

TPO 4 – 1 Deer Populations of the Puget Sound 普吉特海湾的鹿群

Two species of deer have been **prevalent** in the Puget Sound area of Washington State in the Pacific Northwest of the United States. The black-tailed deer, a lowland, west-side cousin of the mule deer of eastern Washington, is now the most common. The other species, the Columbian white-tailed deer, in earlier times was common in the open prairie country; it is now restricted to the low, marshy islands and flood plains along the lower Columbia River. 在太平洋西北区的美国华盛顿州，有两种鹿在普吉特海湾非常**普遍**。最常见的黑尾鹿是华盛顿东部杂交鹿在西部的表亲，它们生活在低地。另一种哥伦比亚白尾鹿，从前在开阔的草原上很常见，而现在只能在低矮的沼泽岛屿地带和哥伦比亚河下游的河滩地区才能看到它们。

Nearly any kind of plant of the forest understory can be part of a deer's diet. Where the forest **inhibits** the growth of grass and other meadow plants, the black-tailed deer **browses on** huckleberry, salal, dogwood, and almost any other shrub or herb. But **this is fair-weather feeding**. What keeps the black-tailed deer alive in the harsher seasons of plant decay and dormancy? One compensation for not hibernating is the built-in urge to migrate. Deer may move from high-elevation browse areas in summer down to the lowland areas in late fall. Even with snow on the ground, the high bushy understory is exposed; also snow and wind **bring down** leafy branches of cedar, hemlock, red alder, and other arboreal fodder. 森林里，几乎任何植物都是鹿的食物。在森林**抑制**草和其它草甸植物生长的地方，黑尾鹿可以吃越橘、北美白珠树、山茱萸和其他几乎所有灌木和草；但**这些只能在好天气里才能吃得到**；在植物衰败、隐匿的严寒季节，黑尾鹿们是如何过冬的呢？避免冬眠的一种方法就是天生的迁徙习性。它们会在夏天迁徙到高海拔觅食区，直到秋天结束再回到低地。即便地面还有残雪，高的灌木也会露出来；风雪天气会**把雪松、铁杉、红桤木和其它乔木多叶的树枝带下来**。

The numbers of deer have fluctuated markedly since the entry of Europeans into Puget Sound country. **The early explorers and settlers told of abundant deer in the early 1800s and yet almost in the same breath bemoaned the lack of this succulent game animal.** Famous explorers of the north American frontier, Lewis and Clark arrived at the mouth of the Columbia River on November 14, 1805, in nearly starved circumstances. They had experienced great difficulty finding game west of the Rockies and not until the second of December did they kill their first elk. To keep 40 people alive that winter, they consumed approximately 150 elk and 20 deer. And when game moved out of the lowlands in early spring, the expedition decided to return east rather than face possible starvation. Later on in the early years of the nineteenth century, when Fort Vancouver became the headquarters of the Hudson's Bay Company, deer populations continued to fluctuate. David Douglas, Scottish botanical explorer of the 1830s, found a disturbing change in the animal life around the fort during the period between his first visit in 1825 and his final contact with the fort in 1832. A recent Douglas biographer states: "The deer which once picturesquely dotted the meadows around the fort were gone in 1832, hunted to extermination in order to protect the crops."

自从欧洲人进入了普吉特海湾，鹿群的数量发生了显著的变化。早期的探险家和殖民者说起在 19 世纪早期那儿有大量的鹿群，与此同时惋惜现在这种诱人动物的稀少。著名的北美探险先驱者刘易斯和克拉克在落基山西部经历种种困难，并且直到第二年 12 月他们才杀死了第一只麋鹿。为了让 40 人在冬天里存活，他们消耗了 150 只麋鹿和 20 只小鹿。当猎物在早春时期迁徙出了低地，远征队决定返回东部而不是去面对潜在的饥饿。此后在 19 世纪最初几年里，温哥华堡成为哈德逊湾公司的总部，鹿的数量持续波动。19 世纪 30 年代，苏格兰植物学探险家大卫·道格拉斯发现了他在 1825 年第一次的探访和 1832 年的最后接触之间出现在温哥华堡附近令人不安的变化。在道格拉斯近期的传记中陈述到：在 1832 年曾经如画般点缀在温哥华堡附近草地上的鹿群已经消失了，为了保护农作物猎杀致灭绝。

