

## Article

# Gold, Skin, and Body: Chinese Buddha Statues Are Constantly Being Shaped and Stripped

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**Abstract:** The brilliant effect of the Buddha not only strengthens Buddhist believers' psychological effects of worship, consecration, and showing off of merits, but also becomes an important dissemination method to attract the public to join in. Starting from the golden skin of ancient Buddha statues, this paper analyzes the relevant historical documents and unearthed objects of gilded Buddha statues in ancient India, Afghanistan, Pakistan, and China and pays attention to the body decoration and technology dissemination as well as the process and influence of Chinese localization. In traditional Buddhist culture, gold technology and its application have an important impact on artistic expression, appearance protection, and the psychology of Buddhist statues. In the Late Tang Dynasty, the government and Buddhism suffered conflicts between supply and demand due to gold resources. The forced stripping of gilded Buddha statues became a historical epitome reflecting the deep social and economic problems.

**Keywords:** golden body; gilded statue of Buddha; mercury gilding; gold leaf gilding; Chinese Buddhism



**Citation:** Liu, Xiangyu, and Xinyi Huang. 2023. Gold, Skin, and Body: Chinese Buddha Statues Are Constantly Being Shaped and Stripped. *Religions* 14: 155. <https://doi.org/10.3390/rel14020155>

Academic Editors: Fátima Matos Silva, Isabel Borges and Helena Albuquerque

Received: 9 December 2022

Revised: 18 January 2023

Accepted: 21 January 2023

Published: 28 January 2023



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## 1. Introduction

Gilded Buddha statues are religious works of art. These statues' appearances are decorated with gold, which is precious, rare, and soft and will never decay or fade, which has been widely recognized by Buddhist believers in all districts of Asia. Through their long-term production and publicity, they have already formed a solid tradition in sculpture and become a typical representative of Asian religious art. In addition, it must be mentioned that, in almost every Buddhist temple, the gilded Buddha statue occupies the most significant position in order to encourage people's consecration and worship. Meanwhile, gilded Buddha statues remarkably demonstrate the Buddha's extraordinary physiological phenomenon of the human body, which has been one of the most notable artistic expressions since the appearance of the Buddha. Buddhism has obtained great help and benefits from gold as a material medium, which plays an irreplaceable role in the production of Buddha statues and the psychology of believers.

At present, academic research on gilded Buddha statues can be roughly divided into three categories. The first kind of research relies on religious texts to explain the religious connotation of gold in Buddhism. In earlier work, Grafton Elliot Smith noted the sacred and immortal properties of gold in religious literature around the world (Grafton 1934, pp. 313–14). From linguistics, based on the Buddhist concept of “the thirty-two physical characteristics of a great man (mahāpuruṣa-lakṣaṇa)”, Ji Xianlin compared the Buddhist scripture translations in Pali, Tocharian, Chinese, and Uighur (Ji 1982, p. 13). He concluded that the Buddha's “golden appearance” was a specific physiological phenomenon caused by a mixture of ancient Indian folklore and religious superstition. Sun Yinggang and He Ping focused on the special cultural background of Gandhara and believed that the rise of Mahayana Buddhism promoted the establishment of the “thirty-two physical characteristics of a great man (mahāpuruṣa-lakṣaṇa)” and the emergence of the gilded Buddha statue (Sun

and He 2018, p. 176)<sup>1</sup>. Meanwhile, Ma Zongjie paid attention to Lokaksema, a Gandhara monk, who came to China to translate Buddhist scriptures. He combined the golden body concept of Mahayana Buddhism with the rituals of statue making, providing theoretical support for the formation of the phenomenon of Buddha statues' golden bodies (Ma 2013, pp. 260–71). Additionally, based on the color vocabulary in Buddhist texts, Phyllis Granoff suggested that the golden skin of the Buddha has symbolic meanings such as nirvana, health, and solemnity of treasure (Granoff 2020, pp. 10–15). All of these are believed to provide a necessary theoretical basis for shaping the Buddha's image and worshippers' experiences of observing the Buddha.

The second type of research is scientific-empirical research on existing gilded Buddha statues. This type of research involves gradually restoring parts of the materials and steps of ancient gilding techniques, providing a scientific basis for the protection of cultural relics and the restoration of Buddha statues. Hu Dongbo et al. conducted scientific detection and composition analysis on the gold leaf and gold glue materials of the thousand-hand Bodhisattva statue in Baodingshan, Dazu, Chongqing (Hu et al. 2008, pp. 44–51). As the research showed, this Buddha statue was decorated with gold leaf and bonded with a mature paint, with tung oil added as a gold glue. In order to create a more brilliant appearance effect of the Buddha image, mercury sulfide was consciously added to the gold glue. In addition, Xia Yin et al. used chemical methods to analyze the painted composition and gold leaf gilding structure of stone statues unearthed in Xi'an, Shaanxi Province, and conducted a horizontal comparison with the gold-leaf-gilded Buddha statues unearthed in Longxing Temple, Qingzhou, Shandong Province (Xia et al. 2008, p. 130). As a result of the research, it was illustrated that the gold leaf composition and gold leaf gilding technology of the Buddhist statues from the two places were the same. Broadly speaking, this result provided new proof for the spreading path of the gilding technology of Buddhist statues. Furthermore, Song Yan et al. expanded the selection scope of research objects (Song et al. 2021, pp. 2599–22). They discovered that gold-leaf-gilded Buddha statues from the Northern Wei Dynasty (386–532) to the Northern Qi Dynasty (550–577) unearthed in Longxing Temple in Qingzhou, Shandong Province, were all decorated and drawn with remarkably consistent high-purity gold leaf and mineral pigments. They pointed out that this might be related to local production. Through scientific examination, Zhou Zhibo et al. found that the gold-plated materials in the Kizil Grotto frescoes were based on a lac dye as the cementation material, which provided key evidence for the exchange of gilding technology on the Silk Road (Zhou et al. 2020, pp. 1–2).

The third kind of research focuses on in-depth analysis from the angle of metal craft and plastic art. Chen Yundun and Li Guoqing focused on the study of the traditional Chinese gold leaf production process and its applications (Chen and Li 1986, pp. 256–65). They believed that Buddhism also led to the introduction of the gold leaf gilding process to decorate the surface of Buddha statues in China, as well as the eastward spread of Buddhism. This progress strongly promoted the development of gold technology in ancient and medieval China. Taking a mercury-gilded bronze Buddha statue as an example, Zhang Fan explored the alliance between the ethnic minority regime in northern China and Buddhist monks during the Sixteen Kingdoms period and designed and produced a Buddha statue model integrated with the Han aesthetic, which promoted the sinicization process of Buddha statue art (F. Zhang 2018, pp. 88–102). Further, Li Jia discussed the artistic cause of gilded Buddha statues from the Northern and Southern Dynasties unearthed in Longxing Temple in Shandong Province from the perspective of gold leaf gilding technology (J. Li 2010, pp. 68–71). It was believed that this technology was introduced with the development of metal technology in the Qin and Han Dynasties (221 BCE–220 CE) in China, but there was no conclusive evidence. In addition, Li Jing and Zhang Jing comprehensively discussed the origin and development of gilded Buddha statues (Li and Zhang 2021, pp. 128–35). The research suggested that the gilded statue of the Buddha was born in Gandhara in the 1st century, leading to the development of mercury gilding technology and gold leaf gilding technology. Later, under the dual role of the arts of Han and non-Han

cultures, this difference was mainly reflected in the form of gold decoration. Gandhara Buddhas were usually covered with gold leaf entirely. However, some Chinese Buddha statues were partially decorated with gold and painted around the 5–6th centuries CE, which was a new look developed in China.

