

TPO 37 – 1 Thales and the Milesians 泰利斯和爱尔兰人

While many other observers and thinkers had laid the groundwork for science, Thales (circa 624 B.C.E.-ca 547 B.C.E.), the best known of the earliest Greek philosophers, made the first steps toward a new, more **objective** approach to finding out about the world. He posed a very basic question: "What is the world made of?" Many others had asked the same question before him, but Thales **based** his answer strictly on what he had observed and what he could reason out-not on imaginative stories about the gods or the supernatural. **He proposed** water as the single substance from which everything in the world was made and **developed** a model of the universe with Earth as a flat disk floating in water.★

尽管很多其他的观察者和思想家已经为科学打下了基础，泰利斯(约公元前 624 年-公元前 547 年)，最有名最早期的古希腊哲学家，在探索世界方面迈出了新的、更加**客观**的第一步。他提出了一个很基础的问题：世界的本源是什么？其他人在他之前也提出过一样的问题，但是泰勒斯把他的答案严格建立在他观察到的现象和推理上——而不是基于想象中关于神或者超自然的故事。他提出，水是世界上一切物质形成的唯一基础，并且提出了一个宇宙模型，在这个模型里，地球是一个平的盘子，飘在水上。

Like most of the great Greek philosophers, Thales had an influence on others around him. His two best-known followers, ~~though there were undoubtedly others who attained less~~ **renown**, were Anaximander and Anaximenes. Both were also from Miletus (located on the southern coast of present-day Turkey) and so, like Thales, were members of the Milesian School. Much more is known about Anaximander than about Anaximenes, probably because Anaximander, who was born sometime around 610 BCE, ambitiously attempted to write a **comprehensive** history of the universe. As would later happen between another teacher-student pair of philosophers, Plato and Aristotle, Anaximander disagreed with his teacher despite his respect for him. He doubted that the world and all its contents could be made of water and proposed **instead** a formless and unobservable substance he called "apeiron" that was the source of all matter.★

就像是大多数的伟大希腊哲学家一样，泰勒斯对于自己身边的人影响很大。他最著名的两个徒弟是 Anaximander 和 Anaximenes，当然他还有很多不那么出名的土地。这两个徒弟都是来自米力都（位于现在土耳其南海岸），他们和泰勒斯一样都是米力都学校毕业的。Anaximander 比 Anaximenes 更为世人所知，也许是因为生于公元前 610 年的 Anaximander 雄心勃勃地要写一部宇宙全史。就像是发生在另一对师生柏拉图和亚里士多德之间的故事一样，Anaximander 尽管崇拜自己的老师，但却与他意见相左。他不相信世界和世界上的东西都是由水构成的，并提出了物质的本源是一种被他称为 apeiron 的无形状的、难以察觉的物质。

Anaximander's most important contributions, **though**, were in other areas. Although he did not accept that water was the prime element, he did believe that all life originated in the sea, and he was thus one of the first to conceive of this important idea. Anaximander is credited

批注 | 1]: ★这段在说什么？

首先，首句引出人物；
然后，说一下这个人是在做什么的，出了个**题**；
最后，谈谈他的贡献。

批注 | 2]: renown

英 [rɪˈnaʊn] 美 [rɪˈnaʊn]

- n. 声誉；名望
- vt. 使有声誉

= fame

批注 | 3]: ★这段在说什么？

首先，说说前一段主人公的影响，出个推断**题**；
然后，引出另外两个人，顺便出几道**题**；
最后，着重谈了其中一个人。

批注 | 4]: conceive

英 [kənˈsiːv] 美 [kənˈsiːv]

- vt. 怀孕；构思；以为；持有
- vi. 怀孕；设想；考虑

conceive of

英美

- 设想；想象

with drawing up the first world map of the Greeks and also with recognizing that Earth's surface was curved. He believed, though, that the shape of Earth was that of a cylinder rather than the sphere that later Greek philosophers would conjecture. Anaximander, observing the motions of the heavens around the polestar, was probably the first of the Greek philosophers to picture the sky as a sphere completely surrounding Earth—an idea that, elaborated upon later, would prevail until the advent of the Scientific Revolution in the seventeenth century. ★

