




The Archaeological Excavation of the Cultural Connotation and Artistic Modeling of Shadow Puppetry in the Han Dynasty and the Enlightenment to the Development of Cultural and Creative Products in Henan

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ABSTRACT

In order to explore the cultural connotation, artistic value and intangible cultural heritage role of shadow puppetry, this paper takes shadow puppetry in the Han Dynasty as the research object and uses modern testing tools to conduct research. First of all, the structure, shape, and material of shadow puppetry were observed with an electron microscope, and relevant literature was collected to classify shadow puppetry and find out the origin of its development. In addition, the mechanical balance software and infrared scanning equipment are used to test the overall structure and shape of the shadow puppet, and explore its archaeological value. The results show that the shadow puppets of the Han Dynasty were mainly made of pig skin, and the dyeing materials were iron sulfate, zinc oxide, iron oxide, and alum. The center of gravity of shadow puppetry is $1/3$ and $2/3$, which is convenient for the performance of opera, and the movements of shadow puppet play are mainly swaying up and down and moving forward left and right, but the modeling characteristics are obvious, which can enhance the vividness of the opera. Therefore, the shadow puppetry of the Han Dynasty can promote the development of Henan's cultural heritage products and enrich its cultural connotation.

Keywords: Han Dynasty, Shadow Puppetry, Artistic Modeling, Characteristics, Intangible Cultural Heritage Products.

INTRODUCTION

The Han Dynasty (202 BC~220 AC) was the main stage in the development of shadow puppetry, which has the national characteristics of classical Chinese and is a collection of traditional Chinese opera forms. Shadow puppetry originated in the Western Han Dynasty (202 BC~8 AC), which has a long history and profound cultural connotations. For the origin and development history of shadow puppetry in the Han Dynasty, it is necessary to understand clearly; specifically, it is divided into these stages: first, the origin stage (Arps, 2019; Hundorova, 2021). This stage was during the early Han Dynasty. The earliest shadow puppetry in the Han Dynasty can be traced back to the early Han Dynasty (206~8 BC). According to relevant historical records, at that time, people in the Han Dynasty would use animal skins, paper, etc., to make shadows, and at the same time display them under the light source, so as to achieve entertainment purposes, or to spread stories (Azarm, 2023; Li & Cao, 2021). This ancient form made the shadow puppet play at that time very simple to organize, so it belonged to a very simple and operable shadow performance at that time, and did not form a fixed script and role. Second, the initial stage of development. This stage is in the Western Han Dynasty (8 BC~25 AC). With the development and progress of society and culture, coupled with the continuous enrichment of art forms, shadow puppetry began to become richer at that time, especially when it began to have fixed scripts, roles, performance skills, etc (Bernáth, Blahó,

Egri, András & Horváth, 2013; Lurie & Mashevskaya, 2023). During this period, shadow puppetry gradually became popular among the people and was officially recorded in history books. Third, the stage of prosperity and development. This period coincided with the Eastern Han Dynasty (25~220 AC), during which shadow puppetry flourished during the Han Dynasty, and at the same time, it became a popular traditional art form among the people, and was occasionally cited in the court and aristocracy. During this period, the shadow puppet theater of the Han Dynasty was extremely rich in scripts, and the characters were extremely distinct, and the performance skills were more and more perfect. At the same time, with the economic and cultural prosperity of the society, shadow puppetry has also begun to be more widely disseminated and promoted. After the end of the Han Dynasty, shadow puppetry also gradually declined, which will not be discussed here. Although shadow puppetry in the Han Dynasty gradually declined in later times, some still insist on protecting and inheriting this tradition, which is also why it can be excavated, inherited and developed to a certain extent in later eras. As one of China's ancient cultural heritages, the origin and development of shadow puppetry in the Han Dynasty has gone through many stages and gained many audiences, becoming a part of China's excellent traditional culture. Its forms of expression are diverse, and its connotation is extremely profound, which has a certain influence on Chinese traditional culture and the culture and art of later generations. In short, the shadow puppetry of the Han Dynasty is the common wealth of mankind, which is worthy of in-depth excavation and research (Bazheir, 2023; Sabirli, 2021). As one of the important parts of China's intangible cultural heritage, shadow puppetry in the Han Dynasty has a long history and profound artistic and cultural value and charm. In the current social environment, it is necessary to consider how to better inherit the Han Dynasty shadow puppetry to develop this traditional art form. Based on this, this paper aims to explore the artistic, cultural and commercial potential of shadow puppetry in the Han Dynasty and its specific application in the design of cultural and creative products of Henan cultural heritage. Combining traditional culture and modern aesthetics is necessary to use the artistic modeling characteristics and cultural connotation of Han Dynasty shadow puppetry to carry out a new design of Henan's cultural and creative products, and inject new vitality into the development of Henan's characteristic culture. Based on this, this paper focuses on the topic of "The Cultural Connotation of Han Dynasty Shadow Puppetry, the Archaeological Excavation of Artistic Modeling, and the Enlightenment to the Development of Cultural and Creative Products of Henan Heritage". Finally, this paper concludes that the intangible cultural heritage products with the cultural connotation and artistic modeling characteristics of Han Dynasty shadow puppetry can be created by combining Henan's regional characteristics, consumer needs, modern elements and other concepts, so as to better develop Han Dynasty shadow puppetry and better protect and inherit it.