In general, the study of gilded Buddha statues from the perspective of gold production technology and technical exchange has not received sufficient attention from the academic community. In fact, existing studies mostly focus on literature induction, typical case analysis, and single studies of gold craft, but they lack exploration of the interaction of gilded Buddha statues with Chinese local gold craft and social and economic development from the historical dimension. It is an inherent tradition of Buddhist statues to have gold bodies. In this case, gilded Buddha statues reflect the close relationship between gold materials and Buddhist beliefs. This phenomenon aroused our research interest, leading to the following questions: How did foreign gilded Buddha statues enter and influence Chinese artistic creation? In addition to the direct influence on the ancient Chinese gold technology, are there other levels of influence? In what physical form and through what method is gold decorated on the uneven surface of Buddha statues? With these questions in mind, we decided to restudy gilded Buddha statues.

This paper mainly discusses the origin and types of gilded Buddha statues and the process of their spread in China. It focuses on the improvement of local gold processing technology, the expansion of application objects, and the transfer of gold resources due to the introduction of Buddhism. We can analyze the specific routes and characteristics of cultural transmission and integration in Asian civilizations using the golden appearance of Buddha statues as a medium.

## 2. Gold as the Buddha's "Skin"

Gold is believed to own the characteristics of rarity, purity, and easy processing and is regarded as one of the most valuable materials in Buddhism. Generally speaking, gold not only participates in the construction of the ideal Buddhist world, becoming the first of the Seven Treasures<sup>2</sup>, but also connects life and faith, emphasizing the divine image of Buddhism.

According to Buddhist theories, Mount Sumeru<sup>3</sup>, the center of the universe, is composed of four treasures, namely, gold, silver, colored glaze, and rock crystal. Around the mountain, there are four continents in the sea. Uttarakuru, located at the north end, is full of gold and enjoys bright days and nights. As for Jambudvīpa, at the south end, it is rich in gold. As is known, Jambudvīpa is the habitat of human beings and geographically refers to the area of the Indian subcontinent. According to records, this place is rich in large trees named Jambu, and gold, which explains why the Jambu continent and Jambu gold are named as such. Similarly, Buddhism describes the paradise of the Pure Land of Buddhism as a glorious scene of golden land. As recorded in the Amitabha Sutra, in the Land of Bliss, "there were seven treasure pools filled with eight merit waters, with the bottom of the pool covered by gold sand. Meanwhile, four sides' steps were made of gold, silver, colored glaze and glass. On the pavilion, there were also fine decoration made of gold, silver, colored glaze, glass, tridacna, red beads and agate. The Buddha on the other shore enjoyed happiness frequently while the ground was fulfilled by gold".

It should be mentioned that the importance of gold is also reflected in the Buddhist concept of the Seven Treasures. The Seven Treasures refer to the seven most precious substances in the world, as considered by Buddhism. However, there are different descriptions in different Buddhist classics. According to the records in Kumārajīva's (343–413) translation of the Amitabha Sutra, the Seven Treasures are gold, silver, colored glaze, glass, tridacna, red beads, and agate. Moreover, the Seven Treasures in Xuanzang's (602–664) translation of the Sutra of Praise for the Pure Land are gold, silver, colored glaze (verulia), rock crystal (Sphatika), tridacna (Musāragalva), red beads, and Ashimagarapha (similar to red agate or carnelian). In the Prajnaparamita Sutra, the Seven Treasures are gold, silver, colored glaze, coral, amber, tridacna, and agate. However, the Seven Treasures of the Lotus

Sutra are gold, silver, colored glaze, tridacna, agate, genuine pearls, and roses. Based on the above Buddhist scriptures, even though there are different interpretations of the Seven Treasures, gold is always the first to be mentioned.

One of the common dissemination methods of Buddhism in real life is to produce and worship Buddha statues. After the statue is produced, gold is often used for the final surface decoration of the skin and clothing. The construction of Buddhist statues may even be interpreted as echoing, perhaps unintentionally, the organic construction of human bodies (M. C. Wang 2016, p. 30). The extraordinary qualities of the Buddha are further emphasized through the skin decorated by gold. This art form, which is specially called “golden appearance” by Buddhists, is characterized by materiality and fragility. While it is shaping the image of Buddha, it is also vulnerable to damage. “Golden appearance” is not only an abstract religious concept but also a form of art that has been fully utilized in the real world. Its ideology and artistic expression have a significantly long history. Approximately around the 3rd–1st century BCE, the written Dirghagama-sutra,<sup>4</sup> the original Buddhist sutra, described the physical appearance of the Buddha as “golden shining like pure gold.” The gold described here has high qualities such as purity, shine, and warmth. When it is used to shape the appearance of the Buddha, it is easy to create psychological associations of holiness and glory. Wobst has shown that adornment, because of its visibility, is a suitable medium for conveying stylistic messages (Wobst 1977, pp. 331–35). Diana argues that ornaments were part of dress strategies and that new combinations of objects were displayed visually over clothing or on the body to constitute new identities (Diana 2003, p. 236). Although most Buddhists believe that the Buddha has outlived his attachment to these materials, both Buddhist texts and Buddha statues actively use gold to decorate the appearance of the Buddha and mark the Buddha as a superior being in order to achieve the purpose of religious communication in different areas of social groups where the Buddha can express and spread their religious identity and status (Kieschnick 2003, p. 8).

Buddha statues in this form have been widely produced and disseminated throughout history. At present, the earliest gold products with decorated Buddha statues found in the world, or gold-decorated Buddha statues, are from the Gandhara region. The Bimaran reliquary, found in Stupa No. 2 in Bimaran near Jalalabad, Afghanistan, in 1838, is one of the earliest physical depictions of the Buddha (see Figure 1). According to the excavated condition and the art of the Buddha statue, it could be inferred that the box was made around the 1st century (Cribb 2015, pp. 26–36; Sun and He 2018, p. 145). The Buddha in this statue, wearing a Hellenic robe with a knot on his right hand, stands on the throne of the golden box and is accompanied by Brahma and Indra from Brahmanism.<sup>5</sup> Thus, it can be concluded that this statue absorbed the native Indian culture and Western Greco-Roman culture. Apart from that, a single mercury-gilded bronze seated Buddha statue dating from the middle of the 1st to 2nd century CE was also found in the area, which was proved to be the earliest Buddha ever discovered with its surface decorated with gold (Li and Zhang 2021, p. 131; The Metropolitan Museum of Art 2004, pp. 51–52) (see Figure 2). This Buddha is jagged at the edge of his head and sits in a preaching position. It is worth mentioning that its appearance and costume are obviously in the artistic style of a Greco-Roman statue. Meanwhile, the gold coin of Kanishka I (127–151), issued by the Kushan Dynasty (c. 100–300), which once ruled Gandhara, features a similar image of the Buddha on the back, with the Greek inscription “BOΔΔO” on the left. From the 2nd century CE, gold leaf came into use in Gandhara. During this period, gold decoration was placed on the surface of Buddhas made of schist, stucco, clay, and other materials (Li and Zhang 2021, pp. 131–32). The typical above examples indicate that Buddhist statues in Gandhara took the lead in adopting gold for artistic expression. At the same time, a number of gold techniques were also applied, such as hammering, chiseling, mercury gilding, and gold leaf gilding, to decorate the surfaces of bronze, rock, and clay. As is known to all, Gandhara is one of the important birthplaces of Buddha art. Gandhara Buddha statues integrate the ideological elements, art forms, and processing techniques of various Eastern and Western civilizations, such as Persia, Greco-Roman civilization, and

