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Foguang
Temple

Summer Exploration

Digital Temple



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CONCEPT

Digital Temple is an immersive project inspired by Foguang Monastery, a Tang dynasty wooden temple on Mount Wutai, China. The project aims to embody the Buddhist ideas of perception and awakening through a VR and AR journey—blending sound, visuals, and interaction. The VR experience begins with a ripple in a bowl that draws players into shifting visions of Foguang Monastery, guided by sounds of wind, bells, and chants, ending in quiet insight. The AR path, on the other hand, invites discovery of five digital fragments—architectural details, bodhisattvas, and archival materials—scattered around the Harvard Yard. The experience embodies the Huayan teaching: “one is all, all is one,” where finding each piece reveals a perspective of the full temple. Beyond a digital reconstruction, the project invites a mindful encounter with the sacred.



BACKGROUND

Foguang Monastery, built in 857 CE on Mount Wutai in Shanxi, China, is one of the oldest surviving Tang dynasty wooden structures. In the 1930s, historians Liang Sicheng and Lin Huiyin revived public awareness through detailed documentation, securing its status as a national treasure and an invaluable time capsule. The monastery showcases technical mastery and spiritual depth, with intricate dougong brackets, sweeping roofs, and a precise axial layout reflecting cosmology. Inside, life-sized Buddha and Bodhisattva sculptures remain in their original places, offering a rare glimpse of Tang religious art. Situated on one of China's four sacred Buddhist mountains and linked to Manjusri, the Bodhisattva of Wisdom, Foguang draws pilgrims and seekers. Its design embodies Huayan Buddhist ideas of interconnectedness, blending cosmic and personal meaning. Today, Foguang stands as a testament to ancient architecture, Buddhist philosophy, and ongoing inspiration for visitors and scholars alike.



AR

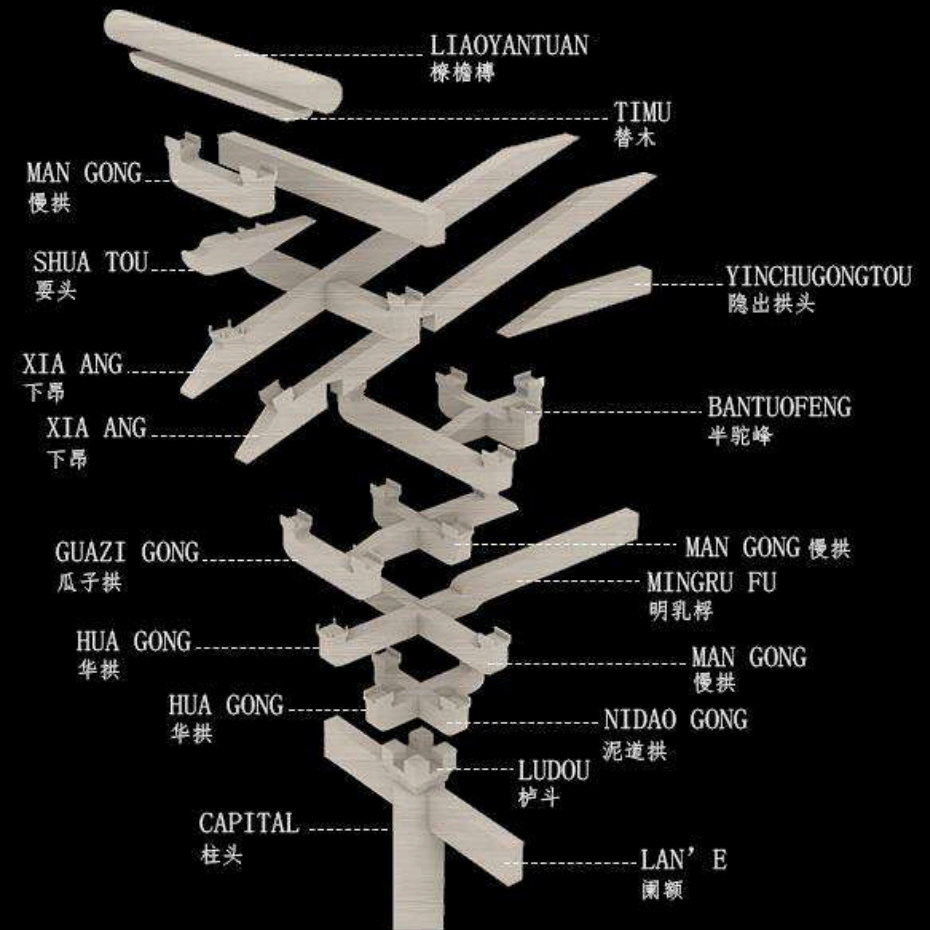
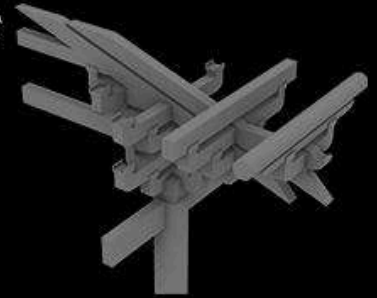
EXPERIENCE

THE GREAT EAST HALL OF FOGUANG TEMPLE

佛光寺东大殿

EXPLODED VIEW OF THE TOUKONG BRACKET SET
ATOP THE OUTER EAVE COLUMN

外檐柱头铺作拆解示意图





The AR installation transforms Harvard Yard into an open-air pilgrimage, inviting visitors to interact with and uncover the Foguang Monastery, through piecing together five digital fragments. Using their phones, participants explore the space, revealing pieces that highlight the temple's architecture, symbolism, and history. As each fragment is found, a glowing digital reconstruction of the monastery gradually emerges in augmented reality. Inspired by Huayan Buddhism's vision of interconnectedness, the project blends hands-on discovery with deeper reflection on how meaning, memory, and space intertwine, showing that the journey of seeking is part of the experience. Through movement and interaction, visitors connect with both the temple's legacy and a worldview that brings the sacred into everyday life.



Nearby, stands the dharani pillar, a stone stele inscribed with sacred dharanis. As visitors approach, they are reminded of the power of sacred texts and the awakening potential of shadow.

Manjusri Bodhisattva then appears, riding a lion through mist. Circling the figure reveals teachings from different angles, inviting reflection on perspective and emptiness, linking the temple to Mount Wutai.

Later on, Samantabhadra Bodhisattva appears riding an elephant. This shimmering figure responds to players' gestures—mirroring a mudra causes it to glow and send out radiant rings, symbolizing compassion through practice.

Finally, projected on a wall, photos from Liang Sicheng and Lin Huiyin's 1930s research invite visitors to explore Foguang's rediscovery.

After finding all fragments, the full temple appears in a clearing, glowing and semi-translucent.

The experience invites visitors to explore Harvard Yard through an augmented reality journey on their phones or tablets. Scattered across five distinct sites, digital fragments of Foguang Monastery come alive through layered visuals, sounds, and stories.

At one spot, floats the delicate dougong — the traditional interlocking wooden brackets that hold up the Chinese temple architecture. This dynamic model assembles and disassembles in real time, revealing the harmony of its design. Visitors can walk around or tap it to explore its intricate geometry, while a narration explains the importance of Tang dynasty dougong balances weight, embodying the balance between form and space.





This VR installation invites a contemplative journey through Foguang Monastery, imagined not just as a physical place but as a living mandala—a cosmic reflection of self and universe. Following the path from illusion to truth, it guides the player through five stages of awakening, blending architecture, sound, light, and movement into a sensory inward pilgrimage.

Each stage embodies the temple's spatial theology within the player's consciousness. Rather than recreating the monastery exactly, the experience offers a thoughtful reconstruction—an unfolding interior space of realization. Players don't just explore the temple; they dissolve into its cosmology. This project aims at a digital pilgrimage reflecting the Buddhist insight that form and emptiness arise together.

VIRTUAL REALITY EXPERIENCE



The journey begins in a quiet space where a single singing bowl glows softly, suspended in midair. When the player gently touches it, ripples spread across its luminous surface, slowly revealing the misty contours of Mount Wutai shimmering within. This shimmering water becomes a portal, inviting the player inward—showing that what unfolds before the player is not just the outer world but the echo of their own mind. Soft winds, distant birdsong, and faint temple bells create a space of calm reflection.

As the player steps forward, they cross a mirror-like surface. Each footfall awakens floating lanterns, their gentle glow representing acts of kindness that light the player's path deeper into this sacred mental landscape. Sutra pillars rise from the fog, their soft light parting the mist as the player advances, guiding them into the heart of one's own consciousness.

Entering a shadowy hall, rows of Buddha statues stand silently. With each mindful breath, candles ignite one by one. The statues shimmer with golden light—not watching but reflecting the light within the player. Their glow flows with their breath, a living mirror of their inner illumination.



Gradually, the hall fades into a star-filled cosmos. Buddha figures multiply and orbit slowly while meeting the player's gaze at eye level, connected by glowing threads forming Indra's Net. Whispers of sutras surround the player in a harmonious chorus. Their form shimmers and fades, mirroring the translucent temple—a sign the player has glimpsed through illusion to meet their own mind's manifestation.

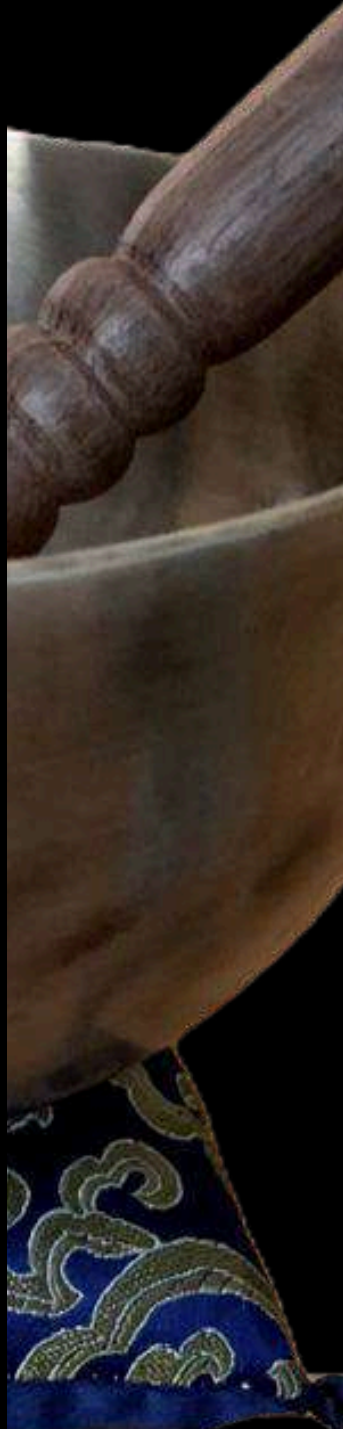
Finally, gazing at Mount Wutai at sunset, the player lowers their gaze and realize they have become the Buddha. They are seeing through the Buddha's eyes. The voice asks, "Why do you seek the Buddha?" and answers, "you were always the Buddha." The scene fades, blending virtual and physical worlds, with the closing words: "The Dharma Realm knows no boundary - nor



SOUND DESIGN



The sound design of the VR experience helps to guide the player through their inward reflection through shifting states of perception. Each stage of the experience features a carefully layered soundscape that mirrors the emotional and spatial atmosphere: wind brushing through mountain pines, distant temple bells, the low resonance of a singing bowl... These sounds are not simply background—they respond to the player's breath, gaze, and movement, deepening the sense of embodied presence. As candles ignite or statues shimmer, subtle tonal shifts reinforce the rhythm of awakening. Spatial audio anchors each sound in three-dimensional space, creating a sense of intimacy and expansiveness, like stepping inside a living mandala. Silence is used as a texture as well—creating contrast, pause, and stillness between moments of revelation. The sound design weaves emotional continuity across scenes, leading the player from illusion to clarity.