LITERATURE REVIEW

Archaeological Excavation of Han Dynasty shadow Puppetry

The Han Dynasty shadow puppetry is an important part of intangible cultural heritage, with a relatively profound connotation. The unique shape of shadow puppetry has rich archaeological inspiration and materials. Shadow puppetry inherits historical and cultural information as well as the cultural value of the Han Dynasty. Through archaeological excavation, we can understand the customs, religious beliefs, and stories passed down among the people at that time. These are the external characteristics and unique artistic varieties of Han Dynasty folk arts, crafts, and operas, reflecting the unique spiritual values, thinking patterns, and cultural consciousness of ancient China. The content of Han Dynasty shadow puppetry mainly includes characters, animal scenery, and enhances its three-dimensional sense and vividness through lectures and other forms. Under the operation of artists, the story content of the Han Dynasty is displayed. Due to its flexible shape and varied movements, people can feel a tension of Han Dynasty opera. In the divination of Han Dynasty archaeology, There is a significant similarity between its pattern and the patterns and character designs in shadow puppetry, reflecting the profound cultural significance of the Han Dynasty. Effective excavation and identification of Han Dynasty shadow puppetry can be achieved through archaeological methods to determine the material, shape, color, and artistic value of the shadow puppetry. It can provide necessary materials and support for modern archaeological excavations, and also verify the descriptions of shadow puppetry in ancient books, providing reference value for modern archaeology.

The Influence of Shadow Puppetry on Modern Artistic Creation

Shadow puppetry can effectively showcase the content of Han Dynasty culture throughout the entire artistic process, and can be constructed with modern art and traditional culture. Through measurement and analysis, as well as appropriate construction, it can be applied to real-life clothing and household items. For example, the copy of shadow puppetry can showcase the traditional charm and fashion value of traditional opera. Through the expression of color, it has folk ideas and can enhance consumers' attention to the design of goods. Considering its material application, it can display the original connotation and content, better reflect the artistic characteristics

of shadow puppetry, and provide support for modern art design, analysis, and determination. At the same time, it can integrate the bottleneck period with modern art products. Through its virtual reality technology, modern people can feel the charm of Han Dynasty shadow puppetry, And apply virtual technology to achieve virtual display to explore the art and culture of shadow puppetry, and apply the integrity of shadow puppetry to modern design and analysis.

METHODOLOGY

Research Methodology

In this paper, the Han Dynasty shadow puppet play is used as a research study, with the help of an electron microscope (frequency: 1Hz, multiple: 2~5.5 times, imaging: 3 dimensions, transmission quality: 4K, Guangdong, Dongguan), strength tester (electronic scale: 1.5Kg, left and right balance: matrix 4×4, Guangdong, Dongguan), infrared scanner (2Hz, 20~45°, Guangdong, Dongguan). The test indicators are: modeling, dyeing, material, mechanical balance, etc.

Materials and Structures

Comparing the materials of shadow puppetry, it is found that the materials are less, the production steps are complex, and the dyeing materials are single, as shown in Table 1.

Table 1. Materials and Structures

Time	Material	Stain	Structure	Barycenter	Change Direction	Hardness
Western han dynasty(202 BC~8 AM)	Cowhide, sheepskin, other skins	Charcoal, alum, zinc oxide	Head, body, limbs	1/2	Up and down, front and back	1~2Hb
Eastern han dynasty(25~220 AM)	Pigskin, cowhide	Iron oxide, iron sulfate, iron hydroxide, alum, zinc oxide	Head, eyes, body, back, limbs, hands, feet	1/3、 2/3	Up and down, front and back	2~4Hb

