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Asian Temple Architecture

Japan's Buddhist Temple Architecture

China's TANG-Dynasty era temple design influences upon Japan

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I. INTRODUCTION

It has been stated that "Architecture" is the divine inspiration of mankind in representing heavenly themes in physical form. Or stated in another manner, it is the mathematical principles of harnessing natural forces within a designated space. Regardless of the rationale, architectural concepts transcend national boundaries, carries the evidence of great civilizations, and highlight the modern societies which have inherited its legacy.

In this regard, socio-religious architecture is one of the important characteristics of advanced civilizations, for it can demonstrate cultural interactions, shared social values, and common political beliefs. Buddhist temple architecture is a prime example of such cosmopolitan interaction between Japan and the East Asian mainland.

What Gothic-style cathedral architecture was to Europe during the Middle Ages, TANG-dynasty era Buddhist architecture was to Japan and laid the foundation of temple design for the next 1,400 years up to modern era. From a distance, temple architecture between China and Japan seems identical to the novice viewer, but closer examination will reveal qualities unique to the Japanese social outlook and national character.



Chinese character for Buddhism, pronounced BUTSU in Japanese, FO in Chinese, PUL in Korean, and PHAT in Vietnamese.

II. HISTORY & RELIGION

Buddhism is one the ancient religions which predates Christianity and was founded in India during the 6th century BCE (Before Common Era). By 1st century BCE, it was introduced to multi-ethnic populations in China. It appealed to the populace via the doctrine that personal salvation can be attained by absolving oneself of passionate materialistic desires and to serve

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the public good through deeds in order to achieve "Nirvana" : the state of void or nothingness, whereby all mental, physical, and emotional forces are in perfect equilibrium.

Depending upon the Buddhist monastic order, achieving Nirvana can be accomplished via personal meditation, invocation of Buddha's saving grace, rhythmic magical chants, or a combination of all three. The focal point for such congregational activities was the Buddhist temple complex.



China's TANG Dynasty circa 600 - 900 CE. Solid portion shows area of direct jurisdiction. Outlined portion reflects extend of socio-political influences in Asia.

In late 6th century CE (Common Era), the SUI dynasty of China became a patron supporter of the religion. Land grants and monetary donations to various sects was followed by extensive temple building programs. In addition, with the vast religious knowledge endowed within the local Buddhist orders, China established her own centers of learning and no longer depended upon missionaries from India. This transition gave Buddhism an unique Chinese quality as its influences expanded into Vietnam, Korea, and Japan.

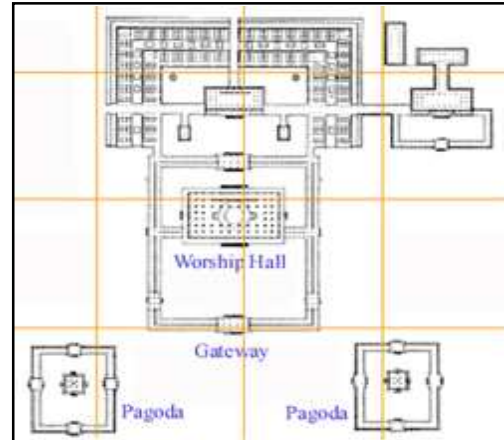
Although Buddhism reached Japan circa mid-6th century CE, it was not until the early 7th century that Japan's YAMATO imperial court established regular contacts with China's TANG imperial court. This relationship facilitated a procession of knowledge flowing from China,

through Korea, to Japan. Buddhism was granted quasi-state recognition status by Japan's imperial court and welcomed among the noble families. Thus a series of temple building projects commenced around the Kansai region, including the cities of Nara and Kyoto. Spectacular complexes were constructed, such as the Todaiji and Horyuji temples, which still exist today.

positioning temples on mountain tops also served defensive purposes during Japan's feudal era. For competing temple sects (such as the rivalry between Miidera and Enryakuji) possessed contingents of "Sohei" (warrior monks) ready to engage in battle to protect the faction's political influence and land patronage. Via Confucian standards, temples



TODAIJI temple located in Nara, Japan. Built in year 752, it is the world largest wooden building. Curvature of the eaves augment smooth outlines of the parametric roof.



