

## *Space Producing and Time: Spatiotemporal Concepts in Linear and Cavalier Perspectives*

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### **Abstract**

It is known that the linear perspective was a significant invention of the European Renaissance, while the cavalier perspective which reverses the linear perspective vision has been applied in traditional Chinese painting for thousands of years. The divergence of perceiving spatiality between Chinese and European art formed in this age. Concerning the representation of space in images, the process of constructing different perspectives not only represents different spatial perception but also is inextricably linked to the correlation between space and time. The role that the cognition of 'time' and 'space' plays in culture formatting is a significant impetus for shaping different approaches to viewing the space of the world in Renaissance art and Chinese painting. The applications of linear and cavalier perspectives, therefore, appear as the artistic epitomes of the spatiotemporal conceptions in the Eastern and Western cultural contexts, which are affected by cosmology, epistemology, philosophy, religion, etc.

Keywords: Spatiotemporal Concepts, Linear Perspective, Cavalier Perspective, Space Production

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## Introduction

Linear perspective was invented in the European Renaissance for creating and organizing spatiality geometrically in painting and architecture, based on the development of scientific technology, humanism, and rationalism. It makes one's vision converge on the fixed 'vanishing point' and 'distance point' with the aid of a nonary grid for fixing the eye focus and creating a three-dimensional space in painting composition and architectural construction. It is this single-point perspective vision that ushered in a linear and static viewing way.

The 'cavalier perspective', which reverses the foreshortening of linear perspective space and presents space in a two-dimensional planar form by using orthographic projection and panoramic composition, has been applied as a significant compositional format in Chinese painting for thousands of years. A dynamic viewing way is required for creating a continuous and infinite vision. Typically, the application of the cavalier perspective can be found in landscape, architectural, and narrative paintings.

For instance, the convergence of vision on a vanishing point exhibited in Masolino da Panicale's work *The Healing of the Cripple and Raising of Tabitha* (Figure 1) is a perfect exemplification of the linear perspective space. In comparison, in Qiu Ying's handscroll *Along the River During the Qingming Festival* (*Qingming Shanghe Tu*, Figure 2), the space is depicted as a sequence in which all scenes are displayed simultaneously despite different times and positions. Rectangular buildings in this painting are aligned toward the same parallel oblique angle of recession instead of convergent in a foreshortening trend. Thus, during the Renaissance, a striking divergence of notions of spatial perception derived from linear perspective appeared between Chinese and European art.

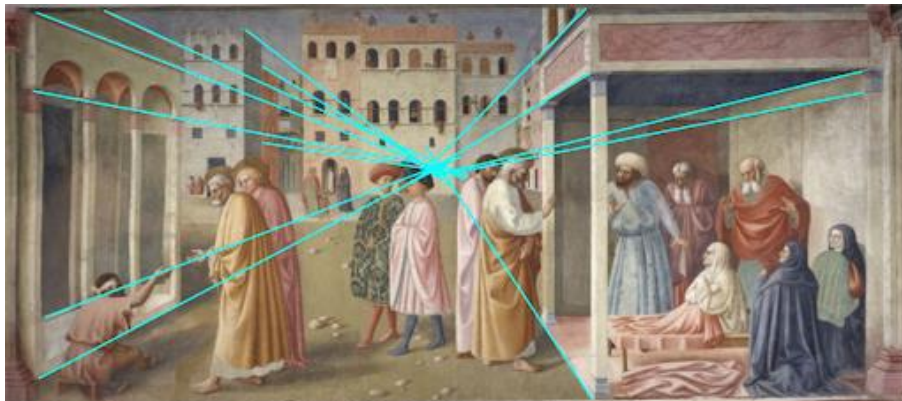


Figure 1. Masolino. (1426-27). *The Healing of the Cripple and Raising of Tabitha* [Fresco]. Cappella Brancacci, Santa Maria del Carmine, Florence, Italy.

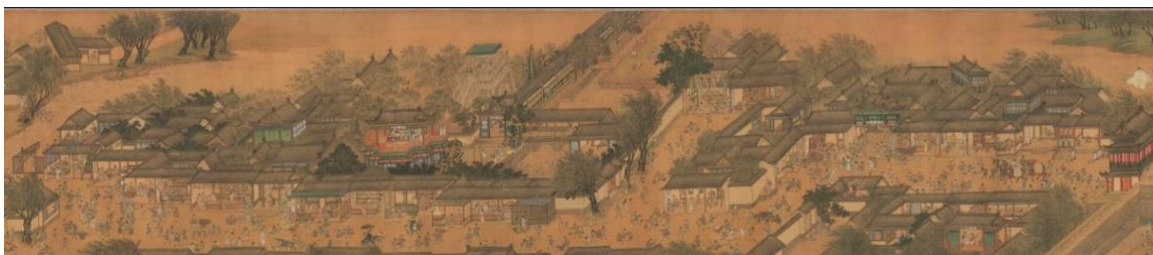


Figure 2. Qiu, Y. (Ming Dynasty). *Along the River During the Qingming Festival* [Handscroll painting]. Liaoning Provincial Museum, Shenyang, China.

