

A Brief Discussion on Chinese Turquoise Decorative Art and Processing Techniques

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Abstract: Turquoise, a precious jade with millennia of history and cultural heritage, exhibits an evolution in decorative style and processing techniques that profoundly reflects the trajectory of aesthetic ideals and technological change across eras. This study systematically traces the developmental lineage of Chinese turquoise art forms and manufacturing craftsmanship from prehistoric times to the contemporary era. The research posits that the transformation of turquoise art and craftsmanship constitutes a significant component of Chinese jade culture and serves as crucial material evidence for studying Chinese material civilization and craft aesthetics from ancient to modern times.

Keywords: Chinese Turquoise, Decorative Style, Processing Techniques

1. Introduction

Turquoise, with its distinctive hue reminiscent of azure skies and lake waters, has left a long and brilliant trail throughout human civilization. As a precious material possessing both natural aesthetic value and cultural symbolism, it serves not only as a vehicle for decorative art but also as a cipher of civilization traversing time and space. From primitive aesthetic imagery and sacred symbols in prehistoric religion and rituals, to emblems of ritual systems on bronze ritual vessels during the Xia and Shang dynasties, and ultimately integrating into secular life as exquisite ornaments, the decorative style of turquoise has consistently interacted dynamically with the aesthetic trends, technological conditions, and cultural exchanges of each era, forming a clear and richly layered evolutionary path.

2. Evolution of Turquoise Decorative Styles

Decorative art began to germinate in the late Paleolithic era and developed during the Neolithic period. The emergence of ornaments marked the liberation of decorative art from utilitarian tools, signifying the formation of humanity's initial symbolic consciousness and aesthetic concepts. Ornaments are important carriers of decorative art, among the earliest spiritual products of humankind, embodying the wisdom and ingenuity of ancients. Turquoise, as one of the earliest mineral varieties used for decoration, is collectively known as one of China's Four Great Ancient Jades alongside Hetian jade, Dushan jade, and Xiuyan jade. Throughout the long river of history, it has witnessed human history and spiritual civilization development, reflecting human aesthetic orientations and decorative art styles under different historical conditions.

Historical records indicate that the earliest unearthed turquoise ornaments in China date back to the Neolithic Peiligang Culture. Turquoise artifacts from the Peiligang cultural site (8200-7500 BP) consist mainly of geometric pendants like square and round bead ornaments (Figure 1). Due to its mysterious sky-and-lake-like color and its rarity, it was revered by ancients as a sacred medium capable of communicating with heaven and earth. The simple geometric forms originated from the most primitive ancient understanding and abstract imitation of the natural world, representing the dawn of primitive self-awareness and aesthetic consciousness. Such geometric turquoise pendants were also strung into necklaces, either alone or combined with other jades (Figure 2, Figure 3). The creation of strung ornaments exemplified the earliest principles of biomimetics, as primitive peoples consciously imitated animals to enhance their own allure. As early as the Paleolithic era, the Beijing Upper Cave Man utilized simple rhythm and cadence to string shells, jades, and bones into necklaces.



Figure 1 *Wuyang Jiahu, Vol. 1, Henan Provincial Institute of Archaeology, Science Press, P457-461*



Figure 2 *Collection of the Institute of Archaeology, Chinese Academy of Social Sciences*



Figure 3 *Collection of the Kunming Museum, Ancient Dian Kingdom*

With the advancement of material production methods and the strengthening of symbolic consciousness, turquoise began to be carved into ornaments imitating natural life forms. Examples include turquoise fish-shaped ornaments discovered at Yangshao cultural sites (7000-5500 BP) and turquoise owl-shaped and fish-shaped ornaments found at Hongshan cultural sites (7000-6000 BP) (Figure 4). Like other ancient jades in prehistoric times, turquoise was imbued with a metaphysical sacred identity, serving as a typical symbolic carrier for prehistoric religious, sacrificial, and belief activities. The ancients hoped that by carving these natural life forms, they could harness unknown and powerful forces, expressing reverence and awe for nature and the cosmos.