III. COMPOUND LAYOUT & MATERIALS

Key characteristic of TANG-era temple architecture was not only the building itself, but also the degree of visual elegance and natural balance harnessed from the environment. This importance was derived from Taoist and Confucian doctrines intermingled with Buddhism. Taoism is the belief of cosmic balance in harnessing natural forces, such as ideas in the "Ying Yang" or "Feng Shui" (colloquial known as Geomancy). Confucianism is the philosophy of social order by which all individual actions must project sincerity and conform to a prescribed hierarchy. This intermingling of Buddhism with other native religions is a common practice throughout Asia.

were constructed according to strict principles of symmetry and axis alignment (shown above, temple ground overhead view with yellow grid lines). Symmetry referred to the placement of worship halls and pagodas in visual balance to each other. Axis alignment referred to the line-of-sight construction of the entry gate, walking path, and worship hall, mostly on the North-South axis and to a lesser degree the East-West axis. In both cases, it was the conscious actions of mankind in partitioning sacred landscape to replicate cosmic order, and thus prepared the spiritual pilgrimage of the person entering Buddha's realm.

Via Taoist standards, temple complexes were located within special terrain features such as mountain tops, hill curvatures, near waterfalls and rivers. However, it should be noted that

With these concepts at hand, a grid-pattern was superimposed upon the entire temple compound to identify the building locations, main pilgrimage paths, and auxiliary walking paths.



Symmetrical layout of the temple, pagodas, pathways. Monk residences in upper right corner is not part of this overall symmetry, but is symmetrical within its own design.

This Confucian arrangement was derived from Chinese urban planning strategies which organized the city into rectangular blocks, created wide thoroughfares and smaller feeder streets, and situated the most important governmental or religious buildings in the northern or central part of the grid.

In contrast to her Asian mainland neighbors which used a combination of stone and wood materials for temple configurations, Japan almost exclusively used wood in such endeavors. The nation was blessed (as still is today) with abundant forests throughout all the home islands, and was thus complemented with a skilled class of woodworking artisans. Wood also represented life, hence to envelope one's creation with wood was to celebrate the existence of life itself. Stone, despite its strength and time resiliency, was time-consuming to carve and incurred high transportation cost. Not to mention, the Samurai warrior class monopolized most of the stone quarries for walled fortifications and castle escarpments.



Overhead schematic for China TANG dynasty capitol of CHANG-AN, first to initiate this urban grid design circa 620 CE. Followed by Japan's KYOTO and Korea's KYONGJU ancient capitols. Geometric grid layout was the forerunner of today's modern city designs.

Another particular Japanese feature was the construction of temples on raised platforms. Due to the hot and humid climate conditions, these stilts provided the necessary ventilation along the foundation base to prevent moisture from compromising structural integrity.

A third feature reflected the Japanese cultural outlook in being conservative decorators. Chinese Buddhist temples were often ornately decorated with eaves and columns painted in bright base colors. The Japanese rendered the temples in polished bare wood finish to

emphasize natural simplicity. In any event, certain types of wood (such as cypress) are weather-resistant in both hot and cold climates, therefore does not require painting for surface protection.

A fourth feature integrated concepts from Japan's "Shinto" (Way of the Gods) religion via the arch gateway called the "Torii". This religion has been colloquially called "Emperor Worship" in the West, but is somewhat of a misnomer. A more correct definition is the worship of terrain phenomena or coalescence of natural forces, such as a waterfall nestled deep in the forest, prominent mountain peaks, unusual rock formations.



Surviving wooden platform blocks of the NISHI GOORII SEKI temple.

The Torii represented the spiritual gateway whereby the pilgrims would commence their spiritual purification tasks. Between the 7th and 19th century, Shinto and Buddhist temples were interwoven as combined worship centers. Therefore, some Buddhist temples had the Torii gateway, while other installed the regular TANG-era gateways. A good surviving example is the Japanese Buddhist-Shinto multiplex at Nashi.



Traditional Japanese TORII spiritual gateway. This example comes from the FUSHIMI INARI Shinto shrine of Kyoto.

