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中国-葡萄牙文化遗产保护科学“一带一路”联合实验室

CHINA-PORTUGAL JOINT LABORATORY
OF CULTURAL HERITAGE CONSERVATION SCIENCE
SUPPORTED BY BELT AND ROAD INITIATIVE

《遗产研究国际动态》(内刊)
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可持续的未来

Sustainable Future

资料来源：
Van Hees RPJ, Naldini S, Roos J.《耐久的过去，可持续的未来》[M]. Delft: TU Delft, Heritage & Architecture, 2014.
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可持续是一种获取或使用资源的方法，以使资源不会损耗殆尽或永久受损。可持续这一术语意为，在满足当代人需求的同时，不损害子孙后代以及其他地区居民的需求。在联合国发布了布伦特兰报告《我们共同的未来》后，可持续成为了一个非常重要的议题（图 1）。这份报告给出了可持续发展最常被引述的定义：“在为满足当下需求的建设同时，不侵害未来一代的需求利益。”

许多遗产建筑除了具有较长的使用寿命外，同时也具有可持续性。因为它们体现了从建材的生产和运输到施工建造再到最终损毁的全生命周期中能源的聚集。建筑存在的时间越长，从材料和具体能源的视角来看，它就越具有可持续性。从能源消耗的视角来看，这一点则不那么明显。能耗与资源的概念应该进一步发展，以适应我们对遗产的干预理念。

既有建筑物，即使被赋予了新的功能，但它们作为历史的见证，也需要得到保护：这是我们的出发点。因此，力求按照 BREEAM 或 LEED 等认证体系将旧建筑改造为绿色建筑不应成为我们的主要目标，过于激进的改造将使其丧失纪念性价值。然而，评估可持续性的标准，

Sustainable means relating to, or being a method of harvesting or using a resource so that the resource is not depleted or permanently damaged[1]. The term sustainability is used in the sense of dealing in such a way with the needs of the present generation that the needs of future generations and people living in other parts of the world are not compromised. Sustainability has become a very important issue after the publishing of the UN Brundtland report “Our Common Future”[2]. From this report comes the most often-quoted definition of sustainable development: “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”.

Many heritage buildings, apart from having a long service life, are sustainable as well[3] because they embody energy, gathered during their whole life cycle, from production and transport of building materials to construction and final destruction: the longer a building exists, the more sustainable it becomes from the materials and embodied energy point of view. For energy consumption, this may be less evident. The concepts of energy consumption and resources should be further developed, to fit in our philosophy of intervention in the existing.

1 http://www.merriam-webster.com/dictionary/sustainable

2 Brundtland G. H., Report of the World Commission on Environment and Development: Our Common Future, Transmitted to the General Assembly as an Annex to document A/42/427 - Development and International Co-operation: Environment, 1987

3 Ven H. Van de, Nusselder E.J, Haas E.M., Dulski B., 2011, Handboek Duurzame monumentenzorg, SBR, Rotterdam

如同其他与古迹相关的标准一样，都可以成为建筑师的灵感来源。

欧盟理事会近期就文化遗产与可持续性通过了非常重要的结论：“……文化遗产由继承自过去的资源所组成……它源于人与场所在时间中的相互作用，并不断发展着。从文化、环境、社会及经济的视角来看，这些资源具有巨大的社会价值，因此，对它们的可持续管理构成了21 世纪的战略选择。”

就风土建筑而言，传统确保了建筑物的耐久性和可持续性，因此，对既有建筑的任何干预都需要尊重传统。对于其他建筑，例如旧工业厂房就是一个很好的例证，它们可能并不具备可称为耐久和可持续的现代需求。然而，即使并不符合当下对绿色建筑的要求，旧建筑依然是极具价值的历史记录者，因此，相比起拆除和按照现代标准重建，再利用仍应是优先考虑的。对旧建筑及古迹的可持续利用取决于它们的灵活度以及如何让既有特征巧妙适应现代需求。历史建筑为未来的可持续利用提供了无限潜力，但这些潜力往往不适应标准化的解决方案及评估工具，它们并不能“一切照常”。

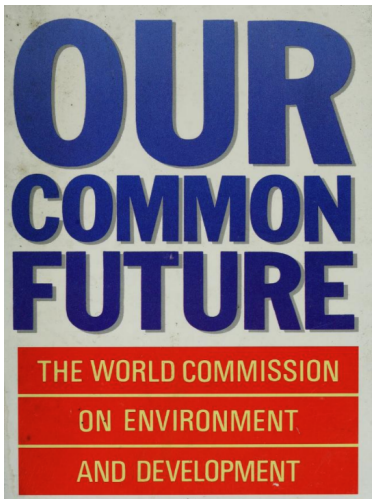

图 1：《我们共同的未来》
Figure 1. *Our Common Future*

Existing buildings, as witnesses of the past, need to be preserved, even when they are given a new use: this is our starting point. Therefore, striving for the transformation of old architectures in green buildings according to accreditation systems like BREEAM or LEED[4] can not be our main aim, as too radical transformations will mean losing monumental value. However, the criteria indicated for the assessment of the sustainability, as well as other criteria, more related to monuments[5], can be a source of inspiration for the architect.

The Council of the European Union recently[6] adopted quite important conclusions with respect to cultural heritage and sustainability: “...cultural heritage consists of the resources inherited from the past... It originates from the interaction between people and places through time and it is constantly evolving. These resources are of great value to society from a cultural, environmental, social and economical point of view and thus their sustainable management constitutes a strategic choice for the 21st century.”

In the case of vernacular architecture, the tradition guarantees durability and sustainability of the constructions, and therefore, any intervention on the existing needs to be done in line with the tradition; other constructions, and a good example is formed by old factories, will probably not possess the modern requirements to be called durable and sustainable. However, even when not matching the current requirements for green buildings, old structures are valuable historic reminders, and as such their re-use should be preferred above demolition and reconstruction according to the modern standards. Sustainable use of old buildings and monuments will lie in their flexibility and in the skilful adaptation of the existing features to modern needs. Historic buildings offer many potentials for a sustainable use in the future, but these potentials do not always fit into standardized solutions and

4 www.breeam.org; http://www.usgbc.org/leed

5 Nusselder E. J., Ven van de H., Haas M. en Dulski B., Handboek Duurzame Monumentenzorg. Theorie en praktijk van duurzaam monumentenbeheer, SBR (2008, 2011)

6 Conclusions on cultural heritage as a strategic resource for a sustainable Europe, Council of Europe, Council meeting Brussels, 20 May 2014

设计师所面临的挑战，是在建筑的历史意义和未来需求以及由此产生的附加值之间寻求到平衡点。

1 设计师的可持续性方法

通过回溯过去，我们试图更好地理解耐久性与可持续性的逻辑以及二者与功能性的紧密关联。这尤其适用于过去的一些情形中，尽管资源与材料稀缺，但仍然创造出了启发性的风土建筑，它对环境挑战和社会需求做出了完美回应。

应该始终牢记，耐久性和使用寿命与建筑所处的环境背景紧密相关，而可持续性也与社会经济背景关系密切。在现代，可以调用全球的先进知识，以适用于场地及具体情形：这是设计及干预措施中可持续方法的关键。

耐久性和可持续性也适用于建成环境呈现传统特征或能唤起我们对某一历史时期记忆的城镇及城市区域。建筑遗产需要被保存及保护，因为它体现了重要的文化价值，这不仅限于单体建筑，也与建筑间的关系，甚至场地景观息息相关。建筑保护以及区域和城市的再认定意味着最终实现居民的团结以及生活品质的提升。正如国际古迹遗址理事会的巴黎宣言所阐述的那样，“将物质和非物质文化遗产纳入可持续性重要范畴的开发程序（应该被促进）”。

通常来说，对既有建筑的修复和再利用应尽可能多地保留原有材料，改善其退化状态，避免不必要的构件更换。材料及建筑技术的真实性将因此得以保存，干预成本也将可控。然而，真正的目标应该是对建筑的使用：对建筑物生命周期的调整、管理和控制应成为可持续性干预的基石。

从技术角度而言，保护应该采用有效的方法和材料，绝非造成（新的）损害。对于再利用的案例而言，至关重要的是如何在遗产价值方面保留建筑的主要特征，同时依然使其成为一个可持续且舒适的场所。

assessment tools - they are not “business as usual”. The challenge for the designer is to reach the balance between historic significance of a building and future needs, and the added value that will emerge from it.

1 Approach on sustainability for designers

By diving into the past, an attempt was made into better understanding how logical both durability and sustainability can be and how close both are to functionality. This especially applies to several situations in the past in which, notwithstanding scarcity of resources and materials, a vernacular architecture was created providing the perfect answer to environmental challenges and social requirements: an inspiring architecture.

It should always be kept in mind that durability and service life are very much related to the environmental context of the building, whereas sustainability is also strongly related to the social-economical context.

In modern times global advanced knowledge has to be tuned, in order to be applied to local and specific situations: this is a key to a sustainable approach in the design (of interventions).