Figure 4 *Complete Collection of Jade Unearthed in China Vol. 2, Science Press, P115, P123*

The rapid development of bronze technology and the establishment of the Xia dynasty's political organization, centered on kingship, ushered in a new era where metal technology coexisted with ancient jade processing techniques. Metal itself also became sanctified, associated with kingship and politics. Turquoise, as sacred jade, began to be combined with metal materials, resulting in numerous sacred objects inlaid with turquoise. Examples include the bronze plaque inlaid with turquoise depicting an animal mask motif and the turquoise dragon combined with a bronze bell unearthed from the Erlitou cultural site (3800-3500 BP) (Figure 5), and multiple turquoise-inlaid bronze plaques found at the Ancient Dian Kingdom cultural site in Yunnan (approx. 2000 BP) (Figure 6) and gold jewelry with turquoise-inlaid in the Warring States period (Figure 7). Turquoise was polished into geometric fragments, serving as the decorative element within frameworks of bronze, other jades, pottery, bone carvings, lacquerware, etc., creating a strong sense of order and regularity. This combination of multiple cultures and forms possessed not only an obvious symbolic construction function related to religious ideology^[1], but also reflected the ancients' subjective construction of form consciousness and spiritual awareness.

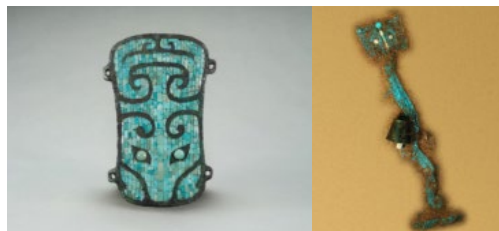


Figure 5 *Collection of Erlitou Site Museum of the Xia Capital*



Figure 6 Collection of Yunnan Provincial Museum



Figure 7 Collection of Hebei Provincial Museum

The Zhou dynasty featured a complete patriarchal clan system and well-regulated ceremonial rites; all classical civilization and ideological consciousness originated here^[2]. During this period, jade served as the carrier and symbol of the dominant ideology in mainstream Zhou society, constituting the core of Zhou culture^[3]. Jade usage shifted from being monarch-centric to aristocratic, shaping the typical, highly ordered paradigm of Zhou dynasty composite jade pendants. Turquoise, as a traditional jade material, was often carved into decorative fittings integrated into these composite sets, embodying reverence for concepts of order in nature and human culture. The Spring and Autumn and Warring States periods witnessed the collapse of the slave system and the formation of the feudal system. With feudal lords vying for supremacy, the royal house weakened, social order became chaotic, and ritual norms crumbled. Against this backdrop, diverse cultural currents surged forth. Science, technology, and productive forces flourished. Iron mining and advances in iron smelting technology spurred innovations in jade-working tools, leading to a boom in the jade carving industry. The contending ideas of various schools during this era saw jade ritual concepts linked with moral concepts. Consequently, the connotation of jade shifted from being deity-centered to human-centered, and the concept of wearing jade formally entered the realm of social ethics. Therefore, apart from ritual objects endowed with specific concepts that inherited tradition, the function of jade pendants in this period also formally transitioned towards decorative jade. Examples include the pattern inlaid with turquoise on the reverse side of the sword guard of the Sword of Goujian, King of Yue, unearthed from a Chu nobleman's tomb and housed in the Hubei Provincial Museum. This concept of jade for decoration has persisted to the present day. Starting from the Ming and Qing dynasties, it became increasingly secularized. Turquoise, prized for its "sky-like color", was particularly favored by imperial nobility and wealthy merchants. Its decorative symbolism represented not only power and wealth but also auspiciousness and beauty.

3. Traditional Turquoise Processing

As one of China's Four Great Ancient Jades, the crafting techniques for turquoise ornaments also evolved alongside the progression of traditional jade-working craft. Based on turquoise's material properties and decorative application forms, its transformation from rough stone to ornament was achieved through two primary methods: turquoise carving craftsmanship and turquoise inlay craftsmanship.