然而，Anaximander 的最重要的贡献是在别的领域。尽管他不接受水是物质本源的说法，他还是相信生命是发源于大海的，并且他是最先提出这个观点的几位先驱之一。他绘制了第一幅希腊人的世界地图，并且认识到地球表面是弯曲的。他相信地球的形状是更类似于圆筒而不是后来的希腊哲学家推测出来的球形。Anaximander 发现了天空围绕北极星转动，他可能是第一位把天空描绘成完全包裹住地球的球形的希腊哲学家，这个观点后来被精细化了，直到十七世纪的科学革命到来之前一直都是流行的观点。

Unfortunately, most of Anaximander's written history of the universe was lost, and only a few fragments survive today. Little is known about his other ideas. Unfortunately, too, most of the written work of Anaximenes, who may have been Anaximander's pupil, has also been lost. All we can say for certain about Anaximenes, who was probably born around 560 BCE, is that following in the tradition of Anaximander, he also disagreed with his mentor. The world, according to Anaximenes, was not composed of either water or apeiron, but air itself was the fundamental element of the universe. Compressed, it became water and earth, and when rarefied or thinned out, it heated up to become fire. Anaximenes may have also been the first to study rainbows and speculate upon their natural rather than supernatural cause. ★

rarefied 英 ['reəriˈfaɪd] 美 ['reriˈfaɪd] adj. 高深精妙的，曲高和寡的；远离常人生活的，怪异的；（空气）稀薄的，含氧量低的	thin out 英 使稀薄；使稀疏
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不幸的是，大多数 Anaximander 写的宇宙的故事已经遗失了，只有一点片段留下。他的其他观点也没有留存下来。同样不幸的是，Anaximander 的徒弟 Anaximenes 的大多数作品也已经遗失了。关于 Anaximenes 我们可以确信的是，他大约出生于公元前 560 年，他继承了 Anaximander 的传统，也与自己的老师意见相左。根据 Anaximenes 的观点，世界既不是水做的，也不是 apeiron 做的，而是空气做的。空气被压缩变成水和土地，空气被稀薄化，加热变成火焰。Anaximenes 可能也是第一个研究彩虹，推测其本质的人，而不是相信彩虹是来源于超自然现象的。

With the door opened by Thales and the other early philosophers of Miletus, Greek thinkers

批注 [5]: sb is credited with sth.
认为 sb 有 sth, 被认为

批注 [6]: conjecture
英 [kən'dʒektʃə(r)] 美 [kən'dʒektʃər]
•n. 推测；猜想
•vi. 推测；揣摩
•vt. 推测

批注 [7]: heaven
英 ['hevɪn] 美 ['hevɪn]
•n. 天堂；天空；极乐

批注 [8]: ★这段在说什么？
首先，承接上段，继续说这个人 Anaximander；
然后，说这个人的观点，出道题，以及观点获取的来源。
最后，提了一下观点的影响。

批注 [9]: pupil
英 ['pju:pəl] 美 ['pju:pəl]
•n. 学生；[解剖] 瞳孔；未成年

批注 [10]: ★这段在说什么？
首先，从上文的讨论对象 Anaximander 引出另一个讨论对象，谈了他们的关系，出了道题；
然后，说新引入的人的观点，并详细描述了一下内容，出了道题。

began to speculate about the nature of the universe. This exciting **burst** of **intellectual** activity was **for the most part** purely creative. The Greeks, from Thales to Plato and Aristotle, were philosophers and **not scientists in today's sense**. It is possible for anyone to create "ideas" about the nature and structure of the universe, for instance, **and many times** these ideas can be **so** consistent and elaborately structured, or just **so** apparently obvious, **that** they can be persuasive to many people. A scientific theory about the universe, however, demands much more than the various observations and analogies that were **woven** together to form systems of reasoning, carefully constructed as they were, that would eventually **culminate** in Aristotle's model of the world and the universe. Without experimentation and **objective, critical** testing of their theories, the **best these thinkers** could hope to achieve was some internally consistent speculation **that** covered all the bases and **satisfied** the demands of **reason**. ★

weave together 一起编织 一起编制 一起编写	woven 英 ['wʊvən] 美 ['wʊvən] v. 编织; 交织 (weave 的过去分词); 编造 adj. 织物的 n. 机织织物
culminate 英 ['kʌlmɪneɪt] 美 ['kʌlmɪneɪt] vi. 到绝顶; 达到高潮; 达到顶点 vt. 使结束; 使达到高潮	辨析: climax 英 ['klaɪmæks] 美 ['klaɪmæks] • n. 高潮; 顶点; 层进法; 极点

