

Celestial Alignments in Historic Sites: Integrating Nature, Belief Systems, and Architecture A Cross-Cultural Study of Ancient Architectural Settings in America, Italy, and China in the Light of Feng-shui

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INTRODUCTION

This paper explores the significance of ancient alignments, particularly the alignment pointing to the sunrise and the celestial north-south alignment in historic sites. These alignments played a significant role in integrating nature and belief systems within ancient built spaces. The method of this research includes cross-cultural literature studies and field investigations of ancient American, Italian and Chinese architectural settings, and applications of the principles of Chinese *feng-shui*, an ancient practice used to harmonize people with their environment.

During the autumnal equinox of 1995, I discovered a major building wall aligned with to the equinoctial sunrise in an Anasazi (*Ancient Ones*) ruin at Mesa Verde, USA. Two years later, Alessandra Veraldi, an Italian architect, and I discovered an alignment linking ancient sites to the sunrise during the equinox of 1997 in Vasanello, Italy. These exciting experiences inspired me to investigate the origin of the celestial north-south alignments that are so prevalent throughout ancient built environments, integrating architecture with landscape.

Alignment is an arrangement in a straight line. According to a basic geometric law, any two points determine a straight line and can align a third point on the same straight line; they also can mark a direction. Humans can abstract architectural structures and geographic features as location points, and align them in the landscape. Alignment linking these location points is definable by the imaginary line of perspective, that is by the viewer's perception. Alignment does not appear as an immediately visible physical form, but rather manifests the linear relationship between these location points.

Alignments exist in the ancient built environment of many cultures. However, the applications of alignments have received much less attention than the fascinating forms of Egyptian pyramids, Greek columns, Roman temples, and Chinese great roofs, which have been admired and duplicated since they were created. A variety of alignments linking architectural structures with geographic features in landscape was first researched in the 1920s, when Alfred Watkins discovered a linear pattern in his native landscape of Herefordshire, England. For a long time, the progress of research on this topic was slow, suffering from rejections caused by the prejudices of the contemporary Western perspective (Pennick, 1989). Nevertheless, the topic of alignment has intrigued many scholars for years, particularly in the field of archeology (William, 1987, Malville, 1989, and Gabriel, 1991).

This paper discusses not only alignments linking features on land, but further alignments pointing to the celestial bodies: sun and stars. "Landscape" in this paper refers to the cosmic scale landscape including the earth and heavenly bodies. Emphasizing integration of time, space and belief systems, this paper presents components including ancient alignments pointing to the sunrise and the ritual meanings implied, origins and applications of the celestial north-south alignment, and the Chinese contradiction between respect and fear of the celestial north-south alignment.

The research uses two methods: 1) study of the literature on ancient thought. Research on ancient belief systems will help us to understand the cultural essence of ancient alignments; and 2) field investigations in the historic sites, in America, Italy and China. Nature was a resource for ancient people's lives and spiritual beliefs, and it is also a resource for us to better understand ancient built environments. Field observations play a significant role in understanding the ancient alignments in

landscape. In this paper each case of ancient alignment is supported by the author's field investigations.

ANCIENT ALIGNMENTS POINTING TO THE SUNRISE AND THE MEANINGS IMPLIED

Sun worship and the significance of sunrise were strongly reflected in many ancient cultures. Most prehistoric American ruins in the Southwest face south, southeast, or east. Sun worship was strongly reflected in Anasazi architecture, landscape settings, and petroglyph, and survives in modern Native American legends.

To observe the relationships between Anasazi settlements and the sunrise, I visited the Far View ruins at Mesa Verde during the summer and winter solstices, and the autumnal and vernal equinoxes. The sunrise at the autumnal equinox of 1995 was, for me, a profound experience. As the first rays shone directly on the ruin, the north wall of the ruin pointed straight at the sun, appearing on the mountain profile of the eastern horizon (Figure 1). It is not difficult to believe that the north wall of the house could serve as a calendar for the ancient people to identify the seasons, especially, the seasons for planting in the spring and for harvesting in the fall, since the sunrises during the fall and spring equinoxes appear at the same position on the mountain profile on the horizon (Xu, 1998).

