From Absolute to Relative: The Indigenous Aesthetic Mechanism of Symmetrical Composition in Dunhuang Murals

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Abstract: The symmetrical composition of Dunhuang murals, when first introduced to China, bore distinct characteristics of a rigid geometric symmetry paradigm, and was imbued with a strong sense of ritualistic formality and sacred symbolism.After its introduction into China, however, this formal system underwent a process of localization, gradually evolving into a visual structure that combined axial stability with local flexibility. This study introduces the concept of the "*elastic symmetry mechanism*" as a new analytical term, intended to describe a structural logic that reconciles balance with adaptability. It examines the transformation of Dunhuang murals from absolute to relative symmetry, focusing on adaptive adjustments in compositional layout, chromatic distribution, and ornamental rhythm, while uncovering the deeper cultural concepts and artisanal practices that sustained this shift. The study argues that this structural evolution was not only a process of Sinicization in visual language but also provides valuable formal resources and theoretical references for contemporary pattern design and visual expression.

Keywords: Dunhuang murals; symmetrical composition; elastic symmetry mechanism; localization; visual structure; image design

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Introduction: From Geometric Symmetry to Structural Elasticity—The Localization Path of Dunhuang Mural Composition

As vital witnesses to the transmission and localization of Buddhist imagery, the murals of the Mogao Caves in Dunhuang are particularly notable for the evolution of their compositional system. In terms of visual structure, these murals are organized around a central axis, producing relatively stable and orderly pictorial arrangements. This compositional method, derived from Indian Buddhist art, embodies distinct geometric features and religious symbolism, representing a visualized expression of "cosmic order."

In the Chinese context, however, this mode of "absolute symmetry" did not persist unchanged. Especially from the Early to High Tang period, symmetrical structures in the murals began to show signs of relaxation: human postures assumed greater naturalism, ornamental patterns displayed increased freedom, and color organization presented gradients and permeation effects. Symmetry ceased to function as a strict mirror replication and instead developed into a form of "adjustable order," more attuned to indigenous aesthetic preferences and cultural frameworks.

This article therefore proposes the theoretical concept of the "elastic symmetry mechanism" to describe a structural language in Dunhuang murals that preserves axial stability while allowing local deviations. This mechanism reflects the cultural transformation from "geometric rationality" to "visual harmony," representing one of the most visually expressive stages in the Sinicization of Buddhist imagery. Through comparative structural analysis and close image reading, and in light of relevant cultural contexts, this study traces the formation of this aesthetic mechanism in composition, color, and ornament, while also exploring its potential implications for contemporary visual design.

1.Paradigmatic Transplantation: The Formative Influence of Indian Symmetrical Composition on Early Dunhuang Murals

The compositional paradigm of Dunhuang murals was not an indigenous invention, but rather a direct inheritance from the artistic tradition of Indian Buddhism. Its core characteristic lay in constructing pictorial structures through absolute symmetry, emphasizing geometric logic and axial order. Within the visual system of Indian Buddhism, symmetry functioned not merely as a formal device but as a symbolic means of expressing a

cosmological vision—projecting images of the sacred, the solemn, and the orderly.

The Ajanta Caves of India provide a representative example, where murals and architectural decoration extensively employed mandala-style central compositions, with imagery unfolding symmetrically around a geometric center. Scholars have noted that the central layouts in Ajanta may embody the symbolic structure of Mount Meru as the cosmic axis. In their analyses, such compositional modes are understood as visual re-creations of the Buddhist cosmology of Mount Meru, where geometric precision reflects the cosmic order in visual terms. Other researchers have emphasized that early Indian Buddhist imagery pursued mirror-like consistency across modeling, bodily gestures, drapery, and mudras, thereby producing a synthesis of "religious symmetry" and "formal standardization."

This symmetrical paradigm was transplanted almost mechanically into early Chinese Buddhist mural production. The murals of the Mogao Caves during the Northern Liang and Northern Wei periods strongly exhibit this feature of "paradigmatic transplantation." For instance, visual observation of Cave 275 suggests that the central icon demonstrates a symmetrical, geometric mirror structure. On the west wall, the Buddha at the altar occupies the center, flanked by attendants positioned in strict bilateral correspondence: gestures and gazes align with precision, while costumes and decorative patterns also conform to symmetrical arrangements. Scholars discussing the inheritance and reconstruction of Buddhist canonical images in early Dunhuang murals point out that at this stage, compositions had not yet undergone active local adaptation; rather, they aimed at faithfully reproducing the "orthodoxy" of Buddhist images. Consequently, the compositional methods were mechanical and stable, marked by a pronounced formulaic tendency.

Similarly, the Defeat of Mara mural in Cave 254 shows bodhisattvas and guardians arrayed bilaterally at the lower register, their figures distributed with military-like regularity and balance. Visually, the contrast between this orderly symmetry and the chaos of demonic figures accentuates the symbolic power of the Dharma and produces an enclosed, ritualized pictorial space. In this sense, the Dunhuang murals of this period may be seen less as products of autonomous visual creativity than as enactments of iconographic conventions.

