# Role of Play in Development

Play is easier to define with examples than withconcepts. In any case, in animals it consists ofleaping, running, climbing, throwing, wrestling, andother movements, either along, with objects, or withother animals. Depending on the species, play may be primarily for social interaction,exercise, or exploration. One of the problems in providing a clear definition of play is that itinvolves the same behaviors that take place in other circumstance—dominance, predation,competition, and real fighting. Thus, whether play occurs or not depends on the intention ofthe animals, and the intentions are not always clear from behaviors alone.

用例证来定义玩耍要比用概念简单得多。在任何情况下，动物间的玩耍都包括跳跃，奔

跑，攀登，投掷，格斗和另外的一些动作，而玩耍的对象可能有其它物品或者动物。根据物 种的不同，玩耍的目的主要包括社交，锻炼，或探索。定义“玩耍”的难点之一是，玩耍过程 中常常包含一些与其它情况下相似的行为，例如统治，捕食，竞争和搏斗。因此，判断其是 否玩耍，要根据动物的目的来确认，而常常通过行为本身很难分析其目的。

Play appears to be a developmental characteristic of animals with fairly sophisticatednervous systems, mainly birds and mammals. Play has been studied most extensively inprimates and canids (dogs). Exactly why animals play is still a matter debated in the researchliterature, and the reasons may not be the same for every species that plays. Determining thefunctions of play is difficult because the functions may be long-term, with beneficial effects notshowing up until the animal's adulthood.

玩耍似乎是那些有着相对复杂的神经系统的动物，主要是鸟类和哺乳动物，的一个发育，

发展的特征。玩耍的大量研究主要在灵长类和犬类中进行。动物到底为什么要玩耍仍然在文 献中存在争议，并且每种物种玩耍的原因也不尽相同。确定玩耍的功能很难，因为它的功能 是长期的，伴随着一些直到动物成年才会显现出来的有利影响。

Play is not without considerable costs to the individual animal. Play is usually very active,involving movement in space and, at times, noisemaking. Therefore, it results in the loss offuel or energy that might better be used for growth or for building up fat stores in a younganimal. Another potential cost of this activity is greater exposure to predators since play isattention-getting behavior. Great activities also increase the risk of injury in slipping or falling.

玩耍对于动物个体并非没有一定的代价。玩耍通常是非常活跃的，包括一些动作，有时 也会发出声音。所以，这些都会导致一些年幼的动物的本来可以用来生长或者储存脂肪的能 量流失。另一个潜在的代价是玩耍增加了动物暴漏给天敌的几率，因为这些多动是吸引注意 的行为。大量的运动也会增加摔倒滑倒导致受伤的危险。

The benefits of play must outweigh costs, or play would not have evolved, according toDarwin' s theory. Some of the potential benefits relate directly to the healthy development ofthe brain and nervous system. In one research study, two groups of young rats were raisedunder different conditions. One group developed in an "enriched" environment, which allowedthe rats to interact with other rats, play with toys, and receive maze training. The other grouplived in an "impoverished" environment in individual cages in a dimly lit room with littlestimulation. At the end of the experiments, the results showed that the actual weight of thebrains of the impoverished rats was less than that of those raised in the enriched environment(though they were fed the same diets). Other studies have shown that greater stimulation notonly affects the size of the brain but also increase the number of connections between the nervecells. Thus, active play may provide necessary stimulation to the growth of synapticconnections in the brain, especially the cerebellum, which is responsible for motor functioningand movements.

根据达尔文理论，玩耍的好处一定超过其损失，不然玩耍就不会得以进化。其中一些潜

在的好处就是直接关于动物的大脑和神经系统的健康发展。在一项研究中，两组小鼠被养在 不同的环境中。第一组成长在一个比较“富裕”的环境中，这样的环境使其可以与其他老鼠接 触，和玩具玩儿，并且接受迷宫训练。另一组生活在“穷困”的环境中，它们被养在独立笼子 里，只有微弱的光照和极少的刺激。最后，结果表明生活在单一环境中的老鼠的大脑重量要 比生活在复杂情况下的老鼠的大脑轻(即使它们被喂养的食物一样的)。另外一些研究表明， 较大的刺激不仅会影响大脑的大小，而且也会增加神经细胞间连接的数量。因此，活跃的玩 耍可以为大脑中的突触连接提供必要的刺激，特别是负责运动机能的小脑。

Play also stimulates the development of the muscle tissues themselves and may providethe opportunities to practice those movements needed for survival. Prey species, like youngdeer or goats, for example, typically play by performing sudden flight movements and turns,whereas predator species, such as cats, practice stalking, pouncing, and biting.

玩耍也会刺激肌肉组织的生长，并能提供练习生存技能的机会。被捕食者，比如小鹿或 者山羊，其典型的玩耍动作就是突然快速跳跃和转弯，相反捕食者，比如猫科动物，则练习 潜行追踪，猛扑和撕咬。

Play allows a young animal to explore its environment and practice skill in comparativesafety since the surrounding adults generally do not expect the young to deal with threats orpredators.

Play can also provide practice in social behaviors needed for courtship and mating.Learning appropriate social behaviors is especially important for species that live in groups,like young monkeys that needed to learn to control selfishness and aggression and tounderstand the

give-and-take involved in social groups. They need to learn how to bedominant and submissive because each monkey might have to play either role in the future.Most of these things are learned in the long developmental periods that primates have, duringwhich they engage in countless play experiences with their peers.