Durability and sustainability also apply to towns and city districts in which the built environment presents a traditional character, or remind us of a certain historic period. The built heritage needs to be preserved and protected, as it embodies important cultural values, not only confined to the single buildings, but also concerning the relationship among them and involving the local landscape. Conservation of buildings and requalification of areas and cities will mean to finally achieve unity and upgrading of the quality of life of the inhabitants. As the ICOMOS Paris Declaration states, “a development process (should be promoted) that incorporates tangible and intangible cultural heritage as a vital aspect of sustainability”[7].

Generally speaking, the restoration and re-use of an existing building should be carried

7 ICOMOS, The Paris Declaration On heritage as a driver of development, Adopted at Paris, UNESCO headquarters, on Thursday 1st December 2011

2 应对复杂性的整体方法

耐久性及可持续性与文化历史价值、环境、建筑当下与未来的功能、使用者的舒适与安全都息息相关。在进行建筑的再利用设计时，我们需要评估、保护并提升建筑材料的耐久性和可持续性。这意味着要考虑到与生活和功能相关的方方面面。建筑需要足够灵活，可适应不同的需求，这将提升连续使用的可能性，以免被废弃和忽视。在保护建筑的历史价值和特征的同时，特别的细部和品质也应该被强调，从而使原有建筑焕发出有吸引力的新面貌，并使得使用者在其中感到舒适和安全。采用相对较小的干预手段来调整、优化既有建筑，将会收获更多。建筑的功能将指引干预措施，以追求即使并不完美的既有状态与更新后的状态的平衡。因此，尽管在对历史建筑的干预中，能耗表现是一个需要考虑的非常重要的方面，但上述因素可能对于我们的建成遗产的可持续的未来才更为至关重要。

应该牢记，耐久性和使用寿命与影响建筑的环境过程（如潮湿，霜冻等）关系密切，而可持续性同样与建筑所处的社会经济背景密切相关。

3 材料与能源

对历史建筑的任何干预都应该是高质量的干预，从材料的角度看也是如此：应该采用兼容且耐久的材料，以减少建筑短时间内又会变得破旧的风险，从而降低对建筑的维护频率。对文化遗产建筑的干预应小心谨慎，这意味着在应用修复材料之前，应该了解它在特定环境下的表现。采用本质上更耐久但不兼容的材料，往往会导致损坏或衰退。任何干预措施都应评估其在特定环境下的兼容性及预期成功率。最佳的干预材料应该是兼容的及可再生的，以保证整体建筑的长期使用寿命。

如今，在追求零能耗建筑时的一个困境是，在不破坏遗产价值、不为历史建筑制造风险的前提下，对遗产的改造能走得多远。然而，对可持续性的关注不应局限于保温及能耗表现，

out keeping the original materials as much as possible, improving their condition when deteriorated and avoiding unnecessary replacements. The authenticity of the materials and the building techniques can be thus preserved and the costs of the intervention can be limited. The very aim, though, will be the final use of the building: change, management and control of the life-cycle of the building should be the cornerstones of a sustainable intervention.

In a technical sense, the conservation should be done with methods and materials, which are effective and by no means introducing (new) damage. The crucial point in the case of re-use, is how to preserve the main characteristics of the building in terms of heritage values, and still make it a sustainable and a pleasant place to be.

2 Integral approach toward complexity

Durability and sustainability are closely related to cultural and historic values, the environment, the present and future functionality of the construction, and the comfort and safety of the users. We need to assess, preserve and enhance durability and sustainability of the materials of a building, while designing its re-use. This implies considering various aspects related with life and function. The building needs to be made flexible and adaptable to different aims, which will increase the probability of a continuous use, avoiding abandon and subsequent neglect. While preserving the historic value and character of a building, special details in the construction can be emphasized, as well as qualities, letting a new and attractive identity emerge from the original one, and making people feel comfortable and safe in it. Modifying and optimizing the existing with relatively small interventions, much can be obtained. The function of the building or building part will guide the interventions, in pursuit of a balance between the existing, even when imperfect or unrefined, and the new. Therefore, although energy performance is a very important aspect to be taken into account when dealing with interventions in historic buildings, the above considerations are perhaps even more essential for the sustainable

还应着眼在替代性的解决方案上。全球知识、创新科技和材料都能为耐久性和可持续性做出巨大贡献。此外，修复方法及材料的选择对于可持续性来说也是至关重要的。原则上，方法应基于既有建筑的适应性：对材料及其所处环境的研究使得对它们的保存及提升成为了可能，以免造成更换和浪费。已经有一些尝试处理这一困境的工具正在开发，以解决保留什么、替换什么、如何替换的问题，但仍需更多进展。

4 结论

对既有建筑的干预应该是对社会需求的回应，以使得建筑物及其周围环境都可供人们使用：由此产生的联系将确保其可持续性使用并支持其维护方针。

遗产建筑是对我们过去的见证，承载着时间的沉淀：它们需要得到受尊重的维护，经过调整以服务于新的目标，在现代条件下以可持续的方式延续它们的生命。建筑师及其他对我们的遗产建筑负责的人应构建起由设计、文化价值和技术组成的理想三角，从而进行平衡的、考虑周全的干预（图 2）。

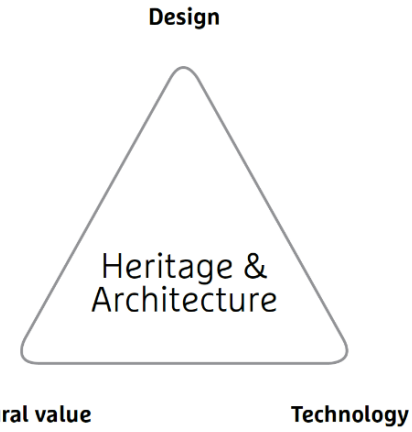

图 2：遗产三角
Figure 2. Heritage Triangle

future of our built heritage[8].

It should be kept in mind that durability and service life are very much related to the environmental processes (moisture, frost, etc.) affecting the building, whereas sustainability is also strongly related to its socio-economic context.

3 Material and energy

Any intervention on a historic building should be a quality intervention, also from the materials point of view: compatible but durable materials should be used in order to reduce the risk of the building becoming shabby looking after a short time and to contribute to a low maintenance frequency. Interventions on architecture belonging to the cultural heritage should be done with caution, which means that the behaviour of restoration materials under the specific circumstances should be known, before application. The introduction of intrinsically more durable, but incompatible materials, has often resulted in damage and decline. Any method of intervention should be assessed in terms of compatibility and expected success within the given environment of the object. The optimal materials for intervention should be compatible and renewable, as a guarantee for a long service life of the whole.

An important dilemma in nowadays striving for zero-energy buildings is how far one can go in monument-retrofitting without either impairing heritage values or creating risks for the historic fabric. The focus for sustainability however should not only be on thermal insulation and energy performance, but also on alternative solutions. Global knowledge as well as innovative technologies and materials can strongly contribute to durability and sustainability. Further, the choice of repair methods and materials is of primary importance for sustainability. In principal the approach should be based on adaptation to the existing: the study of the materials and their condition will make it often possible to keep them and even improve them, avoiding substitutions and waste. There are attempts to develop

8 Roos J., De duurzame ontwikkeling van industrieel erfgoed, in V.A. 'Nieuw in oud, 20 jaar herbestemming Haags industrieel erfgoed', Eindeloos uitgevers, Den Haag, 2013

instruments to deal with this kind of dilemmas, what to keep and what to substitute and how [9], but progress still has to be made.

4 Conclusion

Interventions in the existing should be an answer to societal needs and aim at making both the buildings and their surroundings accessible and usable for the people: the bond which will result will guarantee their sustainable use and will support maintenance policies.

Heritage buildings are testimonies of our past and bear the traces of time: they need to be respectfully maintained and adjusted to serve new goals and continue their life in modern times, in a sustainable way. Architects and all those responsible for our heritage buildings should ideally move in the triangle formed by Design, Cultural Value and Technology to perform a balanced and well-considered intervention.

9 Nusselder E. J., Ven van de H., Haas M. en Dulski B., Handboek Duurzame Monumentenzorg. Theorie en praktijk van duurzaam monumentenbeheer, SBR (2008, 2011)

实践案例 Case Study

荷兰代尔夫特理工大学建筑系馆：旧的大学建筑转变为新的建筑系馆

BK City: An Old University Building Becomes the New Faculty of Architecture

资料来源：
Van Hees RPJ, Naldini S, Roos J.《耐久的过去，可持续的未来》[M]. Delft: TU Delft, Heritage & Architecture, 2014.
Source:
Van Hees RPJ, Naldini S, Roos J. *Durable Past, Sustainable Future*[M]. Delft: TU Delft, Heritage & Architecture, 2014.