Although the ancient Japanese was able to harmonize Buddhist, Taoist, Confucian, and Shinto concepts into their temple complex designs. This layout gradually evolved as other Buddhist and Shinto concepts became predominate. For example, we often associated serene ponds and stoic rock gardens with Japanese Buddhist temples, but these were not part of original TANG-era temple layouts introduced from 7th century China. Rather, these landscaping concepts came from Zen Buddhism of 13th century Japan, which altered the temple layout into an asymmetrical format, and shifted the emphasis towards a balance of natural simplicity and aesthetics.

That being stated, one of the TANG-era legacies which has withstood the test of time is the temple architecture itself. Building characteristics such as gently sloping roof, ripple tile patterns, and wide-angle interior views are signatory accomplishments of the Chinese civilization, as evidenced by its dissemination across the realms of East Asia.

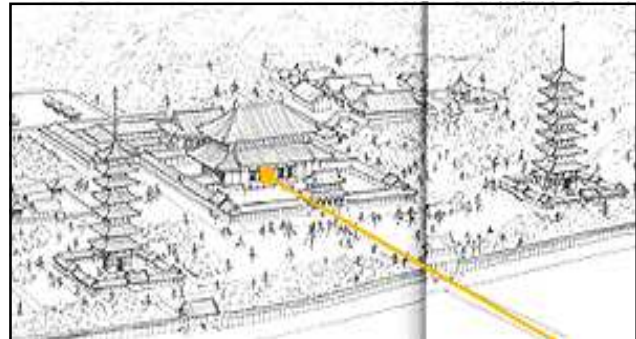


Derived 400 years after the TANG-era, Japanese SEKITEI (rock garden) originated from 13th century Zen Buddhism, which emphasized natural rhythm and simplicity.

IV. ARCHITECTURAL STYLE

The focal point of the temple complex was the main worship hall, which generally housed a large statue of Buddha. Gestures of charity, absolution of fear, salvation, or meditation were carved onto these statues. In accordance with

TANG-era Confucian principles, the arch gateway, main temple thoroughfare, and the worship hall were aligned on the same North-South or East-West directional axis. This *channeled the pilgrims along a prescribed spiritual journey upon reaching the temple complex (shown below with yellow line)*.



The arch gateway identified the temple threshold as the pilgrims summoned their spiritual energy. As they traveled along the main thoroughfare reciting incantations, the symmetrical layout of buildings and pagodas reinforced the imagery of cosmic order. Upon reaching the temple worship hall, they are within the physical presence of Buddha and thus focused their prayers towards the religious icon.

In order to project a grandiose, yet harmonious atmosphere within the worship hall, a special architectural style divided the temple into four interdependent areas : 1) Base columns, 2) Sloping roof, 3) Interlaced brackets, 4) Roof decorations. All four areas were mathematically dependent upon each other. Therefore, structural integrity changes in one area required the recalculation of the other three areas. Since temple-building was both a ritualistic and architectural endeavor, the entire project followed a predefined modular process, for no parts were prefabricated ahead of time.

1) Base Columns

Base of the worship hall was demarcated by support columns anchored along the rectangular perimeter. To ancient man, this rigid geometric shape also identified divine boundaries since one was in the physical presence of Buddha, as represented by the interior statue. Some say this rectangular shape was another Confucian-inspired symbolism of cosmic order and structural stability.



Color schematic of BYODO-IN temple from Japan's HEIAN period by which TANG-style architecture was adopted in-masse.

Note the rectangular base with its projecting columns and intricate brackets in supporting the upper sections.

Very few relics from Japan's HEIAN period of 1,400 years ago have survived into the modern era.

2) Sloping Roof

In order to maintain geometric balance with the natural surroundings, a parametric (gently angled) roof with decorative eaves (projecting overhang at the lower portions of a roof) was conceived. A steep-angle of descent began at the top of the roof, but tapered off to a more gradual incline upon reaching the eaves. This easy-flowing rhythm blended well into the background scenery of hills, forest, mountains. The eaves were carved in a style similar to modern day French curves. They enhanced the overall design by projecting the roof's outlines back into heaven. Some say this design followed the arc of an imaginary circle, hence a very positive Taoist omen since the circle is one of most harmonious geometric shapes. But it is fair to state that Taoist also viewed sharp angles as "natural energy antennas", hence could disrupt the "Feng Shui" of the temple if not properly configured.

