

Official 01

Passage 01

Groundwater

Groundwater is the word used to describe water that saturates the ground, filling all the available spaces. By far the most abundant type of groundwater is meteoric water; this is the groundwater that circulates as part of the water cycle. Ordinary meteoric water is water that has soaked into the ground from the surface, from precipitation (rain and snow) and from lakes and streams. There it remains, sometimes for long periods, before emerging at the surface again. At first thought it seems incredible that there can be enough space in the "solid" ground underfoot to hold all this water.

地下水是指渗入到地下并将所有岩石孔隙填满的水。到现在为止，大气水是最丰富的地下水资源，是地下水在水循环中的一个环节。普通的大气水会从地表、降水以及湖泊河流侵入到地下。在再次冒出地表之前，这些地下水有时会长时间留在地下。最初让人觉得难以置信的是，在我们脚下“坚实的”土地中竟然有足够的空间能储存这么些水。

The necessary space is there, however, in many forms. The commonest spaces are those among the particles-sand grains and tiny pebbles-of loose, unconsolidated sand and gravel. Beds of this material, out of sight beneath the soil, are common. They are found wherever fast rivers carrying loads of coarse sediment once flowed. For example, as the great ice sheets that covered North America during the last ice age steadily melted away, huge volumes of water flowed from them. The water was always laden with pebbles, gravel, and sand, known as glacial outwash, that was deposited as the flow slowed down.

然而，地下水所需的储存空间多种多样。松散的砂子和砾石间有许多颗粒，如沙粒和小石子，它们之间的孔隙是最常见的储存地下水的空间。由这些颗粒组成的水床非常普遍，通

常位于看不见的土壤下方，在携带粗糙沉淀物的湍急的河流曾流过的地方都能找到它们的踪迹。比如，冰河时代覆盖北美的巨大冰层逐渐融化，大量水从那儿流出。水里总会携带些石子、砾石和沙石，这些颗粒会随着水流的减速而沉淀，这就是所谓冰河期的冰水沉积。

The same thing happens to this day, though on a smaller scale, wherever a sediment-laden river or stream emerges from a mountain valley onto relatively flat land, dropping its load as the current slows: the water usually spreads out fanwise, depositing the sediment in the form of a smooth, fan-shaped slope. Sediments are also dropped where a river slows on entering a lake or the sea, the deposited sediments are on a lake floor or the seafloor at first, but will be located inland at some future date, when the sea level falls or the land rises; such beds are sometimes thousands of meters thick.

现代也有冰水沉积，尽管规模相对较小。凡是有携带沙石的河流或者溪流从山谷流至相对平坦的地面时，砂石就随着水流速度的减慢逐渐沉淀；水流通常呈扇形扩散，它们所携带的沙石也会沉淀为光滑的扇形斜面。当河流汇入湖泊和海洋的时候也会有沉淀，这些沉淀最初在湖底或海底，但将来海平面下降或者陆地崛起时，它们就会分布于内陆，通常厚达几千米。

In lowland country almost any spot on the ground may overlies what was once the bed of a river that has since become buried by soil; if they are now below the water's upper surface (the water table), the gravels and sands of the former riverbed, and its sandbars, will be saturated with groundwater.

低地区域上的任何位置可能就是曾经的河床，后续被土壤覆盖而变成现在的样子。如果那些过去的河床和沙洲现在位于地下水位之下，一定会有大量的地下水浸在它们的沙子和砾石之间。

So much for unconsolidated sediments. Consolidated (or cemented) sediments, too, contain millions of minute water-holding pores. This is because the gaps among the original grains are often not totally plugged with cementing chemicals; also, parts of the original grains may become

dissolved by percolating groundwater, either while consolidation is taking place or at any time afterwards. The result is that sandstone, for example, can be as porous as the loose sand from which it was formed.