Together with an Italian architect, Alessandra Veraldi, we discovered a similar alignment at Palazzolo, an ancient village of Etruscan-Roman origin that occupied an important territorial junction, a subdivision of Vasanello, Italy. Along an ancient road running west of the Palazzolo ruins, in front of a necropolis, is a hill at whose foot there is a cave. Standing atop the hill on October 18, 1996, I noticed an alignment from the top of the hill, passing through the ruin of the ancient church,



Fig. 1. The north wall of the Far View ruin pointed straight at the sun appearing on the mountain profile of the eastern horizon (by author).

and pointing directly at the peak of San Pancrazio Mountain to the east (Figure 2). The Italian architect watched the sunrise at the winter solstice (12/21/96) and the equinox (3/21/1997). During the equinox of 1997, she proved my hypothesis that the sunrise position on the profile of San Pancrazio Mountain aligns with the church ruin and the top of this hill. On the top of San Pancrazio Mountain, the Italian architect saw a Roman pagan temple ruin near a little church (Xu and Veraldi, 2001).

According to the Etruscan rite, the foundation of a town was decided in the morning, and main roads were aligned with the point where the sun rose (Morini, 1963, and Veraldi, 2001).¹ In the ancient Italian town of Vasanello, there is a church named Santa Maria della Stella situated just out of the historical town center. According to current archeological research, the central cell of Santa Maria's apse was a pagan temple, and the south facade of the church, even today, shows that its foundation is based on a pagan temple. The road flanked by this ancient temple points to the east (Xu and Veraldi, 2001).

The Chinese also had a strong veneration for the sun. The *I Ching*, (*Book of Change*) written about three thousand years ago, stated that the super god (sun), called *Di*, rises in the east, called *Zhen*. Chinese believed that the living *Qi*, vital energy, comes from the east. In *I Ching* diagrams, the east is a favorable orientation and position, and represents spring, the most vital season for Chinese. Unlike some ancient peoples, Chinese preferred a south orientation for houses and palaces rather than an east orientation, although the east orientation is still favorable (Xu, 1998).

ORIGINS OF THE CELESTIAL NORTH-SOUTH ALIGNMENT

Among the various alignments in the ancient built environment, the celestial north-south alignment was the most common. The north-south alignment not only organized buildings to gain more sunshine and keep warm, but also was used to integrate architecture with its surrounding landscape. Moreover, the application of the north-south alignment was often involved in a cultural belief system.

According to Etruscan legends, after the primordial chaos, Tinia, the most important celestial god who inhabited the north part of heaven, determined the cosmic order. The sky and the earth were divided into four sectors by an invisible cross. The half on his left, from which the sun and the stars rose, was considered as a messenger of happiness; the other on his right, as ruinous. The first axis was the north-south axis. The east-west axis was determined by the positions of the sunrise and the sunset. The north-south axis was invariable, while the axis pointing to the sunrise and the sunset varied with the seasons (D'Aversa, 1989, and Veraldi, 2001).²



Fig. 2. During the equinox, the sunrise position on the profile of San Pancrazio Mountain aligns with the church ruin and the top of this hill (by author).



Fig. 3. The plan of the Vasanello, Italy (by Alessandra Veraldi).

In the Roman tradition, the alignment of the first straight line for a main road of a town was north-south, it was achieved by observation of the sunrise (Pennik, 1989). Even in a small ancient town like Vasanello, there is a main street running from north to south, crossing through the irregular matrix of its urban fabric (Figure 3). This north-south axis seems to reflect the hypothetical layout of the main north-south road during the Roman age (Xu and Veraldi, 2001).