3) Interlaced Brackets & Rafters

Overshadowed by the immense stimuli of the temple exterior, this interlacing framework was actually the prime innovation behind the spacious interior worship hall and supported the wide parametric roof.

The original challenge was to optimally enhance

(in modern marketing terms) the "Customer Experience" of the pilgrims, by manipulating the spatial acuity of the worship hall as they directed their prayers to the Buddhist statue. Constructing a traditional high-angled narrow roof would not have been able to cover the entire hall. Constructing a low-angled wide roof required extensive interior support columns, which would have obstructed the spacious interior view.

The solution was to stack interdependent purlins and rafters onto a limited set of columns. Purlins were horizontal wooden beams braced to the rafters. Rafters were sloping wooden beams that supported the pitched roof. Special grooves were cut into these components for a custom fit (similar to American log cabin construction). Multiple wooden brackets were installed in a step-wise fashion at major connection points where the purlins, rafters, and column all met. Thus, forming the critical framework underneath the roof.



Massive double-level eaves of the HIGASHI HONGANJI temple, constructed on a raised rectangular base in Kyoto, Japan. It was built in 1602 when a schism broke out with its sister temple, the NISHI HONGANJI.

This stacking feature enabled bracketed columns to expand the surface support area. With less columns upholding the temple roof, unobstructed view of worship hall was maintained. In this regard, "Interlaced Brackets" of East Asian temples were as great an architectural accomplishment as "Flying Buttresses" was to European Gothic cathedrals.

Depending upon the stress being channeled, three types of columns were used. The first type, "Intercolumnar", was the most important since it held the bracket assembly, which consisted of the leverage arm, connection block, the block

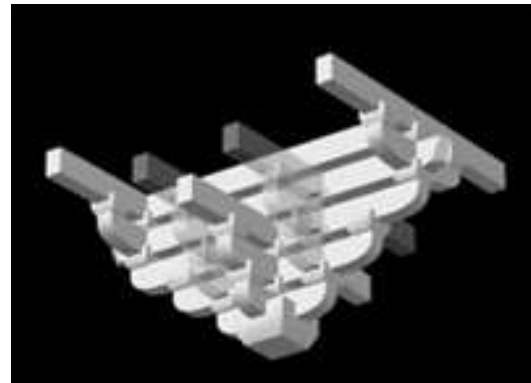
itself, and the extension arm. They were strategically installed throughout the temple interior since they can carry more weight than regular non-bracketed columns. Due to its symmetrical wooden protrusions, some called this apparatus an inverted "Frog Leg Strut" (a very colloquial Chinese description). The second type, "Columnar", was deployed near the temple perimeter and supported the nested purlins and bracket sets. The last type, "Corner", upheld the heavy external eaves along the corners of the temple.



Close-up photo of the interdependent RAFTER and PURLIN set in creating the roof's framework



Color schematic of BYODO-IN temple's interconnecting EAVES, BRACKETED COLUMN, and PURLINS which supported the large sloping roof.



Schematic of the INTERLACED BRACKET set. Note the perpendicular interweaving of the layers in expanding the support area. Top supported the purlin, bottom attached to column.

An intriguing characteristic is the Japanese hardwood's geo-resonance quality within the column framework. It has been documented that during low-intensity earthquakes, the interlaced bracketed columns are able to convert kinetic energy from the ground trembles, into thermal energy via moderate friction among the wooden components. No doubt ancient man would have viewed this quality to be divinely inspired.

4) Roof Decorations

As with Gothic-era water-spouting stone gargoyles, TANG-era roof tiles also channeled rain water to prevent erosion. Temples with smaller roof areas used overlapping ceramic tiles placed in a wave-like rhythm, while roof with larger areas used contoured wooden planks that gave it an overall smooth arc-like features.

Some say this arc or wave-rhythm represented the flowing technique of Chinese calligraphy, while others alluded to the Taoist respect for water. Of the five earthly elements (fire, wood, soil, metal, water), water is the most dominant element for can replenish life or destroy it

outright.