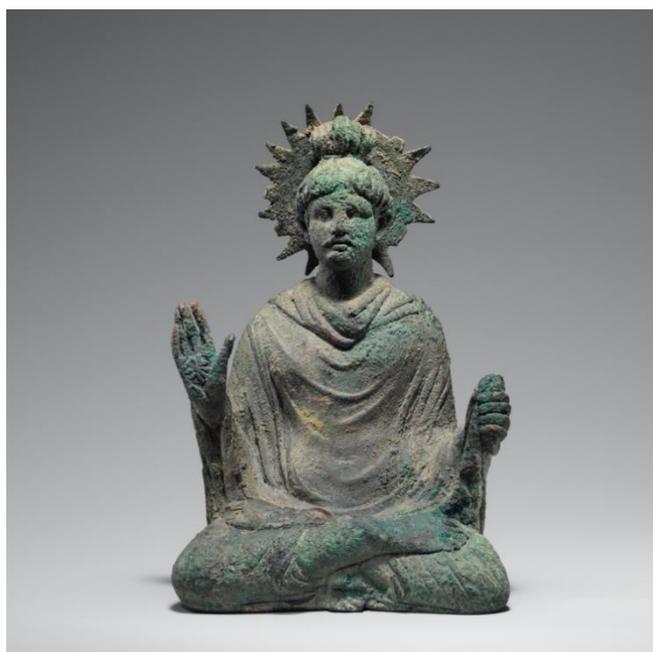
the civilizations of the central Asian steppes. The birth of Gandhara Buddha statues was clearly influenced by the artistic style of Greco-Roman statuary. At the same time, this external factor influenced Gandhara's gold technology. In 334 BC, Alexander's expedition brought advanced gold technology from the Mediterranean to Gandhara. In the temple at Ai-Khanum in northeastern Afghanistan, a gilt-silver Cybeli plate from the 3rd century BC was found, which would have been used for sacrificial rites. This typical silver plate features three ancient Greek gods, the stars, and the moon in a relief, and the surface is gilded. This undoubtedly introduced a new decoration concept and technology demonstration to gold-decorated Buddha statues. In this context, gold became an important material in the production and artistic expression of Buddha statues in Gandhara, focusing on the apparent skin or clothing of the Buddha. With the material advantage of gold, the appearance of the Buddha glittered. By comparison, its visual impact and sense of religious experience are far greater than those of other materials. The design inspiration and decoration techniques of this religious statue not only shaped the Buddha worshiped and offered by believers into a higher being but also provided a new form of surface decoration for religious statues. This created favorable conditions for the development and spread of Buddhism.



**Figure 1.** The Bimaran reliquary, 1st century (circa). Materials: gold and garnet. Dimensions: H. 6.5 cm × D. 6.6 cm. Displayed in the British Museum, London, United Kingdom. Photo source: the official website of the British Museum<sup>6</sup>.

The story “Night Dream of Golden Buddha” by Emperor Ming (28–75) of the Eastern Han Dynasty (25–220) is the earliest record of Buddhism in Chinese history. At that time, the earliest sutra translators coming to China, Kasyapa Matanga and Dharmaratna, recorded in their translation of the Sutra of Forty-Two Sections that, “in the Han Dynasty (206 BCE–220 CE), the Emperor Ming dreamed at night that a person with a golden body and sunlight was flying at the nape” ([Kasyapa Matanga and Dharmaratna 1924–1934](#), p. 722). He was so pleased with himself that he asked his officials the next day, “who is the person?” The knowledgeable person, Fu Yi, said, “I have heard that there is a person in Tianzhu who has attained enlightenment. His name is Buddha. He can fly with a slight lift and he is known as extraordinary.” His appearance was golden. At the same time, the dream was interpreted by the court officials to be associated with the Western “Buddha.” This indicates that golden yellow was the most prominent appearance of the Buddha. This kind of record also appeared in later Buddhist writings such as “Master Mou’s Treatise Dispelling Doubts,” “Biography of Eminent Monks,” “the Disciplines of

the Later Han Dynasty,” and “Historical Records of the Later Han Dynasty,” indicating that the golden Buddha had become a certain social consensus from the Eastern Han Dynasty to the Northern and Southern Dynasties (25–581). In 178–189 AD, the Kushan monk Lokaksema (c. 147–?), in the capital of Luoyang, successively translated the earliest Mahayana Buddhist scriptures in China. As recorded in the Perfection of Wisdom in Eight Thousand Lines (*Aṣṭasāhasrikā Prajñāpāramitā Sūtra*) and the Pratyutpanna Samadhi Sutra, the Shakyamuni Buddha, Buddhas in the Ten Directions, Buddhas of the Three Times (tryadhva-buddhāḥ) and *Nirmāna-buddha* were all golden<sup>7</sup>. This proves that in the late 2nd century, Mahayana gilded Buddha statues had already been systematically introduced into China (Ma 2013, pp. 265–67). From the middle of the 3rd century, Chinese monks traveled westward through the Silk Road to seek dharma. On the way, they saw many bronze and stone Buddha statues decorated with gold. For example, in the Eastern Jin Dynasty (317–420), Fa-hsien (337–422) saw the Buddha’s parietal bone relics in Hiffa City (today’s Jalalabad, Afghanistan) (Fa-Hsien 1985, p. 46). Huisheng of the Northern Wei Dynasty (386–532) saw bronze and stone Buddha statues gilded with mercury and gold leaf in Yumi City (today’s Yutian County, Xinjiang), Uddiyana State (today’s Swat County, Pakistan), and Varusha City (today’s Shahbaz Garhi area, Maldan Shabazi, Pakistan) (Yang 2006, pp. 210–214). This illustrates that Buddha statues were concentrated in Gandhara, the Buddhist art center at that time. They spread across the western regions, from west to east, and finally to inland China. The arrival of gilded Buddha statues brought new changes to the development of foreign religious art and Chinese gold craft.



**Figure 2.** The gilded bronze seated Buddha of Shakyamuni from Gandhara, 1st to mid-2nd century. Materials: gilt bronze. Dimensions: H. 16.8cm × W. 11.4 cm × D. 10.2 cm. Displayed in the Metropolitan Museum of Art, New York, United States of America. Photo source: the official website of the Metropolitan Museum of Art (Behrendt 2007, p. 49).

