

The Relationship Between the Buried Environment of Chinese Cultural Relics and the State of Their Unearthed Preservation

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Abstract: In recent years, a large number of cultural relics have been unearthed in China, but the state of their preservation is not optimistic. The root cause is that cultural relics have been buried underground for nearly a thousand years, and the sudden environmental changes such as temperature, humidity, light radiation and air conditions after the excavation have broken the balance formed before, which naturally has a great impact on cultural relics. This paper mainly studies the relationship between the buried environment of Chinese cultural relics and the preservation status of excavations, emphasizes the important connection between the two, and finds some factors for the better preservation status of cultural relics unearthed. Through case analysis, comparative analysis and other research methods, this paper finds that no matter the buried environment is good or bad, the changes of the buried environment and the sudden changes of the unearthed environment are the core influences of the preservation status of cultural relics. In other words, the destruction of balance is the greatest damage to cultural relics,

Keywords: cultural relics, balance, state of preservation, burial environment, geological conditions.

1. Introduction

In the burial environment, the main factors affecting the preservation of unearthed cultural relics include: the material of cultural relics themselves, the geological conditions where the tombs are located, the burial methods of tombs, etc. [1]. Prior to this, relevant professionals carried out specific analyses on the unearthed preservation status and burial environment of some artifacts unearthed at specific sites, including soil pH, rich cation and ions, different kinds of microorganisms, soil moisture content, and local geological structure conditions. However, there has not been an overall presentation of the burial environment and the preservation status of excavations in different regions of China under different climatic conditions. Therefore, this paper aims to emphasize the important influence of different burial environments on the preservation status of unearthed cultural relics through the analysis of representative cases across China, and provide better burial environments and burial methods for reference. This paper will use case analysis, comparative analysis and other analysis methods to conduct research, so that relevant people can understand the important relationship between the buried environment of cultural relics and the unearthed preservation status, so as to

deepen their understanding of the unearthed state of cultural relics, and provide some reference significance for researchers in related fields in the future.

2. Analysis of Representative Sites in China

Geographical environment and climatic conditions are different in different parts of China, and cultural heritage is distributed in different parts of China, which means that they have different burial and excavation environments, and their preservation status will naturally vary with different burial environments and geological conditions, good or bad. In the following, the below will analyze the mummies unearthed in the ancient city of Loulan, the ivory unearthed in the Sanxingdui site, and the lotus roots and wet female corpses unearthed in the Han Dynasty tomb of Mawangdui.

2.1. Ancient city of Loulan

Located in northwest China's Xinjiang province, Loulan has a temperate continental climate with cold winters and hot summers, little precipitation, and large diurnal and annual temperature ranges. According to the scene of the restoration of farmland in Loulan Museum, it can be seen that the ancient city of Loulan a thousand years ago had both bustling farming scenes and lively market scenes. It is hard to imagine that Lop Nur is barren of grass today. According to historical records and the restoration map of the ancient city in the collection, there are small Bridges and flowing water in the city like Jiangnan, but there are Yordan landforms around it, indicating that the ecological environment is gradually becoming worse. The increasingly dry climate has also provided conditions for the discovery of thousands of well-preserved mummies in Xinjiang.

At present, the two places in the world where the mummies are unearthed the most are Egypt and Xinjiang. Xinjiang mainly extends from the present Loulan to Turpan in the north, of course, the methods of preservation of mummies in the two places are different. According to historical records, the ancient Egyptian method of mummification was to cut a slit in the body and remove all the important organs except the heart, then disinfected the body with alcohol, filled the body with multiple linen bags to restore the original shape, smearing the whole body with beeswax and sesame oil, and then soaking the body in a salt bath for a period of time to thoroughly dehydrate the body. The next step was to dry the body further in Egypt's hot, dry climate. Next, the body is wrapped in a linen bandage to allow it to continue drying, while keeping the limb intact and protected from light and insects. After some manipulation, the body's skin becomes leather-like [2]. On the other hand, the preservation of the mummies in Xinjiang is completely natural, because of the cold and dry natural environment and soft sand in the local area, which enables the mummies to be completely preserved. Extremely dry climate conditions become the major premise for the formation of ancient corpses, and the burial should be in the Gobi desert area with relatively high terrain and relatively low groundwater level, and the burial depth should be appropriate, 2-6 m away from the surface. The specific burial form also has a great impact on the formation conditions of ancient corpses. Corpses with breathable materials are placed directly in the burial chamber with only a reed mat under them, so that the dry air in circulation can quickly carry away the moisture contained in the bodies, creating favorable conditions for the formation of mummified bodies [3].