REFLECTION

The digital temple project is an immersive digital installation that reimagines the 9th-century Foguang Monastery through a dual experience in Virtual Reality and Augmented Reality. The VR component invites participants on an inward journey through five stages of spiritual awakening, guided by Huayan Buddhist philosophy and sensory interactions with light, breath, and sound. In parallel, the AR experience transforms Harvard Yard into a contemplative landscape where visitors uncover five symbolic fragments—architectural, philosophical, and historical—that culminate in the reassembly of the monastery in augmented space. Together, these experiences explore the interplay between perception and truth, fragmentation and unity, offering a multisensory meditation on the nature of reality and the interwoven relationship between self, space, and the sacred.



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BIBLIOGRAPHY

陈晓伟, “灭罪与超度: 辽时期《佛顶尊胜陀罗尼经》与晋北地区的造幢,” 北京师范大学学报 (社会科学版), (北京: 北京师范大学, 2009), 51-53。

金明华. “中国传统佛教建筑的室内光环境研究——以佛光寺东大殿为例.” 超星, 57。

Lin, Wei-Cheng. Building a Sacred Mountain: The Buddhist Architecture of China's Mount Wutai. University of Washington Press, 2014.

Lopez, Donald S., Jr. Religions of China in Practice. Princeton University Press, 2021.

吕舟 et al, 佛光寺东大殿 建筑勘察研究报告. 北京: 清华大学建筑系, 1950. 报告编号 13072156

SPECIAL THANKS

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Cosmic Cycle of Life

Mawangdui
Han Tombs

Summer Exploration



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CONCEPT

This immersive installation draws inspiration from the four-layered lacquered coffins unearthed from the Mawangdui Han tomb, envisioning a multisensory experience that explores the cosmic cycle of life, which is the underlying design logic behind the design of the coffins. The nested coffins, arranged from outer to inner layers, symbolically represent the four seasons—winter, spring, summer, and autumn—each embodying a distinct state of life. This structure resonates deeply with early Chinese cosmology as articulated by Zhuangzi:

"If we examine its beginning, it was originally not life; not only was it not life, it was not even form; not only was it not form, it was not even qi. Entangled in the dim and obscure, it changes and becomes qi; qi transforms into form, form transforms into life, and now transforms again into death—this is but the cyclical procession of the four seasons."

Life, in this worldview, is not a linear progression but a transformation of qi—the vital breath—through phases of emergence and union, just as the seasons perpetually revolve.

Visitors journey through the four seasonal movement, each layer unfolding visual imagery inspired by the intricate iconography on the lacquered surfaces. **The experience is designed as an interactive encounter: by engaging with each seasonal space, visitors activate distinct audiovisual elements corresponding to the energy and symbolic meaning of that phase.** Embedded within this design is the musical cosmology of early China, which associated each season with a particular set of ritual instruments—strings for spring, bamboo pipes for summer, bronze bells for autumn, and stone chimes for winter. Visitors become participants in this cosmological performance, triggering harmonic soundscapes that express the inner rhythms of seasonal change and the evolving states of life.

The final autumnal layer evokes a realm of transcendence as well as a return to the primordial cosmos. Death, in this context, is not an ending, but a passage back to the original state of the universe and the beginning of the cycle.

Through this integration of image, sound, and interaction, the installation reanimates the cosmological imagination embedded within the material culture of Mawangdui, offering a contemplative journey into ancient Chinese understandings of life, transformation, and cosmic cycle.

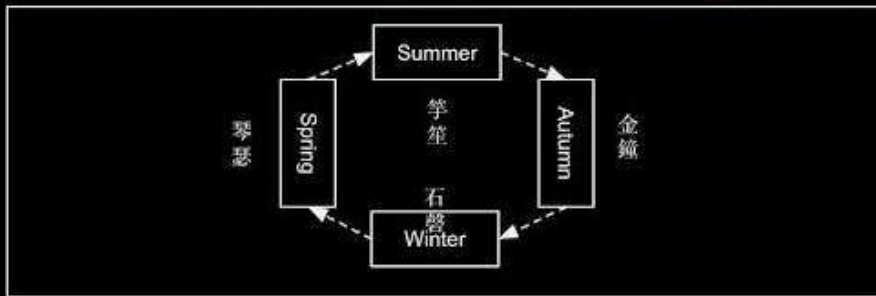
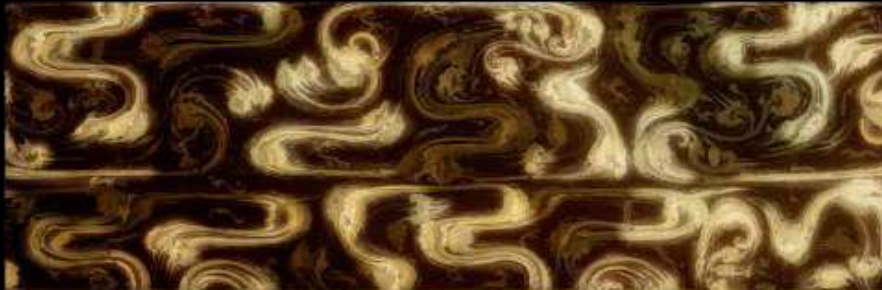
BACKGROUND

The Mawangdui tombs, located in Changsha, Hunan Province, are among the most significant archaeological discoveries of 20th-century China. Excavated between 1972 and 1974, the site includes three Western Han Dynasty tombs (c. 2nd century BCE), the most famous of which belonged to Lady Dai (Xin Zhui), wife of the Marquis of Dai. Her tomb, remarkably well-preserved, contained a wealth of artifacts, including silk manuscripts, lacquerware, cosmetics, and a perfectly preserved body—one of the best-preserved ancient corpses ever found.



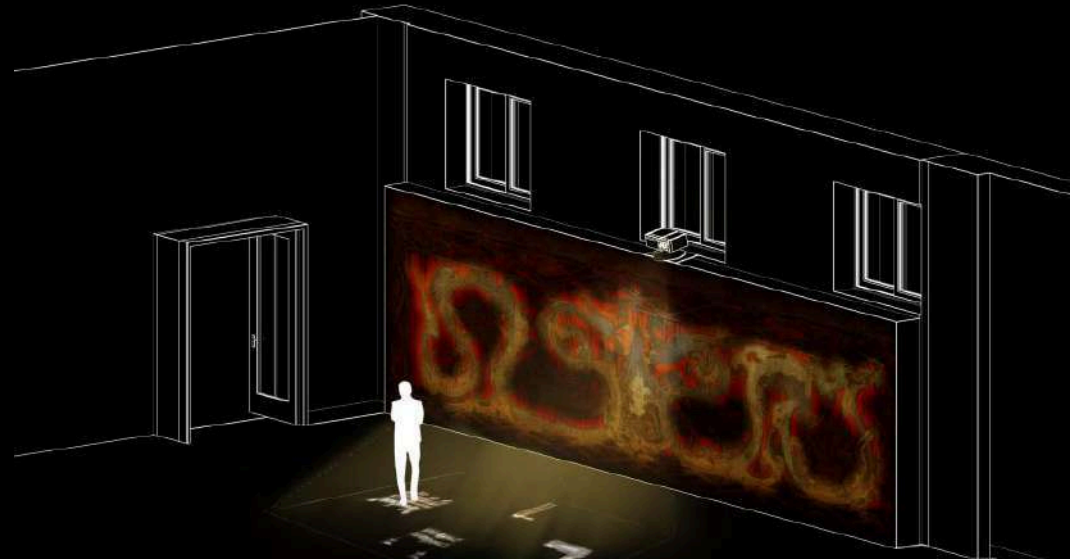
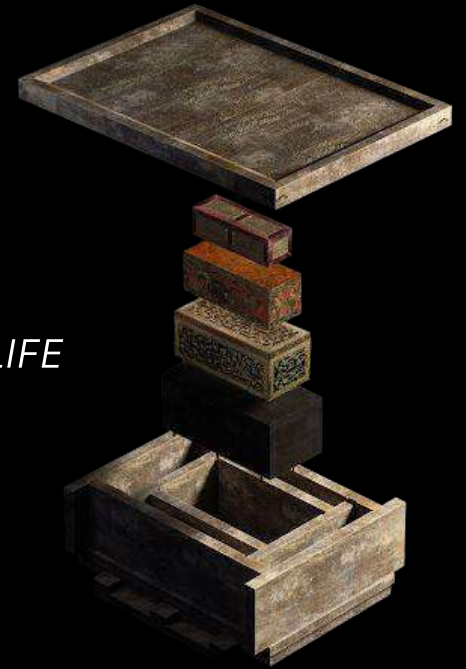
The tomb's elaborate multi-layered coffin structure and burial textiles reveal the high craftsmanship of Han-era artisans and deep beliefs about the afterlife. These items reflect Daoist concepts of immortality and the soul's journey. The Mawangdui findings offer profound insights into Han dynasty society, medicine, art, burial customs, and early Chinese cosmology. They also underscore the sophistication of early Chinese textile and preservation techniques. Today, Mawangdui remains a vital source for historians and archaeologists seeking to understand the spiritual and material life of early imperial China.

INSTALLATION STRUCTURE



INSTALLATION VISUALIZATION:

THE COSMIC CYCLE OF LIFE



WINTER

COFFIN 1

The first coffin of four is plainly black and undecorated in comparison to the smaller coffins. The simple yet stark coloring is symbolic of the present state of the Marquise of Dai: excessive yin energy in death (traditionally represented through the color black) and the dispersion of her life force. However, undulating white wisps of qi serve as a reminder of the constant flux of the cosmos, and hint at the reconsolidation of qi and reawakening of life to come. This first coffin, symbolically winter of the four seasons, is only the nadir of a never-ending cycle. Not only is death an impermanent, fluid state, but also necessary for rebirth. Even in the darkness of winter, the cosmos are never static.

SPRING

COFFIN 2



The second coffin depicts mythical yin and yang creatures battling within flowing golden clouds of qi upon a black lacquer background and the metaphorical arrival of spring in the darkness of winter. The coffin splits the cosmic force of qi into separate yin and yang vessels, symbolic of Han dynasty medical beliefs that the human body was composed of these vessels that balanced yin and yang energy to create human life.