泰勒斯和其他米利都的哲学家开启了探索之门后，希腊思想家们开始推测宇宙的本源。这场激动人心的头脑大爆发在很多方面都是创新的。从泰勒斯到柏拉图再到亚里士多德的希腊人，**在今天看来**，他们不是科学家，而是哲学家。任何一个人都可以对自然或者宇宙组成的本源提出自己的想法，**很多时候**这些想法是一致的且精心架构的，或者只是太明显以至于对于很多人都有说服力。一个精心构建的关于宇宙的科学理论，不论它需要多少多于各种各样观察和类比来形成推理的系统，最终会在亚里士多德的世界宇宙模型里达到成熟。没有实验和客观的、批判性的对于理论的测试，这些思想家可以期待做到最好的是一些内部一致的推测，这些推测涵盖了所有的基础，并**满足了推理的要求**。

In this respect,

批注 [11]: burst

英 [bɜːst] 美 [bɜːrst]

- v. 爆炸; 戳破; 爆裂; (器官或血管)爆裂; 装满; 充满感情; 突然爆发(某种感情); 爆发出; 冲开; 闯; 分页, 断纸
- n. 爆炸; 迸发; 迸发; 冲刺; 一阵短促的射击

批注 [12]: intellectual

英 [ˌɪntəˈlektʃuəl] 美 [ˌɪntəˈlektʃuəl]

- adj. 智力的; 聪明的; 理智的
- n. 知识分子; 凭理智做事者

批注 [13]: for the most part

- adv. 在极大程度上, 多半

批注 [14]: 注意: 形容词之间有

逗号的时候, 一般是并列修饰的作用。

批注 [15]: satisfied the

demands of reason
好词!

批注 [16]: ★这段在说什么?

首先, 总结之前的这些人的功绩造成的影响。

其次, 说一下影响的具体内容, 出道题。

最后, 进行总结。

批注 [17]: 在这方面

为此

就这一点来说

在这点上

TPO 37 – 2 Direct Species Translocation 直接的动物迁移

It is becoming increasingly common for conservationists to move individual animals or entire species from one site to another. This may be either to establish a new population where a population of conspecifics (animals or plants belonging to the same species) has become extinct or to add individuals to an existing population. **The former is termed** reintroduction and **the latter** reinforcement. **In both cases**, wild individuals are captured in one location and translocated directly to another. ★

越来越普遍地，环境保护主义者开始把动物或者整个物种从一个地方迁移到另一个地方。这既可能是向某一族群（同种的动物或者植物）已经灭绝的地区输入新的族群，也可能是向一个现有生物族群引入新的个体。前者的术语是物种再引入，后者的术语是物种再强化。在这两种情况里，野生动物在一个地方被捕获，并且被直接传送到另一个地方。

Direct translocation has been used on a wide range of plants and animals and was **carried out** to maintain populations as a source of food **long before** conservation was a familiar term. The number of translocations carried out under the banner of conservation **has increased rapidly**, and this has led to **criticism** of **the technique** because of the lack of evaluation of its **efficacy** and because of its potential disadvantages. The nature of translocation **ranges from highly organized and researched** national or international programs **to ad hoc** releases of rescued animals by **well-intentioned animal lovers**. **In a fragmented landscape** where many populations and habitats are isolated from others, translocations can play an effective role in conservation strategies; they can **increase** the number of existing populations or **increase** the size, genetic diversity, and **demographic** balance of a small population, consequently increasing its chances of survival. ★