Reduction in numbers of game should have boded ill for their survival in later times. A worsening of the plight of deer was to be expected as settlers encroached on the land, logging, burning, and clearing, eventually replacing a wilderness landscape with roads, cities, towns, and factories. No doubt the numbers of deer declined still further. Recall the fate of the Columbian white-tailed deer, now in a protected status. But for the black-tailed deer, human pressure has had just the opposite effect. Wildlife zoologist Helmut Buechner(1953), in reviewing the nature of biotic changes in Washington through recorded time, says that "since the early 1940s, the state has had more deer than at any other time in its history, the winter population fluctuating around approximately 320,000 deer (mule and black-tailed deer), which will yield about 65,000 of either sex and any age annually for an indefinite period."

鹿群数量的减少预示了它们今后生存的艰辛。当殖民者入侵它们的领地时，人类在它们生活的土地上进行采伐、焚烧，清除障碍，最终将公路、城市、城镇和工厂代替了荒野风景。毋庸置疑，鹿群的数量进一步减少。回想起来，哥伦比亚白尾鹿的命运，现在已经处于被保护地位。而对黑尾鹿来说，人类的压力反而产生了相反的效果。野生动物学家赫尔穆特·布希纳（1953）通过已有记录评论了华盛顿地区生物的自然变化，他说：“20 世纪 40 年代早期，美国拥有比以往任何历史时期都多的鹿群，鹿群冬季的数量在接近 32 万只鹿（杂交和黑尾鹿）左右波动，在此之后的每一年不同年龄段的公鹿和母鹿数量分别会增加至 65 000 只。

The causes of this population rebound are consequences of other human actions. First, the major predators of deer-wolves, cougar, and lynx-have been greatly reduced in numbers. Second, conservation has been insured by limiting times for and types of hunting. But the most profound reason for the restoration of high population numbers has been the fate of the forests. Great tracts of lowland country deforested by logging, fire, or both have become ideal feeding grounds of deer. In addition to finding an increase of suitable browse, like huckleberry and vine maple, Arthur Einarsen, longtime game biologist in the Pacific Northwest, found quality of browse in the open areas to be substantially more nutritive. The protein content of shade-grown vegetation, for example, was much lower than that for plants grown in clearings. 这种鹿群数量的反弹是由于人类其他活动造成。首先，狼、美洲豹和山猫等鹿群的主要猎食者急剧减少。其次，通过限制捕猎时间和捕猎种类来保护鹿群。但鹿群数量恢复的主要原因在于森林减少。大部分的低地的树木被砍伐、焚烧，进而成为了鹿群理想的生活场地。以便他们去

寻找更适合的嫩叶，比如越橘类和枫叶。太平洋西北的生物学家亚瑟·埃纳森还发现在空旷地区的高质量的嫩叶**大部分**都是很**有营养的**，就像在遮蔽中生长的植物，他们所包含的蛋白质比那些在空旷地区生长的植物的蛋白质低得多。

TPO 4 – 2 Cave Art in Europe 欧洲的岩洞艺术

The earliest discovered traces of art are beads and carvings, and then paintings, from sites dating back to the Upper Paleolithic period. We might expect that early artistic efforts would be crude, but the cave paintings of Spain and southern France show a marked degree of skill. So do the naturalistic paintings on slabs of stone excavated in southern Africa. Some of those slabs appear to have been painted as much as 28,000 years ago, which suggests that painting in Africa is as old as painting in Europe. But painting may be even older than that. The early Australians may have painted on the walls of rock shelters and cliff faces at least 30,000 years ago, and maybe as much as 60,000 years ago.