In the midst of these battling creatures are figures of yang disposition playing musical instruments such as the se, believed to balance yin and yang. To balance the excessive black yin energy, the cultivating animals produce small wisps of red yang energy along the edges of the qi clouds. These various forces, all intended to replenish yang energy and reconsolidate qi, harken the arrival of spring through the beginning of the Marquise's rebirth.



SUMMER

COFFIN 3

The third coffin of the sequence is red lacquered and decorated with dynamic scenes of creatures ascending mount Kunlun, the mythical mountain of the West. The vibrant red of this coffin represents dominant yang energy, aligning with the vitality of the summer season emerging in this stage of the cosmic cycle. Imagery of a jade disc with intertwining dragons evokes spiritual illumination, a cultivation concept that brings concentrated qi into the body to reawaken the life force. Along the headboard and the west panel are depictions of the mythical Kunlun, representing the transcendental and transformative nature of this process. Summer, shown in this coffin, is the season of life at its peak—qi condensed and in motion.

AUTUMN

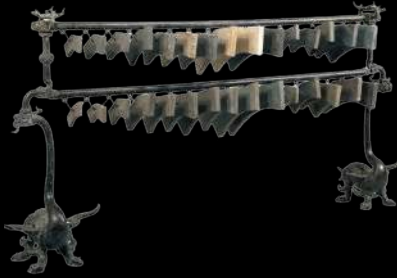
COFFIN 4

The inner coffin of the Mawangdui tomb, emphasizes two intricate decorative techniques: feather appliqué silk and tree-pattern pile embroidery. This research highlights these textiles not only as exquisite works of ancient craftsmanship but also as profound expressions of cultural symbolism, cosmic order, feminine refinement, and societal status. Together, these elements vividly illustrate the Han dynasty's deep cultural and spiritual aspirations, enriching our understanding of ancient Chinese funerary traditions.

The feather appliqué method (羽毛贴花绢) employs meticulously arranged strips of silk interwoven with colored feathers—primarily sourced from birds such as kingfishers—to form luxurious, diamond-shaped patterns. These feathered decorations symbolize immortality and ascension (羽化登仙), echoing ancient Chinese beliefs about the soul's journey to the heavens. The use of feathers also provided practical protection through their elasticity and waterproof qualities, preserving the coffin and the body within.

Around this feather piece is the tree-pattern pile embroidery (树纹铺绒绣), a special embroidery technique using threads of vermilion, black, and smoky threads stitched onto silk, forming black diagonal grids filled with symbolic red and smoky tree motifs. These designs suggest concepts of longevity tree (长寿树) and auspiciousness tree (吉祥树), reflecting Han dynasty ideals.

SOUND DESIGN



The sound design methodology of Mawangdui exhibition are intricate and definitely intriguing if you dig deeper. After researching Han Dynasty Musicology, the connection between the instruments found at Mawangdui, and the four seasons cycle discovered on the T banner cloth, four instruments—Chinese guzheng zither (七弦琴), sheng (笙), bianzhong (编钟) and bianqing (编磬)—are chosen to each showcase a particular season's characteristic. When audience interacts with audiovisual display at the exhibition, the four instrument layers can be controlled and altered simply by where they stand.



INTERACTIVE DESIGN



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BIBLIOGRAPHY

孙良. 2025. “人民画报-马王堆 中华文明的璀璨一隅.”
Rmhb.com.cn. 2025. http://www.rmhb.com.cn/yxsj/sy/202502/t20250206_800391454.html.

温星金. 2022.9 《马王堆一号汉墓棺槨研究综述》https://mp.weixin.qq.com/s/_biz=MzkxNDIxOTQxNQ==&mid=2247491861&idx=2&sn=5c5f127ceb803df9849a37b6f212951c&chksm=c17369edf604e0fb489f2f766e6be87483ee3961b43fe70d541d8d936f27f35a21325c0ef6a0&scene=27

Lu, Chenchen. “Acoustic Alchemy: Bell and Chime in the T-Shaped Banner of Mawangdui Han Tombs | 金声玉振：马王堆T形帛画中的钟磬与音声方术.” 艺术学研究, no. 3 (2024): 91–103.

Wang, Eugene. “Ascend to Heaven or Stay in the Tomb? Paintings in the Mawangdui Tomb 1 and the Virtual Reality of Revival in Second-century B.C.E China.” In *Mortality in Traditional Chinese Thought*, edited by Amy Olberding and Philip Ivanhoe, 37–84. Albany: SUNY Press, 2011.

Wang, Eugene. “入地如何再升天: 马王堆美术时空论 (How to Ascend to Heaven After the Burial? -- Time and Space in Mawangdui Tombs).” 文艺研究, 2015.



Behind the Sydney Opera House

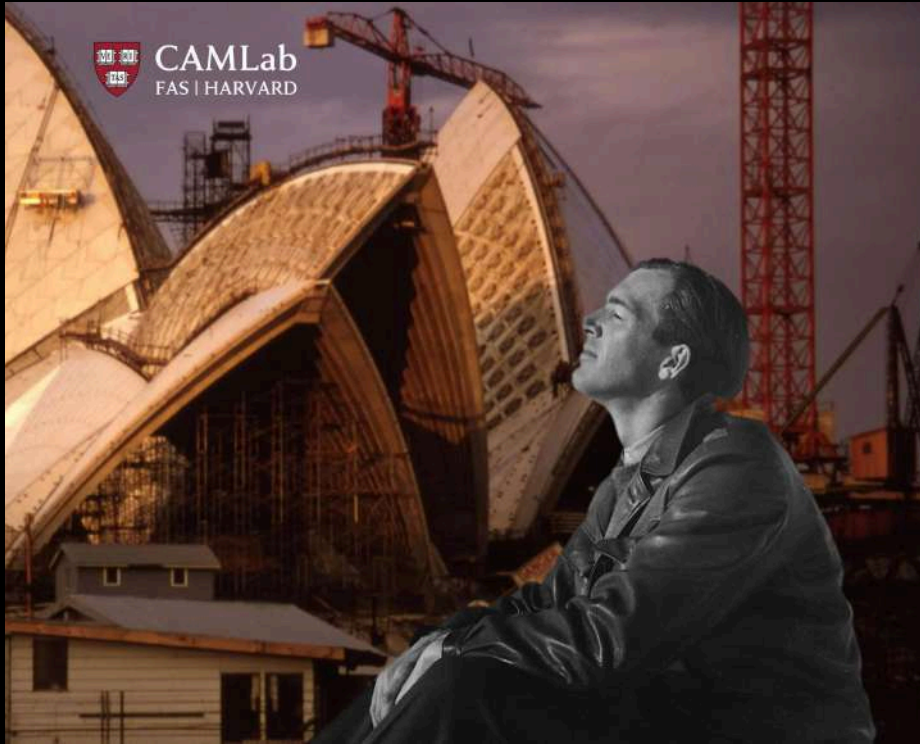
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CONCEPT

In designing the Sydney Opera House, Danish architect Jørn Utzon drew from Chinese architectural and aesthetic principles, gathered from scholar Lin Yutang's writings, *Yingzao Fashi* 《營造法式》, and his own travels. However, this project aims to highlight a deeper philosophic resonance between Utzon and Lin: the art of living. Though from different countries, they shared an ideal that transcends geographical boundaries and seeks to recover human happiness, leisure, and optimism—a spiritual reclaiming against the inexorable march of technical progress.



BACKGROUND

The Sydney Opera House cuts one of the most iconic silhouettes on the Sydney skyline. Seeking to create a national landmark to place Australia on the world stage, the government hosted an international design competition for the Sydney Opera House in 1956. In 1957, Jørn Utzon, a Danish architect with little international renown, emerged as the unlikely winner. Utzon's innovative design featured a roof composed of curved "shells," and seemed to float dreamily above the Sydney Harbor.

Imbued with various global influences, this design embodied Utzon's interest in organic forms, standing in contrast with the stark lines of twentieth-century brutalism. In addition to natural forms, Utzon drew inspiration from Chinese architecture, and Chinese roofs in particular, throughout his life. His encounter with Chinese scholar Lin Yutang—a linguist, educator, and inventor who lived all over the globe—deepened this connection. Lin's vision of the "art of living" promoted leisure, simplicity, and human harmony with nature, resonating with Utzon's belief in human wellbeing as the ultimate purpose of design.

Yet realizing Utzon's vision for the Opera House proved daunting. Its roof geometry presented immense engineering challenges, delaying the project and hiking the budget past original estimates. Mounting political tensions eventually pressured Utzon to resign in 1966, leaving his vision for the building's interior unrealized. In 1973, the Opera House officially opened with a different interior than Utzon designed.

Still, Utzon's resolve to uphold his artistic vision punctuates the legacy of the Sydney Opera House. The Opera House's design and history captures a dialogue between Lin and Utzon, East and West, and a commitment to humanism and an artist's ideals.

The film opens with Lin Yutang and Jørn Utzon standing by a waterfront. Both figures train their eyes on the rippling water and horizon beyond, neither looking back nor at each other. The motif of water firstly represents the dynamic lines in nature that so inspired Utzon and, secondly, lends itself to the title of Lin's 1955 utopian novel, *The Unexpected Island*. For the Sydney Opera House is more than a symbol of Utzon's aesthetic views, but a window into the stubborn human-centered idealism that rang true with Lin's philosophy of living well. Using the ambiguity of space in our Immersive Room, we bring Utzon and Lin together across time and space and position the audience at the center of their conversation.

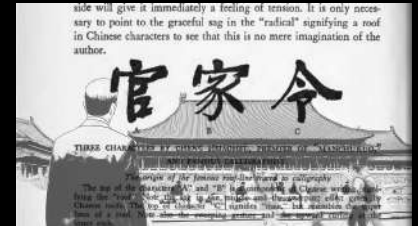
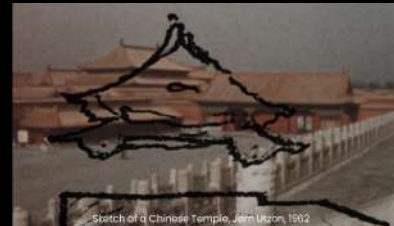
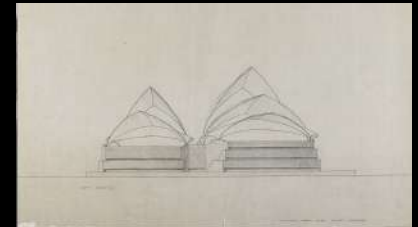
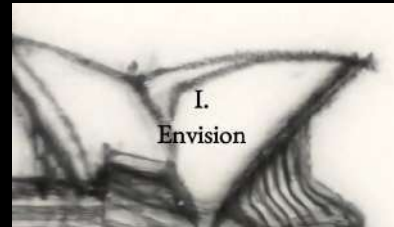
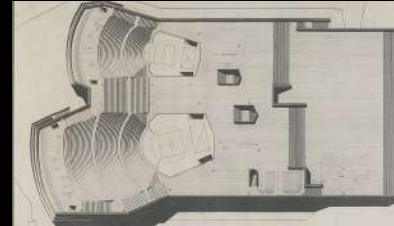
PRELUDE



I. Envision

In *My Country and My People*, Lin Yutang described how the flowing lines of Chinese calligraphy mirrored the lines of nature. By incorporating calligraphic forms, natural beauty was expressed in Chinese architecture. Art's interplay with nature was only one aspect of Lin's broader vision for the Chinese art of living, where man lived in spiritual harmony with nature, free from empty pursuits that drained life of happiness. Perhaps inspired by Lin's celebration of nature, perhaps moved by the optimism and idealism that coloured Lin's novel, Utzon named *My Country and My People* one of his favourite works.