The logic of symmetry extended beyond figural compositions to ornamental details, such as patterning and ceiling decorations. Motifs such as lotuses, scrolling acanthus, and baoxianghua flowers were arranged in two-directional repeats, strictly aligned along axes to reinforce an overall sense of order. This aesthetic of composition clearly reflects the influence of mandala cosmology and the visual logic of Indian religious imagery, rather than the naturalistic narration or spatial arrangements characteristic of traditional Chinese painting.

In sum, the symmetrical composition of early Dunhuang murals may be understood as a paradigmatic extension of "ritual visualization." Its significance lay not only in aesthetic display but also in maintaining doctrinal correctness and sacred authority. As a result, compositional standards during this stage were highly unified, with minimal variation. Yet it was precisely this formulaic structure that provided the foundation for later developments of localization: as cultural contexts shifted and aesthetic ideals evolved, the rigid paradigm of "absolute symmetry" gradually gave way to more elastic and harmonized visual orders.

2.Indigenous Transformation: The Generative Logic of the Elastic Symmetry Mechanism

As Buddhism gradually penetrated Chinese society, the compositional style of Dunhuang murals underwent a structural shift—from the mere "replication of foreign paradigms" to an "active aesthetic adaptation." Particularly during the Early and High Tang periods, symmetrical structures in the murals began to break away from the constraints of "geometric rationality," developing into a compositional tendency that balanced order with flexibility. This study conceptualizes this process as the emergence of the elastic symmetry mechanism, a new analytical term introduced to describe a structural logic that reconciles stability with adaptability. At its core, this mechanism represents the organic adjustment of an imported structural model within the visual system, constituting an active Chinese aesthetic response to foreign formal patterns.

The formation of this mechanism was not an isolated phenomenon, but rather the product of multiple interacting factors: the evolution of pictorial language, cultural psychology, spatial experience, and artisanal practice. This section analyzes its concrete manifestations on three levels: structural elasticity, chromatic transition, and ornamental dynamization.

2.1 Structural Elasticity: The Coexistence of Axial Stability and Local Deviation

While Dunhuang murals retained the central axial principle of Indian Buddhist imagery, they gradually introduced asymmetrical elements into local compositional arrangements, thus producing more layered and narratively dynamic visual systems.

For example, in the mural of the Amitāyurdhyāna-sūtra Transformation in Cave 172, Amitābha occupies the center, while the attendant bodhisattvas, though positioned bilaterally, exhibit subtle differences in posture, expression, and drapery: one bows slightly, while the other adopts a guiding gesture, with hand positions and textile folds deliberately staggered. This "quasi-symmetry" is no longer a mechanical mirror replication but rather an identity-oriented arrangement, where order is maintained through difference and depth is achieved through asymmetry.

Similarly, in the Water-Moon Guanyin of Yulin Cave 2, the principal figure is deliberately shifted off the central axis, while the surrounding landscape elements are arranged not as perfect reflections but as visually balanced adjustments. This deviation, though breaking strict geometric symmetry, does not undermine overall stability; instead, it enhances the sense of "breathing space" within the image. Such treatment reflects a Chinese spatial sensibility of "motion within stillness," privileging relational balance over strict proportional division.

2.2 Chromatic Transition: From Bilateral Blocks to Rhythmic Gradation

The elasticity of symmetry extended beyond line and form into the realm of color. Early murals, following the Indian Buddhist tradition, employed highly saturated mineral pigments (e.g., lapis lazuli, cinnabar) to emphasize sacrality and axial presence. By the High Tang, however, this strategy evolved into softer, gradient-based, and fluid chromatic effects.

For instance, the southern wall landscape in Cave 217 is no longer divided into symmetrical color blocks. Instead, ink outlines combined with layered washes generate tonal transitions from dense to light. The attire of figures increasingly incorporated plant-based pigments, and color zones were rendered with blurred boundaries, creating visual permeation. This technique, drawing on the principles of Chinese landscape painting—such as the transformation between "substance and void"—shifted the role of symmetry from geometric duplication to a coordination strategy embedded in the flow of qi and atmosphere.

2.3 Ornamental Dynamization: Rhythm within Decorative Order

The loosening of symmetry also manifested in mural borders and decorative motifs. In earlier works, motifs such as lotuses, scrolling acanthus, and baoxianghua flowers were organized in tightly regulated "two-directional repeats." By the mid-to-late Tang, however, these motifs began to break their frames, generating rotations, spirals, and directional rhythms that conveyed vitality and motion.

The evolution of flying apsaras (feitian) draperies provides a clear example. In Cave 254, ribbons remain symmetrically mirrored; yet by Cave 220, they curve into "S-shaped" and spiral forms, interweaving and shifting their visual centers. This compositional method of "lines generating momentum" disrupted the static character of traditional symmetrical ornamentation and introduced rhythm and dynamism. As Fang Wen has argued, such linear organization embodies the principle of qiyun shengdong ("spiritual resonance and lifelike motion"), a hallmark of Chinese aesthetics, now expressed in visual structure.