<p>carry out 英 美 ['kæri aʊt] vt. 执行，实行；贯彻；实现；完成</p>	<p>demographic 英 [,demə'græfɪk] 美 [,demə'græfɪk] adj. 人口结构的；人口统计的 n. 特定年龄段的人口；(demographics) 人口统计数据，人口统计资料</p>
<p>criticism 英 ['krɪtɪsɪzəm] 美 ['krɪtɪsɪzəm] n. 批评；考证；苛求</p>	
<p>efficacy 英 ['efɪkəsi] 美 ['efɪkəsi] n. 功效，效力</p>	<p>ad hoc 英 [æd'hɒk] 美 adj. 特别的；临时；专设 adv. 特别地</p>

在环境保护成为人们所熟知的术语之前，直接物种迁移就已经被用于多种动植物，被用来作为食物来源来保持物种数量。打着环境保护的名义的物种迁移数量急剧增加，这就导致了对于**这种技术**的批评，因为我们对其有效性缺乏评估，而且还因为它有潜在的不利之处。实际上的物种迁移涉及到**高度组织化**和**精细调查过**的国内国际项目，也涉及到**好心的动物爱好者**对于动物的拯救与放生。在**一个碎片化的地貌上**，不同的种群和栖息地是彼此隔绝的，这时候作为保护措施物种迁移就起到了重要的作用；他们可以促进动物数量增长，帮助种群规模扩大，增加基因多样性，平衡小种群的数量，最终增加动物的存活率。

批注 [18]: ★这段在说什么？

首先，说一下本文主要是干嘛的
(大概可以推测一下，应该是说
move animals from one site to
another.)

其次，说一下这个行为的目的，
并且给个名词，出**道题**。

最后，总结解释行为的实施方
法。

批注 [19]: ★这段在说什么？

首先，说一下 translocation 的状
况；

其次，说一下它的特点和优势。

The number of ... 【**出题**】

The nature of ...

The function of ...

Translocation clearly has a role in the recovery of species that have **substantially** declined and is the most likely method by which many sedentary species can recover all or part of their former range. However, against this is the **potential** for reinforcement translocations to spread disease from one population to another or to introduce **deleterious** or **maladaptive** genes to a population. Additionally, translocation of predators or competitors may have negative impacts on other species, resulting in an overall loss of diversity. Last but not least of these considerations is the **effort and resources required** in this type of action, which need to be **justified** by evidence of the likely benefits. ★

substantially (极大地) = considerably (巨大地) 英 [səb'stænjəli] 美 [səb'stænjəli] adv. 实质上; 大体上; 充分地	sedentary 英 ['sedntri] 美 ['sedntəri] adj. 久坐的; 坐惯的; 定栖的 ; 静坐的
potential 英 [pə'tenʃl] 美 [pə'tenʃl] adj. 潜在的, 可能的; 势的 n. 潜能, 可能性 ; 电势	justify (好词) 英 ['dʒʌstɪfaɪ] 美 ['dʒʌstɪfaɪ] vi. 证明合法; 整理版面 vt. 证明……是正当的 ; 替……辩护
maladaptive 英 [,mælə'dæptɪv] 美 [,mælə'dæptɪv] adj. 适应不良的; 不适应的; 不利于适应的	deleterious 英 [,delə'tɪəriəs] 美 [,delə'tɪəriəs] adj. 有毒的, 有害的

物种迁移在经历过**大量**减少的物种中起到重要的帮助恢复作用,它还是可以帮助很多**定居**的物种完全或者部分恢复原有规模的最有效办法。然而,反对这个看法的观点是,物种再强化式的迁移是可能把疾病从一个物种传到另一个物种的,或者向一个物种引入有害的或者适应不良的基因。另外,捕食者或者竞争者的迁移也许会对别的物种产生不好的影响,导致多样性的整体减少。这些考虑里,最后但同样重要的一点是,物种迁移所需要耗费的**精力和资源**仍然需要通过分析其可以带来的好处来确定合理性。

Despite the large number of translocations that have taken place, there is surprisingly little evidence of the **efficacy** of such actions. This is partly because many translocations have not been strictly for conservation; neither have they been official nor legal, **let alone** scientific in their approach. Successful translocations inevitably get recorded and gain attention, **whereas** failures may never be recorded at all. This makes **appraisal** of the method very difficult. **One key problem is a definition of success**. Is translocation successful if the individuals survive the first week or a year, or do they need to reproduce for one or several generations? Whatever the answer, it is clear that a general framework is required to ensure that any translocation is justified, has a realistic chance of success, and will be **properly** monitored and evaluated for the benefit of future efforts. ★