This movement invites the audience to meet Lin Yutang and experience his words brought to life. In doing so, we hope the audience may glimpse what struck Utzon when he encountered Lin's words, and imagine what drove him to further explore China and ultimately, conceive of the Sydney Opera House.



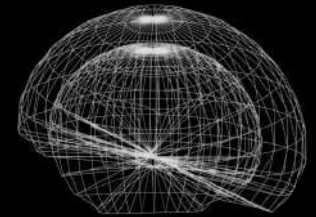
II. Enliven

"There is always something new happening...so that, together with the light, the sun, and the clouds, makes it a living thing."

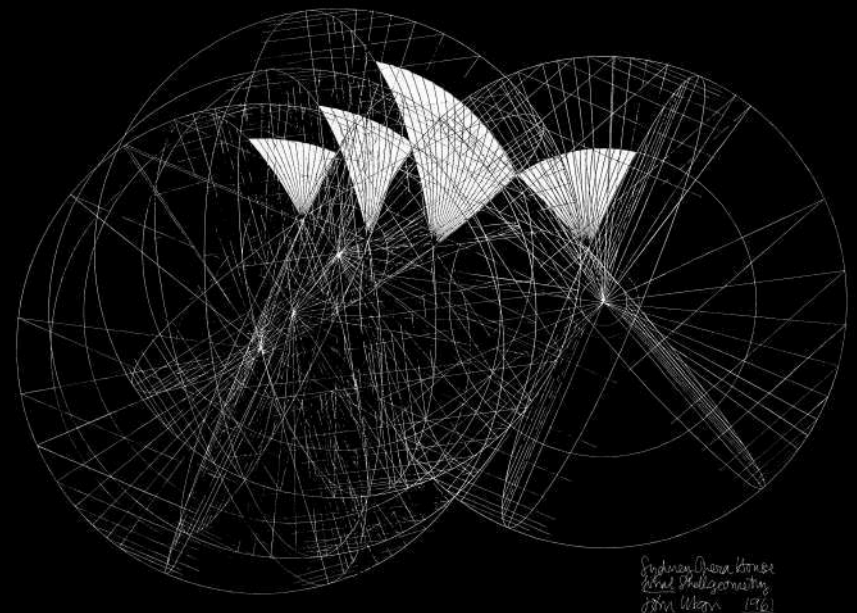
- Jørn Utzon (translated from the Danish)



The construction process of the Sydney Opera House was dogged by controversies, budget overruns, and delays. Construction was split into three stages: the podium, the roof, and the interior. Despite these obstacles, Utzon held fast to his vision. The roof was the cornerstone of his ideal and proved exceptionally challenging. For three years, a solution eluded him. In this process, Utzon drew on ideas that echoed Lin Yutang's emphasis on organic forms to resolve seemingly impossible questions.



This movement reveals Utzon's stubborn commitment to his ideals and determination to turn a dream into reality, creating a building that moves and breathes and changes with its environment.



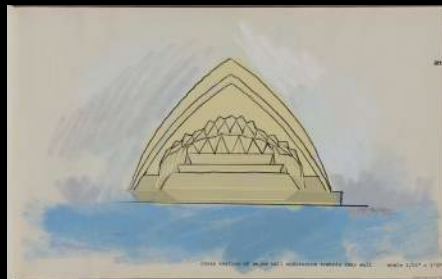
III. Endeavour

Utzon's victory in realizing the roof was brief but significant. While he moved to finalizing plans for the interior, however, time was running out, costs were soaring, and critics grew louder by the day. Utzon's refusal to compromise his design for the interior led him into conflict with a new government determined to rein him in.

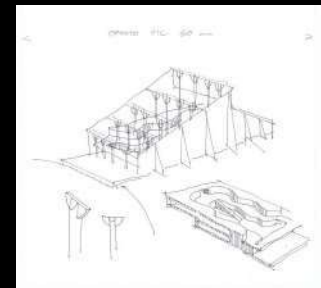
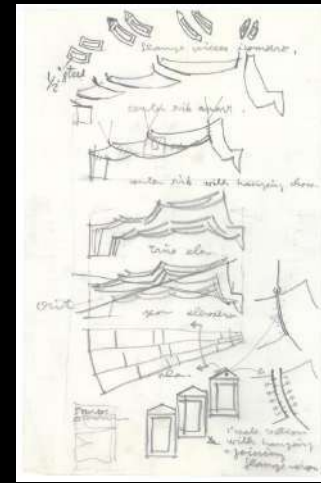
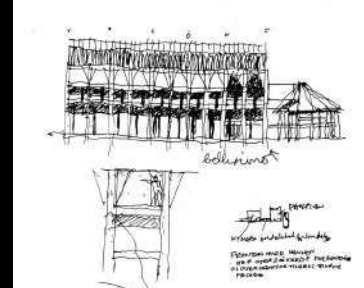
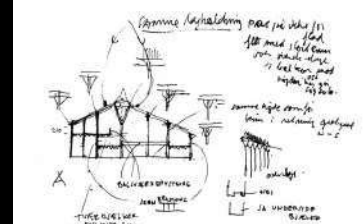
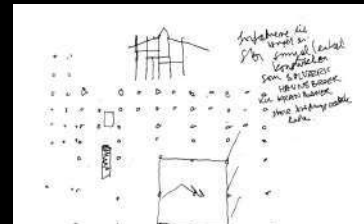
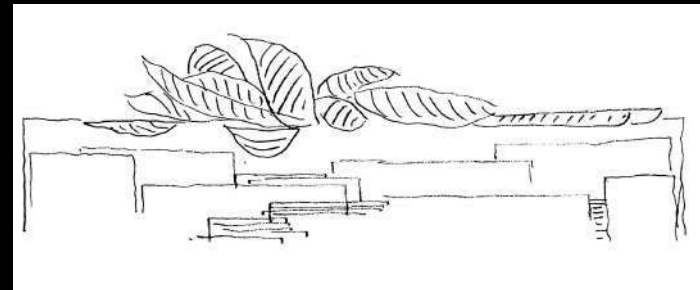
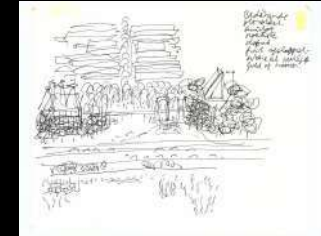
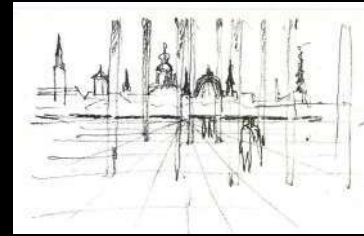
When Utzon failed to deliver drawings that met their demands, his wages were withheld, forcing him to resign.



Though the interior remained unrealized in Utzon's hands, his commitment to an artistic ideal endures.



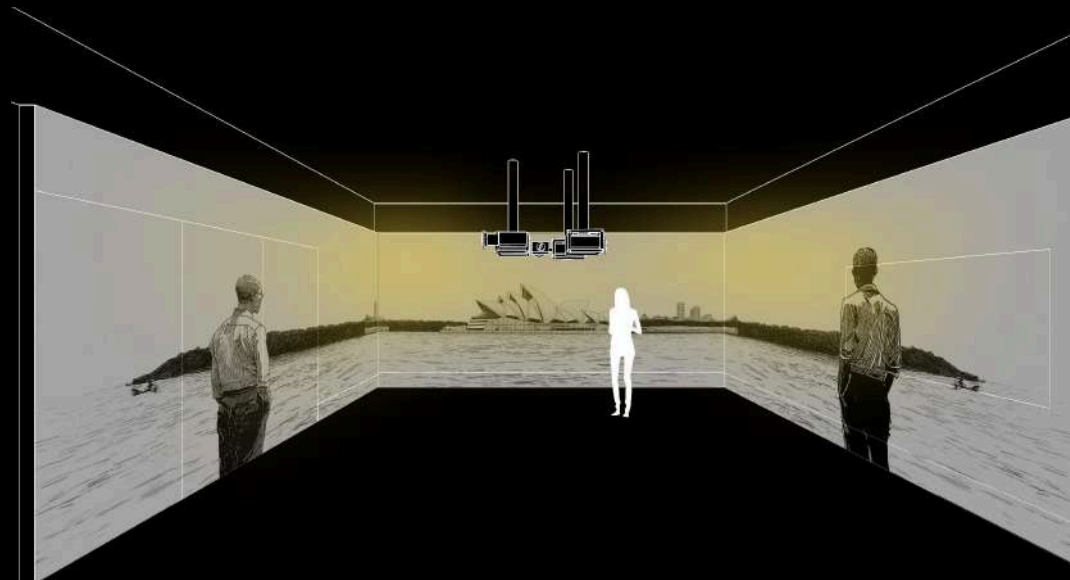
Like Lin Yutang, Utzon was a humanist; both believed art should promote good living by creating spaces that fuel the spirit and evoke enjoyment. The Sydney Opera House was only one chapter in Utzon's life. In his many later designs, he continued to strive for the same ideals, guided always by his belief in architecture as a way to sustain human wellbeing.





INSTALLATION STRUCTURE

"Being an architect is, for me, being a humanist."
- Jørn Utzon





TEAM

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BIBLIOGRAPHY

Chiu, Chen-Yu, Nur Yıldız Kılınçer, and Helyaneh Aboutalebi Tabrizi. "Illustrations of the 1925-edition Yingzao Fashi 營造法式: Jørn Utzon's Aesthetic Confirmation and Inspiration for the Sydney Opera House Design (1958–1966)." *Journal of Asian Architecture and Building Engineering* 18, no. 3 (2019): 159-69. <https://doi.org/10.1080/13467581.2019.1604357>.

Chiu, Chen-Yu. "China Receives Utzon: The Role of Jørn Utzon's 1958 Study Trip to China in His Architectural Maturity." *Architectural Histories* 4, no. 1 (2016): 1-25. <https://doi.org/10.5334/ah.182>.

Chiu, Chen-Yu, Philip Goad, Peter Myers, and Nur Yıldız Kılınçer. "My Country and My People and Sydney Opera House: The Missing Link." *Frontiers of Architectural Research* 8, no. 2 (2019): 136-53. <https://doi.org/10.1016/j.foar.2019.03.002>.

Kjeldsen, Kjeld et al. *Jørn Utzon: The Architect's Universe*. Edited by Kenneth Frampton, Michael Juul Holm, and Mette Marcus. Humlebaek, Denmark: Louisiana Museum of Modern Art, 2008.

Lin, Yutang. *The Importance of Living*. New York: John Day Company, 1937.