### 3. Gold Amalgam, Mercury Gilding Process, and Surface Treatment of Metal Buddha Statues

Gold amalgam, commonly known as gold mud in China, is an alloy product formed by combining gold with metal mercury, which has good chemical activity. Mercury has a shiny silvery color and is present as a heavy liquid at room temperature and pressure. Mercury is copper- and sulfur-loving in nature, so most of it is distributed as mercury sulfide. Natural mercury sulfide was once used as a red pigment by ancient people because of its bright red color. Unearthed wooden bowls from the Hemudu culture period were

coated with substances such as these, suggesting that natural synthetic oils were used in China at least 6000 years ago (Wang and Wang 1999, p. 40). In addition, natural gold also generally contains mercury. Metallic mercury can be obtained through the calcination of mercury sulfide, or the collection of vaporized mercury vapor and condensation, which was the main method of extracting mercury used by ancient people. Gold leaf unearthed in Shuangdun Tomb No. 1 in Bengbu, Anhui Province, in the late spring and autumn periods (770–476 BCE) may be the earliest physical evidence of gold extraction using mercury mixing technology at home and abroad (Qin et al. 2011, pp. 95–96).

The ancient gold amalgam was mainly used as a special coating for the surface treatment of metal objects and was the key material for the invention and application of mercury gilding technology. When using mercury gilding technology, the gold leaf is cut up at first. Under a high temperature of 400 °C, the gold leaf is mixed with molten metal mercury to produce gold amalgam. With the gold amalgam wholly or partially coated on the surface of metal objects, through heating, the mercury evaporates when it is heated, while the gold remains on the surface of the objects. Because of the difference between the thickness of the application of gold amalgam and the baking temperature, the surface of each part of the object will appear inconsistently gold. In this case, when the mercury-gilded implement is preliminarily finished, a standard gold color needs to be chosen. Each part is subject to this accordingly. Through repeated mudding and baking a number of times, the mercury-gilded color of the whole object is unified. Finally, an agate knife with a higher hardness is dipped in saponin water and then pressed and polished back and forth evenly on the surface (H. Wang 1984, pp. 57–58). The advantage of this method is that the tiny glume formed by the evaporation of mercury can squeeze out the tiny gap left on the surface, meaning that the gold layer can be firmly combined with the body, increasing the surface brightness and the ability of the mercury-gilded implement to reflect light. The truth is its appearance is almost the same as that of pure gold. The mercury gilding process saves a large amount of gold, which can not only protect the surface of metal objects from oxidation for a long time, but also improve the visual beauty of the objects.

Mercury-gilded implements can only be determined by analyzing the uniformity of the gold amalgam and the heating traces between the gilded gold layers through the detection capabilities of scientific instruments. Under this standard, it could be inferred that Chinese mercury gilding technology had already appeared in the late Warring States period (475–221 BCE) and developed dramatically afterwards (Xu and Yang 2017, p. 72). According to the existing archaeological data, nearly 40,000 mercury-gilded artifacts from the Qin and Han Dynasties (Jiang 2015, pp. 215–16) have been unearthed, mainly including five types of small artifacts, such as human body ornaments, chariot and horse implements, weapons, daily utensils, and utensil components. Beyond that, the world's first gold amalgam was discovered in the Western Han Dynasty (206 BCE–25 CE) Tomb No. 2 in Shuangbao Mountain, Mianyang, Sichuan, China (He et al. 2007, pp. 44–50). The above data apparently prove that China's mercury gilding technology was an indigenous and independent development. The upper nobles once monopolized Chinese ancient mercury-gilded technology. Their noble and prominent social status was highlighted through the production of mercury-gilded utensils, in fact. In addition to small mercury-gilded objects, the mercury-gilded bronze horse unearthed in Maoling, Shaanxi Province, and the mercury-gilded bronze human-shaped lamp unearthed in the Han Tomb in Mancheng, Hebei Province, both showed that the Western Han Dynasty already had the ability to produce mercury-gilded utensils with a larger size and complex structure (see Figures 3 and 4).



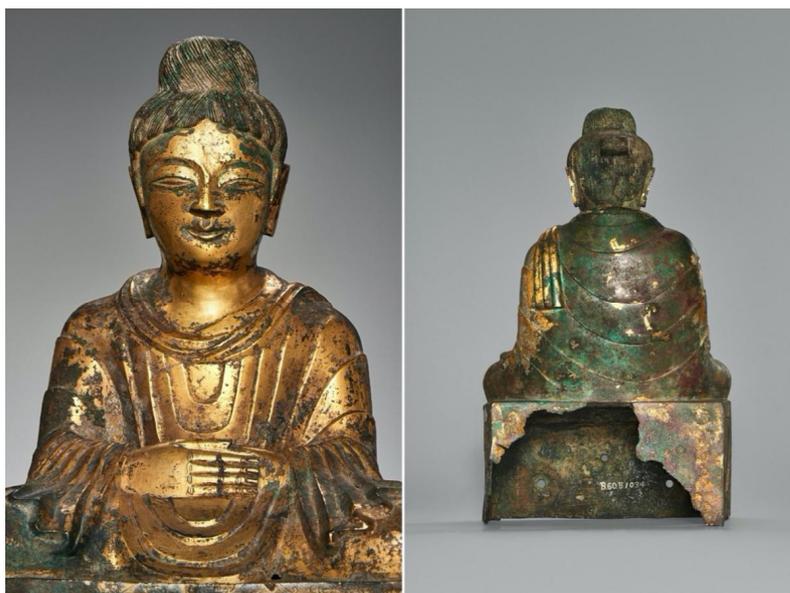
**Figure 3.** Gilded bronze horse from the Western Han Dynasty. Materials: gilt bronze. Dimensions: H. 62 cm x W. 76 cm. Displayed in Maoling Museum, Shanxi Province, China. Photo source: the official website of the Suzhou Museum.<sup>8</sup>



**Figure 4.** Gilded bronze human-shaped lamp from the Western Han Dynasty. Displayed in the Museum of Hebei Province. Photograph taken by the author.

During the Eastern Han Dynasty, the Han Dynasty had already made contact with Buddhism. It is recorded in the *Annals of the Three Kingdoms: the Biography of Dongyi* in the *Book of Wei* that in the first year of the Yuan Shou (2 BCE) of Emperor Ai (25–1 BCE) of the Han Dynasty, Yicun, an envoy of the Kushan Empire of the Western Regions, came to China and dictated the Pagoda Sutra to Jinglu, an official of the school, in Chang'an, the capital of the Han Dynasty (*Treatise on the Three Kingdoms Vol. 12 History of Wei. Dongyi zhuan*, S. [Chen 1936b](#), p. 120). Emperor Huan (132–168) cast a gold pagoda, the Laozi statue, covered with a treasure canopy, which was placed in the palace shrine ([Kasyapa Matanga 1924–1934](#), p. 767). This illustrates that gold was used in the imperial court to produce special items for Buddhist sacrifices. According to the *Annals of the Three Kingdoms*, it was recorded that, from the end of the Eastern Han Dynasty to the Three Kingdoms period (c. 220–265), there was a local despot called Ze Rong (?–195) in Xiapai County