From the analysis of the materials in Table 1, it is found that in the Western Han Dynasty (202 BC~8 AC), the dyeing method of shadow puppetry was relatively simple, mainly dyeing with alum, and then coloring with carbon, and applying zinc oxide to maintain the overall shape of the shadow puppet to prevent it from deforming, and the structure of your head, limbs and torso is the main, and the center of gravity is mainly 1/2. In the Eastern Han Dynasty, the material of shadow puppetry changed, its material was mainly pigskin and cowhide, and the dyeing material increased iron oxide, iron sulfate and iron hydroxide, and its structure became complex, increasing hands, feet and other parts, the center of gravity was at 1/3, 2/3, and its movements were more flexible. Shadow puppetry in the Han Dynasty had a certain status in the society at that time and played a variety of roles. First, entertainment and cultural dissemination. In the Han Dynasty, shadow puppetry was widely used, especially in entertainment and cultural dissemination, and had great influence. At that time, they would enjoy the joy and fun brought by artistic performances by watching Han Dynasty shadow puppet plays, convey positive cultural values, and complete moral education through storylines and character images. In the Han Dynasty, shadow puppetry was also often used in religious ceremonies and sacrificial activities. For example, shadow puppet performances were used to express reverence for the gods and ancestors, and at the same time, this art form was used for religious ceremonies. In the society of the Han Dynasty, shadow puppetry needed to undertake a certain amount of social education and moral enlightenment education. Through the presentation of various characters and storylines in shadow puppetry, positive values, moral principles, historical knowledge, etc. can be conveyed to the audience. As a traditional folk art form, shadow puppetry promoted cultural exchanges and interactions among the people in the Han Dynasty. Whether you are in a city or a rural area, you can enjoy shadow puppetry to enhance communication and understanding with each other (Cavalli, 2022; Yang, 2021). The Han Dynasty shadow puppet theater contributed to the artistic innovation and further development of performance techniques at that time. In the Eastern Han Dynasty, shadow puppet actors began to improve their performance skills and strive to promote the perfection of the plot, which required its structure to be more complex and the movements more flexible, so the structure changed. At the same time, new artistic techniques are explored to make the artistic style of shadow puppetry more diverse, but the quality requirements for shadow puppetry are also improved, and its hardness is required to increase. In the Han Dynasty, shadow puppetry was regarded as very important, and it played a great role in entertainment, religion, cultural exchange, social education, etc., so its material and

structure also changed, as shown in [Figure 1](#).