Thus, ornamentation ceased to function as mere repetitive decoration and instead became an active element in shaping pictorial rhythm and spatial organization. Symmetry was no longer a closed system but a modifiable syntax

serving dynamic perceptual and aesthetic balance.

2.4 Cultural and Artisanal Foundations: The Internal Basis of Symmetrical Elasticity

The elastic symmetry mechanism of Dunhuang mural composition was not only a matter of visual adjustment but was also deeply rooted in Chinese cultural concepts of order, nature, and craftsmanship. It may be understood through Confucian aesthetics of "order without uniformity," Daoist notions of "following the natural flow," and the traditional artisanal practice of "variation within order." Together, these cultural logics and craft experiences provided fertile ground for the emergence of this flexible visual structure.

3.The Contemporary Expressive Value of Structural Wisdom

The transformation of Dunhuang mural composition from "absolute symmetry" to "structural elasticity" was not only a process of localization in visual form, but also an embodiment of extendable structural wisdom. This elastic symmetry mechanism breaks through the rigid logic of geometric symmetry, offering rich paradigmatic experiences for the flexible organization of visual order. Its underlying ideas of dynamic balance, relational structure, and cultural adaptability remain highly relevant to contemporary image communication and design practice.

3.1 From Static Order to Adjustable Structures

With the rapid development of modern visual media, image structures face growing demands for adaptability and fluidity. In traditional design language, symmetry has often been regarded as a symbol of stability and solemnity. The concept of the elastic symmetry mechanism, however, provides an alternative perspective: rather than measuring composition by absolute symmetry, it organizes visual order according to principles of adjustable order.

For example, in modern poster, infographic, and UI interface design, layouts frequently employ "axial stability + partial displacement" to guide visual flow and enhance hierarchical relationships. The offset central structures in Dunhuang caisson ceilings, the differentiated arrangement of figures according to identity, and the rhythmic coordination of ornamental motifs all provide historical precedents for this type of structure. This principle of "overall balance within local differences" not only meets the demand for dynamism in modern aesthetics, but also reflects the Eastern visual thinking of "taking the center as the standard, and using change as wisdom."

3.2 Rhythmic Composition and Visual Flow

In Dunhuang murals, the organization of ribbons, motifs, and background patterns does not rely on mechanical repetition but instead generates a flowing composition imbued with rhythm. Such rhythmic visual arrangements not only breathe vitality into the image but also enrich its narrative layering and visual pacing.

This compositional logic finds resonance in many contemporary media designs. In dynamic visual systems—such as web animations, video transitions, and interactive interfaces—rhythm is often achieved through slight displacements and structural staggerings, which significantly enhance perceptual experience. The visual paradigm of Dunhuang murals demonstrates that rhythm need not depend on absolute symmetry; rather, it can be realized through a strategy of correspondence, displacement, and repetition, thereby integrating order with variation. This provides theoretical support for contemporary design in avoiding monotony while maintaining coherence.

3.3 The Theoretical Export Potential of Localized Structural Concepts

Within the context of globalization, the localized expression of visual structural language has become an increasingly important theme in design culture. While Western modern design has excelled in methods such as modularization, grid systems, and formal unity, Eastern visual traditions emphasize harmony and inclusiveness among artistic conception, relational balance, and dynamic tendencies. The elastic symmetry mechanism embodies not a rejection of Western geometric order, but an ability to organically adjust the logic of symmetry on the basis of cultural adaptation.

Thus, this mechanism is not only the historical experience of Dunhuang murals but also a contemporary paradigm of Eastern structural wisdom. It reminds us that visual order can be open, hierarchical, and fluid, rather

than constrained by fixed rules. In fields such as pattern creation, textile design, and interface layout, this mechanism can be transformed into a compositional principle of "axial guidance + rhythmic adjustment + differentiated coordination," thereby achieving an integration of cultural symbolism and functional expression.

4.Conclusion

The compositional forms of Dunhuang murals gradually evolved from the geometric rationality of early Indian Buddhism into a mode of structural elasticity infused with Chinese cultural characteristics, reflecting both the localization and aesthetic adaptation of visual language. By introducing the concept of the elastic symmetry mechanism, this study demonstrates how Dunhuang compositions, while preserving a sense of order, incorporated local variation, rhythmic modulation, and visual tension in order to align with the expressive logic of indigenous culture.

This compositional strategy not only reveals strong adaptability and artistic expressiveness but also offers valuable references for contemporary pattern development and design practice. As a preliminary exploration, the study suggests future directions such as comparative case analyses of caves and applied translation, which may further deepen our understanding and reactivation of the Dunhuang image system in contemporary contexts.

Finally, with regard to symmetry in Dunhuang murals, the paper reflects that describing their Sinicized development merely as a transition from "absolute symmetry" to "relative symmetry" remains insufficiently precise. Further research will be undertaken to arrive at a more accurate conceptualization and comprehensive summary.

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