遗址生境管理：
空间规划中考古遗址管理的跨学科方法
Managing Archaeotopes:
An Interdisciplinary Approach to Archaeological Sites Management in Spatial Planning

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摘要

在空间规划中，以考古遗址为代表的多维景观历史发展常被忽略。本文通过提出“遗址生境管理”的新概念，将考古学研究与空间规划联系起来。该概念主张通过跨学科方法来帮助构建考古遗址的“遗址生境”，从而将场地中的考古学、美学和生态价值相互融合。作者认为，考古遗址在时间维度，尤其是历史变迁和重要事件中留下的痕迹（即景观史），以及遗址景观的动态变化应被视为空间规划的必要信息。因此，本文指出综合多学科知识的必要性，包括能够反映景观发展和动态变化的学科，如地质学、古生物学、考古学和历史地理学；能够提供地方特征信息的相关学科，如生物学和专名学；以及与人类需求相关的学科，如社会学和心理学。最后，从5个方面提出了与“遗址生境管理”相关的当前和未来议题，并强调了认识和实现跨学科协作对于成功规划所发挥的关键作用。

关键词

空间规划；时间维度；考古遗址；遗址生境管理；跨学科知识

ABSTRACT

The multifaceted historical development of a landscape typically represented by archaeological sites are often overlooked in spatial planning. In this article, Managing Archaeotopes was proposed as a new concept connecting archaeological research with spatial planning. The concept advocates that an interdisciplinary approach could help to build the “Archaeotopes” of archaeological sites, which brings together their archaeological, aesthetic, and ecological values in the landscape. The authors argue that the temporal dimension, i.e. landscape history, especially in terms of the remaining relics of historic development and events in the landscape today, and the dynamics of landscape changes should be treated as necessary information for spatial planning. Thus, knowledge should be acquired from relevant disciplines reflecting the timeline and dynamics of a landscape, such as Geology, Paleontology, Archaeology, Historical Geography, as well as other relevant sources and disciplines providing local characteristic information such as Biology and Onomastics. Knowledge from Sociology and Psychology would be needed when considering human requirement. At last, topics in the present and future were proposed in five aspects to facilitate Managing Archaeotopes, and emphasized the key role of the acceptance and realization of interdisciplinary work for a successful planning in the future.

KEYWORDS

Spatial Planning; Temporal Dimension; Archaeological Site; Managing Archaeotopes; Interdisciplinary Knowledge

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1 引言

在世界范围内，景观总是被视为一种三维空间实体。而本文重点引介了一种概念——“遗址生境管理”，在景观中融入时间维度，使其成为四维的空间实体。时间维度不仅包括现在和未来，也包括了过去——地质过程与人类的开发利用从各方面塑造出的独特景观。然而，空间规划和土地开发往往会忽略景观（尤其是考古遗址）背后的历史，很多时候视其为“一张白纸”。

实际上，每一处景观及其历史都是自然力量和人类活动的综合产物，如史前陵墓（图1，2）和中世纪的防御工事（图3）。景观历史反映了自然与人类的相互影响和关系，这也是空间规划需要重点关注的信息。具体而言，不同的专项空间规划（如景观、农业和林业规划）都需要进行实地调研，分析场地中的土壤、水文、气候和其他自然条件，以完善对其历史背景的认识。设计师还可以通过深入研究景观的演变（如土地利用变化情况）[1]，回溯整个历史进程所留下的遗迹和事件。

对场地独特历史特征的认识、理解和利用，将有助于空间规划师和从业者提高场地的可持续性。因此，越来越多的人开始提倡引入更加成熟的考古遗址管理方法，以整体提升考古遗址在考古学、美学和景观生态学方面的价值。

2 “遗址生境管理”概念

景观中的考古学特征在全球范围内急剧丧失，因为这些特征仅被视作考古学管理与研究的对象，而不被空间规划类专业所关注。我们亟须利用一个全新的概念将考古研究、空间规划与土地利用优化结合起来。总体而言，考古遗址具备以下价值：1）不可再生资源； 2）重塑历史

1 Introduction

Landscape is worldwide mostly seen as a three-dimensional spatial subject. This article focuses on a concept, i.e. Managing Archeotopes, to handle landscape as a four-dimensional subject through the implication of the “time” dimension. Not only is time seen as the present and the future, but also as the past having shaped landscapes by geological processes and human use in various specific aspects. However, spatial planning and land development often overlook the multifaceted historical context of landscapes (especially archaeological sites), so as to treat them as nearly tabula rasa areas.