3.1 Traditional Turquoise Carving

Naturally occurring turquoise is a near-turquoise green, opaque gem material, often found in nodular or botryoidal forms with uneven texture, frequently containing light-colored streaks, spots, and dark brown-black iron matrix. The porcelain-like blue of solid turquoise and the ink-painting-like tieline set turquoise apart among gemstones. In the Neolithic period, due to scarce resources and limited mining capabilities, turquoise appeared only as thin, small pieces. Tools and techniques were also nascent; ancients could only use harder stones from other sources ("stones from other mountains") to cut, grind, carve, and polish turquoise. The initial shaping forms were primarily geometric shapes like blocks and tubes with plain surfaces. Later, with advancing technology, metal tools replaced stone tools. By the Xia, Shang, and Zhou dynasties, ancient artisans had mastered various jade carving techniques, achieving remarkable levels in grinding, cutting, line engraving, relief carving, drilling, polishing, as well as in the utilization of jade material and form. Jade carving techniques matured further during the Warring States period, inheriting traditional methods while also exhibiting innovations distinct from previous eras. More refined iron tools promoted unprecedented advancement

in jade carving technology, allowing for more delicate expression of techniques like intaglio line engraving, low relief, full-round carving, and openwork piercing. The most representative national treasure-level jade carving artifact of this period is the 16-Section Openwork Dragon-Phoenix Pendant with articulated rings, tenons, and jade pins from the Tomb of Marquis Yi of Zeng. Starting from the Song dynasty, the flourishing of folk jade carving ushered in a new era. Subjects became rich and diverse, and artisans gained a deeper understanding of jade material and greater mastery of techniques. By the Ming and Qing dynasties, jade carving craftsmanship reached its zenith. Although turquoise resources were relatively scarce compared to other jades, exquisite turquoise carvings have been unearthed from ancient Chinese tombs. Today, with rapid technological advancement, improved mining techniques combined with modern machinery allow for larger-sized turquoise carvings compared to earlier times. Due to its distinctive gemological properties, turquoise carving has gradually formed an independent branch within the jade carving field. Turquoise carving has also developed its own unique carving principles following the development of techniques, technology, and aesthetics: working according to the material characteristics, removing flaws and imperfections, transforming flaws into artistic features, and cleverly utilizing color variations (freckles, streaks). These principles provide contemporary turquoise carving artists with the means to create works rich in subject matter, featuring exquisite and detailed craftsmanship.

Classified according to traditional jade carving forms, turquoise carving can be divided into four types: bas-relief engraving, full-round carving (sculpture in the round), relief carving, and openwork carving (pierced carving). Bas-relief engraving is the most primitive carving method, subdivided into intaglio line carving and cameo line carving. Intaglio line carving involves carving or grinding lines or patterns recessed below the stone's surface, exemplified by the Hongshan culture turquoise owl-shaped ornament (Figure 4). Conversely, cameo line carving produces lines or patterns raised above the stone surface, such as the Shang Dynasty late period shallow cameo carved turquoise human figure unearthed in Anyang, Henan (Figure 8). Full-round carving is three-dimensional sculpture, requiring the carver to consider the artistic effect from all 360 degrees. Early full-round carvings primarily featured naturalistic subjects, like the full-round carved turquoise frog unearthed from the Shang tomb at Dayangzhou, Xin'gan County, Jiangxi (Figure 9). Relief carving involves carving raised patterns on the stone surface, presenting a semi-three-dimensional effect. The depth of the raised parts varies, classified as high relief, medium relief, or low relief based on protrusion thickness. Openwork carving, also known as "pierced carving", involves partially hollowing out the stone as needed, possessing strong artistic merit. However, due to turquoise's Mohs hardness ranging from 3 to 6 with significant textural variations, raw turquoise suitable for openwork carving was scarce in early times. Presently, due to larger mining volumes, harder turquoise, and stabilized turquoise undergoing surface enhancement treatments (controversial term implying treatment like "magnetization"), openwork effects are carved based on designer requirements.