———. *My Country and My People*. New York: John Day Company, 1936.

———. *The Unexpected Island*. London: William Heinemann, 1955.

Matthiesen, Stig, Bente Jensen, and Thomas Mølvi. *Utzon and Utzon Center Aalborg*. Aalborg, Denmark: Utzon Center, 2011.

Møller, Henrik Sten, and Vibe Udsen. *Jørn Utzon: Houses*. Photographs by Per Nagel. Copenhagen, Denmark: Living Architecture Publishing, 2004.

Weston, Richard. *Utzon: Inspiration, Vision, Architecture*. Copenhagen: Edition Bløndal, 2011.



CAMLab
FAS | HARVARD



The Journey
to the West

Summer Exploration

Digital Gandhara



CAMLab
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CONCEPT

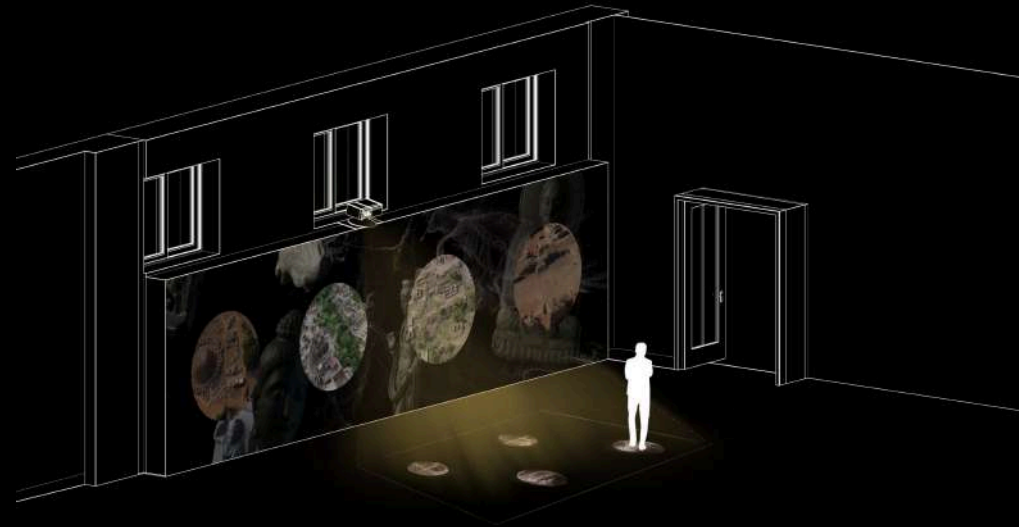
The Digital Gandhara project focuses on preserving Buddhist art and architecture from the ancient Gandhara region, which lies in modern day northwestern Pakistan and eastern Afghanistan. Gandhara, blending Greek, Indian, Persian, and Chinese influences, thrived along the Silk Road between the 1st century BCE and 5th century CE. Now, due to instability and looting, many sites are at risk. Our presentation today will therefore focus on three important sites of the Gandhara region, in which viewers may engage in an interactive experience to immerse themselves in these sites.

To tackle this, Digital Gandhara uses modern digital tools like 3D scans, digital models, machine learning, and multimedia storytelling to document and recreate these historic sites. Bamiyan, famous for its massive Buddha statues tragically destroyed in recent decades; Taxila, a bustling center of ancient learning filled with monasteries and stupas; and Hadda, renowned for exquisite sculptures reflecting rich cultural exchanges, are key highlights of the project. Digital Gandhara creates an immersive online space where anyone—from researchers to curious visitors—can virtually explore these places.

Our project begins first with an introductory video of Xuanzang and his journey up until he reaches the Gandhara region, and then features an interactive experience with videos and digital reconstructions of our three featured sites: Bamiyan, Hadda, and Taxila.

INSTALLATION VISUALIZATION:

DIGITAL GHANDARA



02. HADDA

Hadda, located about 12 kilometers south of Jalalabad in present-day Afghanistan, was a major Buddhist religious and artistic center within the ancient kingdom of Nagarahara. Its proximity to the Indian subcontinent, the Kapisa River, and the Spinghar Range made it a key pilgrimage site and a vital nexus of cultural exchange among Central Asia, South Asia, and the Hellenistic world. During the 7th-century pilgrimage of the Chinese monk Xuanzang, Hadda was renowned for housing sacred relics, believed to include a fragment of the Buddha's skull, his robe, and walking stick. These relics attracted a steady flow of pilgrims, and viewing them required payment. Along with donations and offerings, these fees played a central role in the city's economy.

Hadda's status also benefited from royal patronage, particularly from Emperor Ashoka of the Mauryan Empire, whose promotion of Buddhism brought legitimacy and resources. Architecturally, Hadda is notable for its abundance of stupas, initially constructed in schist and later limestone, often blending Buddhist and Greco-Roman elements.



Tape-Tope-Kalan, west of modern-day Hadda village, once held the Great Stupa and seven chapels surrounding a courtyard. Each chapel contained a clay Buddha statue over five meters tall, and stucco reliefs in Greco-Buddhist style illustrated scenes from the Buddha's life.

Bagh-Gai, to the east, included a fortified stupa courtyard, a monastery, and cliffside caves. Notable are statues depicting the Buddha with figures in Greco-Roman garb, emphasizing Hadda's hybrid aesthetic.

Gar-Nao, perched on a valley edge, featured an elongated stupa enclosure, interconnected grottoes, and a monastery. One stupa wall still displays a line of Buddhas, each with a different hand gesture.

Chakhil-i-Ghoundi, set on a rocky plain, contains an elevated central stupa surrounded by chapels and rooms. Artifacts found here include carved friezes of musicians, dancers, and ritual offerings—demonstrating the city's artistic richness and spiritual depth.



01. BAMİYAN

The Bamiyan Valley in central Afghanistan, once a flourishing cultural crossroads along the Silk Road, was home to a monumental Buddhist sanctuary shaped by Indian, Persian, and Central Asian influences. In the 7th century, the Chinese monk Xuanzang visited the site and described its awe-inspiring landscape: two colossal standing Buddhas carved directly into the sandstone cliffs, flanked by a dense network of caves used for worship, meditation, and monastic life.

These caves, over 750 in total, were carved into the rock at multiple levels, forming a vertical monastery woven into the valley walls. Many served as cells or chapels, with domed ceilings and painted surfaces that once depicted Buddhas, bodhisattvas, and celestial motifs. Though time and destruction have erased much of their detail, surviving traces of frescoes and architectural forms reveal a rich visual culture rooted in Gandharan and Greco-Buddhist traditions. The upper-eastern caves around the smaller Buddha niche, in particular, appear to have concentrated ritual or residential use, reflecting a well-organized religious community.

Beyond the central cliff and its statues, the Bamiyan Valley also includes a wider constellation of sacred sites, fortresses, and archaeological remains, each reflecting the valley's role as a spiritual and strategic center. Xuanzang's records, corroborated by later exploration, point to an interconnected sacred landscape where art, devotion, and daily life coexisted. Even in ruins, the Bamiyan caves and cliffside sanctuaries testify to a once luminous Buddhist world carved into the Afghan mountains; a world of devotion, craftsmanship, and cultural exchange that still resonates today.



BAMYAN (RIGHT)

After leaving Balkh, Xuanzang continued crossing the Hindu Kush region until he arrived at Bamiyan. He describes Bamiyan as a small kingdom that contained rich Buddhist culture and a devout Buddhist population. He especially notes that the people of this region are honest and simple people. Most notably, Xuanzang is impressed with the archaeological findings in this region, specifically two colossal Buddha statues that are carved into the cliffside. There was a larger statue over 140 feet high, and a slightly smaller one around 120 feet high. These statues depicted standing Buddhas painted in golden paint and beautifully decorated with jewels. In addition, there were many monastic caves carved into the cliffs as well, which also impressed Xuanzang.



BAGRAM (RIGHT)

After Bamiyan, Xuanzang travels to Bagram, which was anciently known as Kapisa. Xuanzang's time in Kapisa starts off well, with the King being a devout Buddhist and welcoming Xuanzang, even engaging him in philosophical discussions. Xuanzang also manages to build on his own knowledge of Buddhism as he visits monasteries and meets with Hinayana and Mahayana monks. However, one jealous monk was angry at Xuanzang's popularity and influence, and gave Xuanzang a poisoned cup of milk. However, Xuanzang becomes aware of the danger and chants a legendary spell to protect the milk and then drinks the milk and remains unharmed. This story became a legend of the divine nature of Xuanzang and his spiritual protection. Xuanzang's arrival in Bagram also marks a geographical milestone as he enters the Indian Buddhist heartland and collects rich knowledge of Buddhism.





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BIBLIOGRAPHY

Barthoux, Jules. The Hadda Excavations. Vols. 2,3. SDI Publications, 1933.

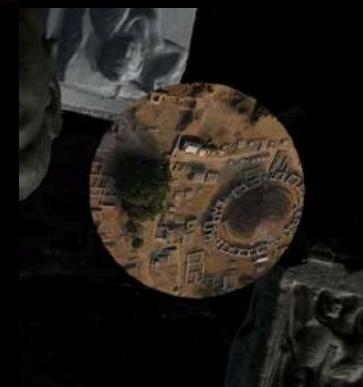
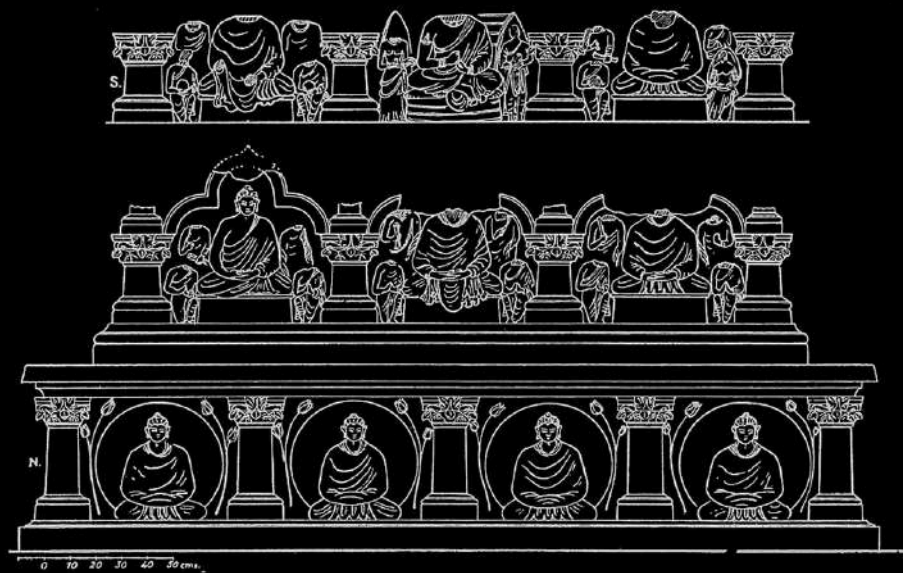
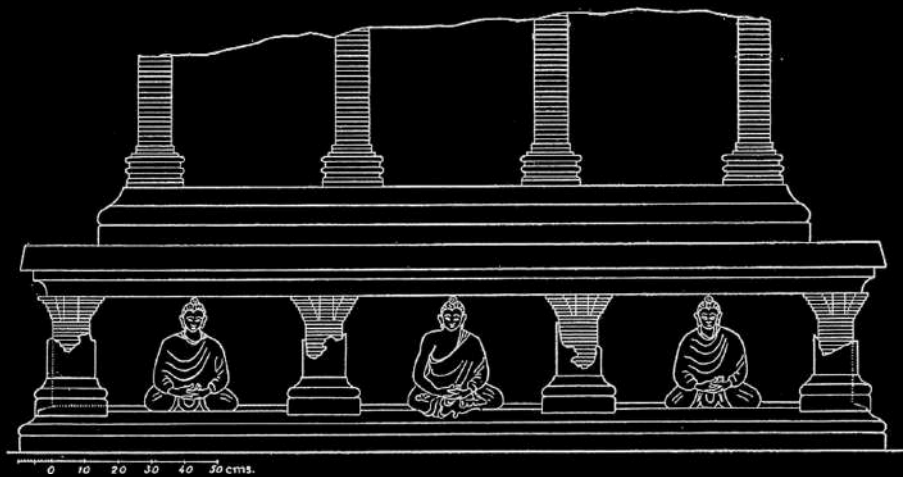
Dhammachai International Research Institute. DIRI Journal Volume 2. Dhammachai International Research Institute, 2013.