(now Xuzhou, Jiangsu Province). He “established Fu Tu Temple. The statue was made of bronze and painted with gold” (Treatise on the Three Kingdoms, Vol. 17 History of Wu. Liuyao zhuan, S. [Chen 1936a](#), p. 5). This was the earliest record of a mercury-gilded bronze Buddha statue in ancient Chinese literature and might also be the earliest use of local, mature mercury gilding technology to treat the surface of a metal Buddha statue. In 1902, Tatsunobu Watanabe et al. of the Japanese Otani expedition team found several broken mercury-gilded statues in a temple in Hotan Prefecture, Xinjiang, China ([Seiko 2014](#), p. 146). One of the mercury-gilded bronze Buddha heads, with a height of 13.7 cm, was believed to have been an imitation of the Gandhara style by local artisans in the second half of the 3rd century. Indeed, this place was an important area of ancient Buddhism in its spreading east, named Khotan, where mercury-gilded Buddha statues possibly entered the Central Plains. In the Sixteen Kingdoms of the Wei and Jin Dynasties (220–439), small standing or seated mercury-gilded Buddha statues gradually appeared in the Central Plains, which were either imported from the western regions or imitations from the Han region. There are presently about 40 representative works in existence (F. [Zhang 2018](#), p. 98). Among them, in San Francisco, United States of America, is the mercury-gilded bronze Buddha statue produced in the Later Zhao Regime (319–351), the fourth year of Jianwu (338), displayed in the Asian Art Museum; it is 39.7 cm high and the earliest Buddha statue in China (see [Figure 5](#)). From the literature and existing objects, it can be confirmed that gilded Buddha statues were a common decoration technology in the eastward spread of Buddhism.



**Figure 5.** Gilded bronze Buddha from the Later Zhao Dynasty. Materials: gilt bronze. Dimensions: H. 39.7 cm × W. 24.1 cm × D. 13.3 cm. Displayed in the Asian Art Museum of San Francisco, San Francisco, United States of America. Photo source: the official website of the Asian Art Museum of San Francisco<sup>9</sup>.

In the Northern and Southern dynasties, when Buddhism was constantly communicating, absorbing, and digesting, the production of mercury-gilded Buddha statues began to flourish, and it has been prevailing and continuing to this day, occupying the mainstream position of mercury-gilded utensils for a long time. The invention of mercury gilding technology is actually an innovation of the surface treatment technology for metal implements, which balances the relationship between the surface treatment of implements and the efficient utilization of gold materials. However, with the prosperity of Buddhism in China, devout believers, especially the emperor, who possessed metal resources, also joined the ranks of those producing Buddha statues, and the number and volume of metal Buddha statues continued to increase. According to historical records, the Ming Emperor

of the Song Dynasty in the Southern Dynasty (420–589) produced a fourteen-foot gilded Buddha statue (Biography of Eminent Monks, [Shi 1992](#), p. 493), while Emperor Xianwen of the Northern Wei produced a giant standing statue of Sakya, “with 100 thousand jin of bronze and 600 jin of gold” (History of the Wei Dynasty, vol. 114. Shi Laozhi, [Wei 1997](#), pp. 3037–38). In the book “*A Record of Buddhist Monasteries in Luo-Yang*” from the Northern Wei Dynasty, there were more than 1000 temples in the city of Luoyang. In the largest Yongning Temple, there were over 40 gilded bronze Buddha statues ([Yang 2006](#), pp. 1–2, 124–25). Moreover, the Buddha statues of the Southern Dynasty flourished during the reign of Emperor Wudi (464–549) of the Liang Dynasty (502–557). During his forty-eight-year reign, it could be said that the emperor ruled the country with Buddhism, with numerous Buddha statues made of gold, silver, and bronze ([Tang 1997](#), pp. 384–85). The mercury-gilded bronze Buddha Maitreya statue of the tenth year of Taihe (486) from the Northern Wei Dynasty is displayed in the Metropolitan Museum of Art, New York, USA. It is 140.3 cm high and known as the biggest statue of its kind at present (see Figure 6). Casting a large metal Buddha statue in ancient times, whether using the casting method or the lost-wax method, was an extremely expensive and complex project in terms of labor and material. This, in turn, increased the consumption of gold, mercury, and metals such as bronze and iron. Before the introduction of Buddhism to China, the main users of mercury gilding technology were members of royalty, which then changed to Buddhist temples. At the same time, the main objects of decoration also changed, from five types of small artifacts, such as human body ornaments, chariot and horse implements, weapons, daily utensils, and utensil components, to medium- and large-sized Buddhist statues<sup>10</sup>. This reflects the influence of the introduction of Buddhism on the application of metal processing technology in China and the distribution of social metal resources.



**Figure 6.** Gilded bronze Buddha Maitreya from the Northern Wei Dynasty, 10th year of Taihe reign. Materials: gilt bronze. Dimensions: H. 140.3 cm × W. 62.2 cm × D. 48.9 cm. Displayed in the Metropolitan Museum of Art, New York, United States of America. Photo source: the official website of the Metropolitan Museum of Art ([Leidy and Strahan 2010](#), p. 59).

#### 4. Gold Leaf, Gold Leaf Gilding Technology, and Multi-Material Treatment on the Buddha's Surface

Gold leaf is a very thin piece of gold that is produced by taking advantage of gold's ductility and malleability and then repeatedly hammering and forging it. In the middle of the 24th century BC, there was a mural depicting the production of gold leaf in the A3 chamber of the Tomb of Mereruka in Sakara, ancient Egypt (Wilson and Allen 1938, pp. 29–30). Compared with Western countries, gold leaf production technology appeared relatively late in China. The earliest gold leaf found in China was a gold-copper earring from the Adun Qiaolu site in Bozhou, Xinjiang Province, dating from the 19th century to the 17th century BCE (The Institute of Archaeology Chinese Academy of Social Sciences 2013, pp. 30–31). The re-decoration of the outer appearance of the earrings showed the precious gold, soft texture, and obvious decorative properties. With the continuous improvement of people's knowledge of metal and forging technology, gold leaf products with a larger area and higher quantity began to appear in the Middle and Late Shang Dynasties. These sites are mainly high-level tombs or sacrificial pits in Zhengzhou and Anyang, Henan Province, and Guanghan and Chengdu, Sichuan Province (Liang and Gao 1962, p. 334; Sichuan Cultural Relics Management Committee 1987, pp. 4–5; The First Team of Cultural Relics Working Team of Henan Provincial Bureau of Culture 1957, p. 72; The Institute of Archaeology of Chengdu City 2004, pp. 6–10), indicating that gold resources were mainly controlled by the upper strata of society. One of them is a semi-circular gold slice unearthed in Tomb M14 of the Gaochengtai West Site in Hebei Province during the middle period of the Shang Dynasty (c. 1700–1600 BCE) (Taixi Archaeological Team of Hebei Provincial Cultural Relics Management Office 1979, p. 43) (see Figure 7). Its thickness is only 1 mm, and the lacquerware surface is flat. Presently, this is the earliest known gilded product discovered in Chinese archaeology. In the Late Shang Dynasty, such lacquerware had also appeared in Tomb No. 171 at Anyang Da Sagong in Henan Province. Its thickness is only 0.01 mm, and the lacquerware surface is flat (Beijing Institute of Iron and Steel Engineering 1978, pp. 34–35).