In fact, each landscape and its own history were molded by natural forces and human activities over time, e.g., a prehistoric grave (Fig. 1, 2), or a medieval fortification (Fig. 3). The history in landscapes suggests the mutual influence and relations between the nature and men, which also be of particular significance to spatial planning. Specifically, specific planning types, such as landscape planning, agricultural planning, and forestry planning, all need the analysis on the history of the landscape by surveying the soils, the water, the climate, and other naturally formed parts on site. Designers could further evaluate changes in the landscape (e.g., changes in land uses)[1], to trace the remaining relics and events in the landscape throughout history.

Reading, understanding, and using the unique historical features of landscapes help spatial planning specialists and professionals improve the site’s sustainability. There is a growing call for bringing a successful approach to the management of archaeological sites that strengthens their overall value in Archaeology, Aesthetics, and Landscape Ecology.

2 The Concept of Managing Archaeotopes

The loss of archaeological features in landscape has globally dramatically increased, as the elements are just regarded as the subject of archaeological administration and archaeological research, instead of a part of spatial planning. It underscores the need for a new concept connecting archaeological research with spatial planning and optimization of land use. Basically, archaeological sites are:

1. 德国北部新石期时代早期的巨石坟墓（大约建造于公元前4000~3300年）
2. 位于德国北部的土丘墓地（大约建造于公元前1600年）不仅是一处考古遗址，而且是一处生态残遗生境。
3. 在德国东北部一处已被集约利用的土地之中，留存了一个大约建造于9世纪的斯拉夫人定居点。

1. Megalithic tomb from the early Neolithic (about 4000 ~ 3300 BC) in north Germany
2. Burial mound in North Germany (about 1600 BC), not just an archaeological monument, but also an ecological refugium.
3. A slavonic settlement (around the 9th century AD) in the subsoil of an intensively used field in northeast Germany.


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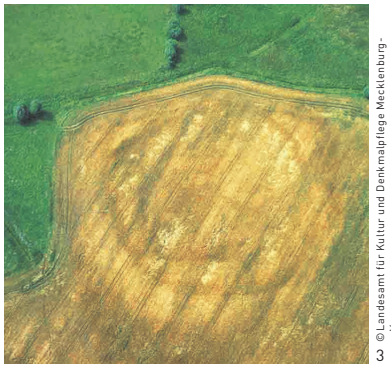
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的不可替代来源； 3）文化景观的景观要素； 4）考古学、美学和生态层面的值得保护的潜在价值；5）与大多数综合性的土地用途、特性、技术和集约程度（特别是对农业的影响和土地开发）相关[2]。

从这个意义上来说，景观中的考古遗址通常可被称为“场所/场地”（该词源自希腊语“tópos”），与其同源词生境（biotopes）或地质遗迹（geotopes）相当。通常，考古遗址也存在生境或地质遗迹，它们同样具备上述价值。基于此，作者提出“遗址生境”（Archaeotope）一词，用以表达考古科学及研究对于场地评价的特殊意义。而“遗址生境管理”（Managing Archaeotopes）的概念则进一步强调规划/管理体系中遗址的全部价值，这与考古保护的愿景是一致的。1979年颁布的《布拉宪章》中将“遗址”（monument）的概念调整为“场所”（place）[3][4]，自此，考古保护的范围便持续扩展到了考古遗址及其周围的物理和社会环境[5]。此外，从景观管理与发展的角度来看，遗址生境管理也适用于将考古遗址作为景观要素的空间规划和景观维护及开发活动。因此，考古遗址与其周围景观现状和发展过程紧密相连。

3 “遗址生境管理”的相关学科

自第一部关于考古遗址保护的国际文件——《雅典宪章》（1931年）颁布以来，《威尼斯宪章》（1964年）、《华盛顿宪章》（1987年）、《西安宣言》（2005年），及其他的许多宪章、宣言和提议也相继诞生。考古保护已经发展成为一种跨学科途径，使遗址的历史和文化背景与保护措施密不可分[6][7]。这一途径在联合国教科文组织提出的国际政策——《关于城市历史景观的建议》（2011年）中获得了进一步拓展与传播。为了明确遗址生境管理在景观设计中的重要价值，下文将从三个方面列举与之相关的各个学科。