In addition, with the general cultural preference for natural simplicity, the Japanese avoided elaborate roof ornaments (ex. dragon icons, heavenly mist, extra cross beams) and did not paint the eaves in bright base colors, as contrasted with their Chinese neighbors.

V. TEMPLE LEGACY

The layout of the temple complex evolved throughout the centuries in Japan. The original 7th century TANG-era emphasis on symmetry and axis-alignment were gradually replaced by asymmetrical designs and terrain-contouring features as Zen and Shingon Buddhist doctrines gained more prominence. However, the temple architecture itself has remained relatively unchanged up to the present day.

The construction of interdependent purlins, rafters, and interlaced bracketed columns

achieved a mathematical harmony that both ancient and modern man could intimately appreciate. In essence, the legacy of the Chinese civilization has transcended national boundaries, language barriers, and ethnic diversity to speak to us via this architectural medium of its past accomplishments.

On the other hand, the legacy of Buddhist temples in Japan is somewhat of a mixed history. For over a thousand years, Japan was able to integrate concepts from Confucian, Buddhist, and Taoist doctrines, as evidenced by her rich temple history. However, the 700-year rule of the Samurai warrior class was broken by the late 19th century, political power reverted back to the imperial court, and the nation was on a fast track towards full industrialization.



Sample ceramic roof tiles, with its reflective and rhythmic qualities.

Desiring to emphasize the divine lineage between the Emperor and Shintoism, and viewing Buddhism as a backwards symbol of feudalism, the political powers at hand decreed in the 1870s that combined temple worship of Shinto and Buddhism was to be segregated.

These centers were converted to strictly Shinto worship where possible or dismantled outright when necessary. The pace of this destruction



Contoured wooden planks of MIIDERA temple, projecting the flow of a smooth circular arc onto its eaves.



BYODO-IN temple complex, with its submerged reception hall. The structure won international praise for its seamless integration of contemporary design with ancient architecture.



BYODO-IN temple complex at night. Demonstrating the tranquil lighting effects of the surrounding buildings and the crescent-shaped windows of the reception hall below.



The submerged reception hall at BYODO-IN temple, with its modern auditorium design.

accelerated during the war years of the 1940s, when ultra-nationalistic groups advanced the notion that wooden Buddhist temples were susceptible to fires from aerial bombing, hence must be dismantled in-masse. Conveniently forgetting ofcourse that Shinto shrines and common townhouses were also constructed of

wood, but were left untouched.

The immediate postwar years fared no better for the surviving wooden temples due to restrictive urban codes such as limitation on building height and barred constructed materials. It has been estimated that nearly 40,000 wooden temples and old townhouses were razed from 1945 until a new urban landscaping ordinance was established in 1972, which finally offered official protection for such architectural heritage. Nowadays, large traditional temple complexes can only be constructed after securing permission from the central government.

On a positive note, Buddhist following in Japan is still strong, for out of 130 million people, about 90 million are devotees. In addition, by the 1990s there was renewed appreciation in promoting the nation's religious-architectural history. One such recognition was the United Nations bestowing Nishi Honganji Buddhist temple as a world heritage site. Another endeavor was the renovation of the Higashi Honganji temple's reception hall. Balancing modern design with the ancient temple layout, the architects won international praise for their insightful solutions. The strive of such contemporary designs was to embrace the temple complex as part of an urban sanctuary and not merely as some relic from the ancient past.

For any party in the United States interested in examining a traditional Buddhist temple in-person, there is a replica of Japan's Byodo-in temple located in the Kaneohe community near Honolulu, Hawaii. Since Japan has a full replica of France's Eiffel Tower called the "Tokyo Tawaa" (Tokyo Tower), then it is only reasonable that the US should possess a full replica of Byodo-in, for the best complimentary gesture is imitation itself. ●●●



BYODO-IN temple at Uji, near Kyoto - Japan.



BYODO-IN temple replica at Kaneohe, near Honolulu - Hawaii. (Minus the red temple color, which is more indicative of Chinese temple influences)

ABOUT THE AUTHOR

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ABOUT THE COMPANY

Lehrmach is a management consultancy with concentrations in transnational marketing, brand transcreation, corporate communication, and online globalization. For additional information, contact lehrmach@lehrmach.com

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