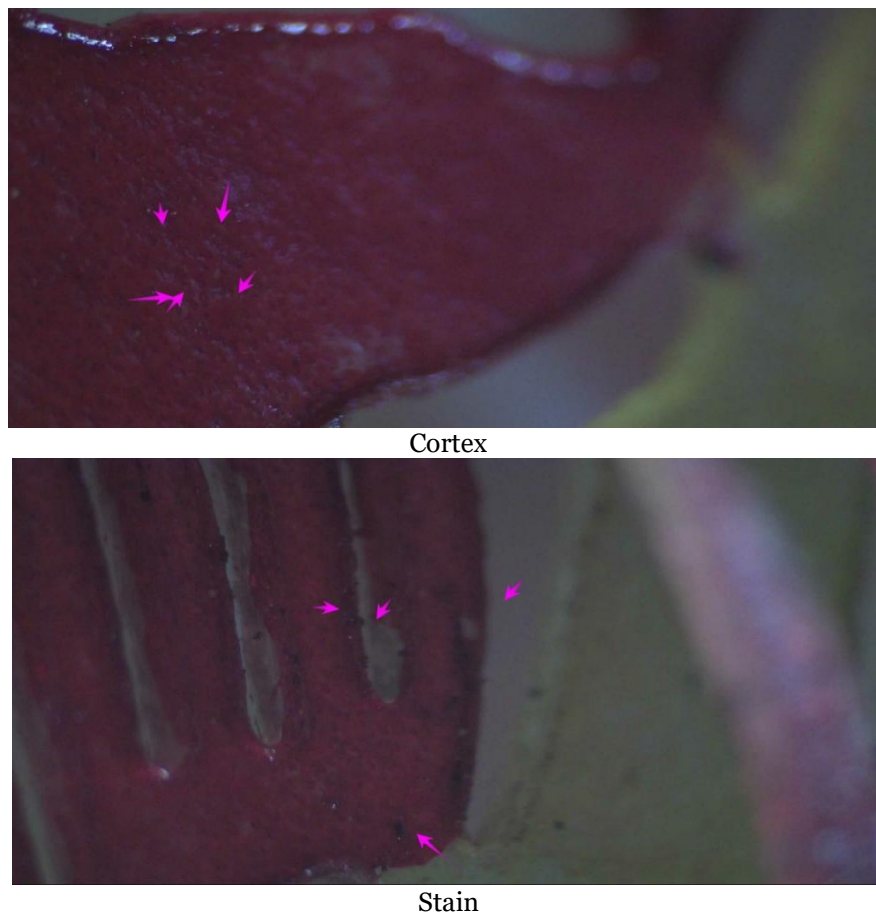


Figure 1. Shadow Puppet Observation of Pigskin

As can be seen from [Figure 1](#), in the Eastern Han Dynasty (25~220 AC), the manufacture of shadow puppets made of pig skin materials has large pores, which can maintain the overall stability of shadow puppetry, and can reduce the weight of shadow puppetry. Shadow puppet figures from archaeological excavations. In many Han Dynasty tombs, archaeologists have found some shadow puppet figures made of animal skins and paper. Shadow puppet figures may have been necessary props for performances, and they were able to show the original artistic form of the Han Dynasty's shadow puppetry (Chao, 2019; Sen, 2023). Second, lamps and lighting equipment. From the archaeology, many lamps and lanterns related to shadow puppetry, as well as lighting equipment, have been excavated. The relics were an important tool used to illuminate and project shadow puppets at the time. Through the excavation of cultural relics, clues can be found about the stage performance environment at that time. In many Han Dynasty terracotta figurines and pottery sculptures, it was also found that there were some shapes related to the Han Dynasty, such as shadow puppetry. Some of the terracotta figurines or figurines depict details such as the wear and hair ornaments worn by Han Dynasty people during shadow puppet performances. In the murals and stone carvings of the tombs of the Han Dynasty, you can also witness some shadow puppet scenes, character images, etc (Huang et al., 2015). Murals and stone carvings can provide information about the art form of shadow puppetry and its status in social life. Fifth, books and literature. In addition to the physical relics, many Han Dynasty books and documents also record the performance form and plot of the shadow puppet show at that time, so you can have an in-depth understanding of the shadow puppet show at that time. Based on the relics or cultural relics related to Han Dynasty shadow puppetry found in archaeological excavations, we can better understand the role of Han Dynasty shadow puppetry in the life of the Han Dynasty, and at the same time, we can also understand its art form and technical characteristics.

The Shape and Center of Gravity of the Shadow Puppet

Comparing the shape of the Han Dynasty shadow puppet, it will be found that simple and smooth lines dominate the shape, the overall shape is vivid, and the center of gravity is located at $1/3$ and $2/3$, as shown in [Figure 2](#).



Body Styling



Head Styling

Figure 2. Shadow Puppet Modeling

As can be seen from Figure 2, the microscopic observation results in Figure 2 show it. Auspicious cloud patterns dominate the overall shape of the shadow puppet show. You use a streamlined line design. Moreover, the shadow puppet is in the form of hollowing, so as to reduce the quality of the shadow puppet. Preventing the shadow puppet from changing its shape, you also increase its flexibility, and the overall line structure is shown in Figure 3.

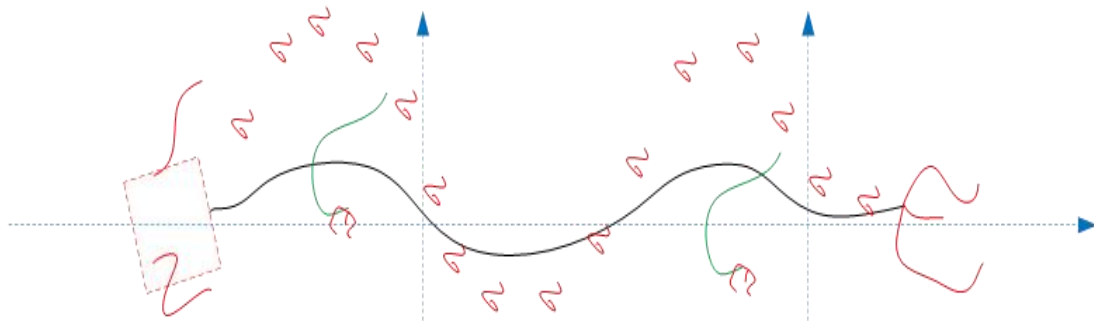


Figure 3. Stick Figure of a Dragon

As can be seen from Figure 3, the shape of the shadow puppet play is rough, and auspicious cloud patterns dominate the lines, and the stability of the overall structure is good. During the Eastern Han Dynasty (25~220 AC), shadow puppetry had many different stories and special forms of expression, which could reflect its cultural connotation. Han Dynasty shadow puppetry featured a variety of story themes, such as myths, legends and