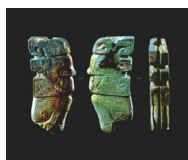


Figure 8 Complete Collection of Jade Unearthed in China Vol. 5, Science Press, P93

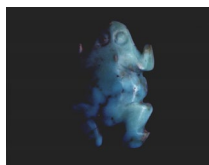


Figure 9 Late Shang Turquoise Frog, Jiangxi Provincial Museum

3.2 Traditional Turquoise Inlay

The Dawenkou period, around 5000 BP, is currently identified as the earliest period employing turquoise inlay techniques. A bone-carved tube (Figure 10) unearthed from the late Dawenkou tomb M4 in Tai'an features turquoise polished into specific round pieces inlaid onto the bone tube. This pioneered the use of turquoise as a decorative element inlaid onto other objects^[4]. Due to mining limitations at the time, turquoise mostly existed as small, thin flakes. The technique of embedding these small flakes into a larger object is recognized as the earliest form of inlay craftsmanship. Its defining

characteristic is enriching the entire object and enhancing its artistic effect by punctuating it with decorations of different colors^[5]. Ancient aesthetic consciousness formed through the continuous sedimentation and condensation of technology and craft over time. This decorative method also reflects the earliest aesthetic wisdom of "working according to the material's characteristics" among the ancients (Figure 11).



Figure 10 Dawenkou M4: 10 Bone-carved Tube Inlaid with Turquoise



Figure 11 Longshan Culture Period Jade Hairpin, Institute of Archaeology, Chinese Academy of Social Sciences

The Bronze Age of the Xia Dynasty marked the second key period for the development of turquoise inlay techniques. The combination of bronze smelting, casting technology, and jade inlaying techniques opened a new chapter of "gold-jade resonance." Archaeological evidence shows that at the Erlitou site in Yanshi District, eastern Luoyang Basin (3800-3500 BP), China's earliest bronze foundry workshop and turquoise artifact workshop were discovered. Excavations revealed the turquoise dragon-shaped artifact and multiple bronze plaques inlaid with turquoise depicting animal mask motifs. Turquoise pieces were shaped into various forms to fit the bronze animal mask base, clearly conveying the imposing and awe-inspiring presence of the mask (Figure 12). From the Warring States period Zhongshan State tomb (approx. 2400 BP), tiger-shaped gold ornament pieces inlaid with turquoise were unearthed (Figure 13), combining fiery cast precious metal with sacred, transcendent jade, creating a brilliantly decorative effect. The Spring and Autumn period Gold-Hilted Iron Sword with Panhui Pattern Inlaid with Turquoise (Figure 14) is considered a pinnacle of Eastern Zhou gold casting craftsmanship, hailed as a zenith of Qin sword making and nicknamed the "Star of Qin Swords." Multiple turquoise-inlaid bronze plaques were found at the Ancient Dian Kingdom cultural site in Yunnan (approx. 2000 BP) (Figure 15). Setting aside academic debates on whether the green beads and inlaid flakes in Dian tombs are turquoise or malachite, Dian craftsmen produced tens of thousands of turquoise inlay flakes measuring 0.18 to 2 cm, creating unique bronze artifacts where bronze craftsmanship and jade craftsmanship complemented each other perfectly^[6].



Figure 12 Bronze Plaque Inlaid with Turquoise Depicting Animal Mask Motif, Erlitou Site Museum of the Xia Capital



Figure 13 Source: Hebei Museum, Warring States Zhongshan State, Tiger-shaped Gold Ornament Piece Inlaid with Turquoise

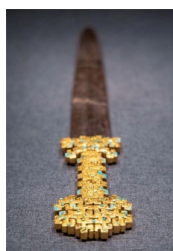


Figure 14 Baoji Archaeological Institute, Spring and Autumn Period, Gold-Hilted Iron Sword with Panhui Pattern Inlaid with Turquoise



Figure 15 Circular Bronze Buckle Ornament Inlaid with Turquoise, unearthed from Shizhai Mountain, Jinning and Lijia Mountain, Jiangchuan

Early stone-in-stone and stone-in-gold inlay primarily used hole setting and groove setting methods, assisted by ancient organic adhesives to fix the shaped jade pieces into drilled holes or grooves. Later, with advances in metal smelting and forging techniques, ancient artisans mastered metal properties, utilizing their malleability to forge exquisite treasures. Gemstone inlay forms became more diverse, especially during the Ming and Qing dynasties where various gem-inlaid ornaments were breathtakingly beautiful, featuring brilliant gold-jade interplay. The most common inlay techniques during this period were bezel setting and prong setting (claw setting) (Figure 16, Figure 17). Bezel setting uses the metal's malleability to encase the lower part (girdle and below) of the stone within a metal frame. Prong setting uses metal claws to tightly grasp the stone. These inlay forms have been used continuously to the present day, with bezel and prong settings becoming mainstream methods for modern gem inlay. Furthermore, based on traditional paradigms, numerous new gem inlay methods have been innovated.