玩耍有助于幼年动物探索其生存环境，并且由于周围的成年动物一般不期望孩子去处理

威胁和捕食者，所以它们可以在相对安全的环境中练习技能。玩耍也可以练习求爱和交配的 社交行为。学习适当的社交行为特别重要，尤其是对于群居动物，比如猴子，它们需要学会 控制自己的自私和攻击性，学着去懂得付出和收获的关系以融入群体。它们要学习怎么去统 治和顺从因为每只猴子都会在将来扮演其中某个角色。大部分这类事情都在灵长类的长期的 幼龄时期学习，期间它们有数不清的玩耍经验。

There is a danger, of course, that play may be misinterpreted or not recognized as play byothers, potentially leading to aggression. This is especially true when play consists ofpracticing normal aggressive or predator behaviors. Thus, many species have evolved clearsignals to delineate playfulness. Dogs, for example, will wag their tails, get down their frontlegs, and stick their behinds in the air to indicate "what follows is just for play."

当然玩耍也有危险。玩耍可能会被别的动物误会，或者不被当做玩耍而潜在地造成攻击。

这个情况尤其在扮演练习正常的侵略性或捕食行为过程中。因此，许多物种都有其明确的表 明玩耍的信号。比如狗，它们用会摇尾巴，前腿趴下，撅着屁股来表示“以下行为都是逗你 玩儿的!”

托福阅读试题

1. According to paragraph 1, why is playdifficult to define?

A.Play must be defined with concepts, not examples. B.Play behavior often looks like nonplay behavior.

C.Play often occurs in the presence of animals that are not playing. D.Play occurs independently of an animal's intentions.

1.原文中，同样的 behavior 会同时发生在 play 和其他一些非 play 的情况中，所以 B 正

确。A 与原文第一句矛盾。C 选项没有提到。D 选项与原文第一段最后一句矛盾。

1. According to paragraph 2, which of the following presents a particular challenge toresearchers who study play behavior in animals

A.The delay between activities and the benefits the animal derives from them. B.The difficulty in determining which animal species play and which do not.

C.The fact that for most animals, there is no clear transition from youth to full adulthood. D.The lack of research on the play behavior of animals other than canids and primates.

2.看第二段的最后两句。倒数第二句说动物玩耍的原因仍然在被 debating，后面说确定

玩耍的作用(function)非常难，那也就对应了原题的 challenge。Because 后面出现了原因，说 这些 function 是长期的，其 beneficial 要到动物成年才出现。所以跟 A 选项吻痕。B、C 选 项原文没提到。D 选项也和问题无关。

1. The word "considerable" in the passage paragraph 3 is closest in the meaning to A.Initial.

B.Practical. C.Eventually. D.Significant.

1. Considerable：重要的，值得考虑的。选项 A 是最初的，B 是实用的，C 是最终的，D

是重大的，有意义的。所以 D 符合，另外后文提到了各种 cost 和 loss。所以可以理解 considerable cost 可以理解为一定量的损失或者风险。

1. According to paragraph 3, each of the following is a cost to animals that engage inplay EXCEPT
   1. exposure to predators.

B.a buildup of fat stores.

C.a loss of fuel that could be used for growth.

D.risk of injury from slipping or falling.

4.从 Therefore 开始后面的都是 potential cost。三种 cost 已经用红色字体标出。B 选项看 似提到了，但是原文是说失去了 fat store 的机会，而不是因为 play 而 build up 了。所以 B 错。

1. Why does the author include the comment "though they were fed the same diets"?

A.To show why rats living in impoverished environments need less food than those living inenriched environments.

B.To eliminate the possibility that differences in diet were responsibly for observed differencesin brain weight.

C.To emphasize the point that rats were fed only the amount of food needed to keep themalive.

D.To suggest that rats fed the same diet have smaller brains than those fed a varied food. 5.这里提到的试验的结果。前面从 in one research of study 开始描述这个试验，提到了两

个对比组，underdifferent conditions。后面是在说结果，括号里面的内容是对结论的解释说 明。A,C,D 三个选项一点儿都不沾边。只要高中学过一点数理化就知道这个是控制变量的试 验，所以答案选 B。

1. Paragraph 4 supports which of the following statements about an animal's brain. A.The heavier the brain, the richer the environment in which the animal was raised.

B.The younger the animal, the harder it is to develop new connections between nerve cells. C.The larger the animal, the harder it is to develop new connections between nerve cells.

D.The larger the animal's cerebellum, the larger will be the animal's nerve cells.

6.原文中从 other studies 开始有描述了另外的观点。说 greater stimulation 不仅会影响大 脑的大小，也会增加神经细胞间的连接的数量，而这个 stimulation 是由 active play 提供的。 根据上文，环境越复杂，activeplay 就越多，因此 stimulation 就越多，导致动物的大脑更大， 也就更重。所以 A 选项符合这个观点。BCD 都没提到。

1. According to paragraph 5, why might play behavior of prey species be differentfrom those of predator species?

A.Unlike predator species, prey species use play to prevent inappropriate socialbehaviors, such as biting.

B.Some prey species are physically incapable of certain types of predator movements.

C.The survival of each species type is linked to particular sets of muscular movements.

D.Predator species have more opportunities to practice play behaviors than prey species. 7.这道题的关键词在于 needed for survival。因为 prey species 和 predator species 对于

survival 的要求不同，所以导致他们 play behavior 也不同。所以选 C。 A，B，D 原文都没 提到。

1. The word "comparative" in the passage paragraph 6 is closest in meaning to A.relative.

B.temporary. C.sufficient. D.complete.

8.comparative 是相对的，相当的。A 是相对的;B 是暂时的;C 是充足的;D 是完成的。所

以选择 A。这里 C 可能会是迷惑选项，因为其意思带入原文也通顺，但是失去了原词的"比 较"的那层意思。

1. Which of the sentences below best expresses the essential information inthehighlighted sentence in the passage paragraph 6 ? Incorrect choices change themeaning in important ways or leave out essential information.

A.Only monkeys that have learned to control their selfish and aggressive behaviors can beinvolved in social groups.

B.Selfish and aggressive animals like monkeys live in groups in order to practice appropriatesocial behaviors.

C.Monkeys and other social animals need to learn behaviors appropriate for their socialgroups.

D.Some monkeys are naturally too selfish and aggressive to understand the give-and-take ofsocial groups, so they learn such important behaviors while young.