Closely linked with space-producing, the process of managing different perspectives in image represents diverse patterns of spatial perception. The understanding of time, as engendered by cosmology, epistemology, religion, and science, also plays an important role in shaping the visual forms of spatiality. The conceptions of 'time' and 'space' contribute to culture formation. The applications of linear and cavalier perspectives appear as the artistic epitome of the spatiotemporal conceptions in the Eastern and Western cultural contexts.

This paper compares the spatiotemporal conceptions conducing to the formation of linear and cavalier perspectives in European Renaissance art and traditional Chinese painting. Exploring both the cultural-historical origin of the different spatiotemporal concepts in the East and West as well as the overlap between them. It discusses the roles linear, cyclical, and spiral temporal conceptions play in the European and Chinese ways of perceiving and producing perspectival space, as influenced by cosmological, religious, epistemological, and scientific factors. This particular focus will additionally extend to the Western and Chinese linguistic structures that contribute to their different cognitions of time and space.

## **1. Linear Temporality in the Linear Perspective**

From ancient Greece to the late Renaissance, time and space in traditional Western interpretations were theologically associated with the existence of God who created the universe with time incidental. This can be firstly traced back to the Aristotelian definition of time as a continuous 'quantity' which exists as an 'accident' of reality. Inspired by Aristotle, the Medieval theologian Saint Augustine then defined time as a creation of God who is the 'divine eternity' existing as a 'never-ending present' in his *Confessions*. This idea also implies his inclination towards linearity and irreversibility of time with his accentuation of 'present'. The Augustinian temporal concept laid a theological foundation for the Renaissance linear thought on time and space. Time and space were also quantified in the physical and mathematical realms, as in Galileo Galilei's theory of free fall, the test of gravity fulfils the quantification of space and time. More notably, time and space were ontologically separated as two independent objects with material and spiritual regards. This explicit demarcation was established by Cartesian dualism, according to which space refers to the objective outer world while time belongs to the realm of thinking that is opposed to the objective realm. The space-time separation later reappeared in Isaac Newton's physics of the relative and absolute time and space as split into a quantifiable and humanly perceivable aspect and an imperceptible aspect of the mathematic realm.

The scientific and theological factors were the most remarkable impetuses for forming the concept of linear time in the West. In the early Medieval period when the cathedral bell had not been replaced by the town clock, time was announced via sound which shaped our life into a daily round. However, the advent of the mechanical clock in the later Middle Ages made time a visible matter measured by the eye. It is the visibility imposed on time that drives time to progress in a linear way as a line, since the eye, as a measurement of the world entitled by physicists and geometers, is able to transform the world into 'a piece of visibility' from a measurable horizontal viewpoint (Romanyshyn, 1989, p 99). Moreover, the clock was also bonded with Christianity as the clock embodies the cosmic system, thus the clockmaker epitomizes God who creates the world, and the Christian idea of time is that of, as claimed in Judeo-Christianity, a 'continuous linear redemptive time-process, the plan of redemption is a divine drama enacted on a single stage without repeat performance' (Needham, 1965, p 47). The concept of visible time engendered by the invention of clock and the invasion of scientific technology paved the way for the quantitation of time and space.

As a product of science and technology and rationalism, linear perspective realized a transformation from a qualitative dimension to a quantitative dimension regarding not only space but also time. In the early time of linear perspective, a physical grid was needed for fixing the painter's eye focus and organizing geometrical space, termed a "window" by the Italian Renaissance artist Leon Battista Alberti (Figure 3). This 'window' established a static viewing way by fixing one's vision on a certain viewpoint. It also set up a demarcation between the viewer and the world, as what Descartes did, defining the world as an objective and quantifiable object that is looked at by the subjective viewer. Seeing through this window, all existences in the world are homogeneously geometricized and reduced to the horizontal depth.