3.1 反映景观时间发展和动态变化的学科

时间是一个连续的过程。因此，当我们试图发现一处考古遗址的独特性时，应该从哪个时间点开始思考呢？我们或许可以构想一条时间轴，一直回溯至年代最久远的遗迹或文物在某处特定的环境中出现之时。

3.1.1 地质学

地质学也许是帮助我们了解景观历史发展脉络“主干”的一个很好的切入点。地质学所涉及的时间维度往往跨越数十万甚或数百万年。由地质过程形成的景观可能取决于最初的地质系统。例如欧洲北部某些地区（如德国、波兰和丹麦）在维斯图利亚冰川作用下形成了一系列不同

1) non-renewable resources; 2) irreplaceable sources for the reconstruction of historical developments; 3) landscape elements of the cultural landscape; 4) of archaeological, aesthetical, and ecological values that are potentially worth protecting; and 5) associated with the most variety in land uses, specifics, technology, and intensity (especially the influence on agriculture and land development)[2].

In this sense, archaeological sites in landscapes can often be characterized as topoi (tópos, Greek for “places” or “sites”), comparable with biotopes or geotopes. Usually, there are also biotopes or geotopes beneath archaeotopes with above described value. Archaeotope, the term expresses the special meaning of archaeological science and research for the evaluation of the site. The concept of Managing Archaeotopes, giving weight to all the values in a planning or management system, is in line with the vision for archaeology conservation. Since the notion change of the “monument” to “place” in Burra Charter 1979[3][4], archaeology conservation has been expanding to archaeological monument and the surrounding physical and social fabrics[5]. It is, in addition, applicable for every spatial planning and activity on landscape care and development where archaeological sites are recognized as landscape elements. With this concept, archaeological sites are inextricable to the state and development of the surrounding landscape.

3 Relevant Disciplines for Managing Archaeotopes

Since the publication of Athens Charter (1931), the first international document about archaeological site conservation, followed by Venice Charter (1964), Washington Charter (1987), Xi’an Declaration (2005), and many other charters, declarations, and recommendations, archaeology conservation has developed as an interdisciplinary approach interconnecting the conservation process within the historical and cultural context of a site[6][7], and extended as international policies like the Recommendation on the Historic Urban Landscape by UNESCO in 2011. To identify the specific values of Managing Archaeotopes in landscapes, the following mentioned disciplines could help in different ways.

3.1 Disciplines Reflecting the Timeline and Dynamics of a Landscape

Time is a continuum. So where should we start in thinking about time when we try to find out the specific of an archaeological site? It is perhaps helpful to imagine a timeline and go back on it to the point where the oldest remains or relics was formed in a specific landscape.

3.1.1 Geology

Geological dimensions maybe a good start to see the “backbone” of a landscape. The dimension of time is usually hundreds of thousands or perhaps millions of years. A landscape formed by geological processes can become fixed by geological systems of the origin. For instance, Vistulian Glaciation in parts of Northern Europe (e.g. Germany, Poland, and Denmark) with a range of different

的冰川形态特征，包括典型的冰碛，冰堆丘和瓯穴。可见，在多数情况下，地质学特征可作为识别景观独特性形成原因的首要依据。

3.1.2 古生物学

古生物遗骸是地质学维度的生命见证，具有特殊的意义。许多地区正是以古生物学发现而举世闻名，却鲜少有遗址因当地参与者或规划师的作为而为人所熟知。例如，中国广西省的柳城洞穴中发现了一种已灭绝的类人猿——巨猿（Gigantopithecus）的大量牙齿化石，由德国人类学家孔尼华在一家药店中首次鉴别出来（1935年），并认为这种人科（Hominidae）动物可能重达300kg。一些科学家认为巨猿的身高近3m，其体型必然已经超过现存的大猩猩。今天的中国，从恐龙到滑翔哺乳动物都有众多全新发现，是全世界最重要的古生物学研究热点地区之一，并拥有令人叹为观止的奇观。但是，中国是否已在空间规划中充分发掘了古生物学发现所带来的巨大潜力？未来，规划师应当增加对古动物学与古植物学的了解和认识。

3.1.3 考古学

在全球语境下，考古学的分类主要取决于工作中具体应用与开发的方法，或者依据遗迹的出现年代。在欧洲的某些区域和世界其他地区，有超过90%的人类历史是借助考古遗迹来断定的，然而规划师在工作中却常常对这些遗迹重视不足。因此，规划师应与更为熟悉场地本身景观特征与周边遗迹的考古学家展开合作。