9.这道题中的原句主干是 learning social behavior is important，特别是对于群居的动物。

然后用了 monkey 做例证。A 选项只提到了 monkeys 要控制自己才能融入群体，但没提到主 干部分。B 选项说自私和攻击性强的动物药学 social behavior，这就把其他动物排除在外了， 改变了原句的意思。C 正确，不仅提到了 monkey 也说到了其他的 social animals(which means

species that live in groups)为了融入群体要学 social behavior。 D 是错误选项，原文并没说猴 子太自私以至于不能理解 give and take…与原文矛盾，不选。

1. .What can be inferred from paragraph 6 about the role of adults in play activities ofthe young?

A.Adults help their young learn to become dominant within the social group. B.Young animals learn how to play from the adults within their social group.

C.Adults allow the young to engage in play behaviors within a protected, sage environment.

D.The long developmental period of some animals allows adults more time to teach their younghow to deal with the threats of predators.

10.根据 young & adult 定位到第六段第一句。说成年动物要让年轻的动物在相对安全的

环境下玩儿。 因此可以得到答案 C 正确。A 原文没有说让 young 去学怎么 dominant，B 原 文虽然提到 social group 但没提到是从 adults 身上学习。D 原文完全没有相关描写。

1. .The word "potentially" in the passage paragraph 7 is closest in meaning to A.undoubtedly.

B.possibly. C.unfortunately. D.quickly.

11.potentially 潜在地。A 市毫无疑问地; B 是可能地;C 是不幸地;D 是快速地。前半句中

有 May be，表达了一中可能性，后半句没有转折，应该是接上上半句往下说的。所以意思 应该想近。

1. According to paragraph 7, how do some animals ensure that other animalsunderstand that they are just playing?

A.By playing only with animals who are not predator.

B.By avoiding any aspects of the play behavior that are dangerous. C.By practicing non-aggressive and non-predatory behaviors.

D.By using a set of signals that occurs only in play. 12.这一段前半部分一直在描述说有动物之间会误以为是真的 aggression，中间出现了

thus 证明后面会说解决的方法。这里说解决方法是用 clear signals 去表达 playfulness。所以 答案是 D。

1. Look at the four squares [■] that indicate where the following sentence can beadded to the passage. Where would the sentence best fit? With messages such asthose, even dogs that are strangers to each other can be playing within a fewminutes.

There is a danger, of course, that play may be misinterpreted or not recognized as play byothers, potentially leading to aggression. ■【A】This is especially true when play consists ofpracticing normal aggressive or predator behaviors. ■【B】Thus,many species have evolvedclear signals to delineate playfulness. ■【C】Dogs, forexample, will wag their tails, get downtheir front legs, and stick their behinds in the air to indicate "what follows is just for play." ■【D】

13.要插入的句子开头为 With message such as those，那么说明前面肯定会描述一些 messages，后面又说 even dogs，那证明前面应该也提到了狗的行为。所以这里应该插在最 后一个空里。

1. Directions: an introductory sentence for a brief summary of the passage isprovided below. Complete the summary be selecting the THREE answer choices thatexpress the most important ideas in the passage. Some sentences do not belong inthe summary because they express ideas that are not presented in the passage or areminor ideas in the passage. This question is worth 2 points.

Play appears to be a developmental characteristic of animals with fairly sophisticated nervoussystems, mainly birds and mammals.

A.Although play often resembles aggression, flight, or other purposeful activities, researchersdo not degree on the reasons for and functions of play

B.Although many animals develop physically from play, too many young animals becomevictims of their natural predators while playing.

C.Animals such as rats, dogs, deer, goats and monkeys learn how to be both dominant andsubmissive during play activities so that they will fit in better with their adult social groups.

D.The function of play is still debated in the research literature primarily because each animalspecies uses so few of the many available types of play behavior.

E.Energy expenditure and security risks are some of the costs to animals of play behavior, butthe costs are not so great that they outweigh the long-term benefits of play to the species.

F.As experiments and observations have shown, animals that play at some stages of theirdevelopment obtain neurological, muscular, or social benefits from the play behaviors.

14.选项 A 对应在原文第一段，提到 play 的行为包括了 running，climbing，fighting 等等 aggression 的行为，但是很难确定其 function 所以 A 正确。E 对应原文第三段，potential cost 提到了 loss ofenergy，security risks 等等，但是第一段也提到说 play 是 long-term beneficial 的，第四段开头说好处一定会 outweigh 其 costs。B 这个原文没有提到，虽然第三段提到了 potential cost，后面也说 adults 通常会让 young 在相对安全的情况下 play，但并没有说太多 太多的小动物变成了 victims。不选。C 这个原文虽然说他们要学 social behavior，但没提到 说这类动物要学着去 dominant，不选。D 选项对应原文第一段，但选项中的原因和原文不符， 不选。E 对应原文第三段，potential cost 提到了 loss of energy，security risks 等等，但是第一 段也提到说 play 是 long-term beneficial 的，第四段开头说好处一定会 outweigh 其 costs。F 选项对应原文第四，五段。第四段说 play 会影响大脑发育，神经细胞间连接的数量。第五 段说到了有益于 muscletissue 的发育。后文第六段也提到了 social Benefits。

# The Pace of Evolutionary Change

A heated debate has enlivened recent studiesof evolution. Darwin's original thesis, and theviewpoint supported by evolutionary gradualists, isthat species change continuously but slowly and insmall increments. Such changes are all but invisible over the short time scale of modernobservations, and, it is argued, they are usually obscured by innumerable gaps in theimperfect fossil record. Gradualism, with its stress on the slow pace of change, is a comfortingposition, repeated over and over again in generations of textbooks. By the early twentiethcentury, the question about the rate of evolution had been answered in favor of gradualism tomost biologists' satisfaction.