如何采用对环境负责的方式，使得既有结构不仅耐久，而且有较高的资源利用率。这是代尔夫特理工大学建筑系馆近期干预的重点考虑。在应对可持续性及室内气候的问题之前，回顾这座建筑的历史以及导致其再利用的事件是很有趣的。

紧急情况下的再利用

2008 年 5 月，当代尔夫特理工大学的建筑系馆被烧毁，安置整个系所的紧迫性催生了重新利用旧化学大楼的决定。这座绰号为“红色化学”的建筑由维瑞曼设计，始建于 1920 年代，完工于 1940 年代。它从未被用作最初定位的功能，在被校董事会使用数年后，便一直空置。一项旨在再利用这座旧建筑的计划已经开始，它试图将这座建筑改造为公寓，对其历史以及计划可行性的研究也已在进行中。尽管如此，对于功能和使用者的改变仍需付出额外努力（图 1）。

虽然建筑空置并可容纳建筑系，但并不意味着它可以被直接使用，因为它已经废弃多年。它需要被修复和改造以满足学生的教育需求，这是一项包含了创造适宜的内部空间以及塑造新的吸引人的外观的复杂工程（图 2）。

计划干预措施的重点之一是全面了解建

How to make the existing structure not only durable, but also resource-efficient, through an environmental responsible approach. Here lies the focus of the intervention recently started for the building hosting the Faculty of Architecture in Delft. Before tackling the problem of the sustainability and indoor climate, it is interesting to retrace the history of the building and the events leading to its re-use.

An emergency driven re-use

When the faculty of Architecture of Delft University of Technology burned down, in May 2008, the urgency of accommodating a whole faculty led to the decision of reusing the old Chemistry building. Nicknamed ‘Red Chemistry’[1], it was constructed in the 1920’s (and completed in 1940’s) by arch. J. Vrijman, but had never fulfilled its original function, and, having served for many year as TU board building, was left empty. A plan had already started aiming at the re-use of the old structure, transforming it into an apartment building, and a study on the history of the building and the feasibility of the plan had already been carried out. The change of function and users, though, required a great additional effort (Figure 1).

The fact that the building was empty and available to harbour the Faculty of Architecture, in fact, did not imply that it could be directly used, as it had been

1 Macel O., Schutten I., Wagner J., Architectuur-archief Technische Universiteit Delft, Publikatieburo Bouwkunde, Delft 1994

筑的特征，以免在修复时困惑不解，丧失它的遗产价值。得益于建筑师和专家的通力合作以及参与方的全力支持，才可能收获良好的结果。

尤其是建筑师们希望在可用的短时间内达到好的结果，因为他们实际上也是在为自己的社区工作。合作意味着交换观点和建议，通过富有成效的争论，最终产生了普遍可接受的方案。

建筑的修复和改造，即计划的第一阶段，已于 2009 年 5 月完成。这一阶段的工作是在围绕原有建筑的传统特征的框架内进行的，也就是说，改造应尽可能少地侵入，尽可能有效率，所使用的材料也应与原有材料相匹配。建筑系馆（主要结构由街道和有覆盖的庭院组成）作为“公共”结构的总体构想是由院长威策·帕泰恩提出的，如果没有对这座建筑的历史和特征有恰当的理解，就不可能提出这一构想。

寻求平衡

“寻求平衡”描述了总体构想所遵循的态度：既尊重现状，又展望未来。建筑的基本特征和“精神”已加以研究，它被定义为功用和文化终将相会的场所。建筑中有价值的部分需要得以展示，甚至赐以全新的视角。建筑的外观和风格无疑是具有价值的，它具有古典的形式以及阿姆斯特丹学派的一些元素。砖，这种荷

abandoned for years. It needed restoration and transformation to meet the needs of the education of students, a complex process involving the creation of suitable interior spaces and also the shaping of a new appealing appearance (Figure 2).

One of the main points in planning the interventions was that the character of the building needed to be thoroughly understood, in order to restore it, without running the risk of mystifying it or even losing its heritage value. The successful result obtained was possible thanks to a good co-operation of architects and specialists and the support of stakeholders.

Especially the architects felt compelled to reach a good result, within the short time available, as they were working in fact for their own community. The co-operation meant exchange of points of view and proposals, and led to a fruitful confrontation tempering excesses and ending with universally accepted solutions.

The restoration and adaptation of the building, i.e. the first phase of the planned works, were completed in May 2009; the works were carried out within the building tradition, which had characterized the original construction, that is to say that the transformations done were as little intruding and as effective as possible, and the materials used matched the original ones. The overall idea for BK-City (a main-structure consisting of street(s) and covered

图 1：代尔夫特理工大学建筑系馆（左） Figure 1. Faculty of Architecture, Technical University (left)
图 2：原来的内院，现在的会议和学习室（右） Figure 2. Formar inner court, now conference and study room (right)

兰传统的建筑材料，与装饰用的天然石材相结合，很适合一座 20 世纪初代表性的教育建筑，材料被修复以增加视觉和历史价值，并表明了连续性（图 3）。然而，宏伟的风格、大尺度空间以及不辨方向的结构所带来的整体影响，也导致了建筑的使用者某种程度上的窒息感。

图 3：传统材料，砖和石材
Figure 3. Traditional materials, brick and stone

校园与城市

大学校园构想于 19 世纪下半叶，当时新的校园建筑在代尔夫特历史中心之外兴建。

随着时间的推移，校园与城市中心的距离越来越远，两者也渐渐失去了联系。随着建筑学院的成立，校园中心向北侧转移，与代尔夫特历史城区中心的联系也变得紧密起来。

规划

原初的化学大楼是宏伟壮观的，但并非引人入胜，而且由于复杂和不完美的形式，如太多难以定位的碎片化的空间，往往使得游客感到困惑。计划中的干预措施虽少但重要，包括获得更多的空间，使建筑设计对使用者来说更易理解等。

增加空间并合理化内部平面

两个外部庭院采用温室的做法转变为了内部空间，一条长廊，或者说是一条带有小径的道路被设计用以连接建筑的各个部分（图 4- 图 5）。新建筑进行了室内改造，以创造一系列大空间用以教学及相关活动，包括工作室、实验室、会议室、餐厅和储藏室等。这些空间解决了学生工作、上课以及接待访客等功能，此外，长而宽的走道促进了他们与教员更多地接触。对于空间定义的

courtyards) as a “public” structure, emerged from the commission of the dean Wytze Patijn and could not have been developed without a proper understanding of the history andidentity of the building.

Looking for balance

“Looking for balance” describes the attitude that was followed in planning an integral approach, respecting the existing and anticipating the future. The nature and the “spirit” of the building were studied, and the building was defined as a place where use and culture were meant to meet in the course of time. What was found to be valuable in the building had to be made visible, or even placed into a new perspective. Valuable were surely the aspect and style of the building, with its classical form and some elements of the Amsterdam School. Brick, the traditional Dutch building material, together with natural stone, used for decoration, were suitable for a representative educational building of the beginning of the 20th cent. and were restored to increase their visual and historical value and to suggest continuity (Figure 3). However, it was also considered that the overall effect of the building on the users was somehow suffocating, due to the combination of the imposing style, large spaces and the disorienting structure.

The campus and the city

The university campus was conceived in the second half of the 19th cent., when the construction of new university buildings found place outside the historic centre of Delft.

The campus developed in the course of the time at a growing distance from the centre, somehow loosing contact with it. With the creation of the Faculty of Architecture, the heart of the campus has shifted towards its north side, and the relationship with the heart of the historical city of Delft has become stronger.

The plan

The original Chemistry building was monumental and imposing, but had never been really appealing and was moreover rather confusing for visitors, due to its complex and somehow imperfect form, with too many fragmented spaces through which it was difficult to orient. The planned

图 4：庭院改造成内部空间，室内
Figure 4. Courtyard transformed into an interior space, interior

图 5：庭院改造成内部空间，室外
Figure 5. Courtyard transformed into an interior space, exterior

成功越发凸显：目前集中空间舒适地服务于日常生活和办公，也有很吸引人的空间用以漫步、休憩、交流。

建筑系馆成为了社会和文化的融合之地：最初关于创建系馆的总体规划是与社会文化相关的，设想让其成为拥有街道和玻璃顶覆盖的广场的公共基础设施，从而使得建筑的潜力以一种不言而喻的方式得到利用、增强和紧密相连（图 6）。这种公共结构往往是缺失的环节，这也是老建筑显得沉闷乏味的原因。它并不是为使用者所建造的。通过改造，建筑显露了它隐藏的美，黯淡的面貌也五彩缤纷起来。建筑系的成员可以在这个重要的城市连接结构中定期聚会。六位建筑师共同努力，在总体规划的框架内创造了一个由不同的场所、颜色和氛围构成的新世界。

裸露的建筑

所有（脱落的）天花均被拆除，设置了新的通道连接各空间，建筑显露出坚固的结构，它有着裸露的材料、管道和电气装置，散发着不完美的美感（图 7）。这些技术装置暴露在视野里，在未完成的裸露的建筑这种非正式的氛围中，强烈地展示着对建筑作为实验室这一最初概念的重新阐释。设计家具的精确选择，内部令人愉悦且惊喜的空间的塑造，都增强了灰色外壳与室内舒适装饰之间的对比，强调了后者的美感并营造出了有吸引力的氛围（图 8）。红色、紫罗兰、紫红色、紫色的地毯也是为了减弱噪音，作用如同一些墙上的大幅相框一样。

甚至图书馆也变得吸引人和有创造性，中

approach was based on a few, though important interventions, consisting in gaining more space and making the building design better intelligible for the users.