基于以上视角，需要研究每种已知文明的发展水平及其在特定景观中形成的历史遗迹。总体而言，人们普遍认为人类文明始于“石器时代”——包括旧石器时代、中石器时代和新石器时代。石器和有机物残骸制成的工具，以及巨石坟墓等史前遗迹均出现于这一时代。当然，自此之后的文明进程也应予以重视。在欧洲，文明进程往往是借助人类对铜、青铜、铁或其他材料的使用来进行描述的，除此之外，也借由罗马帝国的扩张和发展或其他事件来定义。文明进程为规划师提供了一个独特的视角，亦是利用考古学或历史学分支学科研究成果的机会。

3.1.4 历史地理学

当今的景观研究与地理学有着密切联系，尤其是热门的景观考古学、景观都市主义和景观生态学[8]。人们常常（并非总是）将历史与新发现的文字史料联系起来。历史学家则是擅长对文字记录提出批判性观点的专家，在这方面，他们拥有规划师极少关注的渊博知识。而历史

glacial morphological features like specific moraines, drumlins, and kettle holes. A geological feature can mostly be the beginning to think about the specific of a landscape.

3.1.2 Paleontology

Palaeontological remains, witnesses of life in geological dimension, are of specific interests. Many areas are worldwide known for paleontological finds, but unfortunately few by local actors or planners. For example, the Liucheng-cave in Guangxi of China, where thousands of teeth of Gigantopithecus (an extinct genus of ape) have been found. The tooth was first identified in a drugstore by the German anthropologist Ralph von Koenigswald in 1935, and the weight of the animal (Hominidae) was estimated to reach probably 300 kg. Some scientists described the animal as three meters tall, which surely exceeded the size of a gorilla in the present. China today is one of the most important paleontological hotspots with new findings from dinosaurs to gliding mammals, and with the surprising and fascinating landscape to people over the world. Is this outstanding potential so far adequately used in China’s spatial planning? Planners should shed a light on the knowledge from Paleozoology and Paleobotany in the future.

3.1.3 Archaeology

Archaeology, in a global context, is mostly defined by the applied and developed methods of work, or by the age of the subjects. In some European regions and other areas worldwide, more than 90% of human history is identified by archaeological remains that is likely to be overlooked by planners in their work. Today, planners are encouraged to cooperate with archaeologists who are familiar with the on-site landscape information and the archaeological remains in the region.

To go further in time means to have a look on each named culture level and their remains in the specific landscape. Mostly, but not everywhere in a global view, it starts with “Stone Age,” i.e. Paleolithic, Mesolithic, and Neolithic, as first human culture levels. These embrace tools made of stone and organic remains, but also tombs like megalithic graves. After this Age, we should in our minds go further in time and look on every later developed culture level as well. These levels are in Europe often described by the use of copper, bronze, iron or other materials, beneath that also by the expansion and development of imperials, like the Roman Empire or other events. The view on culture levels gives planners a chance to use the findings of established sub-disciplines of Archaeology and History.

3.1.4 Historical Geography

Landscape research today has a close relationship with Geography, particularly inspiring Landscape Archaeology, Landscape Urbanism, and Landscape Ecology[8]. History is often (not always) seen linked with the emerging of written sources and documents. Historians are experts with a critical view on documents and a

地理学作为历史学与地理学的交叉学科，或许非常适合规划师用来弥补这部分知识空白。从历史地理学的角度来看，除了历史地图、历史文献汇编与文献解析以外，还有大量可反映景观特征的资源。另外，纵切法（观察某地区随时间产生的变化）和横切法（特定时间的地域概况）十分有助于理解特定景观的历史动态。只有了解了场地的历史，才能对其现状做出合理评估。

3.2 可提供地方特征信息的学科

3.2.1 生物学

生物学是所有被广泛应用于空间规划过程中的生态知识的基础。若与历史结合，我们则需要关注两个鲜被讨论的视角：1）生物学研究可帮助我们了解该地区动植物物种——即那些在规划中被视为“乡土”或典型物种——的历史演化进程（包括什么物种、何时出现、何处出现）。若结合考古学家和古生物学家的研究，即可能在场地中重现物种演化并将其引入空间规划措施。2）动植物学中，残遗种是另一个研究热点。比如，在欧洲的深湖中生存至今的鱼类中的白鱼——真白鲑（*Coregonus lavaretus*）和欧白鲑（*Coregonus albula*）的亚种，其实是冰川时代的残遗种；抑或是近期在一些考古遗址发现的蜀葵状锦葵（*Malva aclea*），常出现在中世纪城堡遗址中（图4）。