The celestial north-south alignment is also found in ancient American architecture. Pueblo Bonito, in Chaco Canyon, New Mexico, USA, is the largest single Anasazi building. It could have housed perhaps 1000 people in some 600 rooms in 1050-1100 AD. Pueblo Bonito is a spectacular architectural achievement for the Anasazi, who had no metal tools, no wheel, and no beast of burden (Ferguson, 1987). In the center of Pueblo Bonito there is a wall running north-south, which serves as the main axis in the random composition of rooms and kivas (Figure 4).

The celestial north-south alignment was not obvious to the eye in ancient times, unlike the celestial east-west alignment that could be directly marked during the equinox sunrise. Some ancient people, such as the ancient Americans preserved the way to determine the celestial south and north in the form of



Fig. 4. In the center of Pueblo Bonito, an Anasazi ruin in Chaco Canyon, New Mexico, a wall running north-south serves as the main axis of the architectural complex (by author).

myth. Fortunately, ancient Chinese have handed down rich written records on this topic since three thousand years ago.

According to "Zhou Pi Suan Jing," a book written during the Zhou dynasty (1000-771 BC), and reprinted with interpretations by later followers including Zhang Hen (78-139 AD), the famous Han Dynasty Chinese astrologer and Lee Chuen Feng, the national astrologer and feng-shui master in the Tang Dynasty (618-907 AD), the ancient Chinese discovered a method to determine the celestial north and south directions by using a pole about six feet in height. The Chinese found that during the day the sun cast the shortest shadow of the pole to the north and south (Figure 5).

To ensure precision, the Chinese applied a double-checking method combining the positions of sunrise and sunset with the shadow of the pole at noon. This method was developed and applied for a long period of Chinese history, even after the magnetic compass came into common use (Shi, 1989 and Cheng, 1992).

Another way to check the celestial north and south directions, applied 3000 years ago, was to observe the positions of the constellation Ursa Major. Ursa Major played a significant role in ancient Chinese astronomy and astrology. "Zhou Pi Suan Jing" (Lee, 618-907) stated Ursa Major revolved in the north sky at one circuit per year. This phenomenon, observed by the ancient Chinese, was used to determine the seasons (Wang, 1823).

THE CENTRAL CELESTIAL NORTH-SOUTH ALIGNMENT IN THE CITY OF BEIJING

For the ancient Chinese, especially for the emperor, precise knowledge of the four directions was extremely important, not only because it oriented the world, but more importantly, because it located the central point of the world. As a result, the Chinese were motivated to develop many methods to check the directions of south and north again and again. Chinese rulers believed that the emperor, called the son of Heaven, must dwell in a position facing south, in a place called the center of the world, in order for the world to have order, peace, and prosperity (Lee, 618-907 AD). This concept, as a typical Chinese mentality, is thoroughly embodied in the central celestial north-south alignment in the city of Beijing.

The ancient city of Beijing was the capital of a unified Chinese empire for 700 years (1217-1911 AD). The central axis of Beijing is 7.9 kilometers long. Functioning as the backbone of the city, it organized the architectural complexities by linking the grounds in a rich sequence of spatial and social order. The axis passes through nine gates until it reaches the palace's main hall, the Hall of Supreme Peace. This procession then concludes at the Drum Tower and the Bell Tower. Along this central axis the gateways and other built elements were constructed at various heights and in diverse forms. This



Fig. 5. The ancient Chinese found that the sun cast the shortest shadow of the pole to the north and south.

Source: Zhang, 1903.

variety, in combination with courtyards and squares of various lengths and breadths, produced a composition with rhythm and sequence. The intention of this thoughtful procession was to intimidate visitors and awe the subjects of the great house and its master, the emperor of an enduring central empire (Wu, 1999 and Liu, 1960).

Famous national *feng-shui* masters, Liu Benzong and Guo Shoujing, were directly involved in the planning and development of the city of Beijing. The design of the central axis was executed with such perfection that at the noon on the summer solstice almost no shadows are cast within the palace walls. Experiencing this space has been likened to experiencing oneself "at the center of the universe, between heaven and earth" (Eliade, 1959).