最近的一个关于进化的研究引发了激烈的争论。达尔文的原始论点和进化渐进主义者支

持的观点是物种会持续地改变，但非常缓慢，增量也很小。这种改变是普遍的，但是现在短 时间的观察是不能察觉的，并且，这个观点声称，它们通常被掩盖于不完美的化石记录的不 可计数的缺失中。渐进主义及其对物种缓慢变化的引力让人欣然接受，并在世代的教科书中 重复出现。在 20 世纪早前之前，令大部分的生物学家满足于利用渐进主义来回答关于进化 速率的问题。

Sometimes a closed question must be reopened as new evidence or new arguments basedon old evidence come to light. In 1972 paleontologist Stephen Jay Gould and Niles

Eldredgechallenged conventional wisdom with an opposing viewpoint, the punctuated equilibriumhypothesis, which posits that species give rise to new species in relatively sudden bursts,without a lengthy transition period. These episodes of rapid evolution are separated byrelatively long static spans during which a species may hardly change at all.

有时，已经有了结论的问题必须由在已有证据基础上出现的新的证据和新的论点使其重

新展开讨论。在 1972 年，古生物学者 Stephen Jay Gould 和 Niles Eldredge 用相反的论点挑 战了世俗的结论，即断点平衡说，它假设了物种演变为新的物种是通过相对突然的爆发，并 非通过长时间的过渡时期。迅速的进化期被时间相对更长的静态期分开，而在静态时期，物 种是几乎完全不变的。

The punctuated equilibrium hypothesis attempts to explain a curious feature of thefossil record—one that has been familiar to paleontologist for more than a century but hasusually been ignored. Many species appear to remain unchanged in the fossil record for millionsof years—a situation that seems to be at odds with Darwin's model of continuous change.Intermediated fossil forms, predicted by gradualism, are typically lacking. In most localities agiven species of clam or coral persists essentially unchanged throughout a thick formationof rock, only to be replaced suddenly by a new and different species.

断点平衡论试着去解释化石记录的一个古怪的特点----在超过一个世纪的时间里它已经

为古生物学者所熟悉，但一直被忽视。许多物种似乎在上百万年的化石记录中一直没有改变， 这个情况与达尔文的模型所支持的物种的持续变化相悖。进化渐进论的支持者所预测的中间 状态的化石一直没有出现。在大部分蛤和珊瑚的聚集地，其化石在很厚的岩石中都实际上没 有变化，只是突然被另一新的并且不同的物种而取代。

The evolution of North American horse, which was once presented as a classic textbookexample of gradual evolution, is now providing equally compelling evidence for punctuatedequilibrium. A convincing 50-million-year sequence of modern horse ancestors—eachslightly larger, with more complex teeth, a longer face, and a more prominent central toe—seemed to provide strong support for Darwin's contention that species evolve gradually.But close examination of those fossil deposits now reveals a somewhat different story. Horsesevolved in discrete steps, each of which persisted almost unchanged for millions of years andwas eventually replaced by a distinctive newer model. The four-toed Eohippus preceded

thethree-toed Miohippus, for example, but North American fossil evidence suggests a jerky,uneven transition between the two. If evolution had been a continuous, gradual process,one might expect that almost every fossil specimen would be slightly different from every year.

北美马的进化曾经被用作经典的教科书案例来证明渐变进化论，现在却为断点平衡学提

供了同样有说服力的证据。一个有说服力的 5 千万年的马祖先的进化模型----每一代都稍稍 大一点，有更复杂的牙齿，更长的脸，和中间更突出的脚趾----这一切都看似强有力的支持 了达尔文的论点，物种是逐步地进化的。但是，对这些化石更严谨的验证现在揭示了一个不 太一样的故事。马是在不连续的步骤中进化的，其中每个进化步骤中间都有上百万年时间保 持不变，在最后被一个不同的更新的模型取代。比如四只脚趾的 Eohippus 在三只脚趾的 moihippus 之前，但北美化石证据表明在这之间有一个不平稳的，不均衡的转换过程。如果 进化一直都是连续，渐进的过程，人们应该预期到的是每年的化石样本都会存在细微的差别。

If it seems difficult to conceive how major changes could occur rapidly, consider this: analteration of a single gene in files is enough to turn a normal fly with a single pair of wings intoone that has two pairs of wings.

如果很难设想大的改变会迅速发生，想想这些：一个单一基因的改变就足以将有一对翅

膀的苍蝇变成两对翅膀。

The question about the rate of evolution must now be turned around: does evolutionever proceed gradually, or does it always occur in short bursts? Detailed field studies of thickrock formations containing fossils provide the best potential tests of the competing theories.

关于进化速度的问题现在发生了转变：进化过程是逐渐发生的么，还是总是突然短时间

的爆发?对含有化石的厚岩层的细致的现场调查可以检验这两个备受争论的理论。

Occasionally, a sequence of fossil-rich layers of rock permits a comprehensive look atone type of organism over a long period of time. For example, Peter Sheldon's studies oftrilobites, a now extinct marine animal with a segmented body, offer a detailed glimpse intothree million years of evolution in one marine environment. In that study, each of eightdifferent trilobite species was observed to undergo a gradual change in the number ofsegments—typically an increase of one or two segments over the whole time interval. Nosignificant discontinuous were observed, leading Sheldon to conclude that environmentalconditions were quite stable during the period he examined.

偶尔，有一个系列的化石丰富的岩石可以允许人们综合性的观察一种生物在很长一段时 间中的变化。比如，Peter Sheldon 对于三叶虫，一种已灭绝的身体分节的海洋生物，的研究 提供了其对三百万年来在同一海洋环境下进化的一些细节。研究中，八种三叶虫都观察到了 其身体节数数量逐渐改变的过程，在整个时间段中，一般身体都增加了一到两节。没有明显 的不连贯，这使 sheldon 得出结论：海洋环境在那段时间是比较稳定的。

Similar exhaustive studies are required for many different kinds of organisms from manydifferent periods. Most researchers expect to find that both modes of transition from onespecies to another are at work in evolution. Slow, continuous change may be the normduring periods of environmental stability, while rapid evolution of new species occurs duringperiods of environment stress. But a lot more studies like Sheldon's are needed before we cansay for sure.