2.2. Sanxingdui Ruin Site

The ruins of Sanxingdui are located in the Chengdu Plain, known as the "heavenly house" of China. Thousands of years ago, it was also a warm and humid, prosperous place that gave birth to the mysterious Sanxingdui civilization, but it was also caused by extreme weather that led to the collapse of the Sanxingdui system. Among them, the burial and preservation situation is more annoying for experts is the unearthed ivory, because it has been buried in a stable and humid underground

environment for a long time, the moisture content of the ivory itself is high, and there are problems such as fracture and peeling itself, the unearthed ivory is very easy to lose water quickly, crack and powder damage, and because it has been completely dehydrated and very loose, it will be scattered slightly under the force. Therefore, the extraction work is also very difficult, and even the ivory of some sacrificial pits is in such poor condition that the existing protection technology cannot provide perfect protection for them, so the entire burial pits are backfilled.

The Sanxingdui site is located on a higher platform at the front of alluvial fan formed by many tributaries in the upper reaches of the Tuojiang River. According to the topography and soil detection, the underground burial environment is wet and the soil is alkaline. The wet environment will promote the corrosion of ivory, and the underground burial temperature is also high, which will not only cause the expansion and deformation of ivory, but also provide favorable survival conditions for microorganisms in the soil. The sudden change in the excavated environment, especially the room temperature, compared with the underground temperature, the sudden rise of air temperature will accelerate the rate of water loss of ivory, causing incalculable damage to ivory [4].

2.3. Mangwangdui Han Dynasty Tomb

Changsha Mawangdui is located in the subtropical monsoon climate of southern China, with a hot and rainy summer, mild and humid winter and four distinct seasons. The climate here is relatively ordinary. A moire lacquer tripod unearthed from Mawangdui Han Tomb contained lotus root soup from a thousand years ago. When the top was opened, most of the lotus roots disappeared in an instant, and then disappeared completely after being transported to the museum. According to the research, the lotus root remains intact in shape, because the tomb chamber of Mawangdui tomb is deeply buried underground, and the preservation environment after layers of sealing is comparable to that of vacuum. Although the site structure and historical records of Changsha show that there have been many earthquakes in the local area, Mawangdui is located on both sides of the area far from the active fault, so the overall tectonic movement is at most. In addition, the seismic sensation of the underground tombs is not strong, so the lotus root slices are relatively intact in a relatively stable underground burial environment, but the internal fibers have been decomposed and dissolved. The sudden changes in the environment after the excavation, the effect of light and air, and some inevitable shocks occurred during the extraction process, have broken the balance formed in the underground for more than 1,000 years, and great changes have occurred naturally. So it quickly disappeared [5].

Compared to this, the thousand years of the female body of Mawangdui is even more amazing. Throughout human history, the bodies that can be preserved for thousands of years are mainly mummies and mummies such as Xiaohu princess, and the wet body that has been buried for more than 2,000 years and can still be intact as a living body has never been seen. Mrs Xin's specially built coffin, with four layers of protective equipment alone, was worth tens of thousands of dollars to shield it from air and groundwater, so that the ancient body could survive for thousands of years. The first reason is that the burial environment is well sealed, the rammed soil layer is up to 16 meters, and the waterproof facilities are "airtight". Under the surface sealing soil is white paste mud, which has good airtightness, so the ancients often used to cut off air and water to protect the tomb. Under the white paste mud, there is also a layer of charcoal more than 40 centimeters thick, equivalent to today's desiccant. It plays the role of moisture absorption and moisture resistance, coupled with the layers of four layers of coffins and clothes and bedding, so that the body is in a completely constant temperature and humidity, extreme hypoxia or even no oxygen environment, and then after the initial erosion of bacteria, the body will completely stop rotting, and has been stationary in this fresh state. Secondly, the coffin liquid also plays a certain protective role in it, which has a small amount of cinnabar so that the color is blood-colored, there are some Chinese herbal ingredients, and a special enzyme has been tested, which can not only inhibit the growth of bacteria, but also help the body to avoid the fate of

decomposition. The addition of a variety of foreign substances has extended the fresh life of the female corpse.

3. Conclusion

This paper mainly discusses the burial environment and unearthed preservation status of some cultural relics at three typical sites. The above cases all show that the burial environment has an important impact on the unearthed preservation status of cultural relics. Whether it is dry or wet or under the influence of other geological conditions, as long as a stable environmental balance is formed within the burial system, cultural relics can survive for thousands of years. Weak geological movement and overall relative movement have little impact on the underground burial environment. Of course, special burial methods, such as layer wrapping, near-vacuum sealing and the addition of some foreign chemical components, also play a non-negligible role in the preservation of cultural relics in the underground.

This paper has not yet discussed in depth the aspects of environmental monitoring and data investigation. Later, with the support of technical conditions and teams, larger research scales can be added, such as integrated research on buried environments in special regions of the world and more case studies. A large number of real and reasonable data can be collected as auxiliary evidence to draw more scientific and accurate conclusions. To more fully understand and reveal the preservation status of cultural relics unearthed under typical geographical and climatic conditions in different regions of the world. Of course, more case analysis will make the research results more general and convincing.

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