When the architectural setting of the Forbidden City is compared to a model of the ideal *feng-shui* landscape (Xu, 1998), the influence of *feng-shui* is evident, particularly with regard to the central axis. Elements of the ideal *feng-shui* landscape were strongly illustrated in the layout of the Forbidden City. Main halls facing south were combined with

wing buildings to resemble "dragon and tiger hills," while rivers meandered through the entire palace. To resemble "the happy hill" in the natural landscape, the artificial Jingshan hill was raised on the central axis to protect the Forbidden City. In addition, on the southern extension of the central axis the Yanduen hill resembles "the facing mountain," also illustrated in the ideal *feng-shui* model (Figure 6).

According to Chinese literature, the buildings on the Forbidden City's central axis were designed to resemble the stars along the north-south alignment in the sky, thereby dividing the Forbidden City into two main portions. The front palace in the south, where national business and ceremonies were held, resembled the stars of Taiwui in the southern sky, while the rear palace in the north, with the emperor's private courtyard surrounded by 14 courtyards of empresses and concubines, resembled the 15 stars of the Ziwei constellation in the northern sky (Xiao, 1995). Thus the location of the Chinese emperor's house echoes the Etruscan belief that the super god dwelt in the center of the north sky. This powerful spatial arrangement suggests the respectful distance due to the commanding lord of the great central empire.

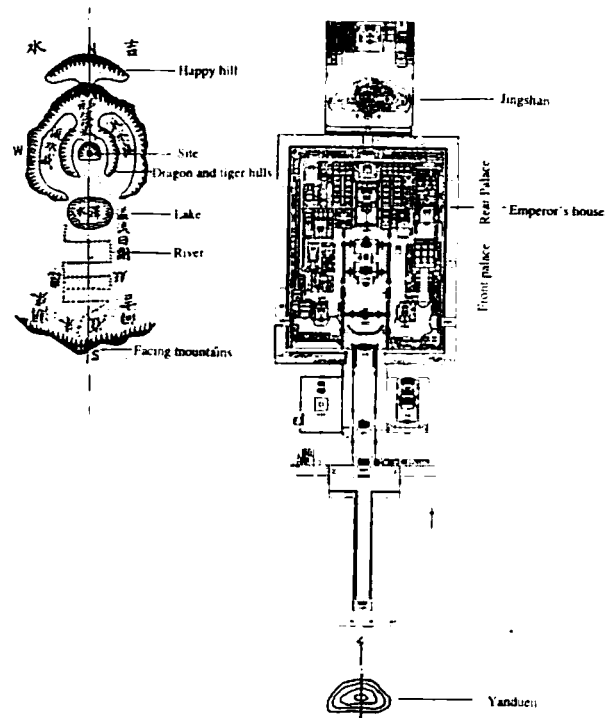


Fig. 6. When the architectural setting of the Forbidden City (right, Source: Liu, 1984.) is compared to a model of the ideal *feng-shui* landscape (left, Source: Xu, 1580.), the influence of *feng-shui* is evident, particularly with regard to the central axis.

CONTRADICTION BETWEEN RESPECT AND FEAR OF THE CELESTIAL NORTH-SOUTH ALIGNMENT

To separate the emperor from the common people, *feng-shui* masters developed a series of charts to be used for selecting the axis of a house. According to *feng-shui* principles, only the emperor and gods could dwell on a celestial north-south axis, as they were powerful enough to handle it. Others must select a house axis at an angle to the celestial north-south axis; otherwise, impending disaster would overcome the entire family (Wu, 1985). Also, an important *feng-shui* principle was to avoid straight lines, as evil spirits traveled along a straight path and bad energy “shot” directly to any human habitat that such an alignment pointed to. The Chinese contradiction between respect and fear of the celestial north-south alignment should not be surprising, as Rudolph Otto stated that ancient peoples developed a close relationship to and spiritual awareness of nature, a consciousness tinged with sacredness, wonder, and fear (Otto, 1932).