folklore, historical stories, and opera scripts. The more common story themes include "Journey to the West", "Romance of the Three Kingdoms" and "Dream of Red Mansions", etc., as well as many fables and moral satirical stories, so the plot is complex and needs to be supported by stable shadow puppetry. In the Han Dynasty, there were many different characters, and generally speaking, their character settings would include positive heroes and villains, as well as a variety of interesting characters, which were often more vivid, three-dimensional, and highly entertaining. At the same time, some of the more common characters in the Han Dynasty shadow puppet theater include different classifications such as kings, monsters, fairies, generals, etc., each type of character will have its own personality traits, and have its own uniqueness, and at the same time, will also have its own performance style. Third, the form of expression. In the Han Dynasty, shadow puppetry would be made through lighting and using tools such as film, so the shape of the shadow puppet should be vivid and easy to identify. The actor needs to manipulate the shadow puppet characters through techniques, and use the white screen, sound effects and music rhythm to show different plots and scenes. At the same time, actors need to use various techniques such as voice changes and facial expressions to complete the shaping of the character image. Fourth, musical accompaniment. Shadow puppetry in the Han Dynasty generally played a certain role with music's rhythm and sound effects. Music enhances the mood and induces the mood of the characters, and at the same time, it is consistent with the content of the performance, making the performance more vivid. The stage set of the Han Dynasty (202 BC~220 AC) shadow puppet show is very simple and has a good imagination. During the Eastern Han Dynasty (25~220 AC), it adopted a simple, delicate and artistic set design. Through lighting effects and props, different scene backgrounds are displayed on the white screen, and at the same time, a stage space with a strong sense of three-dimensionality and richness is shown to the audience (Jia & Wang, 2022; Miscali, 2017). In conclusion, the traditional stories of Han Dynasty shadow puppetry are very diverse and cover a variety of classic themes and characters. At the same time, its performance forms are diverse, and various performance forms cooperate with each other, so as to achieve a good stage effect. Together, the elements constituted the charm of the Han Dynasty shadow puppetry, and made the Han Dynasty shadow puppet theater known as an art form that was much loved and had a profound cultural heritage at that time.

Identification of the Center of Gravity of Shadow Puppetry

The center of gravity of the shadow puppet play was identified and the position of the center of gravity was found, as shown in Figure 4.

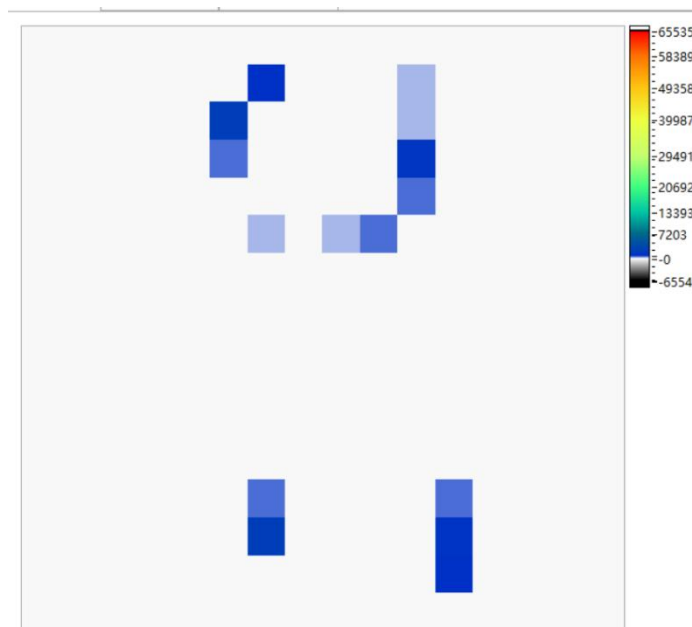


Figure 4. Pressure Distribution in Shadow Puppetry

As can be seen from Figure 4, the pressure of shadow puppetry is distributed in $1/3$ and $2/3$, and the head and feet are the main ones. The artistic modeling of the shadow puppet show is very simple and vivid. The Han Dynasty shadow puppetry figures are generally relatively concise and clear, and the lines are very smooth and have clear outlines. At the same time, it can also vividly show the personality traits and emotional changes of various characters, so it is necessary to clarify the focus point to be more flexible display. In the Han Dynasty, shadow puppetry was used to highlight the figure, generally through vivid colors and strong contrasts. Depending