**Figure 7.** Gold Leaf from the Middle Shang Dynasty. Materials: gold. Dimensions: T. 1mm. Displayed in the Hebei Provincial Institute of Cultural Heritage and Archaeology, China. Photograph taken by the author.

During the spring and autumn periods and the Warring States period (770–221 BCE), gold leaf gradually spread to the capitals of various vassal states and their surrounding areas, covering most areas of northwest, central, and north China. According to archaeological results, Chu State was the most advanced in gold leaf production in the late spring and autumn periods. Moreover, in the late spring and autumn periods of Chu (c. 1030–223 BCE), batches of thinner gold leaf were found successively in the tombs of noblemen in Xichuan, Dangyang, and Bengbu, with the thinnest being only 0.007 mm (Cheng et al.

2019, pp. 10–19; Henan Provincial Institute of Cultural Heritage and Archaeology 1991, pp. 203–208; Qin et al. 2011, p. 94) (see Figure 8). A total of 940 pieces of gold leaf with 13 shapes, including round and triangular, were unearthed in the tomb of Marquis Yi of Zeng from the early Warring States period (475–221 BCE). The thickness of the gold leaf ranges from 0.037 to 0.378 mm (Hubei Museum 1989, pp. 393–95). Each piece of gold leaf has a thick center and a thin edge. The gold leaf was used to decorate flat surfaces such as coffins, chariots, and armor. Chu State was the main gold-producing area in China in the pre-Qin period and the only vassal state that issued a gold currency (Z. Chen 2005, pp. 70–73). Gold resources and developed gold processing technology provided good conditions for the development of gold leaf products. Tracing back to its entire history, this kind of gold leaf developed rapidly from the middle and late Warring States period to the Jin Dynasty (266 CE–420 CE). It was widely applied to the surfaces of utensils and clothing made of lacquer wood, copper, iron, jade, plant fiber, etc. Moreover, it is worth mentioning that gold leaf was used exclusively by royalty. During the Sixteen Kingdoms period (304–439), Emperor Shi Hu (295–349) of the Later Zhao (319–351) produced gold fans, which had already reached the technical level of “thin pure gold such as Cicada wings” (A Record of Ye-Zhong, Lu 1937, p. 6). At the same time, Daoist external alchemy in the Northern and Southern Dynasties had also succeeded in their attempts to forge iron into gold as thin as silk (*Baopuzi Immortal Jinfen Sutra on Scroll the First Volume*, Anonymous 2016, p. 204). A large number of studies have revealed that gold leaf can be as thin as possible as long as it is stuck to the surface of something else. As a result, the development characteristics of gold leaf materialization are the key points that expand the wide applicability of gold leaf products.



**Figure 8.** Round gold leaf from the late spring and autumn periods. Materials: gold. Dimensions: D. 14.4cm. Displayed in the Bengbu Museum, Anhui Province, China. Photo source: the official website of the Bengbu Museum<sup>11</sup>.

In addition to mercury-gilded Buddha statues, the combination of gold leaf production technology and gilding technology provided another option for the surface treatment of Buddha statues. It was recorded in “A Record of Buddhist Monasteries in Luo-Yang” that people in the western regions of the city had the custom of affixing gold to the surface of gilded statues (Yang 2006, p. 210). It was believed that a patient could be cured by fixing gold leaf to a statue corresponding to the diseased part of the human body. This kind of religious behavior, which meets people’s psychological expectations to a certain extent,

promoted the popularity of gold leaf gilding Buddha statues. During the Northern and Southern Dynasties, when Chinese Buddhism flourished dramatically, many Buddhist believers began to use a large amount of gold to decorate Buddhist statues to display their piety. According to the existing archaeological documents, the earliest gold-covered Buddha statues made of clay, wood, and stone appeared successively in Dunhuang, Gansu Province, Mushuke, Xinjiang Province, Yungang, Shanxi Province, and other eastward-spreading routes of Buddhism during the Northern and Southern Dynasties (Lu and Wang 2013, p. 133; Z. Zhang 2006, p. 413; Zhao 2016, p. 60). During the Southern Dynasty, there were other records of foreign gold-leaf-gilded Buddha statues being brought to China, whose inscriptions indicated that they were “foreign gold-leaf seated statues” with a height of seven feet (Biography of Eminent Monks, Shi 1992, p. 179). This shows the close religious and cultural exchanges between China and foreign countries in this period. The majority of these different types of gilded Buddha statues were gold-leaf-gilded stone statues. According to statistics, there are 216 typical gilded stone statues from the Northern and Southern Dynasties in China in total. A total of 191 of them are distributed in northern China, including Hebei, Henan, Shandong, and Shaanxi provinces, while 25 are distributed in southern China, including Sichuan province (Li and Zhang 2021, p. 130). Comparatively speaking, these gilded stone statues’ distribution proportion is much larger in the north than in the south. Apart from that, another remarkable discovery has drawn attention: the distribution and number of these gilded Buddha statues coincide exactly with the main route of Buddhism spreading from west to east along the Silk Road. This proves the historical fact that Buddhism was introduced into China from the west.

The gold leaf gilding technique is a type of processing technology that covers heterogeneous objects with gold leaf entirely or locally. By virtue of the adsorption of gold leaf itself or with the use of adhesive materials, the process plays a dual role of both decoration and sealing on the surface of Buddha statues. Specifically, the process can be divided into two steps. The first step is to boil the adhesive materials. Generally, a lacquer, tung oil, or ichthyocolla is chosen for boiling into a thick semi-liquid, which is then evenly spread on the surface of the Buddha statue. Second, as the adhesive material dries quickly, bamboo clips are used to pick up pieces of gold leaf and place them in order. After pressing and polishing with a cotton ball or agate knife, the gilded Buddha statue is completed. Generally speaking, the face, hair ornaments, body postures, and costumes of Buddha statues are mostly uneven surfaces. In order to facilitate a consistent visual perception of gold-leaf-gilded Buddha statues, the surface adhesion of the gold leaf must be tight and uniform. Therefore, the more gold leaf produced, the thinner the thickness, the better the uniformity, and the easier it is to complete the production of gilded Buddha statues. With this background, gold leaf with an extremely thin thickness, uniform size, good uniformity, and mass production came into being. At present, there is not enough evidence to prove that these kinds of gold leaf and gold leaf gilding techniques were influenced by foreign gold-leaf-gilded Buddha statues. However, before the introduction of Buddhism to China, the main users of gold leaf gilding technology were members of royalty, which then changed to Buddhist temples. At the same time, the main objects of decoration also changed, from small artifacts to medium- and large-sized Buddhist statues, and the surface of decorative carriers changed from plane to three-dimensional.