3.2.2 专名学

农田名、湖泊名、河流名、聚居区名等地名，都是可被用来了解前人对其周边景观认知的常用资料。人类对于所有权、特定地点、特殊财产和过往战争史等不同方面的了解，构成了历史的根基。地名不仅是了解景观历史的来源，同时也是值得保护的文化遗产[9]。

在场地分析中使用地名时需要注意的是：1）场地名称须参照其原始含义；2）景观元素的名称必须符合当前场地的本地语境；3）内容/描述必须清晰明确。

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4. 蜀葵状锦葵这一物种常常可指示9世纪左右德国东北部斯拉夫的防御工事。

4. *Malva alcea*, a species often associated with Slavonic fortifications (around the 9th century AD) in northeast Germany.

deep-going knowledge that is little used by planners. Historical Geography, the overlapping discipline between History and Geography, may be of specific interest to cover these research gaps. From this disciplinary dimension, historical maps, historical text collections, and text ratings are just a few of many sources that can bring information on the specific of a landscape; methods like the longitudinal section (the development of an area over time) and the cross-section (the area at a specific time) are both very useful to understand the dynamics of the specific landscape in the past. We can only assess the landscape today if we know the past landscape.

3.2 Disciplines Providing Local Characteristic Information

3.2.1 Biology

Biology is the basis of every ecological knowledge that is well established in most spatial planning processes. In terms of historical aspects, we would like to focus on just two seldom used points of interest: First, biological research gives us the knowledge about the historical development (including which, where, and when) of animal and plant species in a region—the ones discussed as the “native” or typical species in planning. Often together with the findings of archaeologists and paleontologists, it is possible to reconstruct the development of species in a landscape and to get the chance to introduce these aspects in spatial planning. Another research interest is relic-species both in Zoology and Botany. In Europe this can be e.g. a fish-taxon which has survived in deep lakes as glacial relics, like whitefishes (subspecies of *Coregonus lavaretus* and *Coregonus albula*), or specific plant species which are in the recent landscape to locate the specific archaeological sites like *Malva aclea*—species on medieval castle facilities (Fig. 4).

3.2.2 Onomastics

Locality names, e.g. field names, names of lakes and rivers, and settlement names, are familiar sources to understand the view of former generations on their surrounding landscapes. It was in history basis to know about the ownership, specific location, special properties, historical martial events, and other aspects. Locality names are on one hand sources to understand the history of a landscape, but on the other hand also cultural property worth protecting[9].

For the use of locality names in the analysis of landscapes, three prerequisites must be met: 1) the names must correspond with the original meaning; 2) the names of the landscape components must be localizable in the recent landscape; and 3) the meaningful content/statement must be clear.

3.3 Disciplines Relating to Human Requirement

People have formed the landscapes, but the reverse is also true. The cultural background of people in a specific landscape should not be underestimated by planners who need to promote the introspection. Perhaps lessons can be drawn from Sociology and Psychology to foster a better cognition on the well-intentioned planning and the successful and widely accepted spatial planning.

3.3 与人类需求相关的学科

人类创造景观，景观也塑造人类。规划师应当重视特定景观中的人文背景。或许，可以借鉴社会学和心理学的相关知识，提升规划师对富有人文关怀的、成功且被广泛认可的空间规划的认知水平。

3.3.1 社会学

景观中的考古遗址是重要的公共资源，其开发利用应考虑不同利益相关者的需求，规划过程中也应考虑公众参与。社会学（特别是景观社会学）提供了一些有效方法（如实地考察、问卷调查和访谈）来实现对不同使用者及其活动行为与景观之间关系的分析。

3.3.2 心理学

高质量的景观是连接人与环境的重要纽带。对心理学（尤其是环境心理学）的理论的应用有助于使景观触发人们特定的心理效应。考古遗址往往是场所精神的实质载体，可借此赋予当地居民归属感。