迄今为止，发现的最早的并且有迹可寻的工艺品是珠链和雕刻，然后还有绘画，人类在旧石器时代晚期的遗址上发现了它们。虽然我们可能会认为早期的艺术成就都是不成熟的，但西班牙与法国南部的岩洞画显示出了高超的技艺，在非洲南部发掘出的自然石板画也是如此。其中的一些石板画看上去像是在 28 000 年前画出的，这表明非洲绘画与欧洲绘画一样时间久远，但可能更早些。至少 30 000 年前，也可能追溯至 60 000 年前，早期澳大利亚人就已经在岩石遮蔽的墙上和悬崖断面上作画了。

The researchers Peter Ucko and Andree Rosenfeld identified three principal locations of paintings in the caves of western Europe: (1) in obviously inhabited rock shelters and cave entrances; (2) in galleries immediately off the inhabited areas of caves; and (3) in the inner reaches of caves, whose difficulty of access has been interpreted by some as a sign that magical-religious activities were performed there.

研究人员彼特·阿寇 和安德烈·罗森菲尔德指出西欧洞画的三个主要地点：（1）在明显有遮蔽可供人类居住的岩石和洞穴入口处，（2）在居住的洞穴一出门的走廊上，（3）在洞穴所能及的最深处，有人认为之所以在最深处作画是因为当时的人们曾在这里进行神秘的宗教活动。

The subjects of the paintings are mostly animals. The paintings rest on bare walls, with no backdrops or environmental trappings. "Perhaps, like many contemporary peoples, Upper Paleolithic men and women believed that the drawing of a human image could cause death or injury, and if that were indeed their belief, it might explain why human figures are rarely depicted in cave art." Another explanation for the focus on animals might be that these people sought to improve their luck at hunting. This theory is suggested by evidence of chips in the painted figures, perhaps made by spears thrown at the drawings. But if improving their hunting luck was the chief motivation for the paintings, it is difficult to explain why only a few show signs of having been speared. Perhaps the paintings were inspired by the need to increase the supply of animals. Cave art seems to have reached a peak toward the end of the Upper Paleolithic period, when the herds of game were decreasing.

这些绘画的主题大部分都是动物。这些画画在裸露的岩石上，没有任何背景和环境装饰。或许，同许多当代人一样，后石器时代的人们也相信画人物像会引起伤害或死亡。如果这确实是他们的信念，那就解释了为什么在洞穴绘画中很少描绘人物。对于画中以动物题材为主的另一个解释是，人们在探索如何提高打猎的命中率。墙上所画的动物身上有一些伤口，很可能是原始人

向它们扔矛时留下的，这个证据也证实了以上判断。但如果提高打猎命中率真的是岩壁画的主要动机，那么就很难解释为什么只有少数画上有被矛戳过的痕迹。或许是出于增加猎物的需求而画的画。在后期旧石器时代猎群数量减少时，岩洞画艺术似乎达到了顶峰。

The particular **symbolic significance** of the cave paintings in southwestern France is more explicitly revealed, perhaps, by the results of a study conducted by researchers Patricia Rice and Ann Paterson. The data they present suggest that the animals portrayed in the cave paintings were mostly the ones that the painters preferred for meat and for materials such as hides. For example, wild cattle (bovines) and horses are portrayed more often than we would expect by chance, probably because they were larger and heavier (meatier) than other animals in the environment. In addition, the paintings mostly portray animals that the painters may have feared the most because of their size, speed, natural weapons such as tusks and horns, and the unpredictability of their behavior. That is, mammoths, bovines, and horses are portrayed more often than deer and reindeer. **Thus, the paintings are consistent with the idea that the art is related to the importance of hunting in the economy of Upper Paleolithic people.** Consistent with this idea, according to the investigators, is the fact that the art of the cultural period that followed the Upper Paleolithic also seems to reflect how people got their food. But in that period, when getting food no longer depended on hunting large game animals (because they were becoming extinct), the art ceased to focus on portrayals of animals.

也许研究者帕特丽夏·赖斯和安·派特森所做研究的结果更清楚地揭示了法国西南部的岩洞画的特殊**象征性意义**。研究显示，绘画者喜欢食用的动物或喜欢用作兽皮的动物是岩洞画中经常被描绘的动物。比如，野牛（牛）和马的出现比我们预料的更为频繁，可能因为它们比其它动物更大更沉（肉更多）。另外，画作中主要描绘了绘画者害怕的动物，它们的体形、速度、与生俱来的武器如长牙和角，以及它们行为的不可预知性都令绘画者感到恐惧。于是，和鹿、驯鹿相比，猛犸、牛和马会更经常画在墙上。**因此，在旧石器时代晚期的人的经济中，岩洞艺术与打猎的重要性有关，这些画作也与这个观点相符合。**看起来旧石器时代晚期的文化期的艺术也反映了人们如何得到食物，根据调查者的研究，这一事实也与前文的想法一致。但在那个时期，当不再依靠猎取大型猎物获得食物时（因为它们开始变得稀少），岩洞艺术便不再以描绘动物为主了。