以上说的都是松散的沉积物，那些坚固的沉积物，也拥有以数万计的毛细孔来容纳水。因为最初颗粒间的缝隙通常并未完全被黏固的化学物质塞满，而且部分颗粒很可能在固化时或固化后被渗入的地下水溶解；结果这些砂岩最终变得和形成它的散沙一样多孔。

Thus a proportion of the total volume of any sediment, loose or cemented, consists of empty space. Most crystalline rocks are much more solid; a common exception is basalt, a form of solidified volcanic lava, which is sometimes full of tiny bubbles that make it very porous.

因此，不管沉积物是疏松还是坚固，它们中一定有空隙。大部分结晶体岩石都非常坚硬，但也有例外，最常见的就是玄武岩，它是一种固化的火山熔岩，经常充满了微小气泡，从而变得十分多孔。

The proportion of empty space in a rock is known as its porosity. But note that porosity is not the same as permeability, which measures the ease with which water can flow through a material; this depends on the sizes of the individual cavities and the crevices linking them.

岩石的孔隙度就是指其中空隙的比例。但需要注意的是，孔隙度与渗透率是不同的。渗透率衡量的是水渗透物质的难易程度，它取决于与单个空隙以及连接空隙间裂缝的大小。

Much of the water in a sample of water-saturated sediment or rock will drain from it if the sample is put in a suitable dry place. But some will remain, clinging to all solid surfaces. It is held there by the force of surface tension without which water would drain instantly from any wet surface, leaving it totally dry. The total volume of water in the saturated sample must therefore be thought of as consisting of water that can, and water that cannot, drain away.

当充满水分的沉淀物或者岩石样本被放置在适宜的干燥环境中时，大部分的水分会流失，但仍有部分水会继续附着在坚实的表面上。要不是因为表面张力，这些水分也会立刻蒸发，仅留下完全干燥的样本。因此，试验样本的含水量既包括可以流干的水，也包括不能流干的水。

The relative amount of these two kinds of water varies greatly from one kind of rock or sediment to another, even though their porosities may be the same. What happens depends on pore size. If the pores are large, the water in them will exist as drops too heavy for surface tension to hold, and it will drain away; but if the pores are small enough, the water in them will exist as thin films, too light to overcome the force of surface tension holding them in place; then the water will be firmly held.

这两种水的相对含量因岩石或沉积物种类不同而改变，即便它们有相同比例的孔隙，还取决于孔隙的大小。如果孔隙很大，其中的水会形成水滴，太重足以克服吸引它的表面张力，就会流走；但如果孔隙够小，水会像薄膜一样，太轻无法克服表面张力，从而稳稳地附着在孔隙表面上。

Passage 02

The Origins of Theater

In seeking to describe the origins of theater, one must rely primarily on speculation, since there is little concrete evidence on which to draw. The most widely accepted theory, **championed** by anthropologists in the late nineteenth and early twentieth centuries, envisions theater as emerging out of myth and ritual. The process perceived by these anthropologists may be summarized briefly. During the early stages of its development, a society becomes aware of forces that appear to influence or control its food supply and well-being. Having little understanding of natural causes, it attributes both desirable and undesirable occurrences to supernatural or magical forces, and it searches for means to win the favor of these forces. Perceiving an apparent connection between certain actions performed by the group and the result it desires, the group repeats, refines, and formalizes those actions into fixed ceremonies, or rituals.

由于几乎没有具体材料可供研究，探寻戏剧的起源只能凭推测。19 世纪末 20 世纪初，为人类学家们所拥护的一种理论得到了世人的广泛认同；这种观点认为戏剧起源于神话和宗教仪式。这些人类学家们推论过程可简要概括如下：在社会发展早期，人们相信有股力量可以影响甚至操控他们的食物供应和幸福生活。在对自然原因并不十分了解的情况下，他们把希望或不希望发生的事情都归咎于超自然的或魔幻的力量，并且试图寻找各种途径赢得这些力量的厚爱。当他们意识到自己的某些行为和期许的结果之间存在明显的联系以后，人们便开始重复并且完善这些行为，最终形成固定的典礼或宗教仪式。

Stories (myths) may then grow up around a ritual. Frequently the myths include representatives of those supernatural forces that the rites celebrate or hope to influence. Performers may wear costumes and masks to represent the mythical characters or supernatural forces in the rituals or in accompanying celebrations. As a people becomes more sophisticated, its conceptions of supernatural forces and causal relationships may change. As a result, it may abandon or modify some

rites. But the myths that have grown up around the rites may continue as part of the group's oral tradition and may even come to be acted out under conditions divorced from these rites. When this occurs, the first step has been taken toward theater as an autonomous activity, and thereafter entertainment and aesthetic values may gradually replace the former mystical and socially efficacious concerns.