Akin to the visualization of time caused by the mechanical clock, linear perspective is an invention that led the space of the world to be a matter of the eye. The horizon preestablished in the linear perspective vision implies the distant end of the horizontal vision and space. Meanwhile, the fixed vanishing point becomes the endpoint of an event or a piece of landscape. Time, which here is regarded as a linear single path with clear beginning and end points, freezes and reaches its culmination at the vanishing point.

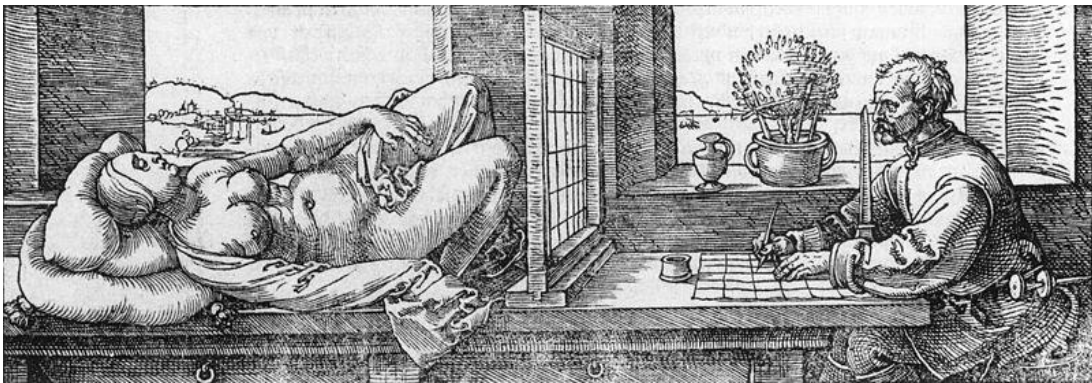


Figure 3. Dürer, A. (1600). *Draughtsman Drawing a Recumbent Woman* [Woodcut print]. The Metropolitan Museum of Art, New York, United States.

## 2. Spatiotemporal Concepts in the Cavalier Perspective

Unlike traditional Western understandings, time and space in traditional Chinese thought are inseparably bonded as a unified whole instead of two separate objects. For instance, the Chinese characters *yu* (宇) and *zhou* (宙) respectively denoting space and time constitute the word *Yu Zhou* (宇宙) that corresponds to the English word 'universe' or 'cosmos'. From the formation of characters, we can notice that Chinese cosmology is an embodiment of the unification of space and time. Based on the space-time correlation in cosmology, astronomical systems were designed with the correlation of heaven and earth, time and space, since ancient Chinese astronomers believed that the change of celestial phenomena foretold the fortune and misfortune of the corresponding earthly places. In addition, the ancient Chinese seasonal rules also followed the inseparable connection between spatial and temporal cognition where each of the five directions corresponds to a season.

Influenced by the deeply rooted spatiotemporal concepts, the cavalier perspective was generated and used in representing spatiality in traditional Chinese painting, which took dominance in visual art for thousands of years. Typically, the successive compositional form created by the cavalier perspective manifests the connection of time and space. Landscapes, architectural complexes, and figures situated at different locations and times are represented simultaneously in a successive long scene. This spatial arrangement downplays the specificity

and distinction of time and space, while stressing equality and unification between space-time and humans.

The cavalier perspective applied in traditional Chinese painting is inclined to convey the circular and spiral trajectory of space-time and change. This understanding of spatiotemporal motion can be traced back to the thoughts in the *Book of Changes*, Taoism, and the variant of Buddhism. According to the *Book of Changes*, everything in the world follows successive temporal orders and changes according to their corresponding hexagrams, circularly repeating and renewing themselves, such as the alteration of sunrise and sunset, the four seasons, the death and rebirth, and so on. However, this cycle contains waxing and waning, discontinuity, retreating, and final returning, implying a cumulative advancing progress. Inspired by *the Book of Changes*, the Taoist attitudes toward time and change also deliver the concept of circularity with the connotation of a spiral trend, which can be detected from Chuang Tzu's statement, saying that 'The succession of decline, growth, fullness, and emptiness go in a cycle, each end becoming a new beginning' (Chan, trans., 1969, p 206). In Sino-Buddhism, it is believed that life is endlessly circular and recycled via reincarnation, everything in the world renews itself repeatedly by replacing the decayed and dead version of itself. The above schools of thought provided a theoretical basement for the visualisation of space which is formed via the cavalier perspective.