Adding space and streamlining the interior plan

Two external courtyards were transformed into interior spaces using greenhouse elements, and a long corridor, a street indeed with side paths, was designed to connect the various parts of building (Figure 4 - Figure 5). The new building was altered inside to create a clear succession of large rooms meant for educational activities and related functions, and including ateliers, laboratories, conference halls, offices, restaurants and storage rooms: all spaces where the students could work, lessons could be given and visitors accommodated. Besides, long and wide corridors could stimulate contacts between them and the education staff. What is becoming increasingly evident is how successful the definition of the spaces has been: presently there are pleasant spaces where daily life and work concentrate and also attractive spaces to move about, sit, talk.

The building of the faculty of Architecture has become a place where the social and the cultural sphere could merge: a social and cultural master plan originated aiming at the creation of “BK-CITY”, envisaged as a new public infra-structure consisting of street(s) and glass-covered squares, in which the potential of the building could be used, enhanced and intertwined in a self-evident manner (Figure 6). This public structure had always been the missing link, the reason why the old building was somehow dull and uninspiring. It had not been created for the users. Through the

图 6：通道连接空间，促进了建筑使用者之间的交流
Figure 6. Corridor connecting spaces and stimulating contact between users of the building

图 7：原有建筑的不完美暴露在视野中，提示原先的实验室功能
Figure 7. The imperfection of the original construction is left in sight reminding of the function as a laboratory

央的桌子上按颜色和明暗度摆放着未出售的书籍。这也是一种重复利用书籍的耐久的方式。

修复后的建筑不同于原有的建筑，但又与它最初的特征很接近，完美地连接了过去与未来。在这个意义上，这座建筑成为了再利用的典范。2011 年 7 月，它获得了保护领域的欧洲遗产奖，并提名了荷兰的改造奖项。

建筑系馆

尽管如此，建筑目前仍需改善，尤其是关系到室内气候（提升）及结构的可持续性修复的方面。这正是第二阶段的干预措施，“驻足建筑系馆！”，以耐久和可持续的方式提升这座原先打算作为教师临时办公场所的建筑的舒适度。

使用墙体内保温的提议被驳回了，因为对这种类型的建筑来说侵入性和成本都过高了。即使是在建造公寓时研究过的嵌入双窗框，在目前的状况下似乎也是不可行的：检修将会很困难，而且在现有预算下也几乎不可能解决窗间砖石墙的保温问题。窗框的冷桥问题被接受了，它将作为不完美的建筑系统的一部分。窗框经过现场处理，将变得更为耐久。

新的通风系统

2008 年时构想为临时措施的空气循环系统也需要提升，尤其是在空气清新度方面。新设计的系统是基于自然通风的理念。该项工作的出发点依然是既有的结构。特别关注到了房间的不同

transformation the building has revealed its hidden beauty, and changed its greyish aspect into a colourful one. The members of the BK-community could meet on a regular basis in this vital urban and connecting structure. The joined effort of six architects produced thus a new world made of different places, colours and atmospheres, and developed within the framework of the master plan.

A naked building

Having taken out all (dropped) ceilings, and having connected the spaces by opening new passages, the building emerged as a strong structure, with exposed materials, pipes and electrical installation, recalling the beauty of the imperfection (Figure 7). The infrastructure of technical installations left in sight, made the reinterpretation of the original idea of a laboratory emerge in a strong way, in the still informal atmosphere of an unfinished - naked - building. The accurate choice of the design furniture and the creation of pleasant and surprising spaces inside, contributed to enhance the contrast between the grey shell and the cosy interior decoration, emphasizing the beauty of the latter and creating an attractive atmosphere (Figure 8). The choice of the red, violet, fuchsia and purple carpets was also meant to dampen the noise, like the large photo panels on some walls.

Even the library was made attractive and original with the central desk constituted of layers of unsold books, ordered by colour and shade, with a glass plate on top. This is also a durable way of re-using books.

The restored building was different from the original one, and yet very close to its original

图 8：对室内装饰和家具的精确选择，与粗糙部分形成了对比
Figure 8. Accurate choice of interior decoration and furniture, in contrast to the rough parts

朝向，从而量身定制调节室内气候的措施，另一个关注点则是那些原先为化学实验室所预留的既有通风口。这些带有狮头装饰的通风口（图 9）从未被使用，现已被砖石填充密封。

新的自然通风系统是基于最有效率且最少侵入的原则：“狮头”中的填充物被取出，恢复其功能，通风管道则悬挂在天花下。

图 9：狮头状通风口（内部可见填充物）
Figure 9. The lion head like ventilation openings (filling visible inside)

热回收系统

连接“狮头”的通风管道为热回收装置和房间提供新鲜空气；在该装置中，房间的热量流向从室外引入的空气。这些空气通过通风孔扩散到房间中。待排出的热空气，离开热回收装置，通过通风管道经另一个“狮头”最终排出（图 10）。图 11 所示为送风管和排风管。待排出的空气在送风管旁流动，加热新鲜空气。左图可见一根织物管道，送气时它会膨胀。空气通过通风孔输送到房间。右图的管道曾作为 2008 年通风系统的送风管。

identity, and perfectly connecting past and future. In this sense, the building has become an icon of re-use. As such, in June 2011, it obtained the Europa- Nostra price in the field of conservation and the nomination for Dutch Renovation Award.

BK city

Still, the building presently needs improvement, especially for what concerns the indoor climate (upgrade) and sustainable repair of the structures. This is the focus of the second phase of the intervention, “BK-City Stay!”, improving the comfort in a durable and sustainable way, of a building originally meant to be the temporary seat of the faculty.

A proposal to apply internal insulation on the walls was dismissed as too invasive for the type of building and also too expensive. Even the insertion of double window frames, which had been studied when apartments were to be created, appeared for the present situation not feasible: the accessibility and maintenance would be difficult and the insulation of the masonry piers in between windows virtually impossible in relation to the budget. However, double glass within the existing iron frame would be possible. The formation of a cold bridge in the window frame will be accepted and will become part of the imperfect building system. The window frames were treated in situ to be more durable.

The new ventilation system

The air-circulation system, which had been conceived in 2008 as a temporary solution, needed improvement, especially for what concerns the refreshment of the air. The newly designed system is based on a natural ventilation concept. The starting point for planning the work was again the existing structure. Special attention was paid to the different orientations of the rooms, needing a tailored indoor climate approach, and to the existing ventilation openings, originally meant to serve the rooms where chemical experiments were to be done. These openings, furnished with moulded decorations looking like lion heads (Figure 9), had never been used and were sealed with masonry fillings.

The new plan of natural ventilation is based on the most effective and still less intrusive measures possible: the “lion heads” were freed from the filling and re-used and

图 10：连接“狮头”的通风管道
Figure 10. Ventilation ducts connected with the “lion heads”

图 11：送风管（织物）及排风管
Figure 11. Supply (fabric) and exhaust ducts

庭院的通风由屋顶和墙面的开口承担（图 12），相较于室内空间的使用者来说，它的标准要更高。在夏季，1 至 2 度的室内外温差足以建立冷却所需的空气流动，而冬季供暖则由屋顶上的“空气处理装置”控制。建筑的供热体系依赖于热电联合系统。

维护与提升

该建筑常规维护的对象还包括砖石、天然石材以及屋顶石板。屋顶受到了特别的关注。连接着立面腰线的屋顶在 1960 年代就被改造了，以便安置窗户，从而使得阁楼空间能够被利用。2008 年时，这些窗户的保存情况已经相当糟糕，故而给它们重新装饰，刷上了欧洲各国国旗的明亮色彩。通过这种方式，通过建筑外立面展示了新学院更加非正式的氛围和国际化的特征。然而，这只是一个临时的解决方案，最近开始的干预措施将其置换成了铝框窗户。作为“中间”状态的非正式色彩表达不再有效。一种中性的表达及重复性排列窗户的方式，使其比起立面，更像是屋顶的一部分，用以提示原有石质檐口上的石板屋面（图 13）。

ventilation ducts were hung from the ceiling.

The heat recovery system

A ventilation duct, connected to a ‘lion head’, supplies fresh air to a heat recovery unit and to the room; in the unit, the heat from the room is transferred to the air from outside. The air is spread into the room through a ventilation hole. The warm air to be exhausted, having left the heat unit, goes through an exhaust duct and another “lion head” and is finally eliminated (Figure 10). In Figure 11, supply and exhaust ducts can be seen. The exhaust air flows near the supply duct, thus heating up the fresh air. On the left a textile duct is visible, which swells when air is supplied. Through little holes the air is distributed in the room. The duct on the right used to serve as air supply duct in the ventilation system of 2008.

The ventilation of the courtyards is entrusted to the openings positioned on the roof and in the walls (Figure 12), both at a higher level with respect to the people in the room. In the summer, a difference of 1-2 degrees, between the outside air and the air in the room will be sufficient to establish the necessary air movement for the cooling, whereby the heating in the winter will be ruled by an “Air Handling Unit” positioned on the roof of the building. The heating system for the building is based on a Combined Heat Power system.