故事（神话）在这种仪式中发展起来，这些故事中经常会有仪式庆祝或期望影响的超自然力量的典型。在这种仪式或伴随的庆典中，表演者们可能会穿上戏装戴上面具来扮演神秘的角色或超自然力量。当人们认识事物的能力进一步加强的时候，他们对超自然力量以及与其引发的事件间因果关系的认识就发生了改变；于是，他们会抛弃或者修改某些仪式。不过在这些仪式中发展起来的神话故事继续在人们的口头流传，甚至可能脱离了仪式而被演绎着。这时候，戏剧做为一种自发的活动迈出了自己的第一步，接着，戏剧的娱乐和审美价值开始渐渐取代先前的带有神话色彩的、在社会上灵验的关注。

Although origin in ritual has long been the most popular, it is by no means the only theory about how the theater came into being. Storytelling has been proposed as one alternative. Under this theory, relating and listening to stories are seen as fundamental human pleasures. Thus, the recalling of an event (a hunt, battle, or other feat) is elaborated through the narrator's pantomime and impersonation and eventually through each role being assumed by a different person.

尽管戏剧起源于宗教仪式的说法是目前最被大众认可的，但无论如何这都不是戏剧起源的唯一理论；另一种推测认为戏剧源于说书。在这个理论中，与故事产生联系和聆听故事被视为是人类基本的乐趣。因此，讲述人通过自己的手势和模仿把对一个事件的回忆（一次打猎、战役或是其它功勋伟业）表现得淋漓尽致，这种方式最终演变成为由不同的人来演绎不同的角色。

A closely related theory sees theater as evolving out of dances that are primarily pantomimic, rhythmical or gymnastic, or from imitations of animal noises and sounds. Admiration for the performer's skill, virtuosity,

and grace are seen as motivation for elaborating the activities into fully realized theatrical performances.

另外一种与之相关的理论认为，戏剧主要是从无声的、有节奏的舞蹈、体操，或模仿动物声音的过程逐渐演变而来。人们对表演者的演技、审美能力和优雅的欣赏被视为是表演者将他们的表演精心策划为戏剧的动力。

In addition to exploring the possible antecedents of theater, scholars have also theorized about the motives that led people to develop theater. Why did theater develop, and why was it valued after it ceased to fulfill the function of ritual? Most answers fall back on the theories about the human mind and basic human needs. One, set forth by Aristotle in the fourth century B.C., sees humans as naturally imitative—as taking pleasure in imitating persons, things, and actions and in seeing such imitations. Another, advanced in the twentieth century, suggests that humans have a gift for fantasy, through which they seek to reshape reality into more satisfying forms than those encountered in daily life. Thus, fantasy or fiction (of which drama is one form) permits people to objectify their anxieties and fears, confront them, and fulfill their hopes in fiction if not fact. The theater, then, is one tool whereby people define a world or escape from unpleasant realities.