Figure 16 Flower-shaped Gold Hairpin Inlaid with Turquoise, 12th Year of Zhengde Reign, Ming Dynasty



Figure 17 Ming Dynasty Gold-inlaid Pale Yellow Sapphire Hat Finial

4. Contemporary Turquoise Processing

Jade, possessing both natural attributes and aesthetic value, is an excellent medium for artistic creation. Contemporary turquoise craftsmanship adheres to the traditional principle of "working according to the material," emphasizing the fusion of the material's natural form with artificial carving, and pursuing a high unity of "craftsmanship" and "material". The resulting artworks not only embody the exquisite skills and profound time investment of the craftsman but also convey a sense of ancient solemnity and ritual. While continuing the essence of traditional techniques, contemporary turquoise creation actively incorporates modern design language and advanced technological means, achieving

an organic integration of skill inheritance and epochal innovation, thereby continuously revitalizing this ancient art form.

4.1 Contemporary Turquoise Carving

Traditional jade-working techniques, inherited since the Paleolithic era, have evolved from primitive manual chipping to modern automated carving machinery. Innovations in tools coupled with technological advancements have led to the continuous refinement of the craft. Based on modern jade carving processing methods, turquoise carving can also be classified into manual carving and machine carving.

Modern manual carving follows traditional forms. The carver must deeply understand the stone's characteristics—its material, color, fissures—and design accordingly, executing meticulous carving based on the raw stone's traits. Manual carving showcases not only the technical level of the carver but, more crucially, the carver's personal character and artistic-cultural cultivation. Outstanding jade works are the communion of the mind with nature's secrets, the convergence of reason and emotion, the perfect fusion of "beauty in its form, form in its spirit, spirit in its meaning." Highly skilled carvers can imbue the stone with soul and life through their hands, transforming the decayed into the miraculous, or rendering the stubborn stone into eternal art, thereby enhancing the stone's value and significance. For example, Figure 18, "Celestial Flowers Offering Auspiciousness" by China Master of Arts and Crafts Yuan Jiaqi. The warm, moist texture of turquoise naturally resonates with the compassion of Guanyin and the purity of the lotus. The material's inherent tranquility endows the statue with a spirituality transcending the mundane, making it an artistic masterpiece embodying Eastern wisdom and divine beauty.

With ongoing technological progress, empowered by technology, precision techniques like CNC (Computer Numerical Control) carving and 3D modeling have vastly expanded the boundaries of creation and efficiency. For stones requiring mass production and of lower value, machinery significantly increases carving efficiency and reduces labor costs. For instance, a single operator using a machine can produce over 100 plain round turquoise pendants per day. However, for high-quality stones, machine carving exhibits limitations in line treatment, often resulting in a rigid appearance and lack of finesse. Designers skillfully employ a hybrid model of "machine roughing, manual finishing." This approach preserves the vitality and spirit of traditional manual carving while substantially boosting production efficiency. Under this model, designers first use CNC carving machines to rapidly establish the basic outline and form, ensuring precise dimensions and smooth lines. Subsequently, experienced carvers take over, meticulously refining details, removing flaws and imperfections, ingeniously utilizing colors, and imbuing the work with unique artistic charm. This "human-machine collaboration" allows technology to empower art, freeing artisans from repetitive labor to focus their intellect more on creativity and emotional expression.