很多来自不同时期的不同的生物都需要开展相似的相近研究。大多数研究者希望发现物

种进化的这两种模式都存在。缓慢的，连续的变化可能是在环境稳定的时间段下的规律，而 快速进化的新物种则发生在环境变化时期的压力下。但是，我们需要更多的想 Sheldon 所做 的研究以证明这个观点。

托福阅读试题

1. The word "innumerable" in the passage isclosest in the meaning to A.countless.

B.occasional. C.large.

D.repeated.

1.innumerable 是不可计数的，A 是无数的，B 是偶然的，C 是大的，D 是重复的。这个 单词是 numerable 加否定前缀，很容易就能推出意思来。

1. According to paragraph 1, all of the following are true EXCEPT A.Darwin saw evolutionary change as happening slowly and gradually.

B.Gaps in the fossil record were used to explain why it is difficult to see continuous smallchanges in the evolution of species.

C.Darwin's evolutionary thesis was rejected because small changes could not be observed inthe evolutionary record.

D.By the early twentieth century, most biologists believed that gradualism explainedevolutionary change.

2.A 答案对应第一段第二句， B 对应第一段第三句，D 对应一段最后一句。C 与原文冲

突，原文一直在说 darwin 理论被人们广泛接受。

1. Which of the sentences below best expresses the essential information in thehighlighted sentence in the passage paragraph 2 ? Incorrect choices change themeaning in important ways or leave out essential information.

A.The punctuated equilibrium hypothesis challenged gradualism, which holds that speciesevolve in relatively sudden bursts of brief duration.

B.The punctuated equilibrium hypothesis developed by Stephen Jay Gould and NilesEldredge was challenged in 1972.C.In 1972 Stephen Jay Gould and Niles Eldredge challengedgradualism by positing that change from one species to another cannot occur without alengthy transition period.

D.The punctuate equilibrium hypothesis, in opposition to gradualism, holds that transitionsfrom one species to another occur in comparatively sudden burst.

3.高亮句子的主干部分是断点平衡论挑战了原来的渐进论，然后解释了断点平衡论的内

容。A 选项 which 修饰不明，容易产生误解;B 选项与原文矛盾，C 与原文不符，原文 S 和 N 的观点是 change 的发生是 withoutlengthy transition 的。D 和原文意思相符，并且也包含了所 有的主干部分。

1. According to paragraph 1 and paragraph 2, the punctuated equilibrium hypothesisand the gradualism hypothesis differed about

A.Whether the fossil record is complete. B.Whether all species undergo change. C.Whether evolution proceeds an a constant rate.

D.How many new species occur over long periods of time. 4.根据原文，渐进论是说物种演变是通过长时间的缓慢改变发生的;断点平衡论是说物种

演变是短期爆发的。所以选择 C，进化是否是匀速发生的。

1. According to paragraph 3, the lack of intermediate fossils in the fossil record ofsome species
   1. has been extensively studied by paleontologist for over a century.
   2. contradicts the idea that most species have remained unchanged for millions of years. C.challenges the view that evolutionary change is gradual.

D.is most common in the fossil records of clam and coral species.

5.根据 lack of intermediate fossils 定位到第三段倒数第二句，在往前看一句说，这一情况 对于达尔文学说是不和的，而达尔文学说正是渐进论，这一段的最后也说原来的物种突然被 替换，而不是渐渐进化改变的。所以 C 符合原文意思。 A 与原文第一句破折号后矛盾，原 文说这一现象一直被 Ignored，B 选项原文矛盾，该现象应该是反对了达尔文学说，支持了 物种有长期不改变的论点。D 虽然正确但是只是本段的细节，不能表达主题，所以不选。

1. The word "compelling" in the passage paragraph 4 is closest in the meaning to A.surprising.

B.persuasive. C.controversial. D.detailed.

6.Compel 本身是强迫，此处作为 evidence 的形容词可以延伸为说服力强的。因此答案

选 B 有说服力的。A 是惊奇的，C 是有争议的，D 是细节的。都不沾边。另外通过句义可 以判断，前文说马的进化 was once 是经典的渐进论的证明，is now(轻微转折)提了"equally" 怎么样的证据证明了点断平衡论，前文既然说对 gradualevolution 很支持，那么后文出现 equally，那应该对点断论也是有力证据。因此选 B。

1. Paragraph 4 mentions that North American horses have changed in all the followingways EXCEPT in

A.the number of toes they have. B.the length of their face.

1. their overall size.
2. the number of years they live. 7.对应部分在第四段的第二句和第五句，只有 D 选项没有出现。 8.The word "alteration" in the passage paragraph 5 is closest in meaning to

A.imperfection. B.replacement.

C.change. D.duplication.

8.这一句话说一个怎么样的单一基因就足以变一个普通飞禽的一对的正常翅为两对翅

膀，所以有推理应该是要改变这个基因。所以选 C，Alteration 是修改，变更，A 选项是不 完美，B 是替换，D 是复制 带入后都改变了原文的意思。

1. According to paragraph 7, Peter Sheldon's studies demonstrated which ofthefollowing about trilobites?

A.They underwent gradual change over a long time period.

B.They experienced a number of discontinuous transitions during their history. C.They remained unchanged during a long period of environmental stability.

D.They evolved in ways that cannot be counted for by either of the two competing theories. 9.根据 Peter Sheldon 定位到原文第二句。后面对 trilobites 进行了描述，A 选项对应了原

文第三句，后文又继续说没有明显的断点。所以 A 正确。 B 与原文第四句冲突。C 与第三 句冲突，D 原文没有这种说法。而且上文也表明它符合 gradual evolvement。

1. .The word "occasionally" in the passage paragraph 7 is closest in meaning to A.undoubtedly.