为了进一步探寻戏剧的起源，一些学派开始从人类发展戏剧的动机上建立理论。为什么戏剧会发展，为什么在戏剧完全脱离宗教仪式以后还有这么大的价值？大部分答案都回到那些关于人类心智和人类基本需求的理论中。首先，亚里士多德在公元前 4 世纪提出，人们天生好模仿，并从模仿他人、事物和动作以及观看模仿中获得乐趣。另外，20 世纪提出的先进理论认为人类擅长幻想，通过幻想将日常生活中的现实重塑成更加令人满意的形式。因此，人们通过幻想或虚构（戏剧的一个形式）把他们的焦虑和恐惧具体化，再通过这种方式面对焦虑和恐惧，并从虚构中满足他们现实中无法实现的愿望。所以，戏剧成为了一种帮助人们认识和理解这个世界，或是帮助人们逃避不满现实的工具。

But neither the human imitative instinct nor a penchant for fantasy by itself leads to an autonomous theater. Therefore, additional explanations

are needed. One necessary condition seems to be a somewhat detached view of human problems. For example, one sign of this condition is the appearance of the comic vision, since comedy requires sufficient detachment to view some deviations from social norms as ridiculous rather than as serious threats to the welfare of the entire group. Another condition that contributes to the development of autonomous theater is the emergence of the aesthetic sense. For example, some early societies ceased to consider certain rites essential to their well-being and abandoned them; nevertheless, they retained as parts of their oral tradition the myths that had grown up around the rites and admired them for their artistic qualities rather than for their religious usefulness.

但是，无论是人类模仿的本能或是对幻想的嗜好本身都不能发展成为独立的戏剧，因此，我们需要更多解释。一个必要的条件可能是一种要脱离通常人们看待问题的视角。比如，这个条件的一个标志是喜剧构想的出现，因为喜剧要求足够的发散思维，我们需要将社会规范中的离经叛道的行为视作极其荒谬的事情，而不是对公众群体福利的严重威胁。另一个导致戏剧独立的条件是审美感觉的出现。例如，一些早期社会的人们认为有的仪式对他们的幸福生活来说不再是必需品，并且取消了那些仪式。虽然如此，人们还是保留了那些口头传述故事的传统并且热爱从这些仪式里发展起来的神话，出于它们的艺术性，而不是宗教原因。

Passage 03

Timberline Vegetation on Mountains

The transition from forest to treeless tundra on a mountain slope is often a **dramatic** one. Within a vertical distance of just a few tens of meters, trees disappear as a life-form and are replaced by low shrubs, herbs, and grasses. This rapid zone of transition is called the upper timberline or tree line. In many semiarid areas there is also a lower timberline where the forest passes into steppe or desert at its lower edge, usually because of a lack of moisture.

通常从山坡上的森林到没有树的苔原是一种非常戏剧化的转变。在一个垂直距离只有几十米的地方，树木这种生命形式就消失了，取而代之的是低矮的灌木、草本植物和牧草。这种快速过渡的区域被称为上行树带界线或林木线。在许多干旱的地区存在着下行树带界线，在这里由于缺乏水分森林变成干草原，甚至在最下端会出现沙漠。

The upper timberline, like the snow line, is highest in the tropics and lowest in the Polar Regions. It ranges from sea level in the Polar Regions to 4,500 meters in the dry subtropics and 3,500-4,500 meters in the moist tropics. Timberline trees are normally evergreens, suggesting that these have some advantage over deciduous trees (those that lose their leaves) in the extreme environments of the upper timberline. There are some areas, however, where broadleaf deciduous trees form the timberline. Species of birch, for example, may occur at the timberline in parts of the Himalayas.

上行树带界线，和雪线一样，在热带最高，在极地最低。从极地地区的海平面到干燥的亚热带地区的海拔 4 500 米处以及潮湿的热带地区海拔 3 500 米至 4 500 米处都有上行树带界线。树带界线内通常是常绿树，它们和处于上行树带界线处极端恶劣环境中生长的落叶树木相比，具有一定的优势。然而，在部分地区也有由落叶阔叶林组成的树带界线。例如，在喜马拉雅的部分地区，桦树就在树带界线上。

At the upper timberline the trees begin to become twisted and deformed. This is particularly true for trees in the middle and upper latitudes, which tend to attain greater heights on ridges, whereas in the tropics the trees reach their greater heights in the valleys. This is because middle- and upper- latitude timberlines are strongly influenced by the duration and depth of the snow cover. As the snow is deeper and lasts longer in the valleys, trees tend to attain greater heights on the ridges, even though they are more exposed to high-velocity winds and poor, thin soils there. In the tropics, the valleys appear to be more favorable because they are less prone to dry out, they have less frost, and they have deeper soils.