Upper Paleolithic art was not confined to cave paintings. Many shafts of spears and similar objects were decorated with figures of animals. The anthropologist Alexander Marshack has an interesting interpretation of some of the engravings made during the Upper Paleolithic. He believes that as far back as 30,000 B.C., hunters may have used a system of notation, engraved on bone and stone, to **mark phases of the Moon**. If this is true, it would mean that Upper Paleolithic people were capable of complex thought and were consciously aware of their environment. In addition to other artworks, **figurines representing the human female in exaggerated form have also been found at Upper Paleolithic sites**. It has been suggested that these figurines were an ideal type or an expression of a desire for fertility.

旧石器时代晚期的艺术不仅仅局限于洞穴绘画。许多矛杆和类似的东西上都画了动物作为装饰。人类学家亚历山大·马斯哈克对旧石器时代晚期的一些雕刻品有一个有趣的解释。他认为在公元前 30 000 年，猎人们可能使用了一种刻在骨头或石头上的标志法来**标记不同的月相**。如果

此论述是真的,这就意味着旧石器时代晚期的人们已经有了复杂的思维并对他们的环境有了一个理性的认识。人们还在旧石器时代晚期的遗址上发现了以夸张的形式描绘妇女的小雕塑。这也暗示了这些小雕塑是一种理想形象或者说表达了当时的人类期望多生育的愿望。

TPO 4 – 3 Petroleum Resources

石油资源

Petroleum, consisting of crude oil and natural gas, seems to originate from organic matter in marine sediment. Microscopic organisms settle to the seafloor and accumulate in marine mud. The organic matter may partially decompose, using up the dissolved oxygen in the sediment. As soon as the oxygen is gone, decay stops and the remaining organic matter is preserved. 石油是由原油和天然气组成，似乎都源自于海洋的有机物沉淀。微小的有机物沉积到海底并堆积在海泥里，有机物会局部分解，消耗沉淀里的溶解氧，当氧气消耗殆尽分解便停止，留下剩余的有机物。

Continued sedimentation—the process of deposits' settling on the sea bottom—buries the organic matter and subjects it to higher temperatures and pressures, which convert the organic matter to oil and gas. As muddy sediments are pressed together, the gas and small droplets of oil may be squeezed out of the mud and may move into sandy layers nearby. Over long periods of time (millions of years), accumulations of gas and oil can collect in the sandy layers. Both oil and gas are less dense than water, so they generally tend to rise upward through water-saturated rock and sediment.

持续的沉积——堆积物沉积到海底的过程将有机物埋藏于海底，使之受到海底温度、高压的影响，最终转变成石油和天然气。当泥状沉积物被挤压在一起时，天然气和石油液滴会被挤出泥层，然后进入附近的沙层。经过很长的一个周期（数百万年），积聚的天然气和石油会在沙层中聚集。因为石油和天然气的密度都比水低，所以他们通常通过富含水的岩层和沉积物往上升。

Oil pools are valuable underground accumulations of oil, and oil fields are regions underlain by one or more oil pools. When an oil pool or field has been discovered, wells are drilled into the ground. Permanent towers, called derricks, used to be built to handle the long sections of drilling pipe. Now portable drilling machines are set up and are then dismantled and removed. When the well reaches a pool, oil usually rises up the well because of its density difference with water beneath it or because of the pressure of expanding gas trapped above it. Although this rise of oil is almost always carefully controlled today, spouts of oil, or gushers, were common in the past. Gas pressure gradually dies out, and oil is pumped from the well. Water or steam may be pumped down adjacent wells to help push the oil out. At a refinery, the crude oil from underground is separated into natural gas, gasoline, kerosene, and various oils. Petrochemicals such as dyes, fertilizer, and plastic are also manufactured from the petroleum.