B.basically. C.once in a while. D.to some extent.

1. .occasionally，是偶然偶尔的意思。A 是毫无疑问的，B 是基本上，C 是偶尔有一次。

D 是在一定程度上。因此应该选 C。并且上文提出问题说是否有过逐渐进化?那么下文给的 是一个逐渐进化的例子，所以应该是在表达偶尔有一两个的意思。

1. .The main purpose of paragraph 7 is to A.Describe one test of the competing theories. B.Provide an example of punctuated equilibrium.

C.Describe how segmented animals evidence both competing theories. D.Explain why trilobites became extinct.

11.上文说实地勘测会给 competing theories 提供 test，第七段就给了试验例子，那么就证 明是 A 正确。B 与原文冲突，这个例子是支持渐进论的。C 也不对，理由同上。D 与原文目 的不符。

1. Look at the four squares [■] that indicate where the following sentence can beadded to the passage.Where could the sentence best fit? They believe thatenvironmental conditions may play a crucial role in determining which of the twomodes will be in operation over a given period.

■【A】Similar exhaustive studies are required for many different kinds of organisms

frommany different periods. ■【B】Most researchers expect to find that both modes of transitionfrom one species to another are at work in evolution.■【C】Slow, continuous change may

bethe norm during periods of environmental stability, while rapid evolution of new speciesoccurs during periods of environment stress. ■【D】But a lot more studies like Sheldon's areneeded before we can say for sure.

12.首先句子开头出现了 They，那么我们应该能在前文找到一个提到人物的地方，句子 又提出 environmentalcondition 的作用，那么后文应该会出现对这一理论的解释，那么 C 是 符合的，也可以进行代入验证。

1. .Directions: selected from the seven phrases below the phrases that correctlycharacterize punctuated equilibrium and the phrases that correctly characterizegradualism. Two of the phrases will not be used. This question is worth 3 points.

A.States that new species emerge from existing species during relatively brief period of time. B.Was first formulated by Charles Darwin.

C.Explain why North American horses have become smaller over time. D.States that new species evolve slowly and continuously from existing species.

E.Explain the lack of intermediate fossil forms in the fossil record of many species.

F.Competition is usually strongest when the density of the competing populations is the same.

G.States that a species will not change unless its environment changes. 1 )

Gradualism

A B C D E F G

2 )

punctuated equilibrium A B C D E F G

13.A 断点平衡论论点为物种变化发生突然，快速，符合。B 对应文章第一段第一句话，

符合渐进论。C 与原文第四段第二句矛盾，原文说马进化会变大。不选。D 原文第一段第一 句，符合渐进论。E 对应原文第三段。符合点断平衡论。F 原文没提到，不选。G 原文最后 一段，说渐进论应该会是环境比较稳定的情况下的进化规则。符合渐进论。

# The Invention of the Mechanical Clock

In Europe, before the introduction of themechanical clock, people told time by sun (using,for example, shadow sticks or sun dials) and waterclocks. Sun clocks worked, of course, only on cleardays; water clocks misbehaved when the temperature fell toward freezing, to say nothing oflong-run drift as the result of sedimentation and clogging. Both these devices worked well insunny climates; but in northern Europe the sun may be hidden by clouds for weeks at a time,while temperatures vary not only seasonally but from day to night.

在欧洲，在机械表被引入以前，人们利用太阳(比如棍子的影子和日晷)和水钟来确定时

间。当然，太阳钟只能用于晴天使用，而水钟表在水温下降到冰点时会出错，长期漂浮的东 西因为下沉或堵塞而无法工作。这两种仪器在晴天都运行的很好，但北欧，太阳可能会藏在 云后长达一周，同时，温度不仅会随季节中变化，也因昼夜而不同。

Medieval Europe gave new importance to reliable time. The Catholic Church had its sevendaily prayers, one of which was at night, requiring an alarm arrangement to waken monksbefore dawn. And then the new cities and towns, squeezed by their walls, had to know andorder time in order to organize collective activity and ration space. They set a time to go tosleep. All this was compatible with older devices so long as there was only one authoritativetimekeeper; but with urban growth and the multiplication of time signals, discrepancy broughtdiscord and strife. Society needed a more dependable instrument of time measurementand found it in the mechanical clock.

中世纪欧洲使得可靠的时间变得更重要。天主教堂每天有七次的祷告，有一个是在晚上，

它要求设定闹钟以便在破晓前叫醒布道师。另外新的城市和小镇，由于其空间的限制，他们

必须要知道并且安排时间去组织集体活动和分配空间。他们设定时间睡觉。所有这些用老的 仪器都是可以一致的，只要只有一个权威的时间记录者。但是随着城市的发展和报时信号的 倍增，时间错乱导致了不和与争吵。社会需要一个更加可靠的工具去衡量时间，这个仪器就 是机械钟表。

We do not know who invented this machine, or where. It seems to have appeared in Italyand England (perhaps simultaneous invention) between 1275 and 1300. Once known, itspread rapidly, driving out water clocks but not solar dials, which were needed to check thenew machines against the timekeeper of last resort. These early versions were rudimentary,inaccurate, and prone to breakdown.

我们并不知道是谁发明了这个机器，或者在哪。它好像是出现在意大利或是英国(也许

是同时发明的)在 1275 年到 1300 之间。一旦被人们所知，它就快速传播并替代了水钟表， 但日晷依然存在，用来对照这个新仪器与原来的计时法。早期的版本很原始，不准确且易坏。

Ironically, the new machine tended to undermine Catholic Church authority. Althoughchurch ritual had sustained an interest in timekeeping throughout the centuries of urbancollapse that followed the fall of Rome, church time was nature’s time. Day and night weredivided into the same number of parts, so that except at the equinoxes, days and night hourswere unequal; and then of course the length of these hours varied with the seasons. But themechanical clock kept equal hours, and this implied a new time reckoning. The CatholicChurch resisted, not coming over to the new hours for about a century. From the start,however, the towns and cities took equal hours as their standard, and the public clocks installedin town halls and market squares became the very symbol of a new, secular municipalauthority. Every town wanted one; conquerors seized them as especially precious spoils ofwar; tourists came to see and hear these machines the way they made pilgrimages to sacredrelics.