尽管大量的物种迁移已经发生了,让人惊奇的是还没有什么证据来证明这些行动的功效。这有一部分原因是因为很多物种迁移不是严格为了环境保护的;也不是官方的或者合法的,在实施过程中就不谈是否科学了。成功的物种迁移不可避免地记录下来,获得别人的关注,**然而**不成功的可能根本不会被记录下来。这就使得评价这种行为非常困难。一个关键的问题是,我们应该如何定义成功的物种迁移。如果迁移过去的物种存活一周或者一年就算是成功了,还是需要它们繁衍上一代或多代才算成功?不论答案是什么,我们都需要一个总体的框架,来确保任意一次物种迁移都是正当的,它们实际上确实有可能成功,而且会被妥善监控并且评估

批注 | 20|: ★这段在说什么?
首先,说一下 translocation 的好处;
其次,说一下它的劣势。【**出道题**】
最后,辩证总结。

批注 | 21|: let alone
•更不必说; 听任; 不打扰

批注 | 22|: appraisal
英 [ə'preɪzɪl] 美 [ə'preɪzɪl]
•n. 评价; 估价 (尤指估价财产, 以便征税); 估计

批注 | 23|: ★这段在说什么?
首先,说一下有效性的证据很少;
其次,说一下原因【**出道题**】:
最后,让步说应该怎样作。

其未来带来的好处。

An example of apparent translocation success involves the threatened Seychelles warbler. This species was once confined to Cousin Island, one of the Seychelles islands, and reduced to 26 individuals. **Careful habitat management increased** this number to over 300 birds, but the single population **remained vulnerable to** local catastrophic events. The decision was taken to translocate individuals to two nearby islands **to reduce this risk**. The translocations took place in 1988 and 1990, and both have resulted in healthy breeding populations. A successful translocation exercise **also** appears to have been achieved with red howler monkeys in French Guiana. A howler population was translocated from a site **due to be flooded for hydroelectric power generation**. **【significantly modified】** The **release site** was an area where local hunting had reduced the density of the resident howler population. Released **troops** of monkeys were kept under visual observation and followed by **radio tracking** of 16 females. Although the troops appeared to undergo initial problems, causing them to split up, all the tracked females settled into normal behavioral patterns. ★

一个明显的物种迁移成功的例子是关于濒危的 Seychelles warbler 的。这个物种一开始只生存于 Seychelles Island 群岛之一的 Cousin Island，数量直降到 26 只。小心的栖息地管理使其数量增加到超过 300 只，但是这个物种只存在于 Cousin Island 这一个地方导致其对于当地的灾害事件抵抗力极低。人们决定，为了降低这个风险，把这种鸟迁移到另外两个岛屿上。针对这种鸟的迁移发生于 1988 年和 1990 年，两次迁移都导致了鸟类数量的健康增长。另一个成功的迁移活动发生在法国圭亚那地区的 red howler monkey 身上。因为原栖息地被水力发电导致的洪水淹没，这种猴子被迁移到了别的地方。**释放地点**是一个本地捕猎降低了这种猴子族群密度的地区。猴子被释放以后一直在人们的观察之下，并且 16 只母猴**被无线电追踪**。尽管释放猴群经历了最初的困难，导致族群的分解，所有被追踪的母猴最终找到了正常的行为模式。

Unfortunately, the success stories are at least matched by **accounts of failure**. **Reviewing** translocation of amphibians and reptiles, researchers C.Kenneth Dodd and Richard A. Siegel concluded that most projects have not demonstrated success as conservation techniques and should not be **advocated as though** they were **acceptable** management and **mitigation** practices. ★

as though 好像，仿佛，似乎， 即使	mitigation 英 [ˌmɪtɪˈɡeɪʃn] 美 [ˌmɪtɪˈɡeɪʃn] n. 减轻 ；缓和；平静
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不幸的是，这些成功的案例背后，**有同样数量巨大的失败案例**。研究者 C. Kenneth Dodd 和 Richard A. Siegel 在**回顾**了两栖动物和爬虫的迁移案例后，得出结论，大多数迁移项目并没有把成功阐释为保护措施的成功，**尽管**它们是**可以接受的**管理和**减轻**问题的实践，它们也不应该**被提倡**。