Maintenance and improvement

The general maintenance of the building will also include the brick masonry, natural stone and the slates of the roofs. The roof will be given special attention. The roof originally reaching the string-course of the façade had been transformed already in the 1960’s, before the re-use, in such a way that windows could be placed, to make the attic space utilizable. In 2008 these windows were found to be in a pretty bad state of conservation and were upholstered and painted in bright colours, those of the European flags. In this way the more informal atmosphere of the new faculty would be expressed by the exterior of the building and the international character of the faculty suggested. However, this solution was meant to be temporary, and a recently started intervention will substitute the windows with aluminium framed ones. The informal colouring as an expression of an “in between”

图 12：前庭院玻璃幕墙上的窗户
Figure 12. Windows in the glass walls of a former courtyard

图 13：屋顶及窗户的现状
Figure 13. Present situation of roof and windows

第二阶段所达到的可持续性的程度是妥协的结果：通过整体而创新的方法提升既有建筑，以达到历史 / 文化、生态、社会及经济等方面的平衡。

time is no longer valid. A neutral expressive and repetitive way of placing windows more belonging to the roof than to the façade, is the solution chosen, as an interpretation of the old slate roof ending on the stone cornice (Figure 13).

The level of sustainability, which can be reached in the second phase, will result from a compromise: improve the existing through an integral and innovative approach to reach a balance between historical/cultural, ecological, social and economic aspects.

平台动态 Platform Dynamics

采用测量法、问卷调查法和统计分析法确定传统民居室内环境舒适度——以皖南地区为例

Determination of Indoor Environment Comfort of Traditional Folk Houses by Measurement, Questionnaire Survey, and Statistical Analysis: A Case Study in Southern Anhui, China

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1 引言

目前对传统民居室内环境舒适度的研究主要聚焦在室内温湿度等单一热环境，而以人为本的传统民居活化利用研究中应该对包括热环境以外的光环境、室内空气质量和声环境等室内整体环境舒适度进行提升。且由于传统民居室内环境现状研究的地域差异性以及建筑自身独有的特征，现有研究无法很好的指导皖南地区的传统民居室内环境的活化更新提升改造。因此，本文对中国安徽省黄山市徽州区西溪南古村落的传统民居室内热环境、声环境、光环境、室内空气质量的现状进行了全面的调研和评估，并以一个典型的传统住宅姚氏民居为例。通过主观感知评价—问卷调研、客观数据分析—实地监测以及统计分析等方法，对传统民居室内环境进行深入全面的调研，并综合其现状以及居民主观舒适度的反馈结果，以此确定满足居民舒适性需求的室内环境参数调节范围。

2 材料和方法

2.1 研究对象。安徽地区（图1）位于中国夏热冬冷双向性不利气候区，由于其地形地势等

1 Introduction

At present, studies on the indoor environment comfort of traditional dwellings mainly focus on a single thermal environment such as indoor temperature and humidity. However, the human-oriented study on the active utilization of traditional dwellings should improve the overall indoor environment comfort including light environment, indoor air quality and sound environment other than thermal environment. Moreover, due to the regional differences in the research on the current situation of the indoor environment of traditional dwellings and the unique characteristics of the architecture, the existing research cannot be a good guide to the improvement and transformation of the indoor environment of traditional dwellings in southern Anhui. In the historical development of southern Anhui, profound cultural deposits have been deposited, and there is a unique regional folk house culture. The indoor environment of traditional folk houses lacks long-term objective environmental monitoring data and subjective evaluation of residents. The current situation of indoor thermal environment, light environment, and indoor air quality of traditional residential houses

条件又被分隔为皖南、皖中和皖北三个区域，三个区域的气候各有特色，其中，皖南地区的湿冷湿热特征最为明显，其对防暑防寒防湿的综合性需求更为强烈。以现有传统民居居多的黄山市，水系纵横，境内除新安江以外，还有发源于黄山北坡的青戈江，而且横亘着黄山、齐云山（白岳）及其余脉，是一个“八山一水一分田”的山区。位于皖南地区的徽州传统民居集中反映了该地区的山地特征、风水意愿和地域美饰倾向，其结构基本相同，多为多进院落式（小型者多为三合院式），一般坐北朝南，倚山面水。徽州传统民居布局基本相同，以中轴线对称分布，面阔三间，中为厅堂，两侧为室，厅堂前院落称“天井”，具有采光通风的作用，亦有“四水归堂”的吉祥寓意。

本文选择了位于黄山市徽州区的西溪南古村落作为调研对象，西溪南村始建于唐朝，村落现保存完好的明代建筑 10 多处，清代民居 100 多幢，是典型的皖南传统民居聚集村落。根据天井的位置及布局，大致分为三种类型（图 2）：“凹”型（三合院型）、“回”型（四合院型）、和“日”型（三合院加四合院型）。本研究还选择了西溪南村的“姚氏民居”为室内环境数据实时监测对象，其三间三进式“日”字形布局是典型的皖南传统民居平面布局形式，民居坐南朝北中轴对称，面宽 9m，进

in the ancient village of Xixinan, Huizhou District, Huangshan City, Anhui Province, China, were comprehensively investigated, and take a typical traditional residence in Yao’s House as an example. Through the methods of subjective perception evaluation - questionnaire survey, objective data analysis - field monitoring, and statistical analysis, this paper conducts an in-depth and comprehensive survey of the indoor environment of traditional residential buildings and synthesizes its current situation and the feedback results of residents' subjective comfort, to determine the adjustment range of indoor environment parameters that can meet residents' comfort needs.

2 Materials and Method

2.1 Research Subjects. Anhui Province (Figure 1) is located in China's hot-summer and cold-winter climate zone, and due to its topography and other conditions, it is divided into three regions: Southern, Central, and Northern Anhui, each of which has its climate characteristics . Among them, the characteristics of hot and high humidity, cold and damp are the most obvious in southern Anhui and its comprehensive demand for heat, cold, and humidity prevention is stronger . In addition to Xin'an River, there is also Qingge River which originates from the northern slope of Huangshan Mountain, and there are Huangshan Mountain, Qiyun Mountain (Baiyue) and its remaining veins,

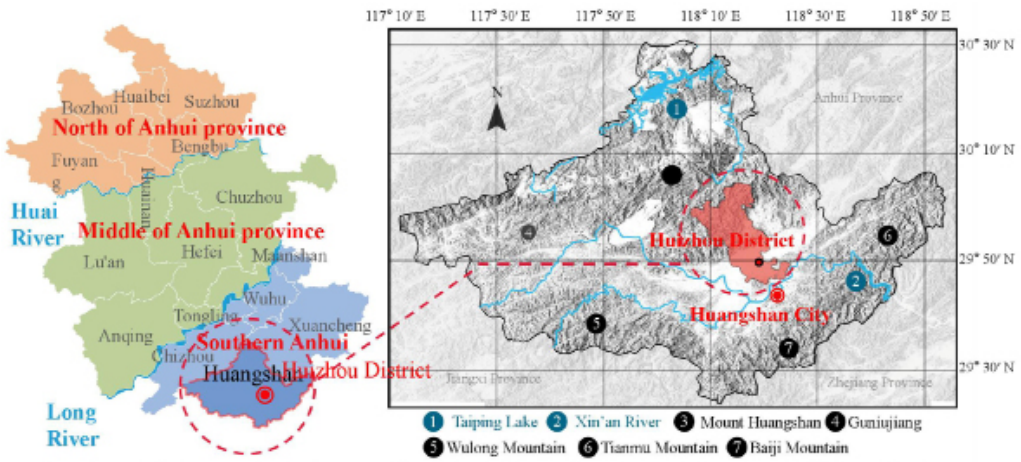

图 1：徽州地区位置图
Figure 1. Location of Huizhou District

深 23.3m，民居内有两种不同尺度的天井且保存相对完整，具有研究的代表性。

2.2 室内环境舒适度评价方法。本次研究的内容是传统民居的室内综合环境舒适度，舒适度评价层次结构包括综合舒适度评价目标、人体舒适度标准层和数据指标层（图 3）。

选择 GB/T50785-2012 中非人工冷热源的评价指标（aPMV）来评价室内热环境。将照度值作为光环境舒适度主要衡量指标。对于室内的环境质量舒适度，使用 PM2.5 和 CO2 浓度分布情况来评估。采用 A 声级的评价方法对皖南传统民居声环境进行研究分析。

2.3 问卷调研。本次研究中，问卷调研与实地监测选取黄山市冬季（2022 年 1 月 25 日至 1 月 28 日）与夏季（2022 年 7 月 8 日至 13 日）典型气象日进行的，具体问卷信息如下：

（1）收集受访者及其所居住的传统民居基本信息。

（2）受访者对室内热环境、光环境、室内空气质量以及声环境的舒适度评价。

（3）受访者适应室外环境变化时所表现的适应性行为。

which is a mountainous area called “eight mountains and one water and one field”. The Huizhou traditional houses located in the southern part of Anhui reflect the characteristics of the mountainous area, feng shui will and the tendency of regional beauty decoration. Their structure is the same, with multiple courtyards inside the residences. Folk houses generally sit in the north to the south, according to the terrain built. The layout of traditional houses in Huizhou is the same, with symmetrical distribution in the central axis. The courtyard in front of the hall is called “patio”, which has the function of lighting and ventilation, and also has the auspicious meaning of “four waters return to the hall”.

This paper selects the ancient village of Xixinan, which is located in the Huizhou District of Huangshan City, as the research object. Xixinan Village was built in Tang Dynasty, with a history of more than 1200 years, and the village now has more than 10 well-preserved Ming Dynasty buildings and more than 100 Qing Dynasty dwellings, which is a typical gathering village of traditional dwellings in southern Anhui. The traditional houses in Xixinan Village are usually compact in group layout, with wooden beams and columns as the main load-bearing structure and brick, stone, and earth as the main wall materials.