on the character's personality and the characteristics of each character, the color of the head and feet is used. In this way, the identity and emotional performance of the character can be better reflected. The clarity of the center of gravity can better display the artistic modeling characteristics of the Han Dynasty shadow puppetry, including the exaggerated costumes of the characters, which can make the range of action and artistic tension better expressed, so as to attract the audience's attention. Fourth, the details are very delicate and expressive. Although the characters of the Han Dynasty shadow puppet show are very simple, they are very delicate and expressive in terms of details. For example, the characters' facial expressions and gestures, including the costumes' details, can reflect the character's personality and emotional state, so that the audience can have a sense of immersion and feel the lifelike character. In the Han Dynasty, the actors of shadow puppetry needed to operate the shadow puppets behind the curtain. In the process of operation, they will use many different techniques to show the audience different plots and scenes. Among them, the clarity of the center of gravity can better reflect the movements of the shadow puppet play, and the combination of various techniques such as manual operation and sound effects, the actors will make the shadow puppet characters come to life (Karpuyuk & Kulishova, 2022), and at the same time, become very energetic, can really move, so as to achieve a good performance effect. In short, the artistic modeling of shadow puppetry in the Han Dynasty is characterized by extreme simplicity, vividness, exaggeration, and very distinctive characteristics. Let the Han Dynasty shadow puppet show have a unique visual charm, and through exquisite skills, to show an extraordinary, colorful image and a rich story scene. Based on this, the shadow puppetry of the Han Dynasty was welcomed by the people at that time and has been passed down. Infrared scanning of the center of gravity of the shadow puppet show that the center of gravity is located at the junction of the body, and $1/3$ and $2/3$ are the important junctions of the head and body, so the characters can be better displayed, as shown in Figure 5.

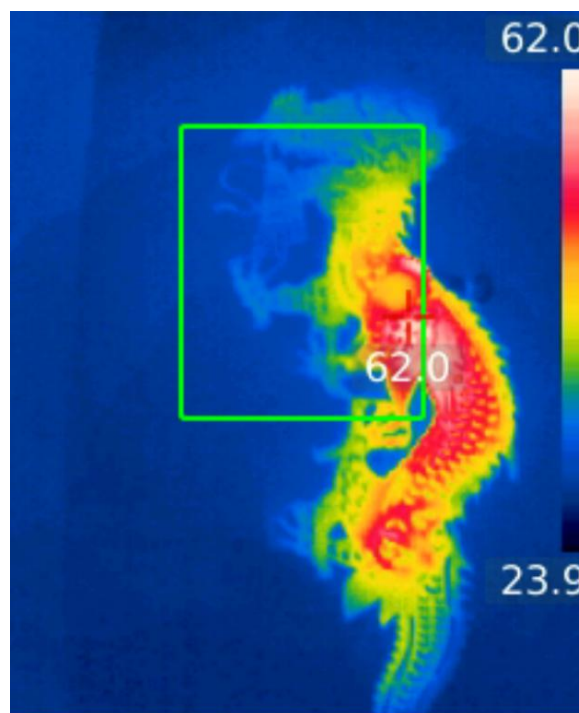


Figure 5. The Center of Gravity of Shadow Puppetry

As can be seen from Figure 5, the infrared scan of the shadow puppet show that the center of gravity is located in the middle of the body and is connected to the limbs. The position of the center of gravity of the shadow puppet is determined, which is related to its development. In the early Han Dynasty, the Han Dynasty shadow puppet theater began to take shape and was recognized, and the shadow puppet structure was simple. Han Dynasty shadow puppetry is just a simple form of using shadow effects. With the passage of time, shadow puppetry has become an art form that requires scripts, characters, and performance skills (Lawtoo, 2021; Liang, Dong, Pan & Zheng, 2023). From some relics and cultural relics found in archaeology, it can be seen that the society at that time had been very recognized for shadow puppetry, so its early center of gravity structure was determined. In the Han Dynasty, shadow puppetry was often performed in temples, folk ceremonies, or court venues. From archaeological excavations, you can also find many settings related to the place, such as stage sets and lamps, etc., which can help you understand and understand the scene of the shadow puppet performance at that time, so the shadow puppet shape is simple and easy to carry. Han Dynasty shadow puppetry often had plot

themes such as myths and legends, folk tales (legends), and historical stories. After archaeology, it was found that during the Eastern Han Dynasty (25~220 AC), terracotta figurines and murals depicted different shadow puppet images and storylines, so it can reflect the high attention to character building and plot setting at that time, and the simple center of gravity structure can better display the content of shadow puppetry.

DISCUSSION

Enhance the Cultural Connotation of Intangible Cultural Heritage Products in the Han Dynasty