讽刺的是，新仪器有破坏天主教堂权威性的倾向。虽然几世纪以来，尽管城市瓦解，罗

马没落，但教堂仪式一直保持着对时间记录的兴趣，教堂时间是自然的时间。白天和黑夜被 分为均等的部分，所以除去昼夜平分点，白天和黑夜时间是不均等的;当然因此，这些时间 的长度也随着季节变化。但是，机械时钟时间间隔相等，这意味着新的时间计算法。天主教 会进行反抗，将近一个世纪都不肯转化到新的时间。但一开始，城镇都接受了均等时间作为 他们的标准，并且安装公共的时钟在城镇大楼和市场变成了新的世俗市政权威的标志。每个

城镇都想要一个;胜利者视它们为珍贵的战利品，在游人去神圣古迹朝圣的路上，他们专程 去看并听这些钟表。

The clock was the greatest achievement of medieval mechanical ingenuity. Its generalaccuracy could be checked against easily observed phenomena, like the rising and setting ofthe sun. The result was relentless pressure to improve technique and design. At every stage,clockmakers led the way to accuracy and precision; they became masters of miniaturization,detectors and correctors of error, searchers for new and better. They were thus the pioneers ofmechanical engineering and served as examples and teachers to other branches ofengineering.

钟表是中世纪机械精巧装置的最大成就。它的正确性的可以通过简单地可观察日出日落

等常见现象来证明。这样的结果是对技术和设计进步的残酷的压力。在每个阶段，制表人引 领者准确与精度，他们成为了微型化的大师，错误的探测器和校正者，更新更好的搜寻者。 因此他们是机械工程的先驱，是工程学其它分支的典范和老师。

The clock brought order and control, both collective and personal. Its public display andprivate possession laid the basis for temporal autonomy: people could now coordinatecomings and goings without dictation from above. The clock provided the punctuation marksfor group activity, while enabling individuals to order their own work (and that of others) so asto enhance productivity. Indeed, the very notion of productivity is a by-product of the clock:once one can relate performance to uniform time units, work is never the same. One movesfrom the

task-oriented time consciousness of the peasant (working on job after another, astime and light permit) and the time-filling busyness of the domestic servant (who always hadsomething to do) to an effort to maximize product per unit of time.

钟表带来了秩序和控制，既有集体的也有个人的。它的公开展示和私人拥有铺设了短期

自治的基础：人们现在可以不用根据上层的命令来调整去留。钟表也为集体活动提供了时间 提示，同时使个人能够安排他们自己的工作，以加强生产力。事实上，生产力的准确概念是 时钟的副产物，一旦一个人可以将其表现用统一的时间单位衡量，那么工作就永远都不会一 样了。人们从农民以任务为导向的工作方式(在时间和光线条件允许的情况下，一件工作接 着一件的干)和家奴以时间为导向的工作方式(总有事情做)中转变到了将单位时间的生产量 达到最大化的努力中。

托福阅读试题

1. Why does the author provide the informationthat "in northern Europe the sun may be hiddenby clouds for weeks at a time, whiletemperatures vary not only seasonally but fromday to night"?

A.To emphasize the variety of environments in which people used sun and water clocks to telltime.

B.To illustrate the disadvantage of sun and water clocks.

C.To provide an example of an area where water clocks have an advantage over sun clocks. D.To counter the claim that sun and water clocks were used all over Europe.

1.从第一段的第二句开始，原文列举了这两种 device 各种的缺点，最后一句前半句说它

们 work，后面 but 表转折，证明要说有些情况它们不能用。所以选择 B。A 说人们在各种情 况下都在使用这两种方法，与原文表达的意思相反，C 将两种方法比较，原文没有这层意思。 D 整个和划线部分相反，原文说在 northern Europe 不能用。

1. According to paragraph 2, all of the following are examples of the importance oftimekeeping to medieval European society EXCEPT

A.the need of different towns to coordinate timekeeping with each other. B.the setting of specific times for the opening and closing of markets.

C.the setting of specific time for the start and finish of the working day. D.the regulation of the performance of daily church rituals.

2.虽然原文提到说城与城之间要保持一直，但其目的是 organize collective activity，和

ration space。 而 collective activity 对应了选项 B，C 对应 set time to go to sleep,也就是结束工 作的时间。D 对应开头 catholic church 的 prayers 活动。

1. According to paragraph 2, why did the medieval church need an alarmarrangement? A.The alarm warned the monks of discord or strife in the town.

B.The church was responsible for regulating working hours and market hours. C.The alarm was needed in case fires were not put out each night.

D.One of the church's daily rituals occurred during the night.

3.对应原文的第二句话，可根据 alarm arrangement 定位，前文说 one of which was at night， 后面说 towaken monk before dawn，这两个都可以算是原因，选项中符合的只有 D。

1. The word "authoritative" in the passage(paragraph 2)is closest in meaning to A.actual.

B.important. C.official.

D.effective.

1. authoritative 是权威的，A 是真实的，B 是重要的，C 是官方的，D 是有效的。因此 C

是正确的。文章中也说 only one 怎样的 time keeper，所以应该是官方准确时间。 5.The author uses the phrase "the timekeeper of last resort" to refer to

* 1. water clocks. B.the sun.

C.mechanical clocks. D.the church.

5.前文说需要它去 check 这个 machines，which 前面说的是 solar dials所以指的是 the sun。

1. The word "rudimentary" in the passage(paragraph 3)is closest in meaning to A.rare.

B.small. C.impractical. D.basic.