Klimburg-Salter, Deborah. The Kingdom of Bamiyan: Buddhist Art and Culture of the Hindu Kush. Naples, Rome: Istituto Universitario Orientale Dipartimento di Studi Asiatici and Istituto Italiano per il Medio ed Estremo Oriente, 1989.

Li, Rongxi. A Biography of the Tripitaka Master of the Great Ci'en Monastery of the Great Tang Dynasty. Numata Center for Buddhist Translation and Research, 1995.

Marshall, John. A Guide to Taxila. Superintendent Government Printing, India, 1918.

Petzet, M., Prof. Dr. Mission to Bamiyan, Afghanistan. ICOMOS Germany, 2004.



PRELUDE



Prior to reaching the sites featured in this exhibition, which lay in the Gandhara region or present-day northwestern Pakistan, Xuanzang's journey had begun long before, as he had been travelling across Asia for years. His travels prior to reaching Gandhara are vital as they built his experiences and knowledge of Buddhism while also establishing him as a prominent monk and setting up a strong foundation for his arrival in Gandhara.

The introductory video displayed on the wall represents Xuanzang's travels through different regions until he eventually comes across Hadda, one of the sites featured in today's exhibition. The video begins with Xuanzang's departure in 629 CE from Chang'an, the capital of China during the Tang dynasty, and follows him throughout East and Central Asia. Each site features a geographical milestone in his journey, while also containing important legends associated with that region.

XUANZANG'S JOURNEY TO THE WEST



Xuanzang (602–664 CE) was a 7th-century Chinese Buddhist monk, scholar, traveler, and translator whose contributions profoundly shaped the course of East Asian Buddhism. Born Chen Hui (later Chen Yi) near Luoyang during the Sui dynasty, he was ordained at age 13 and received full monastic ordination in Chengdu amid political chaos. At twenty-seven, defying Tang dynasty restrictions, he embarked on an epic 17-year overland pilgrimage to India, traversing the Silk Road and studying at India's renowned Nalanda University under the venerable Śīlabhadra.

Xuanzang returned to Chang'an in 645 with approximately 657 Sanskrit Buddhist texts. Backed by Emperor Taizong, he established a major translation bureau and produced meticulous Chinese renditions of foundational Mahāyāna scriptures—totaling some 1,330 fascicles—and authored the *Records of the Western Regions*, a seminal travelogue on Central Asia and India. As the principal founder of the East Asian Yogācāra (Consciousness-Only) school, he compiled the influential *Cheng Weishi Lun* and mentored disciples who cemented his doctrinal legacy.

HAMI/YIWU (LEFT)

After crossing the Anxi desert, Xuanzang reaches Hami, a kingdom ruled by a local Hu king. He stays at a monastery in Hami where 3 other monks of Hu descent lived, who were all very overwhelmed with joy at Xuanzang's arrival as they are happy to see another fellow Chinese and even weep at his arrival. The king of Hami welcomes Xuanzang kindly, offering him supplies and refuge. During his stay in Hami, a royal envoy from King Qu Wentai of Gaochang (present day Tulufan junction) arrives, and asks the king of Yiwu to release Xuanzang to travel west to his kingdom. The envoy even includes horses, camels, and other resources to ensure Xuanzang's safe travel to the Tulufan junction.



GAOCHANG (RIGHT)

After leaving Hami through the help of King Qu Wentai's envoy, Xuanzang reaches the tulufan junction, previously known as Gaocheng. Upon his arrival, the king and queen as well as others paid their respects to Xuanzang. The king Qu Wentai was so moved by Xuanzang's teachings that he tried to persuade him to stay as a monk in the Tulufan junction and give up his westward journey, but Xuanzang refused. This upset the king, and he continued to try and bribe Xuanzang with material goods and incentives to stay, but Xuanzang still declined. Then, frustrated, Qu Wentai began to hold Xuanzang against his will, saying he had to either stay or he would send him back to his home country. After the fourth day of detaining Xuanzang, the king began to feel ashamed and let him go. To help with Xuanzang's journey, Qu Wentai gave him many departing gifts, including thirty suits of religious garments, warm clothing, one hundred taels of gold, thirty thousand silver coins, five hundred rolls of silk and satin, and even 30 horses and 25 attendants. Most notably, the King also wrote to various kingdoms declaring letters of passage to ensure Xuanzang could travel through them safely.

AGNI (RIGHT)

After leaving the Tulufan junction, Xuanzang reaches the small kingdom of Agni, or present day Yanqi Hui. The king of Agni welcomed Xuanzang with warmth and respect. The people of Agni also respected Xuanzang, as they were followers of Buddhism and provided Xuanzang with resources and protection along his journey. Xuanzang stayed in Agni for several days as he prepared to embark upon more treacherous terrain. Agni marked a turning point in his journey as it was one of the few peaceful and supportive stops where Xuanzang received moral and spiritual validation.



KUQA (LEFT)

After Xuanzang leaves Yanqi Hui, he reaches Kuqa. Kuqa was a large center of Buddhism, as it was a large kingdom with many monasteries and thousands of monks. The people of Kuqa welcomed Xuanzang with respect and pride, as they admired his devotion and provided him with supplies and interpreters. Xuanzang stayed in Kuqa for a considerable amount of time to study Sanskrit Buddhist scriptures, exchange teachings with local monks, and observe the blend of Indian, Central Asian, and Chinese Buddhist practices. Xuanzang notes that most people in Kuqa predominantly follow Hinayana teachings, but also preserve important Sanskrit texts. He also notes that while he learned a lot during his stay in Kuqa, the doctrines were incomplete, and that he needed to continue traveling Westward to reach true Dharma.



ASKU (RIGHT)

After leaving Kuqa, Xuanzang reaches Asku, where he stays for several months. He was welcomed very warmly in Asku, most notably by the King, who was delighted to welcome Xuanzang due to his reputation. The king provided him with food and supplies, along with an escort of twenty five soldiers to help him on his dangerous travels westward. Similar to his experience in Kuqa, although Asku consisted of supportive locals who were devout buddhists, many of the doctrines in this region were not complete, further motivating Xuanzang to continue westward to find Dharma.



GEOGRAPHICAL MILESTONES

CHANG'AN (LEFT)

At the outset of Xuanzang's journey, the fall of the Sui dynasty and the ensuing sociopolitical upheaval in China prompted the dispersal of Buddhist communities. Amidst this turmoil, Xuanzang and his brother decided to leave their native district for Chang'an, the newly consolidated capital under Tang rule. En route, Xuanzang stopped in Chengdu, where he received full monastic ordination, solidifying his resolve to advance his studies. Despite the state-imposed prohibition on foreign travel, and his brother's opposition, Xuanzang clandestinely departed by navigating the Yangzi River through the Three Gorges. He eventually reached Chang'an via Tianhuang Monastery at Jingzhou, and subsequently Xiangzhou and Zhaozhou. Upon arrival, he petitioned the Tang court for permission to travel westward to seek Buddhist scriptures, but his request was denied. Undeterred, in the eighth month of the third year of Zhenguan (629 CE), Xuanzang embarked on his unauthorized pilgrimage, prompted by a visionary dream, at the age of twenty-six.



LIANGZHOU (RIGHT)

Following his departure from Chang'an, Xuanzang passed through Lanzhou and continued westward with a companion from Liangzhou. Liangzhou, the administrative center of the Hexi Corridor, served as a critical nexus for interactions between China and the western regions. Xuanzang remained in Liangzhou for approximately one month, during which he delivered public lectures on seminal Buddhist texts such as the Mahāparinirvāṇa Sūtra, Mahāyānasamgraha Śāstra, and Mahāprajñāpāramitā Sūtra. His eloquence and erudition earned him widespread acclaim among local merchants, some of whom carried news of him to other western territories. However, the regional governor, Li Daliang, opposed his westward aspirations and ordered his return. In response, the esteemed teacher Huiwei dispatched two disciples, Huilin and Daozheng, to secretly escort Xuanzang out of the city and toward the frontier.

JADE GATE (LEFT)

After escaping Liangzhou, Xuanzang travelled to Guazhou, where he met two men from the Hu tribe. The younger of the Hu men was moved by his teachings and consented to send him across the Yumen pass, which was the main gateway out of China toward the Western Regions, and the five watchtowers that lay shortly after. The older Hu man gave him his horse which had made the journey 15 times before. Xuanzang started the journey with the young Hu man and they reached the Sha river and saw the Yumen pass. However, after they crossed the river, while sleeping, the Hu man slowly advanced towards Xuanzang with a knife, but luckily Xuanzang sensed it and started reciting scriptures to him. Shortly after this, the Hu man soon turned back and retreated but Xuanzang continued on alone. He traveled alone through the desert and saw an army of several hundred bandits scattered all over, which he managed to fight off by himself. Then, after travelling more than 80 li he finally saw the first watchtower. After crossing the first 4 watchtowers by making friends with the captains, most notably Wang Xiang, the guards at the fourth watchtower advised him to head to the An'xi desert where he could replenish his water at the 'Wild Horse Spring' and avoid the fifth watchtower which had stricter guards.



ANXI DESERT (RIGHT)

To reach the Wild Horse Spring, Xuanzang had to cross the Anxi Desert, which stretched more than eight hundred li and contained many evil spirits in the desert. He travelled more than a hundred li through the desert but was lost and could not find Wild Horse Spring. Then, when taking a sip out of his water jug, he accidentally spilled all of the water that was supposed to last him his whole journey. He had no water for four nights and five days, and was very weak. While riding his horse aimlessly, his horse suddenly changed directions and led him to a pasture and a pond of water. This is known as the red horse prophecy because although it is never explicitly stated that Xuanzang's horse was red, there is a legend present in Buddhism that a monk riding a red horse would bring back the true teachings of the Buddha from India to China, and Xuanzang's horse helped him do so.