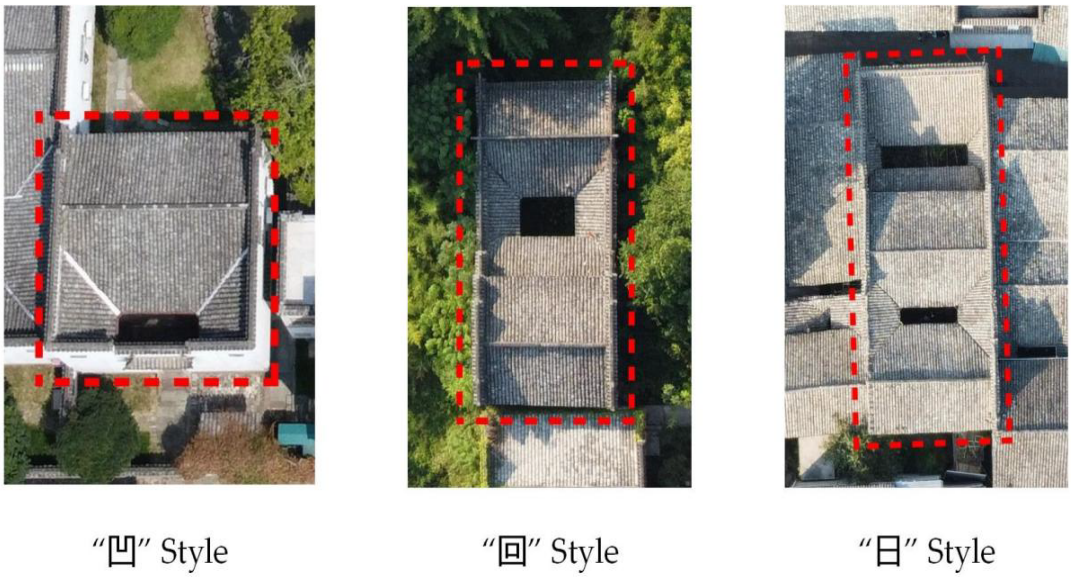

图 2：西溪南村传统民居的三种典型平面图
Figure 2. Three typical floor plans of traditional houses in Xixinan Village

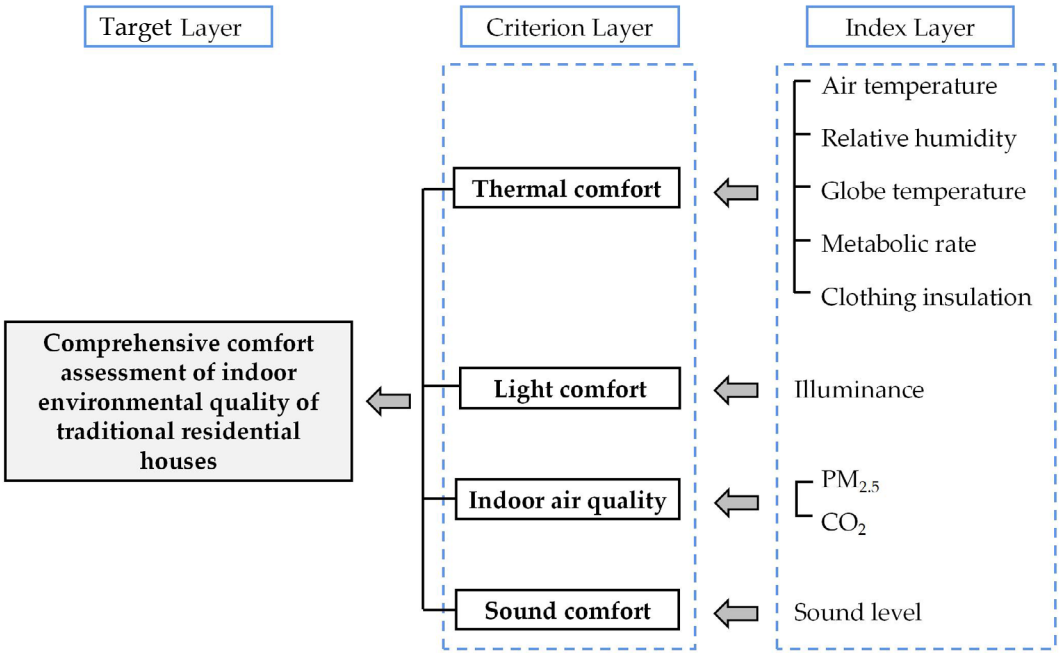

图 3：传统住宅室内环境舒适度评价的层次结构
Figure 3. Hierarchy structure of indoor environmental comfort evaluation of traditional residential houses

2.4 现场测量。姚氏民居的实地监测使用了表 1 中所列的仪器，各项仪器自动记录间隔时间设置为 1 分钟。所有监测设备的精度都复合 ASHRAE55-2017 中规定的要求，在姚式民居布置监测点。

2.5 统计方法。本文基于每一个环境参数区间中的人体舒适感觉投票的样本数分布频率，作为加权回归模型分析的权重。本文根据不同季节室内环境参数分布区间的样本数，对平均舒适感觉与室内环境参数进行加权线性回归，得到不同季节的舒适度评价和室内环境参数之间的线性回归模型，并计算得到不同季节的环境舒适范围。

3 结论

本研究对通过问卷的调查、现场监测和统计分析的方式，对以“姚式民居”为例的皖南地区传统民居室内环境现状进行了一个全面的评估，将客观环境监测得到的数据（如室内的温湿度、空气流速、室内光照强度、PM2.5 和 CO_2 浓度等现场监测数据）与居住者的主

According to the location and layout of the patio, there are three types (Figure 2): “ 凹 ” style, “ 回 ”style, and “ 日 ” style.In this study, the “Yao's House” in Xixinan Village was selected as the object of real-time monitoring of indoor environmental data, and its unique “ 日 ” shape layout is a typical layout of traditional residential buildings in southern Anhui. The dwellings face north and south, with an axisymmetric layout, 9m in width and 23.3m in depth. There are two patios of different scales in the dwelling, which are relatively intact and representative of the study.

2.2 Evaluation method of indoor environmental comfort. The content of this study is the comprehensive indoor environmental comfort of traditional residential houses, and the comfort evaluation hierarchy includes the comprehensive comfort evaluation target, human comfort standard layer, and data index layer (Figure 3).

The evaluation index (aPMV) of unartificial cold and heat source (GB/T50785-2012) was selected to evaluate the thermal environment in the room. The illumination value is used as the main measurement index. PM2.5 and CO_2 concentration distribution are

观环境舒适度反馈相结合。我们的研究为建筑设计师和工程师对传统民居的室内品质环境提升提供了理论基础。该研究的主要结果可以归纳为以下几点：

1. 皖南传统民居的室内热环境仍有较大提升空间。根据皖南传统民居室内热环境满意度问卷调查以及室内监测结果发现，冬季和夏季室内热环境的满意度极低，仅为 8.2% 和 8.8%；冬季和夏季室内环境的 aPMV 值范围满足标准的比例仅有 5.2% 与 8.0%；皖南传统民居的居民他们对恶劣环境有较强的适应性，他们在冬季以及夏季的中性温度分别为 15.5℃和 28.7℃（图 4）。因此，对皖南传统民居进行活化更新时，应该进一步细化室内热环境参数设定标准，从而在提升热舒适度的同时，达到降低成本与减少能源消耗的目的。

2. 皖南传统民居建筑设计的采光劣势加上后天规划布局的干扰使得室内光环境问题愈加严重。其中，皖南传统民居中卧室的室内光环境最差，最大光照强度仅为 19.91x。根据统计分析结果，皖南传统民居室内光环境的舒适度与光照强度呈线性关系，室内光照强度的舒适区间为 752.6-1252.51x（图 5）。

used to evaluate indoor environmental quality comfort. This paper adopts the evaluation method of A sound level to study and analyze the sound environment of traditional residential houses in southern Anhui.

2.3 Questionnaire research. In this paper, the questionnaire study and field monitoring were conducted on typical meteorological days in winter (January 25 to January 28, 2022) and summer (July 8 to 13, 2022) in Huangshan City, the details are as follows. The contents of this questionnaire study are as follows.

(1) Collect basic information about the respondents and the traditional houses they live in.

(2) Respondents' comfort ratings of indoor thermal environment, light environment, indoor air quality, and sound environment.

(3) Adaptive behavior of the respondents in adapting to changes in the outdoor environment.