Draw on historical and cultural traditions, and tap intangible cultural heritage resources in order to enhance value. Henan Province is a region responsible for historical and cultural inheritance in China, and there are a lot of intangible cultural heritage and resources in this region. Henan cultural heritage resources can be carefully excavated and protected, so as to better develop cultural and creative products, and based on the inspiration and materials obtained from it, to achieve the purpose of inheriting and promoting local traditional culture. Secondly, combine modern scientific and technological innovation and increase the added value of products. In the process of developing Henan cultural and creative products, modern scientific and technological innovation can be used, and various technical means such as digitalization and intelligence can be used to improve the added value of products. For example, virtual reality technology displays intangible cultural heritage traditional crafts and innovative products with a strong sense of design technology. Thirdly, pay attention to design and quality improvement, and create a unique brand image. In the process of developing Henan cultural and creative products, attention is paid to the improvement of design and quality. Through cooperation with designers and continuous strengthening of process training, etc., we can create a unique brand image and high-quality products to improve our brand competitiveness. In addition, in the process of marketing, it is necessary to highlight regional characteristics and cultural connotations. Henan is a region with a very rich historical and cultural heritage, so when carrying out marketing activities, it is necessary to highlight its regional characteristics and profound cultural connotations to achieve better development results. At the same time, you can also use various methods such as storytelling marketing and local characteristic packaging to attract consumers' attention. In addition, various partnerships have been established upstream and downstream of the industrial chain, and Henan cultural heritage products have been actively developed. In short, it is necessary to use the resources of various partners to form a perfect industrial chain. To this end, we can also establish close cooperative relations with local craftsmen, manufacturers, designers, etc., and promote industrial development together in upstream and downstream links. Moreover, it is necessary to promote industrial development with the support of government departments. For example, the relevant preferential policies or support brought by the government are used to promote the development and development of Henan's cultural and creative products. In addition, related activities can also be organized to promote the further development of the intangible cultural heritage industry. Finally, we should pay attention to the cultivation and inheritance of talents. Promote the further development of Henan's cultural and creative products. For this reason, human resources are particularly important. Based on this, it is necessary to strengthen efforts to cultivate as many talents as possible who master the traditional crafts and skills of intangible cultural heritage, and cultivate talents with a sense of innovation in intangible cultural heritage among the new generation of talents. In short, based on the strategy, it can better promote the development of Henan's cultural and creative products, provide effective guidance for the further development of related fields, and promote the combined development of local cultural traditions and modern economy.

Enrich the Shape and Color of Intangible Cultural Heritage Products

The characters of the Han Dynasty (202 BC~220 AC) shadow puppet play are generally very simple and clear, with smooth lines and clear outlines, which can vividly express each character's personality traits and emotional changes. Moreover, in line with the characters' plastic art characteristics, the Han Dynasty shadow puppet theater will exaggerate the characters' characteristics and emotional states to make the characters more dramatic and expressive. Han Dynasty shadow puppetry often used bright colors to show the characters' differences, to strengthen the overall visual effect. Moreover, in the Han Dynasty, shadow puppetry would use color to better show the tension of the characters according to their identities and symbolic meanings such as personalities and fates: motor performance and facial expressions. In Han Dynasty shadow puppetry, the characters were performed with exaggerated movements and vivid gestures to attract attention and convey the emotions of the characters. For facial expressions, exaggerated treatment will also be made according to reality, and the characters' inner world will be shown through mouth and eye details. In order to be able to combine the characteristics of the times with the significance of modern innovation, Henan cultural and creative products that are more in line with the needs of modern people can be designed. Han Dynasty shadow puppetry has a unique

literary connotation and modeling characteristics, which can be combined with content to create cultural and creative products with the characteristics of Han Dynasty shadow puppetry. Many of the tools and equipment excavated from the archaeological excavations are related to the performance of shadow puppetry, which can reflect the actual performance of shadow puppet performers at that time, and require some auxiliary tools and certain skills. Color and structure are the result of the development of shadow puppetry in the Han Dynasty, and have been inherited and developed to a certain extent. Through the analysis of the relevant cultural relics and books excavated from the tombs of the Han Dynasty, it can be inferred that in the society at that time, the shadow puppetry of the Han Dynasty has always had a certain symbol. Not only is it a simple form of entertainment, but at the same time, it carries a lot of different functions. For example, the function of religious belief and moral education. Through the excavation of the relevant relics and cultural relics in the Han Dynasty shadow puppetry, and the in-depth analysis and research of them, we can understand the development of the Han Dynasty shadow puppet play and some related historical details. At the same time, it reveals its position and role in the social life of the Han Dynasty, and promotes the development of Henan's cultural and creative products characters of the Han Dynasty shadow puppet show are relatively simple and vivid, so in the process of design, designers can learn from this feature and shape the product image through smooth lines and clear outlines, so that the product image is more dramatic and expressive. At the same time, in terms of the expressions and facial characteristics of the characters, designers can also learn from the expressions and emotional states of the characters in the Han Dynasty shadow puppetry to make the products more vivid and personal. Designers can combine the actual situation, through bright colors and contrasts, so that there is a major and secondary display between each part to improve the visuality. Alternatively, the main part can be treated with brighter colors to attract the eye. In terms of symbolic meaning, designers can also integrate the meaning and connotation of various colors into the product to make their product image richer and more connotative. It can be combined with some common pattern elements and decorative styles of shadow puppetry in the Han Dynasty to integrate some traditional elements into the product design to show the significance of cultural inheritance. In addition, designers can also integrate modern elements and fashion trends into Henan cultural heritage products, so that the image of the product not only has rich cultural heritage, but also meets the current aesthetic standards. Fourth, three-dimensional sense and detail processing. Strong three-dimensional design techniques make the image of Henan cultural heritage products more lifelike and three-dimensional. In terms of details, the design should also combine the character modeling, clothing, subtle expressions, etc., to add more details to it, to make the product's texture higher and improve its ornamentality.