Digital Gandhara Journey to the West

Digital Gandhara aims to preserve fast-disappearing Buddhist art and architecture by combining a global research effort with cutting-edge digital technologies.

Supported by archeologists and scholars in Afghanistan and Pakistan—as well as collaborators from around the world—the project digitally documents and reconstructs the major archaeological sites in the Greater Gandhara region. Through 3D scanning, digital modeling, data visualization, machine learning, multimedia storytelling, this project creates an immersive online environment that allows scholars and the general public to virtually experience the Buddhist sites of Gandhara. Digital Gandhara joins efforts to raise global awareness of Afghanistan's and Pakistan's cultural heritage and as a foundation for the long-term preservation and restoration of art and culture.

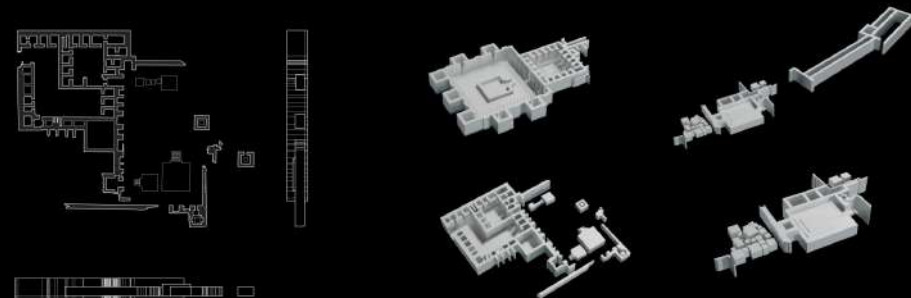


Taxila | Dharmarajika Stupa

The Dharmarajika Stupa is located in the western part of the Taxila valley, near the head of the Ravi that flows toward the Indus ridge. It lies southwest of the ancient city of Taxila, about 1.3 kilometers away.



INSTALLATION EXPERIENCE



03. TAXILA



Nestled in a valley northeast of Rawalpindi, ancient Taxila thrived at the crossroads of geography, trade, and faith. Protected by the Lora Hazara mountains, Murree ridge, and Margalla Hills, and nourished by the Haro River, its fertile terrain supported agriculture and dense settlements. Strategically located on a major trade route linking the Indian subcontinent to Central and Western Asia, Taxila became a vibrant center of learning and spiritual life.

One of its most sacred sites is the Dharmarajika Stupa, believed to have been founded by Emperor Ashoka in the 3rd century BCE. The now-ruined central stupa was once surrounded by smaller stupas and chapels adorned with carved niches, trefoil arches, and Hellenistic-style columns. A relic deposit discovered in Chapel G8—including nested containers of steatite, silver, and gold, and a scroll dated to 78 CE—was enshrined by a donor from Balkh in honor of the Buddha and the Kushan king.



Northeast of Dharmarajika stands Jaulian, a 2nd-century monastic complex perched on a forested hill. Its intricately decorated stupa includes the “Healing Buddha,” whose navel was touched by pilgrims seeking cures. The adjacent monastery housed 56 cells across two floors and revealed artifacts such as coins, manuscripts, and a jeweled miniature stupa.



TOKMOK (LEFT)

After making the long journey through the Ice mountains, or Tian Shan, Xuanzang finally reaches Tokmok. In Tokmok, he visited Suyab, which he describes as a vibrant trading city rich with a mix of different cultures. Most notably, he meets a powerful Turkic ruler, Tong Yabghu Qaghan, during a retreat in that area, who gives him support and protection while in Tokmok. Although the area was very culturally diverse and therefore did not give Xuanzang much knowledge on Buddhism, he still learned a lot about different cultures and Turkic traditions.



TASHKENT (RIGHT)

Tashkent, formerly known as Chach, is described by Xuanzang as a densely populated area with many small city states within it. These city-states operated independently, but all recognized the political authority of the Western Turkic Khaganate. Even though Tashkent was known for being a hub of trade and having a vibrant economy, Xuanzang marvels at how there is no presence of Buddhism in the region, with there being a lack of any monasteries or temples, highlighting the lack of Buddhism along this region of the Silk Road.

SAMARKLAND (RIGHT)

Samarkand, also anciently referred to as Kang, impressed Xuanzang due to the regions' immense wealth and prosperity, as he labeled it as one of the most significant and culturally influential cities in Central Asia. Samarkand had a flourishing market due to their agricultural production and skilled craftsmen, making it a center of trade and cultural exchange. Similar to previous regions he visited, Buddhist influence in Samarkand was limited, and Xuanzang even encountered firsthand hostility by locals when he visited an abandoned Buddhist shrine. However, his attempts to spare fellow Buddhist followers from hostility and punishment impressed the king, who therefore allowed Xuanzang to publicly preach Buddhism. Xuanzang's preaching led to many locals in this region becoming interested in Buddhism, allowing Buddhism to grow in this area, and allowing Xuanzang to leave a lasting legacy and influence on Samarkand.



TERMEZ (RIGHT)

In contrast to the regions he had previously visited, Xuanzang was pleasantly surprised from his arrival in Termez, which was a region that was deeply rooted in Buddhism. Located along the Oxus river, Termez consisted of many monasteries with Xuanzang recording seeing over 10 monasteries which lay home to around a thousand monks. He notes that many of these monks practiced the Hinayana tradition, specifically the Sarvāstivāda school. He also notes that these monasteries contained many important relics and Buddha images that were widely venerated. Termez marked the first region in a while that Xuanzang was given the opportunity to learn Buddhist texts, doctrines, and practices before reaching Gandhara, as many of the other regions he visited contained incomplete or a lack of Buddhist doctrines.



KUNDUZ (LEFT, TOP)

Xuanzang stayed in Kunduz, which is in present day northeastern Afghanistan, for a relatively long time during his journey, about half of a year. This is because during his stay there, the local king died, causing political instability in Kunduz, delaying Xuanzang's journey. During his extended time in Kunduz, Xuanzang used this time to continue teaching and as a result grew in fame as many Buddhist monks and common folks came to visit him. After his extended stay, Xuanzang eventually continues westward, crossing the Hindu Kush mountains and Kapisa to reach Balkh.

BALKH (LEFT, BOTTOM)

The people and ruler of Balkh welcomed Xuanzang with great spirit. Xuanzang was also able to study the local Buddhist practices and exchange ideas with monks and scholars in that region, while also getting to rest before continuing onward with his journey. In addition, Xuanzang also reported seeing a relic of the Buddha's skull bone in this region. During his time in Balkh, Xuanzang was also heavily motivated by a powerful dream he had. During his dream, he dreamt of a divine being who assured him that this mission would succeed and he would be protected. This dream gave him the reassurance and power he needed to continue onto more remote and isolated territories.

Alchemy of Colors

Mineral Pigments in
Mawangdui Tombs

Summer Exploration



Scientific Rediscovery and Preservation

Thanks to modern techniques like XRF mapping, researchers can:

- Reconstruct lost pigment schemes
- Authenticate techniques and materials
- Trace pigment sources such as Chenzhou cinnabar and Hubei copper mines
- Understand chemical degradation and restoration needs

This integration of material science and cultural analysis affirms color's enduring power as both artifact and idea.

The Eternal Spectrum

Mineral pigments in the Mawangdui tombs are not simply remnants of ancient decoration—they are the visual scaffolding of a worldview. Serving ritual, cosmological, medical, and alchemical functions, these colors activated a space of spiritual transit. Preserved through millennia, they continue to speak—of transformation, immortality, and the brilliance of a culture that painted with the energies of the cosmos itself.

Muscovite



Potassium Aluminum Silicate Hydroxide
Fluoride

Muscovite is a silvery to grey mica mineral known for its sheet-like structure and elasticity, resulting from perfect basal cleavage. Non-toxic in solid form, it can irritate the lungs when inhaled as fine dust.

In Chinese alchemy, muscovite was employed to stabilize mercury and modulate its transformation in elixir preparation, thus playing a crucial role in the formulation of longevity substances. While some deposits existed in Xinjiang, Sichuan, and Inner Mongolia, muscovite was often imported.



Quartz



Silicon Dioxide

Quartz is a ubiquitous silicate mineral appearing in a range of colors and forms, including amethyst, citrine, and agate. In Chinese alchemy, quartz was incorporated into compounds like the Empyrean-Roaming Elixir and the Jade Fountain eye remedy, where it symbolized transformation and purification.

Despite its potential toxicity, it was sometimes ingested; historical accounts, such as those by Sun Simiao, report adverse effects like severe headaches, which were countered with antidotes such as "purple snow."





Special Thanks

Hunan Museum
Harvard Art Museum
Harvard Natural History Museum

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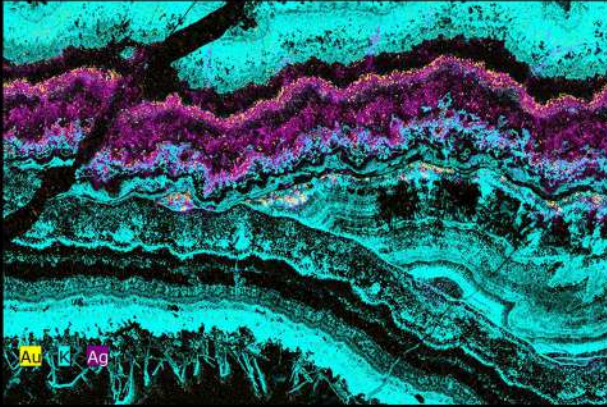


Introduction

A Visual Language of Immortality

In the tombs of Mawangdui, pigment is not mere embellishment—it is language, ritual, and transformation. Painted onto silk banners, lacquered coffins, and cosmological manuscripts, mineral colors served as agents of alchemical change and symbolic navigation. This brochure explores how pigments were deployed in early Chinese funerary art to structure space, encode cosmic knowledge, and guide the soul beyond death.





Seeing the Invisible: XRF Mapping and Material Revelation

X-ray fluorescence (XRF) mapping is a non-destructive scientific method that identifies and maps the elemental composition of materials. By scanning a surface with a finely focused X-ray beam, atoms emit fluorescent X-rays that are unique to each element. These emissions are recorded and used to construct color-coded spatial maps, revealing where specific elements are concentrated.

At Mawangdui, XRF mapping allows researchers to look beneath the surface of painted textiles and lacquered coffins, uncovering hidden layers, pigment composition, and deterioration patterns invisible to the naked eye. This technique not only helps authenticate and preserve artifacts but also reconstructs the original color schemes and artistic techniques of the Han dynasty.

Advanced applications include 3D tomography, where multiple XRF scans are combined to render layered images. These reconstructions offer new insight into the craftsmanship, materials, and ritual use of pigments in early Chinese funerary art.