4 当前及未来相关议题

4.1 土地利用技术

如今，地理信息系统（GIS）与遥感技术相结合的地图和其他相关资料已在文化遗产规划过程中得到广泛应用[10]。今后，针对考古遗址调研技术的发展仍然值得重视，特别是对农业技术和森林的影响的调查[11]——如曾经使用过的特殊犁地工具以及历史上的交通对土壤层压力载荷所造成的影响。在景观改造策略中应考虑对考古遗址的保护，尤其应注重排水和土壤的改良。几乎所有的土地利用技术都是全球考古遗址保护的重要研究与实践领域。

4.2 以规划为导向的考古学研究

虽然规划师已经能够发掘场地近期的生态和美学特征，但是，规划师与考古学家的合作——通过航空考古等现代方法——有望进一步提升规划和土地开发相关领域研究与从业人员对于考古遗迹和遗址本身的外观、空间扩展和不同价值的认识[12]。此外，规划师不仅应保护考古遗迹本身，还应保留遗址与环境的历史背景，如历史环境、陈设和视觉轴线等。

4.3 教育及职业培训

景观中的考古遗址能否留存，取决于是否规划了适宜的土地利用。因此，大学和其他教育机构需要设立更多关于考古遗址保护的土地利用培训课程。这些专业培训体系建议包括规划科学、农业、林业、土木工

3.3.1 Sociology

Landscapes with archaeological sites are important public resources. The development and utilization of them should consider the requirements of different stakeholders, as well as the public participation in the planning process. Sociology, especially Landscape Sociology, provides several effective methods such as field visits, questionnaire, and interviews, to analyze the relationships between different people and their activities and the landscape.

3.3.2 Psychology

Landscapes with high quality act as an important connection between human and the surround environment. Theories from Psychology (especially Environmental Psychology) could help form landscape with certain psychological effects. Archaeological sites reflecting local culture are often resources of sense of place, and could help form the sense of belonging of local people.

4 Topics in the Present and Future

4.1 The Technological Aspect of Land Use

Nowadays, maps and related information from geographic information system (GIS) integrated with remote sensing are widely used in planning process of cultural heritage sites[10]. Further investigations will remain very important in the future on technological, especially agro-technological and forest-related effects on archaeological sites[11]. This embraces for example the effects of used tools (like special plows) and pressure loads by vehicles on relevant soil layers. Amelioration activities should include the protection of archaeological sites, with a particular attention to drainage and soil improvement. The technological aspect of almost all land uses is an important area of research and practice for the preservation of archaeological heritage sites worldwide.

4.2 Planning-Oriented Focus

Planners, though, are usually able to find out the ecological and aesthetical particularities of sites in the recent landscape. The knowledge on the appearance, the spatial extension, and the different values of archaeological remains and sites in relevant areas of planning and land development should be continuously improved, with modern methods like aerial archaeology[12]. The cooperation between planners and archaeologists are expected. Besides, not just should the physical archaeological remains be protected by planners, but also the relation between the environment and archaeological remains in the historical context, which can be the historical surrounding, settings, visual axes, etc.

4.3 Education and Vocational Training

The preservation of the archaeological archive in landscapes depends on adapted land uses. More training courses for this land use need to be established at universities and other educational institutions on the protection of archaeological

程、生态修复和土壤改良等研究方向。各级课程都应同时包含各自的基本学科内容以及与景观中的考古遗址保护相关的内容。

4.4 土地利用政策

有时，考古遗址的保护需要改变当前的土地利用，这意味着我们需要将考古遗址视为机遇和挑战，而这离不开政治远见与智慧。

5 结论

如果我们认识到考古遗址是一种景观要素，那么未来，进行跨学科协作将是成功的关键。当前，世界范围内的考古遗址的消失速度令人震惊，这必须引起我们的反思。在此，作者呼吁景观行业应当积极采取行动。**LAF**

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sites. The predestined specialist training system includes disciplines such like Planning Science, Agriculture, Forestry, Civil Engineering, Amelioration, and Soil Improvement. Curricula at all levels of training should contain the specific between the disciplines and the preservation of archaeological sites in landscapes.

4.4 Land Use Policy

The protection of archaeological sites sometimes requires changes of current land uses, which needs political insights and wisdom to recognize archaeological sites as chances but obstacles.

5 Conclusion

If we acknowledge archaeological sites as landscape elements, the acceptance and realization of interdisciplinary work will be the key of success in the future. The dimension of disappearance of archaeological sites worldwide is alarming, which must lead to a rethink. The impoverishment of landscapes in this regard should be opposed by active actions. **LAF**

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