During the Tang and Song dynasties (618–1279), when Buddhism flourished, this kind of gold leaf was widely used in large-scale Buddhist statues and temples. Emperor Jingzong (809–827) of the Tang Dynasty (618–907) built his palace with “100,000 pieces of gold leaf” (Taiping yulan, F. Li 2008, p. 203). In the Northern Song Dynasty (960–1126), the Dunhuang region’s envoy to repair the Buddha statue came “begging for 100,000 pieces of gold leaf” (Song Huiyao, Edited the Manuscript, volume 198 Minority V, Xu 1957, p. 768). The gilded clay Buddha statues from the middle of the Northern Song Dynasty in Zhangzi County, Shanxi Province, are only 0.00016–0.00022 mm thick with gold leaf (Wang et al. 2020, p. 41). Built in Chongqing in the 22nd year of Shaoxing (1152) during the Southern Song Dynasty (1127–1279), the Tongnan Buddha is 18.43 m high, and 369,000 pieces of gold

leaf are used to complete the decoration of the whole body (Xu and Liao 2020, pp. 95–96). The huge demand for gold made the craftsmen look for a more economical way to use gold and a faster technique to make gold leaf. The mass production of gold leaf in ancient China was realized because of the invention and application of Wujin paper. The earliest liner material was probably made from some kind of animal hide, with paper later being made from plant fiber. It is not clear when animal skins and paper were used (Han and Ke 2007, p. 799). If paper is used as a liner material, this would indicate a time after Cai Lun (c. 61–121) developed paper from woody bast fiber in the 105 years of the Eastern Han Dynasty (Pan 1998, p. 86). In the Genealogy of Fatie Puxi of the Southern Song Dynasty, “Kui paper,” which records the calligraphy of rubbing inscriptions on tablets<sup>12</sup>, is the liner paper used to make gold leaf (Cao 1939, p. 2). In the Ming Dynasty (1368–1644), “Tiangong Kaiwu” first recorded the production method of Wujin paper, stating that “all Wujin Paper was made by Suzhou and Hangzhou. Its paper is made of East China Sea bamboo film. By lighting the lamp with soybean oil, blocking the surrounding air, stopping the pinhole ventilation, and smoking light, this paper is finished (Song 1978, pp. 338–40).” Therefore, the paper has high heat resistance, wear resistance, and impact resistance. Repeated stacking helps to evenly disperse the beating force. The production of gold leaf has been upgraded from one-by-one hammering to multi-layer hammering with a uniform thickness and uniform shape<sup>13</sup>. Scholars have investigated the traditional gold leaf production process in Nanjing, Fuzhou, and Quanzhou and found that at least 1792–2048 pieces of gold leaf can be produced at one time by using Wujin paper. Up to now, Wujin paper is still the core material in gold leaf production (Lian 2002, p. 346; K. Wang 1980, pp. 40–43). The technological improvement of batch leaf production and the maturity of gold leaf gilding technology not only meet the demand for Buddhist gold but also improve the utilization rate of gold and effectively solve the construction and efficiency problems in the gold installation projects of giant Buddha statues.

In addition to the gilded decorations on three-dimensional Buddha statues, Buddhism also developed a new type of low-embossing decoration technique in the planar grotto frescoes called gelled patterning and gilding. The gelled pattern is usually higher than the wall, with gold leaf above it, in order to increase the three-dimensional stereoscopic effects of the picture. The Kizil Grottoes, in Kuqa, Xinjiang Province, were dug in the 3rd century by Qiuci State, an ancient country in the west. They are the earliest Buddhist grottoes in China and the most western in terms of geographical location. Thanks to their location at the intersection of Eastern and Western civilizations in ancient times, the cave paintings not only show the Indian and Greek styles of early Buddhist art but also have a number of traces of gilded decoration. In addition, the technique of gelled patterning and gilding can also be seen in murals from the Northern Wei Dynasty in Dunhuang Mogao Cave 263 (Duan and Fan 2006, pp. 55–59), which happen to illustrate the propagation path that Buddhism took in its spread to China from the west. In fact, whether it is a three-dimensional Buddha statue or a plane fresco, the decorative layer formed by gilding on the surface plays the extra roles of waterproofing, corrosion prevention, weatherproofing, and peeling protection, which enables a lot of fragile Buddhist art that could easily decay to be preserved for a long time.

### **5. Stripping the Buddha’s Gold Garments: The Contradiction between Gold Technology Evolution and Resource Supply and Demand**

The value of gold has a high degree of consensus in human society. After Buddhism was introduced into China, it actively built and spread Buddhist thoughts with the help of gold. Chinese believers gradually accepted and imitated the gold decoration and worship of Buddha statues to obtain spiritual comfort. Generally speaking, Buddhism had a certain influence on the gold technology and social resource distribution in ancient China. As mentioned above, gold resources in ancient China gradually flowed from the ruling class to the religious field. The use of gold has expanded from the showing off of materials in secular life to the spiritual sustenance of religious belief. From a technical processing

perspective, ancient Chinese craftsmen further processed solid gold in its simple form into gold amalgam and gold leaf through forging, alloying, melting, and other methods and then applied it in the exterior decoration production of Buddha statues through mercury gilding, gold leaf gilding, and other technologies. These two main surface treatments expanded the application of gold and promoted the development of gold leaf production technology in ancient China.

A comprehensive comparison of the mercury gilding and gold leaf gilding processes used in the surface treatment of Buddha statues shows that the gold leaf gilding process has more advantages in terms of processing technology and decoration applications (see Table 1). As for the mercury gilding process, due to the use of mercury elements that are harmful to the human body in the production of raw materials, the bottom substrate must be made of metal, and the construction needs to be equipped with a stable and continuous fire source for baking. Due to the double influence of technical difficulty and metal material loss, the scale and quantity of production of mercury-gilded Buddha statues can only be relatively small. In fact, the technical difficulty of gold leaf gilding lies in the mass production of gold leaf. This problem was encountered because the original technology could not meet the increasing demand for gold ornaments on Buddha statues, which forced people to seek better technological solutions. Usually, the essence of technology is to utilize phenomena to combine and self-evolve existing technologies so as to bring new efficiency improvements and value niches (Arthur 2009, pp. 168–84). They promote and influence each other through science and the economy. The inventions of mercury gilding and gold leaf gilding make full use of the characteristics of gold. They use a chemical reaction or the means of physical processing to improve the utilization rate of materials and reduce economic costs. With the prosperity and development of the social economy and foreign exchange in the Tang Dynasty, gold crafting was also at the peak of the development period in ancient China (Qi 1999, p. 9). As recorded, the society of the Tang Dynasty greatly respected Buddhism, and eight emperors once spared no expense to welcome Buddhist relics (Han 1993, pp. 4–5). In this case, gold resources and the two technologies of mercury gilding and gold leaf gilding were widely used in the religious field of the country. However, the flamboyant decorative behavior of gilded Buddha statues has gradually evolved into a social phenomenon of extravagance and waste. The gradual imbalance between the technological evolution of gold and the social demand for gold has resulted in the consumption of more gold and other metal resources and even brought unforeseeable and destructive consequences to the social economy.

**Table 1.** Comparison of mercury bronzing and gold leaf bronzing techniques used in the surface treatment of Buddha statues.