The Chinese contradiction between respect and fear of straight alignments was also reflected in the layout of the “spirit way,” a linear element approaching Ming Imperial tombs. The site for the Ming tombs northwest of Beijing was chosen by *feng-shui* masters (Jellicoe, 1991; Xiao, 1995). It is enfolded by U-shaped mountains and faces south toward an open space, where a meandering river passes through. This site was believed to have a super *feng-shui* quality.

The spirit way approaching the Ming tomb complex is over 1200 yards long. It has often been thought of as an example of straight alignment. In reality, it is not a straight line, but rather a gently curved road flanked by colossal stone guardian figures representing civil and military officials, elephants, camels, as I confirmed during my field investigation in 1998 (Figure 7). From the spirit way, a meandering road, through hilly land, travels up 5 kilometers and then leads to the Changling, the first tomb of the thirteen Ming emperors, who seem divine enough to handle the straight north-south axis only when living and holding the superpower of the empire.



Fig. 7. The spirit way of the Ming Tombs seems to be a straight line on the map, but it is a gently curved road in reality (by author).

The ancient Chinese mixture of respect and fear of the celestial north-south alignment is often ignored by some contemporary architects, who likely use the central alignment in the Forbidden City as an ideal model and basis to reorganize other ancient Chinese sites. The recently built street approaching the entrance of the Liao Wood Pagoda demonstrates such an example. Built in 1056 AD, the Liao Wood Pagoda is the main structure within the *Fegongsi* temple complex in Shanxi Province, China. As a masterpiece of the Liao Dynasty and the largest wooden pagoda in the world, it is a national treasure and ranks among the finest of architectural marvels. Knowing this, I took special note of particular *feng-shui* applications while visiting the temple in the summer of 1998, when the new street was not finished and some existing structures around the site had not yet been cleared away. At this time, I could still see that the original entrance gate was located southeast of the temple complex and was off the complex's central axis (Figure 8). Absorbing *Qi*, the vital energy, from the southeast and avoiding the straight line preferred by evil spirits, this layout of the entrance path served as an excellent example of *feng-shui* application.

Unfortunately, ignoring the original design, the current designers aligned the new street with the existing central north-south axis. As a result, the new street points directly at the Pagoda's entrance, thereby destroying the *feng-shui* quality of the Pagoda (Figure 9). Also, the new road is flanked by commercial tourist buildings that simply come across as imitation antiques. It is sad



Fig. 8. The original entrance gate of the Liao Wood Pagoda (by author).

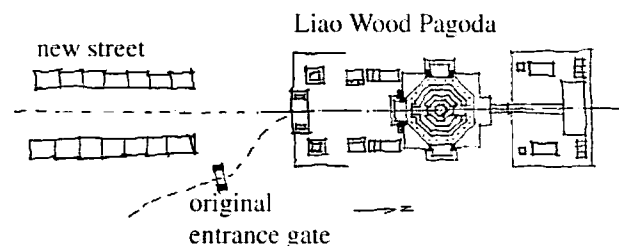


Fig. 9. The sketch of the site plan (by author).

that the original design integrating the architecture with its surroundings and the ancient spirituality of this place have now been lost to us.

CONCLUSIONS

The last two decades brought a new respect for the re-interpretation and rethinking of ancient traditions. Crowds of tourists all over the world have broken the silence of ancient places. To meet the needs of both commerce and cultural preservation, many tourist attractions at or near various historic sites are being remodeled. It is important that we emphasize the protection of the ancient architecture within its surroundings as a whole, paying special attention to the preservation of the original site's built and natural surroundings. As common and important phenomena in ancient cultural landscapes, ancient alignments deserve greater attention.