批注 | 24]: **significantly**
英 [sɪɡ'nɪfɪkəntli] 美 [sɪɡ'nɪfɪkəntli]

•adv. 显著地；相当数量地
modify

英 ['mɒdɪfaɪ] 美 ['mɑ:dɪfaɪ]

•vt. 修改，修饰；更改
•vi. 修改

批注 | 25]: **troop**

英 [tru:p] 美 [tru:p]

•n. 军队；组；**群**；多数
•vi. 群集；成群而行；结队
•vt. 把（骑兵）编成骑兵连

批注 | 26]: ★这段在说什么？

说成功的例子，以及 translocation 的原因【出道题】:

批注 | 27]: ★这段在说什么？

表明观点，并且利用例子，说明不提倡的态度及原因。

TPO 37 – 3 Modern Architecture in the United States

美国的现代建筑

At the end of the nineteenth century, there were basically two kinds of buildings in the United States. On one hand were the buildings produced for the wealthy or for civic purposes, which tended to echo the architecture of the past and to use traditional styles of ornamentation. On the other hand were purely utilitarian structures, such as factories and grain elevators, which employed modern materials such as steel girders and plate glass in an undisguised and unadorned manner. Such buildings, however, were viewed in a category separate from "fine" architecture, and in fact were often designed by engineers and builders rather than architects. The development of modern architecture might in large part be seen as an adaptation of this sort of functional building and its pervasive application for daily use. Indeed, in his influential book *Toward a New Architecture*, the Swiss architect Le Corbusier illustrated his text with photographs of American factories and grain storage silos, as well as ships, airplanes, and other industrial objects. Nonetheless, modern architects did not simply employ these new materials in a strictly practical fashion—they consciously exploited their aesthetic possibilities. For example, glass could be used to open up walls and eliminate their stone and brick masonry because large spaces could now be spanned with steel beams.

在十九世纪末尾，在美国主要有两种建筑。一种是为财富或者为城市而建，这种建筑沿用了过去建筑的设计，使用的装饰物也是中规中矩的。另一种是纯粹功利主义的建筑，例如工厂和谷仓。这些设施采用了现代的材料，例如钢铁大梁和玻璃板，建筑风格朴素且不加装饰。然而，这样的建筑是不被归类到“好”的建筑一类中的，它们实际上常常是被工程师或者建筑者设计的，而不是建筑师设计的。现代建筑的发展很大程度上被视为这种功能性建筑的变种以及其日常生活的普遍运用。实际上，在这本影响巨大的《走向新建筑之路》里，瑞士建筑学家 **Le Corbusier** 通过很多图片阐述了他的文字，这些图片是关于美国的工厂、谷物仓库、筒仓、船只、飞机，以及其他的工业产物的。然而，现代建筑并不仅仅是简单使用了这些新型材料作为严格的实用用途——他们还发掘了这些材料的美学可能性。例如，玻璃可以被用在开放墙壁上，减少其石头和砖块的使用，因为钢铁的横梁可以横跨巨大的空间。

The fundamental premise of modern architecture was that the appearance of the building should exhibit the nature of its materials and forms of physical support. This often led to effects that looked odd from a traditional standpoint but that became hallmarks of modern architecture for precisely this reason. For example, in traditional architecture, stone or brick walls served a structural role, but in a steel-beam building the walls were essentially hung from the internal skeleton of steel beams, which meant that walls and corners no longer needed to be solid but could be opened up in unexpected ways. At the Fagus shoe factory in Germany, for example, German architect Walter Gropius placed glass walls in the corners, effectively breaking open the box of traditional architecture and creating a new sense of light and openness. Similarly, steel beams could be used to construct balconies that projected out from the building without any support beneath them. These dramatic balconies quickly became a signature of modern architects such as Frank Lloyd Wright. Wright's most dramatic residence, Fallingwater, has balconies that thrust far out over a stream in a way that

seems to defy gravity.