上行树带界线的树木开始扭曲和变形，尤其在中高纬度地区的树木，这些地区的树木往往会在山脊上长得更高，而在热带地区的树木则在山谷里长得更高；因为中高纬度地区树带界线受积雪覆盖时间和深度的影响很大。由于山谷中积雪覆盖较厚且持续时间很长，树木即便是生长在大风和贫瘠的土地里，也往往会在山脊上长得更高。在热带地区山谷里更有利于生长，因为山谷不易干涸、很少结霜，并且有更深的土壤。

There is still no universally agreed-on explanation for why there should be such a dramatic cessation of tree growth at the upper timberline. Various environmental factors may play a role. Too much snow, for example, can smother trees, and avalanches and snow creep can damage or destroy them. Late-lying snow reduces the effective growing season to the point where seedlings cannot establish themselves. Wind velocity also increases with altitude and may cause serious stress for trees, as is made evident by the deformed shapes at high altitudes. Some scientists have proposed that the presence of increasing levels of ultraviolet light with elevation may play a role, while browsing and grazing animals like the ibex may be another contributing factor. Probably the most important environmental factor is temperature, for if the growing season is too short and temperatures are too low, tree shoots and buds cannot mature sufficiently to survive the winter months.

目前还没有一个普遍认同的解释来说明为什么会在树带界线上出现树木停止生长这种戏剧化的现象。多种环境因素都起到作用，例如，积雪过多会让树木透不过气，雪崩和雪移能摧毁树木；长时间积雪缩短了有效生长季节的时间，树苗无法生长；另外，风速会随着海拔的升高而增加，增加树木承受的压力，很明显，正是这种风速带来的压力导致树木在高纬度地区发生变形。一些科学家提出，随着海拔的上升而不断增强的紫外线、野生山羊等动物的放养，都是导致树带界线形成的因素。或许最重要的环境因素是温度，因为如果生长季节太短并且气温太低，树芽和树苗都无法充分地成长而存活过冬季。

Above the tree line there is a zone that is generally called alpine tundra. Immediately adjacent to the timberline, the tundra consists of a fairly complete cover of low-lying shrubs, herbs, and grasses, while higher up the number and diversity of species decrease until there is much bare ground with occasional mosses and lichens and some prostrate cushion plants. Some plants can even survive in favorable microhabitats above the snow line. The highest plants in the world occur at around 6,100 meters on Makalu in the Himalayas. At this great height, rocks, warmed by the sun, melt small snowdrifts.

在林木线之上有一个称为高山苔原的地带。由于紧挨着树带界线，苔原上都是矮灌木、草本植物和牧草。随着海拔的增加，物种的数量和多样性会逐渐减少，直到出现大量空地伴着零星的苔藓和地衣这样的伏地垫状植物。有些植物甚至可以在雪线以上有利的微环境中生存，世界上海拔最高的植物是出现在喜马拉雅山上 6 100 百米的马卡鲁峰。在这个高度上，被阳光温暖过的岩石可以将小雪堆融化。

The most striking characteristic of the plants of the alpine zone is their low growth form. This enables them to avoid the worst rigors of high winds and permits them to make use of the higher temperatures immediately adjacent to the ground surface. In an area where low temperatures are limiting to life, the importance of the additional heat near the surface is crucial. The low growth form can also permit the plants to take advantage of the insulation provided by a winter snow cover. In the equatorial mountains the low growth form is less prevalent.

高山植物最突出的特点是其低矮的生长形态。这种特点使他们能够避开大风最强势的势头，并且有助于他们利用紧邻地面相对较高的温度。在这样一个低温限制生命的地区，地表提供的额外温度是至关重要的。低矮的生长形态也可以帮助植物充分利用冬季积雪所提供的保温环境。在赤道区的山脉上低矮的生长形态并不常见。