional function. Fresher buck rubs (less than two days old), in particular, are visited more frequently by adult females than older rubs. In view of this behavior it has been suggested that chemicals present in fresh buck rubs may help

physiologically **induce** and synchronize fertility in females that visit these rubs. This would be an obvious advantage to wide-ranging deer, especially to a when courting several adult females during the autumn rut. Another visual signal produced by white-tailed deer is **termed** a buck scrape. Scrapes consist of a clearing (about 0.5 meter in diameter) and shallow depression made by pushing aside the leaves covering the ground; after making the scrape, the deer typically urinates in the depression. Thus, like a buck rub, a scrape is both a visual and an olfactory signal. Buck scrapes are generally created after leaf-fall in autumn, which is just before or during the rut. Scrapes are usually placed in open or conspicuous places, such as along a deer trail. Most are made by older males, although females and younger males (2.5 years old or less) occasionally make scrapes.

问题 9: 询问单词意思 (**induce**);

问题 10: 询问关于 **chemicals** 的陈述正确的选项;

问题 11: 询问单词意思 (**termed**);

问题 12: 询问 **buck rubs** 与 **buck scrapes** 的区别;

因为雄性和雌性白尾鹿都会嗅和舔舐雄鹿擦痕,所以这些擦痕还有一个重要的功能。特别的,新鲜擦痕(两天以内制造的)要比更久远的擦痕受到更多关注。这种行为表明新鲜擦痕上的化学物质可能有助于从生理上诱导并协调关注这些擦痕的雌鹿的繁殖力。这对分布广泛的鹿群显然是一个有利条件,尤其对秋天发情期中一只处于较高社会统治地位的同时向几只成年雌鹿求爱的雄鹿而言。由白尾鹿制造的另一种视觉记号叫做雄鹿窝。雄鹿窝是一个通过将地面上的树叶推开而产生的干净而较浅的低坑(直径约 0.5m)。雄鹿窝制造完成后,鹿通常会在低坑里小便。因此,像雄鹿擦痕一样,雄鹿窝既是视觉上的也是嗅觉上的记号。雄鹿窝通常在秋天树叶落下后,雄鹿发情期间或之前出现。雄鹿窝常位于开阔或显眼的位置,比如沿着鹿的行动路线。绝大部分雄鹿窝由年龄更大的雄鹿制造,但有些雌鹿和年轻雄鹿(2.5年或更年轻)偶尔也制造雄鹿窝。