油床是宝贵的地下石油积聚处，而油田是被一个或多个油藏覆盖区域。当人们发现油藏或油田时，就会把井钻到地下。固定的塔称为井架，建造井架是为了控制长距离的钻杆。现代使用的便携式钻井机安装使用完成后，会被拆除和移走。因为石油的密度与在下层的水不同，或者因为石油上面的气体扩张形成的压力，当井探至油藏时，石油通常会上升至井内。现在石油的上升已经可以很好的进行控制，但在过去，井喷或管涌经常发生。气体压力逐渐减小，然后油从

井中被抽出。水或蒸汽会通过相邻的井被注入，以帮助推出石油。在炼油厂，地下的原油被分离成天然气、汽油、煤油和各种油类。石油还可用来生产石油化工产品，如染料、化肥、塑料制品等。

As oil becomes increasingly difficult to find, the search for it is extended into more-hostile environments. The development of the oil field on the North Slope of Alaska and the construction of the Alaska pipeline are examples of the great expense and difficulty involved in new oil discoveries. Offshore drilling platforms extend the search for oil to the ocean's continental shelves—those gently sloping submarine regions at the edges of the continents. More than one-quarter of the world's oil and almost one-fifth of the world's natural gas come from offshore, even though offshore drilling is six to seven times more expensive than drilling on land. A significant part of this oil and gas comes from under the North Sea between Great Britain and Norway.

随着石油越来越难以找到，石油勘探已经开始到更恶劣的环境中进行。比如，在最新发现的油田案例中，阿拉斯加北坡油田的开发和阿拉斯加管道建设就是成本高、难度大的例子。海底钻探平台将寻找石油的区域延伸到了海洋大陆架上——陆地附近浅海下缓缓的斜坡。世界上 1/4 以上的石油和近 1/5 的天然气都来自近海，尽管近海钻井的成本比陆地钻井高 6 至 7 倍。世界上相当一部分的石油和天然气来自英国和挪威之间的北海。

Of course, there is far more oil underground than can be recovered. It may be in a pool too small or too far from a potential market to justify the expense of drilling. Some oil lies under regions where drilling is forbidden, such as national parks or other public lands. Even given the best extraction techniques, only about 30 to 40 percent of the oil in a given pool can be brought to the surface. The rest is far too difficult to extract and has to remain underground. 当然，地下还能发现更多的石油。油藏可能太小或远离潜在的市场因而钻井费用过高而不适宜开采。一些石油存在于禁止钻井的地区，如国家公园或其他公共土地。即使提供最好的采油技术，油藏中也只有大约 30%到 40%的石油可以抽至地面。其余的因为太难抽取而不得不在地下。

Moreover, getting petroleum out of the ground and from under the sea and to the consumer can create environmental problems anywhere along the line. Pipelines carrying oil can be broken by faults or landslides, causing serious oil spills. Spillage from huge oil-carrying cargo ships, called tankers, involved in collisions or accidental groundings (such as the one off Alaska in 1989) can create oil slicks at sea. Offshore platforms may also lose oil, creating oil slicks that drift ashore and foul the beaches, harming the environment. Sometimes, the ground at an oil field may subside as oil is removed. The Wilmington field near Long Beach, California, has subsided nine meters in 50 years; protective barriers have had to be built to prevent seawater from flooding the area. Finally, the refining and burning of petroleum and its products can cause air pollution. Advancing technology and strict laws, however, are helping control some of these adverse environmental effects.

此外，从地下和海底开采石油并运送到消费者的途中的任何地方都会产生环境问题。如果石油运输管道因为故障或塌方损坏，将会造成严重的石油泄漏。运载石油的油轮在发生碰撞或意外搁浅（如在 1989 年阿拉斯加发生的油轮搁浅）的情况下，石油泄露会导致海上产生浮油。海上钻井平台也可能会泄露石油，导致油污漂流到岸上造成海滩污染，危害环境。有时一个油田的石油被抽取后，地面会发生下沉。加利福尼亚州长滩附近的威尔明顿油田在 50 年内下沉了 9 米；人们不得不建造保护围墙以防止海水灌进这个地区。最后，石油炼制、燃烧以及其产品也会造成空气污染。**不过不管怎样**，先进的技术和严格的法律正在协助控制这些对环境的不利影响。