Type of Technology	Raw Material Form	Bottom Substrate Material	Construction Methods	Buddha Statue Scale	Safety
Mercury gilding	Gold amalgam	Metal substrate	Heating	Medium- and large-sized Buddha statues	Toxic danger
Gold leaf gilding	Gold leaf	Unlimited	Pasting with glue	Unlimited size, especially suitable for giant Buddha statues	Safety

After the “An Shi Rebellion,” the Tang Dynasty faced the financial dilemma of a lack of national power and expenditure (Gernet 1987, p. 40), which led to a conflict of economic interests between the imperial center and the Buddhist group. Scholastic officials represented by Han Yu (768–842) began to oppose Buddhism in an attempt to stop the extravagance of society (He 2000, pp. 58–59). During the reign of Emperor Wuzong of Tang (814–846), including the Huichang years (841–846), it was repeatedly ordered to destroy Buddha statues and to strip them of their gold ornaments. Moreover, the Japanese monk

Ennin (793–864) recorded in his travel notes, “Ennin’s Travel in T’ang China,” that in Shandong Province, he received a national decree issued by the imperial court: “the state and county department should take the gold of the world’s gold and bronze Buddha statues, and weight the gold and turn them over to the State Treasury (Ennin 2007, p. 152).” Under the strong intervention of the imperial court, gilded Buddha statues had to be stripped of their gold, weighed, and handed over to the State Treasury. As a rare and precious metal resource in the social economy, gold served the functions of circulation, payment, and storage in social economic communication<sup>14</sup>. When the existing social economic order was destroyed, the ruler was bound to focus on the original, stable temple economy. The great tension of the polarization between the poor state and the rich temples led to the rulers confiscating and plundering the temple economy by invitation or forceful means, so as to use it for emergency subsidies of the government’s finances, placing labor and resources under the name of the government (Jing 2013, p. 41). In addition, the same situation also occurred in the first year of Renzong Kangding (1040) at the beginning of the Song Dynasty, when the imperial court ordered “the prohibition of Buddha statues decoration with gold leaf” (History of Song Ren Zongji, Toqto’a 1985, p. 208). Although Buddha statues in the Tang and Song dynasties were universally revered and worshipped by the world, they were still stripped of their luxurious and solemn golden skin and clothing in the face of the difficult reality. Therefore, it can be seen that technology is not an independent factor born outside of society. Technology and society interact, restrict, and develop together in the same process.

## 6. Conclusions

Gilded Buddha statues are typical examples of cultural communication and integration between different civilizations. Their emergence and spread reflect the close relationship between body decoration, technological dissemination, and religious development in the complex social and historical background of Asia. With the help of the precious material medium of gold, Buddhism not only constructed the ideal paradise but also shaped and decorated the skin of various Buddha statues in reality. Gandhara was not only one of the birthplaces of the early Buddha statues but also took the lead in decorating them with precious and easily malleable gold. In this case, it made this the fixed and standard paradigm for Buddha decorations in all Buddhist traditions. Thanks to the universal recognition of the value of gold in human society, the gilded statues of the Buddha that originated in Gandhara were powerfully spread across Asia. Consequently, the gilded statues of the Buddha strengthened the communication between regions, being endowed with multi-level connotations such as craft, culture, and religion in the process of transmission.

With the spread of Buddhism to the east, gilded Buddha statues also actively absorbed and influenced the gold technologies in different regions. As research has shown, this situation changed the inherent trend of the distribution, processing, and application of gold resources in traditional Chinese society. As a matter of fact, existing data show that, even though the production of gold amalgam, gold leaf, mercury gilding, and gold leaf gilding technologies all originated in China, the introduction of Buddhism and gold leaf-gilded Buddha statues from Grandhara accelerated the application of gold resources and technologies to Buddhism in China. In particular, it played an important role in promoting the production of gold leaf and gold leaf gilding technology in the Northern and Southern dynasties. This provides a double guarantee of the material and technology for the surface treatment of Buddha statues with different scales and materials. Since the Wei, Jin, Northern, and Southern dynasties, Buddhism has used the greatest volume of gold, resulting in a large amount of gold resources in society flowing to the temples, which once had an impact on the national economy at that time. The driving force behind the evolution and progress of gold technology comes from solving the problem of the rational and efficient utilization of gold materials. However, with the progress and popularization of technology, as well as the change and development of society and the economy, there

will be dislocation or even alienation between the purpose and result of technological processing, which will lead to deeper social and economic problems. The wearing and stripping of the gold costumes of ancient Chinese Buddha statues are a periodical reflection of the mutual influence and restriction between gold processing technology and social resource allocation and moral orientation.

**Author Contributions:** Conceptualization, X.L. and X.H.; methodology, X.H.; investigation, X.L.; writing—original draft preparation, X.L.; writing—review and editing, X.H.; visualization, X.L. All authors have read and agreed to the published version of the manuscript.

**Funding:** This research received no external funding.

**Institutional Review Board Statement:** Not applicable.

**Informed Consent Statement:** Not applicable.

**Data Availability Statement:** Not applicable.

**Conflicts of Interest:** The authors declare no conflict of interest.

## Notes

- <sup>1</sup> In Buddhism, it is believed that the Buddha has 32 unique features after practicing and accumulating merits, such as a fleshy bun growing on the top of his head, and a real golden body.
- <sup>2</sup> In Buddhism, it is believed that there are seven most precious treasures in the world, which are sacred things for cultivation and offering in Buddhism.
- <sup>3</sup> Mount Sumeru is the highest sacred mountain in Buddhism, Jainism, and Hindu Cosmology, where the Hindu gods reside.
- <sup>4</sup> The Dirghagama-sutra is one of the four basic classics of the early Buddhist Agama Sutra, and it is named as such because of its length.
- <sup>5</sup> Brahma and Indra were originally Hindu gods; they were gods that appeared after being deified, and were later absorbed by Buddhism.
- <sup>6</sup> [https://www.britishmuseum.org/collection/object/A\\_1900-0209-1](https://www.britishmuseum.org/collection/object/A_1900-0209-1).
- <sup>7</sup> Buddhas in the Ten Directions are innumerable worlds in the ten directions of the dharmadhatu of Buddhism, and each world has a Buddha, which is the general name for all Buddhas. Buddhas of the Three Times (tryadhva-buddhāḥ): refers to the Buddha who has attained enlightenment in the past, present and future in Buddhism. Nirmāna-buddha is the changing body of the Buddha, who desire to help all living beings and manifest himself by enlightenment.
- <sup>8</sup> <http://www.szmuseum.com/GoldShow/Appreciation/gjpxs?page=4>.
- <sup>9</sup> <https://collections.asianart.org/collection/seated-buddha-dated-338/>.
- <sup>10</sup> Human body ornaments are general expressions of all kinds of ornaments worn on different parts of the body. These ornaments include men's belts and swords, as well as women's hairpins, bracelets, buttons, etc.
- <sup>11</sup> [https://www.ahbbmuseum.com/?list\\_21/128.html](https://www.ahbbmuseum.com/?list_21/128.html).
- <sup>12</sup> Calligraphy rubbing is the technique of using a dye to reproduce text or graphics on a hard surface on easily portable paper.
- <sup>13</sup> Multi-layer hammering is the main processing form of gold leaf mass production. This method uses Wujin paper to layer and protect the gold leaf, and effectively improves the quality and efficiency of gold leaf production through regular pounding.
- <sup>14</sup> Since ancient Chinese, people have planned to store gold. These stores of gold included different forms of objects such as utensils, jewelries and curries. 'storage' means that gold is wealth. Through the means of storage, it could protect its relatively stable economic benefits.

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