6.rudimentary 是基础的。 A 是稀有的，B 是小的，C 是不切实际的，D 是基本的。所

以根据词义 D 正确。这里我们可以看并列的词都是负面的，这里的 rudimentary 也是在强调 未发展，有落后的意味。如果按照负面词来判断，C 可能成为迷惑选项，但其词义不符。

1. According to paragraph 4, how did the Catholic Church react to the introduction ofmechanical clocks?
   1. Its used mechanical clocks through the period of urban collapse.
   2. It used clocks to better understand natural phenomena, like equinoxes.
   3. It tried to preserve its own method of keeping time, which was different from mechanical-clock time.
   4. It used mechanical clocks to challenge secular, town authorities.

7.可定位至相关段落，关键词为 resisted，not coming over，所以证明 church 在拒绝新的 计时方法，也就是在试着保护自己的方法。

1. The word "installed" in the passage(paragraph 4)is closest in meaning to A.required.

B.expected by the majority of people. C.standardized.

D.put in place.

8.installed 被安装的，A 是需要的，B 是被大部分人们希望的，C 是标准化的，D 是放 置于。D 最符合，并且原文中原词的后面也跟了地点，所以用 D 最合适。

1. It can be inferred from paragraph 5 that medieval clockmakers
   1. were able to continually make improvements in the accuracy of mechanical clocks. B.were sometimes not well respected by other engineers.

C.sometimes made claims about the accuracy of mechanical clocks that were not true. D.rarely shared their expertise with other engineers.

9.根据 clockmaker 定位至倒数第二句，说制表人是正确和精密的领路人然后就对他们各

种赞扬。B，C，D 选项都是在贬低制表人，所以很容易排除。B，D 选项又和最后一句话明 显冲突。 A 符合原文。

1. Paragraph 5 answers which of the following questions about mechanical clocks. A.How did early mechanical clocks work?

B.Why did the design of mechanical clocks affect engineering in general? C.How were mechanical clocks made?

D.What influenced the design of the first mechanical clock?

10.第五段主要说 clockmaker 引领了准确，精准工程的发展，他们是 master，teacher 等 等，然后说他们是先锋，但这些都是因为他们是制表人。所以这道题选 B。 ACD 原文都没 提到。

1. .The word "pioneers" in the passage isclosest in meaning to A.leaders.

B.opponents. C.employers.

D.guardians.

11.pioneer 是先驱，A 是领导者，B 是对手，C 是雇主，D 是监护人。原文单词所在句 后半句也说道他们作 teacher，所以很容易理解他们是领导者。

1. According to paragraph 6, how did the mechanical clock affect labor? A.It encouraged workers to do more time-filling busywork.
2. It enabled workers to be more task oriented.
3. It pushed workers to work more hours every day. D.It led to a focus on productivity.

12.定位到原文最后一句，说使人们从 task-oriented 和 time-filling busyness 的模式变为

maximizeproduct per unit of time，从而提高了 productivity，所以选择 D。A，B 原文都提到 了，但是是转化前的状态，C 没提到。

1. Look at the four squares[■] that indicate where the following sentence can beadded to the passage. Where would the sentence best fit? The division of time nolonger reflected the organization of religious ritual.

Ironically, the new machine tended to undermine Catholic Church authority. Although

churchritual had sustained an interest in timekeeping throughout the centuries of urban collapsethat followed the fall of Rome,church time was nature's time.■【A】Day and night were dividedinto the same number of parts, so that except at the equinoxes, days and night hours wereunequal;and then of course the length of these hours varied with the seasons.■【B】But

themechanical clock kept equal hours, and this implied a new time reckoning.■【C】The CatholicChurch resisted, not coming over to the new hours for about acentury.■【D】From the start,however, the towns and cities took equal hours as their standard, and the public clocks

installedin town halls and market squares became the very symbol of a new, secular municipalauthority. Every town wanted one; conquerors seized them as especially precious spoils ofwar;tourists came to see and hear these machines the way they made pilgrimages to sacredrelics.

13.原句中 no longer 反应宗教仪式了，那么此句前后应该有对现在的计时制度的描写，

另外句末提到了 religious ritual，所以附近也应该有对宗教组织的态度描写，满足这两个条 件的位置是 C。

1. Directions: An introductory sentence for a brief summary of the passage isprovided below. Complete the summary by selecting the THREE answer choices thatexpress the most important ideas in the passage. Some sentences do not belong inthe summary because they express ideas that are not presented in the passage or areminor ideas in the passage. This question is worth 2 points.

The introduction of the mechanical clock caused important changes to the society of medievalEurope.

A.The increasing complexity of social and economic activity in medieval Europe led to theneed for a more dependable means of keeping time than sun and water clocks provided.

B.Because they were unreliable even in sunny climates, sun clocks and water clocks were rarelyused in Europe, even before the invention of the mechanical clock.

C.Before the mechanical clock, every city wanted a large number of timekeepers because moretimekeepers allowed for better organization of collective activities.

D.Soon after the invention of mechanical clocks, sun and water clocks became obsoletebecause mechanical clocks were far more accurate.

E.Predators help maintain biological diversity by limiting populations of a dominantcompetitor species, thereby preventing that species from excluding others.

F.The removal of sea stars reduces the diversity of the community in which they arepredators, and is therefore a bad idea.

14.A 对应第二段倒数第一句和倒数第二句后半句"with urban growth and the

multiplication of timesignals, discrepancy brought discord and strife. Society needed a more dependableinstrument of time measurement and found it in the mechanical clock."正确。B 与原文 第一段矛盾。不选。C 原文并没有提到说有大量的 timekeepers，而第三段还说只能有一个权 威的 timekeeper 不选。D 对应原文第三段，说应用 mechanical clock 之后 water clock 很快被 弃用了，但 sun clock 依然留下用来对照 mechanical clock 的准确性，错，不选。