2.4 Field measurements. The field monitoring used the instruments listed in Table 1, and the automatic recording interval of each instrument was set at 1 min. The accuracy of all monitoring equipment was compounded

名称 Name	参数 Parameter	范围 Range	准度 Accuracy
Testo175H1	气温 Air temperature 相对湿度 Relative humidity	-20℃~+55℃ 0~100%RH	±0.4℃ ±2%RH
Kestrel	风速 Wind velocity	0.4~40m/s	±4%
NK-5500	风向 Wind direction		
JTR-04	黑球温度 Globe temperature	-20~+80℃	±0.5℃
JTG-01	光照强度 Illuminance intensity	0.1~100000Lux	±4%
GT-1000	颗粒物 Particulate matter(PM)	0~99999 μg/m^3	±1%
Testo535	二氧化碳浓度 CO_2 concentration	0~10000ppm	±2%

表1：测量设备的详细信息
Table 1. Detailed information about the measuring device

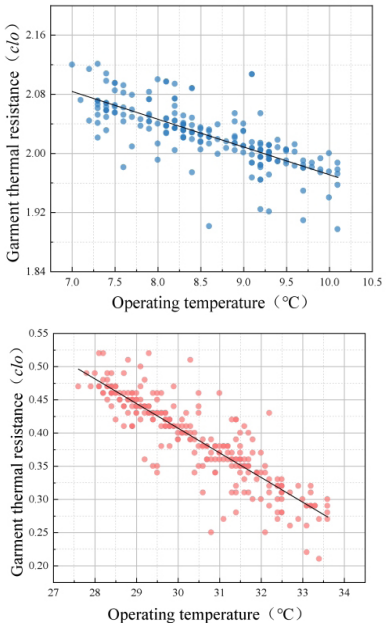

图 4：工作温度作为 aPMV 分布的函数
Figure 4. Operating temperature as a function of aPMV distribution

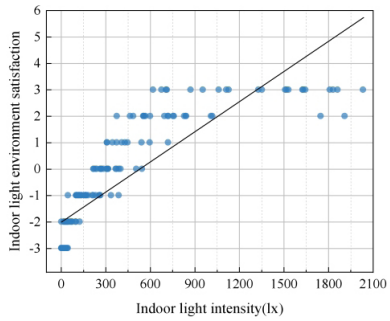

图 5：室内光强与满意度的关系
Figure 5. The relationship between indoor light intensity and satisfaction

3. 皖南传统民居室内空气质量表现优秀。在冬季与夏季，分别有 46.1% 和 66.6% 的受访者对室内的空气质量感到舒适（图 6）。在监测期间，姚式民居冬季和夏季室内的 CO_2 与 PM2.5 的浓度均满足标准中的规定。

4. 皖南传统民居受访者对室内声环境满意度较高，满意度比例高达 70.8%；监测期间，姚式民居室内昼间和夜间满足标准中规定的声压级数值比例高达 94.4% 和 86.8%（图 7）。室内外出现的短暂性高声压噪声源均来自于居民生活和生产劳作，并不会对居民的日常生活与休憩造成太大影响。

with the requirements specified in ASHRAE 55-2017. The arrangement of monitoring points was set in “Yao's House”.

2.5 Statistical approach. In this paper, based on the sample size of the distribution interval of indoor environment parameters in different seasons, a weighted linear regression of the average comfort feeling and indoor environmental parameters is conducted to obtain a linear regression model between the comfort evaluation and indoor environmental parameters in different seasons, and the environmental comfort range in different seasons is calculated.

3 Conclusion

This paper makes a comprehensive assessment of the indoor environment status of traditional residential houses in southern Anhui with “Yao's House” as an example through a questionnaire survey, field monitoring, statistical analysis, and other methods, and then combined with the objective environmental monitoring data (such as indoor temperature and humidity, air flow rate, indoor light intensity, PM2.5 and CO_2 concentration and other on-site monitoring data) with the subjective environmental comfort feedback of residents. Our research provides a theoretical basis for architectural designers and engineers to improve the indoor quality and environment of traditional residential houses. The main results of this research can be summarized as follows:

1. There is still much room for improvement in the indoor thermal environment of traditional dwellings in southern Anhui. According to the questionnaire survey of indoor thermal environment satisfaction of traditional dwellings in southern Anhui and indoor monitoring results, it is found that the satisfaction of indoor thermal environment in winter and summer is extremely low, only 8.2% and 8.8%; the aPMV value range of the indoor environment in winter and summer meets the standard only 5.2% and 8.0%; residents of traditional dwellings in southern Anhui have strong adaptability to harsh environments, and their neutral temperatures in winter and summer are 15.5 °C and 28.7 °C, respectively (Figure 4).

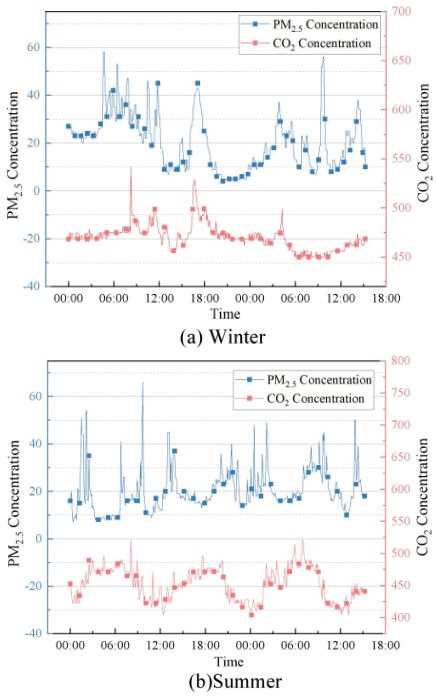

图 6：CO_2 浓度和 PM2.5 浓度在室内空气质量中的分布
Figure 6. Distribution of CO_2 concentration and PM2.5

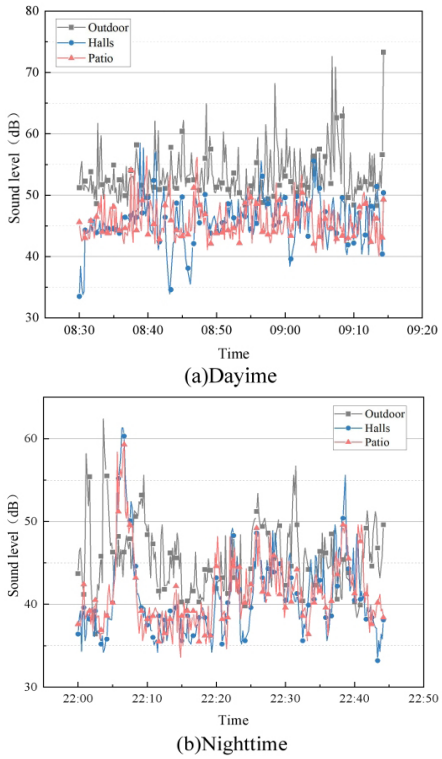

图 7：姚氏民居不同测点的声压值
Figure 7. Sound pressure values of Yao-style houses at different test points

Therefore, when revitalizing and updating traditional dwellings in southern Anhui, the indoor thermal environment parameter setting standards should be further refined to improve thermal comfort while reducing costs and energy consumption.

2. The disadvantages of lighting in the design of traditional residential buildings in southern Anhui and the interference of acquired planning and layout make the problems of indoor light environment more and more serious. Among them, the bedroom of traditional residential houses in southern Anhui has the worst indoor light environment, and the maximum light intensity is only 19.9 lx. According to the results of statistical analysis, there is a linear relationship between the comfort level of the indoor light environment and the light intensity of traditional dwellings in southern Anhui, and the comfort range of indoor light intensity is 752.6-1252.5 lx (Figure 5).

3.The indoor air quality of traditional dwellings in southern Anhui is excellent. In winter and summer, The indoor air quality was rated as comfortable by 46.1% and 66.6% of respondents respectively. During the monitoring period, the indoor concentrations of CO_2 and PM2.5 in Yao's House in winter and summer both met the standards (Figure 6).

4. The respondents of traditional dwellings in southern Anhui have higher satisfaction with the indoor sound environment, with a satisfaction ratio of 70.8%. During the monitoring period, 94.4% and 86.8% (Figure 7) of the daytime and nighttime sound pressure levels in Yao's House met the standards. Indoor and outdoor transient high noise sources all come from residents' life and production and will have no impact on residents' daily life and rest.

活动报道 Latest Events

东亚木结构建筑保护与利用国际学术交流会

International Symposium on Conservation and Utilization of Timber-framed Structures in East Asia

资料来源 Source：
https://mp.weixin.qq.com/s/NEVyOmLcEfIaFkb2i7VsYA

图 1：东亚木结构建筑保护与利用国际学术交流会海报
Figure 1. Poster of the International Symposium on Conservation and Utilization of Timber-framed Structures in East Asia

为推动东亚国家木结构建筑保护与利用领域的交流与协作，联合国教科文组织东亚多部门地区办事处将于 2023 年 11 月 25 日与泉州市人民政府共同举办“东亚木结构建筑保护与利用国际学术交流会”。

今年 6 月，联合国教科文组织与泉州在联合国教科文组织－中国青少年发展基金会梅赛德斯－奔驰星愿基金《中国世界遗产地保护和管理》项目四期（2021-2024）框架下共同启动了“古厝新声”试点活动。试点活动以“泉州：宋元中国的世界海洋商贸中心”世界遗产地为承载，以闽南传统民居营造技艺非物质文化遗产为切入点，探索遗产保护的新视野和可持续发展的新路径。试点活动响应了《保护世界文化和自然遗产公约》通过 50 周年庆祝主题“下一个 50 年：世界遗产作为韧性、人文精神和创新的源泉”，同时也契合了《保护非物质文化遗产公约》通过 20 周年纪念主题“我们即活态遗产”对非物质文化遗产的多样性和丰富性以及促进国际合作的作用的倡议精神。

To promote the exchange and collaboration among East Asian countries on the conservation and utilization of timber-framed structures, UNESCO Multisectoral Regional Office for East Asia and Quanzhou Municipal People’s Government will co-organize the “International Symposium on Conservation and Utilization of Timber-framed Structures in East Asia” on 25 November 2023.