现代建筑的基础前提是建筑物的外观应该展现出其真实的材料和物理支撑的形状。这就经常会导致它们与传统建筑相比，看起来很奇怪，但是也是因为这个原因这就成为了现代建筑的特征。例如，在传统建筑里，石头和砖墙被用作搭建一座建筑的结构，但是在钢铁做梁的建筑里墙壁是悬挂在内部的钢梁结构上的，这就意味着墙壁和墙角不再需要是坚固的，可以以意想不到的方式被打开。例如，在德国的 Fagus 鞋厂里，德国建筑家 Walter Gropius 在墙角放置了玻璃墙，打破了传统，创造了新的光感和开放感。相似的是，钢梁可以被用作建造阳台，这种阳台可以伸出建筑，不需要底部的支撑。这种戏剧化的阳台很快就成为了现代建筑师的标志，比如 Frank Lloyd Wright。Wright 的最富有戏剧化色彩的住所是 Fallingwater，这个住所拥有一个悬于溪水之上的阳台，看起来就好像是克服了重力。

The ways in which new technology transformed architectural design are dramatically illustrated through the evolution of the high-rise office building. After ten or twelve stories, masonry construction reaches a maximum possible height, since it runs into difficulties of compression and of inadequate lateral strength to combat wind shear. Steel construction, on the other hand, can support a building of 50 or 100 stories without difficulty. Such buildings were so different from any previous form of architecture that they quickly acquired a new name—the skyscraper.

新科技改变建筑设计的方式通过高耸入云的办公楼戏剧性地展示出来。在十层十二层楼之后，高大建筑达到了其最大的高度，因为强大的压迫力和不足的抵抗风力的侧面强度不能支持楼继续长高。然而，钢铁结构就可以毫不困难地支持 50 或者 100 层的高楼。这样的建筑与传统的建筑大相径庭，以至于它们很快就获得了一个新的名字——摩天大楼。

From the standpoint of real estate developers, the purpose of skyscrapers was to increase rental space in valuable urban locations. But to create usable high-rise buildings, a number of technical challenges needed to be solved. One problem was getting people to the upper floors, since after five or six stories it becomes exhausting to climb stairs. Updated and electrified versions of the freight elevator that had been introduced by Elish Graves Otis in 1853 (several decades before skyscraper construction) solved this problem. Another issue was fire safety. The metal supporting buildings became soft when exposed to fire and collapsed relatively quickly. (They could melt at 2,700 Fahrenheit, whereas major fires achieve temperatures of 3,000 degrees). However, when the metal is encased in fire-retardant materials, its vulnerability to fire is much decreased. In Chicago, a system was developed for surrounding the metal components with hollow tiles made from brick-like terra-cotta. Such tiles are impervious to fire. The terra-cotta tiles were used both to encase the supporting members and as flooring. A structure built with steel beams protected by terra-cotta tiles was still three times lighter than a comparably sized building that used masonry construction, so the weight of the tiles was not a problem.

站在地产开发商的立场上，摩天大楼的目的是在可用的城里地点上增加可出租的空间。但是

为了创造可用的摩天大楼，大量的技术问题需要解决。一个问题是如何把人们带到高层去，因为在五六楼之上，爬楼梯就变得很累了。Elisha Graves Otis 在 1853 年（摩天大楼被造出来的几十年前）发明的、经过改进和电气化的货梯解决了这个问题。另一个问题是防火问题。钢铁支持的建筑在遇到火灾时会变软，并且很快就倒塌了。（它们可以在 2700 华氏度融化，而一场大火温度可以到 3000 华氏度）。然而，当钢铁结构用防火材料包裹起来后，它对于火灾来说就不那么脆弱了。在芝加哥，人们研发了一个系统，以便于使用类似于陶瓦的空心瓦片来包裹住钢条。这种瓦片是防火的。这种瓦片既被用来保住承重墙，也用于保护楼板。这种由陶片保护的钢条建造的建筑比相似规模的石头结构的大楼要轻三倍，所以瓦片的重量不是问题。