The cavalier perspective space, typically represented in landscape painting, becomes the artistic embodiment of circular-spiral temporality. Regardless of the changing seasons, times, and distinct locations, the natural landscape is always depicted as its general state without specificity. It is the absence of specificity of differences and changes that conveys the law of nature as a cycle, within which everything in the world is repeating and eventually going back to the starting state. Moreover, in landscape painting, the mountain is the main body of the painting, the process of appreciation drives the viewer's vision to move from the distance to the near scenery and then back to the distance, that is, the main object turns to the secondary scenery and then returns to the main body (Figure 4). This back-and-forth viewing way implies the correlation between spatial and temporal perceptions and suggests the transcendence from the natural landscape to the artist's spiritual contemplation. Viewing from the far to the near and then back to the far is a circular return, while within which a changeable upward spiral trace is included, testifying to a circular-spiral spatiotemporal trajectory in traditional Chinese landscape thought.

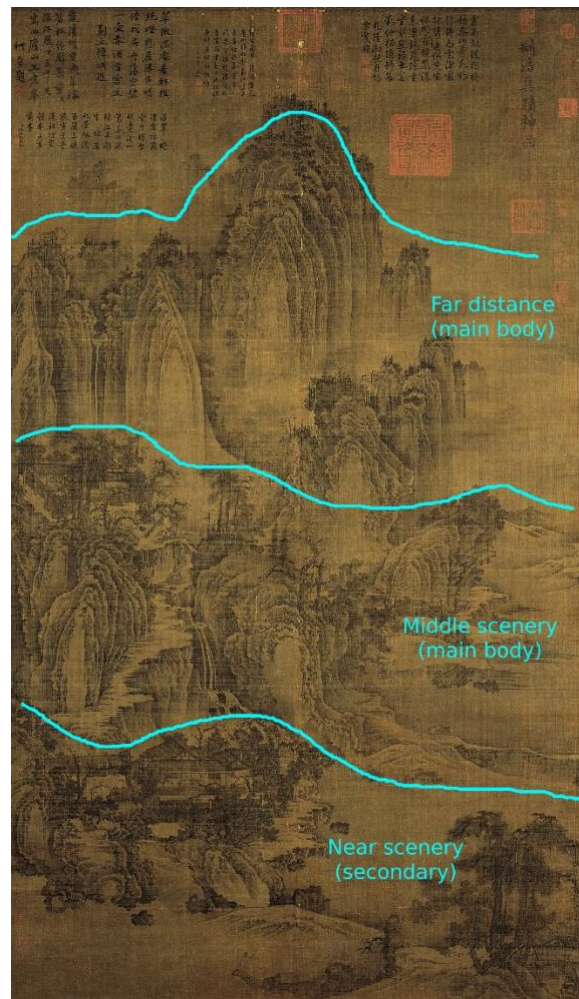


Figure 4. Jing, H. (Five Dynasties and Ten Kingdoms). Mt. Kuanglu [Handscroll painting].  
Palace Museum, Taipei, China.

### 3. Spatiotemporal Concepts in Linguistic Expressions

In addition to the epistemological, cosmological, and religious notions, linguistic expressions also play an important role in moulding different spatiotemporal concepts in the East and the West. Describing time from the linguistic point of view with the participation of spatial metaphors ‘encourages structural alignment between the two domains and may cause relational structure to be imported from space to time’ (Boroditsky, 2001). This comparison is typically manifested in English and Mandarin linguistic systems.

In the English language, horizontal terms, such as “forward” and “behind”, “last” and “next”, appear more frequently for spatial-temporal description. For example, we say “look forward”, and “last/next week”, this speech conveys a horizontal linear temporal progress. In comparison, vertical metaphors, such as “up” and “down”, in Mandarin we say “shàng” and “xià”, are more frequently employed in the description of space-time in Mandarin to describe the temporal order of weeks, months, and events. For instance, “last/next week” in Mandarin is “shàng/xià zhōu”, that is “up/down week”. Therefore, English speakers show a horizontal bias in conceiving time, while Mandarin speakers are inclined to think about time in a vertical way.

One of the properties of linear perspective shows that diverse dimensions of depth are homogenized and quantified by geometrical measurement and eventually reduced to a

horizontal depth. This trait is analogous to the horizontal way English speakers understand space and time, while the cavalier perspective in Chinese landscape painting which accentuates multiple perspectives and back-and-forth dynamic vision is consistent with the vertical-biased Chinese linguistic system.

### **Conclusion**

In conclusion, time and space bear inseparability and correlation in both Western and traditional Chinese thought when it comes to constructing spatiality in visual art. The different perspectival representations do not merely hinge on the retinal nature and spatial perception, but also on the different concepts of time as well as linguistic systems. All these factors that shape different spatiotemporal cognitions are essentially attributed to the diverse conceptual apparatus shaped by cultural-historical distinction.

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