Earlier this June, UNESCO and Quanzhou jointly launched the “Traditional Architecture in New Vibe” pilot activity within the framework of UNESCO - China Youth Development Foundation Mercedes-Benz Star Fund “Conservation and Management of World Heritage Sites in China” Project Phase IV (2021-2024). Within the geographical scope of the “Quanzhou: Emporium of the World in Song-Yuan China” World Heritage site, the pilot activity takes as an entry point the living heritage of Minnan Traditional Residential Architecture Craftsmanship to explore new horizons of heritage conservation and new pathways of sustainable development. The pilot activity speaks to the theme of the 50thanniversary of the Convention Concerning the Protection of the World Cultural and Natural Heritage, “The Next 50: World Heritage as a source of resilience, humanity and innovation”, and resonates with the spirit of the 20th anniversary of the Convention on the Safeguarding of Intangible Cultural Heritage, “We Are Living Heritage”, and its advocacy on the diversity and abundance of living heritage and its role in promoting international cooperation.

In this context, this international symposium focuses on the shared architectural traditions of East Asian countries and the

在这一背景下，此次国际学术交流会将着眼于东亚国家共同的建筑传统，结合“闽南传统民居营造技艺”的传承发展，邀请东亚地区木结构专家学者与国内相关专家学者进行交流与分享。通过传统建筑和非遗的共同纽带，此次国际学术交流会将为东亚乃至东南亚国家的相关方搭建起一个交流平台，为遗产保护和可持续发展贡献新的经验与思考。

transmission and development of Minnan Traditional Residential Architecture Craftsmanship, and invites experts and professionals from China as well as East Asian countries to engage in dialogue and exchange. Through the shared link of traditional architecture and living heritage, this international symposium will provide an exchange platform for East Asian and even Southeast Asian countries, generating new insights and practices on heritage conservation and sustainable development.

“世界考古学：古代城市与皇家首都”国际研讨会

“World Archaeology: Ancient Cities and Royal Capitals” International Symposium

资料来源 Source：
https://www.iccrom.org/news/first-asia-pacific-regional-information-meeting-gathers-iccrom-network-exchange-perspectives

图 2：“世界考古学：古代城市与皇家首都”国际研讨会现场
Figure 2. Site of the “World Archaeology: Ancient Cities and Royal Capitals” International Symposium

2023 年 7 月 20 日，ICCROM 总干事韦伯•恩多罗出席了国际文化财产保护与修复研究中心 (ICCROM) 和国立文化财研究院 (NRICH) 联合在韩举办的“世界考古学：古代城市和皇家首都”国际研讨会。研讨会是 NRICH 和 ICCROM 于 6 月签署的谅解备忘录下的首个成果。

“世界考古学”研讨会汇集了国际专家，讨论韩国、津巴布韦、埃及、土耳其等地考古遗址的调查和研究案例，以及助力这些遗址及其周围环境发展的相关保护和管理政策。恩多罗总干事在开幕词中指出，韩国在保护考古遗产方面采取了令人印象深刻的实地行动，并鼓励与东南亚及其他地区的成员国分享专业知识。他再次感谢

On 20 July 2023, ICCROM Director-General Webber Ndoro was in the Republic of Korea for the joint ICCROM and NRICH international symposium, “World Archaeology: Ancient Cities and Royal Capitals.” The symposium was the first outcome of the MoU signed between NRICH and ICCROM in June.

The “World Archaeology” symposium brought together international experts who discussed cases of investigation and research on archaeological sites in Korea, Zimbabwe, Egypt, and Türkiye and related conservation and management policies that have contributed to the development of these sites and their surroundings. In opening remarks, Director-General Ndoro noted the Republic of Korea’s impressive on-the-ground actions to conserve archaeological heritage and encouraged the sharing of expertise with other Member States in Southeast Asia and beyond. He thanked Korea once again for their continuous commitment and fruitful collaboration with ICCROM and expressed hopeful expectation of more collaboration in the next five years under the MoU.

The Director General gave the keynote speech on “Ancient cities in Southern Africa” with specific reference to the World Heritage site of Great Zimbabwe. “Our topic today, though we are dealing with ancient cities, is very relevant to the planning of today's cities.”

韩国与 ICCROM 持续且卓有成效的合作，并表示希望在未来五年根据谅解备忘录的精神落实更多合作。

总干事发表了题为“南部非洲古城”的主题演讲，具体提到了大津巴布韦世界遗产地。“虽然我们今天讨论的是古代城市，但我们的主题与如今的城市规划非常相关。”

在此之前，他访问了首尔丰纳洞百济王国时期的土制防御工事丰纳土城。他与《韩国先驱报》和韩联社就考古、遗产以及两者的区别进行了交谈。“考古学是我们决定去发现和研究的东西，但只有当社会或公众开始认同这个地方时，它才成为‘遗产’。”

这次考古联合国际研讨会是 ICCROM 和 NRICH 新合作协议的关键组成部分之一。明年的研讨会将在意大利举行。

Prior to the symposium, the Director-General visited Pungnaptoseong, an earthenfortification dating back to the Baekjae Kingdom situated in Pungnap-dong, Seoul. He spoke with The Korea Herald and Yonhap News Agency about archaeology, heritage and the difference between the two.“Archaeology is what we decide to go and discover and do research on, but it only becomes ‘heritage’ when communities, or the people themselves began to identify with the place.”

This joint international symposium on archaeology is one of the key components of the new collaboration agreement between ICCROM and NRICH. Next year’s symposium will be held in Italy.

“分与合：超越东西的现代主义”欧洲现代建筑研讨会

European Modern Architecture Symposium “Convergences and Divergences, Modernism beyond East and West”

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图 3：“分与合：超越东西的现代主义”欧洲现代建筑研讨会海报
Figure 3. Poster of the European Modern Architecture Symposium “Convergences and Divergences, Modernism beyond East and West”

欧洲现代建筑研讨会“分与合：超越东西的现代主义”于 11 月 16–18 日在柏林举行。会议呼吁就中欧和东欧现代建筑历史进行反思和分析。

会议从横向和无阶级角度探讨了现代建筑的历史，摒弃了如“东方”“西方”等过时和简

European Modern Architecture Symposium “Convergences and Divergences, Modernism beyond East and West” was held in November 16-18 in Berlin. The Organizers of the conference call for contributions that critically rethink and analyze the history of European modern architecture with reference to Central and Eastern Europe.

The conference addresses the history of modern architecture from a horizontal and non-hierarchical perspective, overcoming outdated and simplistic categories such as East and West. It will focus not only on design and urban planning issues, but also on questions related to the transformation of societies, the exchange of ideas, the building of relationships between people or the struggle for a better future. The conference approaches architecture from a broader perspective - presenting it as a “seismograph” of the visionary and at the same time ambivalent experience of Modernism, which has much to say not only about the particular

单的分类。会议不仅关注设计和城市规划问题，还关注与社会转型、思想交流、建立人与人之间的关系和为更美好未来而奋斗的问题。会议从更广阔的角度来探讨建筑——将其视为现代主义的具有远见卓识和矛盾经验的“地震仪”。建筑不仅是历史特定时刻的见证人，还是当下生活的阐释者。

长期以来，理论和政治结构导致了中欧和东欧在欧洲建筑史学中的边缘化地位。而本次会议鼓励人们更仔细地审视 20 世纪和 21 世纪欧洲政治、地理和文化边界之间及之外的动态。其目的不仅是分析差异，还要书写现代建筑的联系史，运用一系列尺度和方法：关注时间框架和重要事件，探索历史和记忆相遇的城市、地区和边界，以及从个人故事的角度审视建筑——那些传记背后的或现代主义特定建筑对象和思想背后的故事。

会议汇集研究人员、建筑师、设计师、建筑历史学家、城市活动家和公民社会参与者所代表的各种观点和专业领域。主要目标是在国际关系、依附关系、影响力和权力的背景下批判性地重新思考现代主义的遗产及其在中欧和东欧的相关转变。

moment in history but also about the present.

For too long, theoretical and political constructs have contributed to a territorial or thematic marginalization of Central and Eastern Europe in European architectural historiography. Instead, the conference encourages a closer look at the dynamics between and beyond the political, geographical and cultural borders of Europe in the 20th and 21st century. The aim is not only to analyze the differences, but also to write a history of connections in modern architecture, employing a range of scales and approaches: focusing on timeframes and milestones, exploring cities, regions and borders where histories and memories meet, as well as examining architecture from the perspective of individual stories – those behind biographies or those behind particular architectural objects and ideas of Modernism.

The conference seeks to bring together various perspectives and areas of expertise represented by researchers, architects, designers, architectural historians, urban activists and civic society actors. The main goal is to critically rethink the legacy of Modernism and its associated transformations in Central and Eastern Europe in the context of international relations, dependencies, influence, and power.

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