Cosmology in Color:

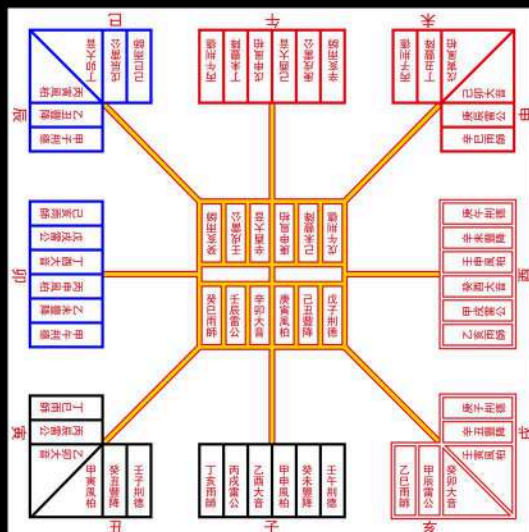
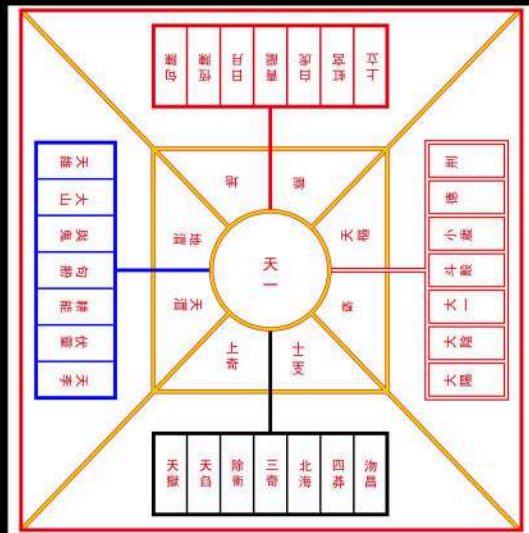
The Five Phases and the Painted World

In early Chinese cosmology, color functioned as a symbolic and energetic language that structured the universe. Based on the theory of correlative cosmology, the world was understood as a system of interconnected forces, where every element - planet, season, organ, direction, and deity - corresponded to a particular color.

Each hue expressed a specific form of qi, the vital energy that powered cosmic transformation. Red represented fire, summer, vitality, and expansion, qualities linked to the heart and the south. Black stood for winter, water, concealment, and the kidneys. Blue-green evoked the energy of spring and birth, tied to wood and the east. White was associated with autumn, metal, and purity, and yellow symbolized centrality, balance, and the Earth itself.

These associations governed not just artistic design but ritual, medicine, governance, and burial. The Chinese emperor wore yellow to signify his central role in the universe. Burial chambers like those at Mawangdui were arranged and painted according to these color-directions, aligning the soul of the deceased with cosmic harmony.

Manuscripts from Mawangdui show how color helped visualize the movements of deities and cosmic forces. One diagram tracked three spirits - Taiyin (Great Yin), Xing (Punishment), and De (Virtue) - through a 60-year cycle using pigments like red, blue, black, and white. These color choices were not aesthetic; they were cosmological instructions for life, death, and spiritual navigation.



Cosmic Diagrams
from Mawangdui Manuscript



Pigments and Their Symbolic Function

At the heart of Mawangdui Tomb 1 lies a remarkable T-shaped silk banner painted with mineral pigments. Far more than decoration, these colors formed a ritual and cosmological map, guiding the deceased through the afterlife. Applied with technical mastery to textiles and lacquered coffins, pigments like cinnabar (red), malachite (green), and azurite (blue) carried deep symbolic meaning:

- Cinnabar signaled yang energy, blood, and resurrection, often coating red coffins.

- Azurite and malachite conveyed renewal, springtime, and cosmic breath.

- Pigments enacted yin-yang dualities, such as red serpents and blue fish - symbolizing fertility and cosmic regeneration.

These colors were functional metaphysical tools. Painted scenes depicted medical procedures like cauterization through fantastical creatures, showing how art, medicine, and myth were intertwined.

The color scheme of black exteriors to red interiors of the Mawangdui coffins mirrored the journey from death to rebirth. Preserved for over two millennia, these pigment-rich surfaces stand as enduring witnesses to Han China's visual language of immortality.

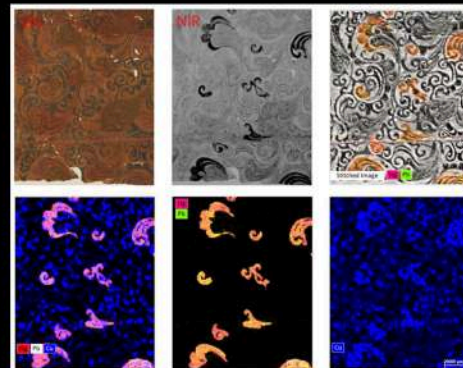


Pigments on Silk: Weaving Auspicious Energies into Cloth

Beyond lacquer and manuscript, mineral pigments were masterfully applied to textiles—most notably silk—to imbue garments and wrappings with auspicious power. In Han cosmology, textiles served as both material covering and ritual medium.

Colors applied to silk were not only decorative embellishments but carriers of energetic resonance. When cinnabar was painted onto funerary garments, it activated yang forces believed to protect and elevate the soul. Green and blue pigments—derived from malachite and azurite—evoked vitality, breath, and spring renewal, aligning the textile with celestial rhythms and rebirth.

These dyed and painted silks became tactile diagrams of cosmological harmony, enfolding the deceased in a matrix of protective color. As part of funerary assemblages, pigment-colored textiles bridged earthly substance and heavenly influence, ensuring that the body's final veiling mirrored the cosmic order it was destined to rejoin.





Cinnabar

HgS

Mercury Sulphide

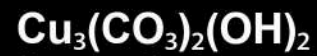
Cinnabar, a vivid scarlet to brick-red mineral with a quartz-like symmetry, is composed of mercury sulphide and possesses one of the highest refractive indices among minerals. Mined since the Neolithic period, it was highly prized both as a pigment and a source of quicksilver.

Central to Daoist alchemical practices, cinnabar was a key ingredient in elixirs of immortality such as the Three Envoys Elixir and Seven-Cycle Cinnabar, believed to harness transformative properties of mercury for life extension. Despite its sacred status, ancient sources acknowledged its toxicity; chronic exposure could result in mercury poisoning. Repeated sublimation was employed in an attempt to purify the substance. Major historical sources included Guizhou and Hunan.





Azurite

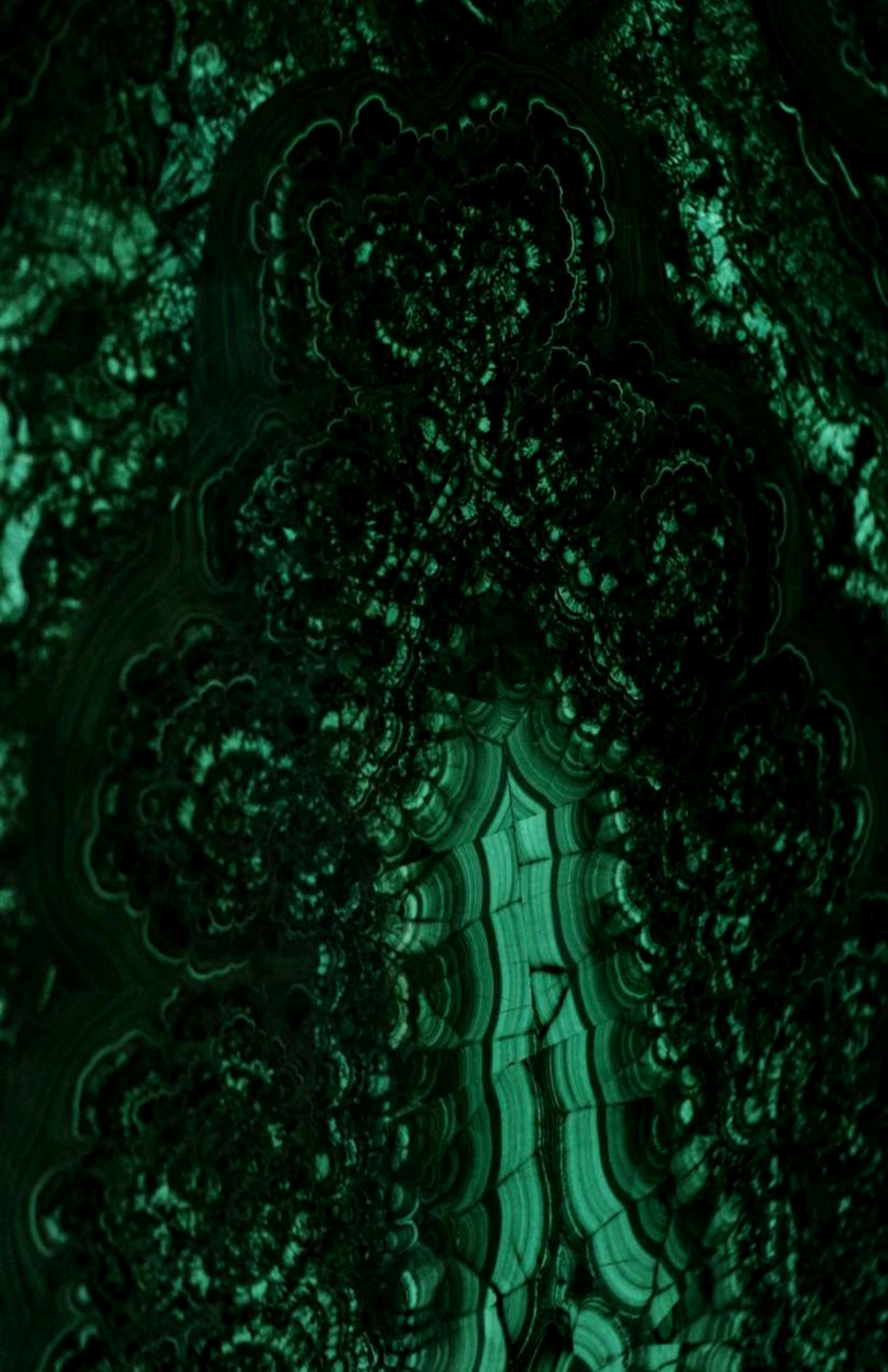


Copper Carbonate Hydroxide

Azurite is a deep blue copper-based carbonate mineral that occurs in prismatic crystals and nodular formations. Chemically unstable in air, it often converts to malachite over time. Although relatively safe in solid form, the powdered mineral can release bioavailable copper and must be handled with care due to its moderate toxicity.

In antiquity, azurite was not always clearly distinguished from malachite or verdigris, and the terms may have been used interchangeably. It was primarily sourced from the Tonglushan copper mines in Hubei.





Malachite



Copper Carbonate Hydroxide

Malachite is a green copper mineral with nodular and laminar textures, valued for both its pigment and medicinal properties. Its toxicity arises from soluble copper compounds; thus, grinding and ingestion were discouraged.

In Daoist alchemical recipes such as the Empyrean-Roaming Elixir and Grand Unity Jade Powder Elixir, malachite played a vital role, and its laminar form was preferred for superior purity and efficacy. It was also used to seal alchemical vessels, as in the Six-One Lute. The primary historical source was the Tonglushan mine in Hubei.