Figure 18 National Master of Arts and Crafts Yuan Jiaqi's work "Celestial Flowers Offering Auspiciousness"



Figure 19 Tiffany Blue Book Series Necklace

4.2 Contemporary Turquoise Inlay

Turquoise has appeared in multiple ancient civilization cradles worldwide. Although diverse cultural backgrounds have endowed turquoise with different expectations, its use as an object for

decoration, ritual, etc., stems from a deep-seated, cosmopolitan cultural recognition. In the field of contemporary turquoise art, besides inheriting traditional turquoise carving art, modern designers leverage turquoise's color and structural characteristics to maximize the expression of its inherent natural beauty. They fuse contemporary aesthetics with traditional culture, forging outstanding works uniquely suited to current lifestyle aesthetics while embodying the distinctive charm of turquoise. For example, Figure 19, the Tiffany Blue Book series necklace released in 2015 by the American jewelry brand Tiffany & Co. This piece employs two gemstones of contrasting blue textures—turquoise and aquamarine—to depict a waterfall cascading down. Turquoise's color is dazzling and luminous. Within the designer's seemingly disordered arrangement, it perfectly captures the natural beauty of turbulent water rushing over cliffs, splashing into brilliantly dazzling spray. Some creators, cherishing a reverence for natural beauty and focusing on the ontology of things, advocate for "unadorned simplicity, integrated with nature". They emphasize subtlety, a return to simplicity, pursuing the philosophical realm of "Great Music is Faintly Heard, Great Ingenuity Appears Clumsy". They seek to capture those simple, moving moments in life (Figure 20). What such creators need is an artistic expression of "non-carving", conveying the true, inherent beauty of simplicity and essence^[7]. Other creators innovatively develop turquoise design methods and utilize leftover fragments in inlay design schemes, offering new ideas for the sustainable development of turquoise resources (Figure 21). Contemporary turquoise inlay possesses a pluralistic and open creative perspective, no longer confined to traditional motifs and forms. It actively integrates modern aesthetic concepts and cross-material expression. Designers dare to break traditional frameworks and also experiment with clever combinations of turquoise with metals, pearls, diamonds, and even new composite materials. Through contrasts in texture, color clashes, and structural innovations, they construct inlaid artworks rich in visual layers and possessing contemporary aesthetic language. This trend not only broadens turquoise's artistic expressive power but also promotes deeper integration and innovation between traditional crafts and modern design.



Figure 20 Creator: Li Yuan "Pine Stone"

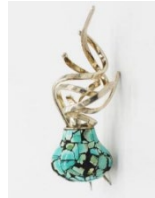


Figure 21 Creator: Chen Jing "Metamorphosis"

5. Conclusion

The artistic journey of turquoise is a "Chronicle on Stone" spanning thousands of years, an epic merging faith, power, aesthetics, and technology. The evolution of its decorative style and processing techniques is far from a simple technological succession; rather, it is a concentrated reflection of the spiritual ethos and material civilization of Chinese civilization across different historical periods. Looking ahead, the vitality of turquoise art lies precisely in this dialectical unity of inheritance and innovation. Contemporary designers need to be deeply rooted in the fertile soil of traditional culture, understanding the ingenuity and symbolism of the ancients. Simultaneously, they must possess the courage to face the future, embracing new technologies, new ideas, and new aesthetics. Only then can this ancient "stone of the sky" continue to shine, not merely as an echo of history, but as an artistic bridge to the future, narrating Eastern ancient wisdom and contemporary innovation to the world.

References

[1] Shuxian Ye. *Jade Mythology Belief and the Chinese Spirit*[M]. Fudan University Press, 2019: P33.

- [2] Hou Wailu et al. *History of Chinese Thought, Vol.1*[M]. People's Publishing House, 1957: 81.
- [3] Sun Qingwei. *Research on the Jade Use System of the Zhou Dynasty*[M]. Shanghai Ancient Books Publishing, 2008: 298.
- [4] Liu Wenqiang. *The Origin and Development of Prehistoric Turquoise Inlay Craftsmanship* [J]. *Art & Design Research*, 2021, (06): 84-90.
- [5] Qin Xiaoli. *Turquoise and Inlaid Ritual Ornaments from a Cross-Cultural Perspective* [J]. *Research on Central Plains Culture*, 2020, 8 (06): 12-19.
- [6] Wang Liming. *Green Ornaments in Ancient Dian Tombs: Misinterpreted "Faience"* [J]. *Oriental Culture: Art*, 2019, (04): 74-87.
- [7] Li Yuan, Zhang Ronghong. *Art Jewelry Creation with Zhushan Turquoise: "Scenery on Turquoise"* [J]. *Journal of Gems & Gemmology*, 2019, 21 (02): 61-64.