Provide Innovative Ideas for the Development of Intangible Cultural Heritage

It can combine traditional culture and modern elements to design a unique and easily recognizable brand identity. So as to improve the public's impression of the brand. Seventh, aim at the audience's preferences and design products based on them. Designers need to combine the preferences of the target audience and the current aesthetic trends, etc., and adjust and optimize them according to the audience's needs in the design process, to ensure that the product image can attract target consumers. In this way, designers can better design products with unique style and excellent quality. At the same time, it integrates the artistic elements of the Han Dynasty, such as shadow puppetry and modern design concepts, and it shows the unique style and charm of Henan cultural and creative products, which are full of cultural connotations and artistic characteristics. In this way, more people can be attracted to buy and show off a unique visual effect. Designers can choose the more classic storylines and character settings from the Han Dynasty shadow puppet theater as inspiration for product design. Then, Henan's local historical and cultural elements are integrated, and then the storyline and character image rich in local characteristics and charm are created to create intangible cultural heritage products with strong charm. Secondly, artistic modeling and expression. Designers should learn from the Han Dynasty shadow puppet play for the artistic design of the characters, such as simple and vivid, expressive, etc., and reflect the characteristics well in the product design. And through exquisite craftsmanship and meticulous carving, to show the visual charm of the Han Dynasty shadow puppetry. Designers can excavate the cultural connotation and historical significance contained in the IP of Han Dynasty shadow puppetry, and transform it into design elements with contemporary aesthetic taste and values. In addition, it is used to create a story-rich, unique, and emotionally valuable IP image to better carry Henan's cultural heritage forward. Fourth, combine modern needs. Designers can combine the needs of modern people, such as personalization and functionality, environmental protection concepts, sustainable development, etc., to create elements that are in line with current fashion trends and lifestyles. For example, you can consider adding some intelligent technology elements, environmentally friendly material applications, etc. Fifth, reflect regional characteristics. In product design, designers can also use some elements of Henan's regional characteristics, such as architectural style, customs, traditional handicrafts, etc., to design intangible cultural heritage products, so that Henan's cultural heritage can penetrate into intangible cultural heritage products. Through this research, it can be realized that the shadow puppetry of the Han Dynasty has

profound historical and cultural value, and has a unique artistic charm, which is not only very unique, but also can bring certain enlightenment. Based on this, we can better combine modern and traditional arts, and on the basis of the intangible cultural heritage value of shadow puppetry in the Han Dynasty, combined with modern design concepts and the needs of modern people, we can develop and manufacture some intangible cultural heritage products rich in Henan's regional characteristics, modern aesthetic concepts, and traditional characteristics of shadow puppetry. In the process of designing Henan's cultural heritage products, we should also strive to inherit the essence of the artistic and cultural characteristics of Han Dynasty shadow puppetry, and better realize innovation.

CONCLUSION

Shadow puppetry is an integral part of the cultural development of the Han Dynasty (202 BC~220 AC), and its historical and cultural connotations are profound, and it has certain excavation significance. In this paper, a microscope and scanner were used to observe it. The results showed that the main materials of shadow puppetry in the Han Dynasty were pig skin, iron sulfate, zinc oxide, iron hydroxide and alum, the center of gravity was in the position of $1/3$ and $2/3$, and the hardness was $1\sim 4\text{Hb}$, and the modeling was streamlined, extensive and vivid, with obvious characteristics of the Han Dynasty. The structure of shadow puppetry is simple, mainly for the body and limbs, which was improved in the Eastern Han Dynasty (25~220 AC), and the structure gradually became complex. Therefore, the Han Dynasty shadow puppet theater has an impact on the cultural connotation development and design concept of Henan's cultural heritage products, and to better inherit the Han Dynasty shadow puppetry, a traditional cultural heritage with precious value, all parties should make active efforts to integrate the Han Dynasty culture and Henan cultural heritage products to promote the development of Henan's cultural and creative industries.

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