Since alignment is not immediately viewed as a tangible physical form, the ancient landscape configuration and the relationship between a building and its surroundings, urban or natural, are easily overlooked. Lack of knowledge about ancient alignment not only can obstruct our perception of many facets of ancient architecture, but also may enable the destruction of an historic site by innocent misinterpretation.

Alignments pointing to the sunrise and the positions of stars have a powerful function as indicators of orientations, seasons and time. Indicating the seasons for planting in the spring and for harvesting in the fall, the alignments pointing to the sunrise positions during equinoxes are commonly found in historical sites. Functioning as the central axis of an architectural complex, the celestial north-south alignment played a significant role in architecture of many cultures, although the celestial north-south alignment was not obvious to the eye in ancient times, unlike the celestial east-west alignment that could be directly marked during the equinox sunrise. Both Etruscan and the ancient Chinese beliefs stated that the north-south celestial alignment was a sacred place where the God, super power, or emperor dwells.

For ancient people, natural phenomena and the rules developed from them were so absolute that they appeared to be the order of the God, or the superpower in heaven. Such worship transfers these alignments from the existing realm to a spiritual realm. As Benjamin Schwartz states, the concrete rule is what is known to exist, while the spiritual concept is what would be wished to exist (Schwartz, 1985). What is wished to exist is pregnant with an ideal model for designing and building. Manifesting the linear relationship between architecture and landscape, these alignments were inherently abstract and human, and therefore meaningful. Many ancient alignments, particularly the celestial east-west alignment and the celestial

north-south alignment, in built environments were common ritual for ancient peoples.

Field investigation is critically necessary, and it should attend to celestial and seasonal phenomena as they existed in ancient times, not just to landscape features that are salient to the modern eye. My experience in discovering two alignments pointing to the sunrises during equinoxes in the ancient sites of the Anasazi and in Italy became the basic perspective of this research. Since the natural environment shaped the ancient people's live and spiritual beliefs, observing natural phenomena is also a way for us to more clearly understand design concepts of ancient built environments. When we study an architectural space of an ancient people whose culture and techniques have been mostly lost, field investigations of phenomena on the landscape are crucial. Moreover, even when some ancient literature relevant to this topic is available, observing the phenomena is often necessary, since without perceptive knowledge from the field, interpretation can be distorted.

In ancient cultures, there was a complex mixture of respect and fear of the nature's power and rules. It was strongly reflected in the ancient Chinese practice of the celestial north-south alignment. For the ancient Chinese, the celestial north-south alignment represented the center of the universe, a place where only the emperor or God dwells. On the other hand, the sequence movement in the Chinese palace was designed with a meandering path by setting a series of gates, because according to *feng-shui*, the evil energy travels along a straight line. There are misunderstandings and confusions in relevant publications and contemporary practice. Some modern people, even the Chinese, think that the central alignment of Beijing is a model for any Chinese ancient architectural site, while some think that Chinese built spaces avoid any straight lines. Such misunderstandings could misdirect the public, or ruin a remodeled ancient space.

Ancient belief systems closely tie to observations of natural phenomena, and instructions on the use of alignments to make a record of time, seasons, orientations, and positions. The belief systems gave the meanings to alignments, and in turn, to the design of alignments in a built environment. Even though ancient peoples had very limited techniques, using the naked eye and simple tools, and lacked understanding of what we call "science," their thinking at the cosmic scale was much more integrative and systematic than our contemporary thought system. A cross-cultural study on ancient alignments in various cultures would help us to understand the concept of integrative design models applied in ancient sites.

NOTES

¹ Translation from Italian by Alessandra Veraldi, Mario Morini, *Atlante di storia dell'urbanistica* (Milano, 1963).

² translation from Italian by Alessandra Veraldi, Arnaldo D'Aversa. *La divinazione nella cultura etrusca e romana*. Brescia: Paideia Editrice, Gammurrini, G.F. - Cozza A. - Pasqui A. - Mengarelli R. (1972). *Carta archeologica d'Italia. Materiali per l'Etruria e per la Sabina*. (Firenze, 1989).

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