



Comparative Study of Selected Bronze Drums Between Thailand and Southwest China

Jinxi Liu

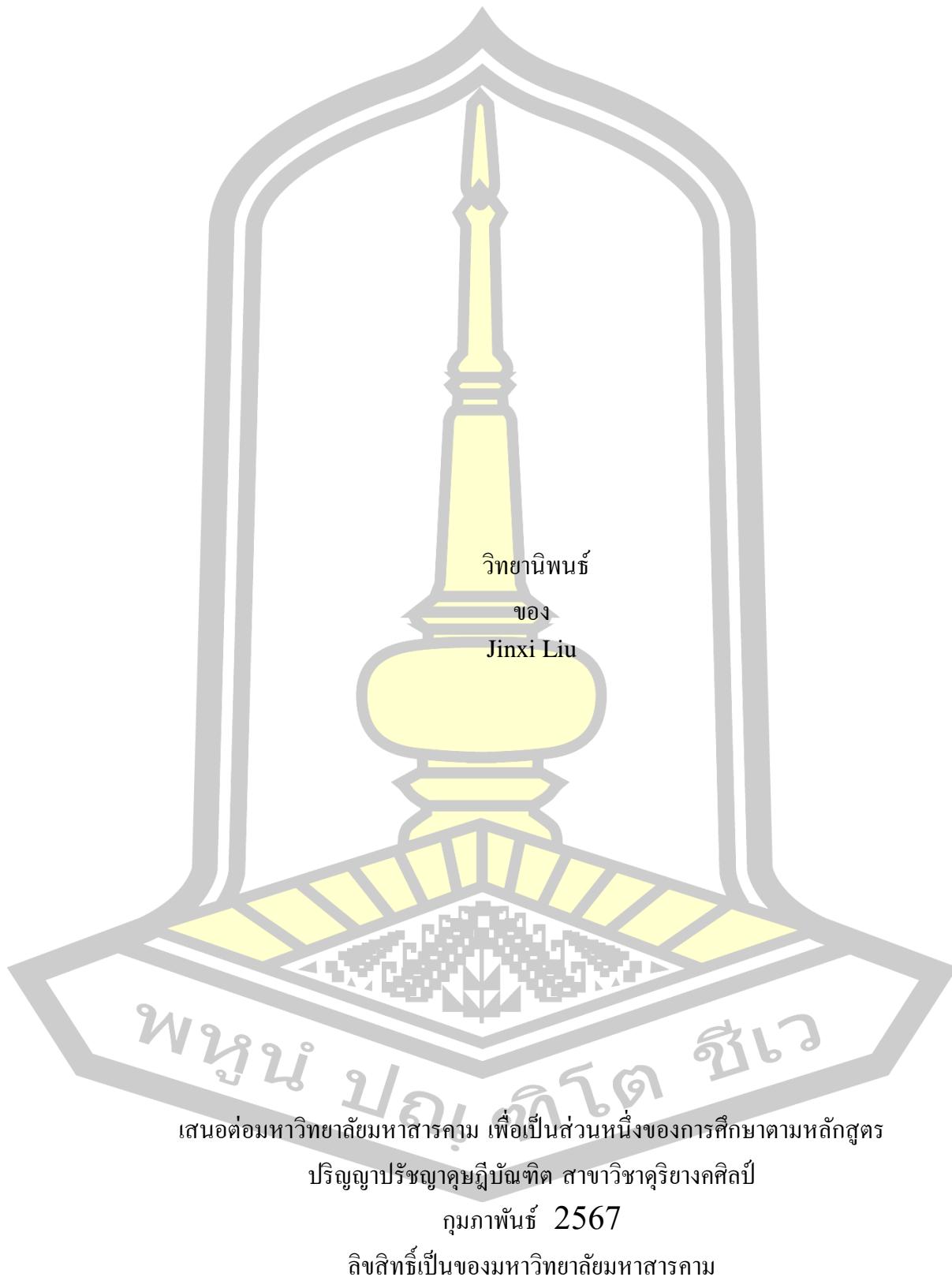
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A Thesis Submitted in Partial Fulfillment of Requirements for
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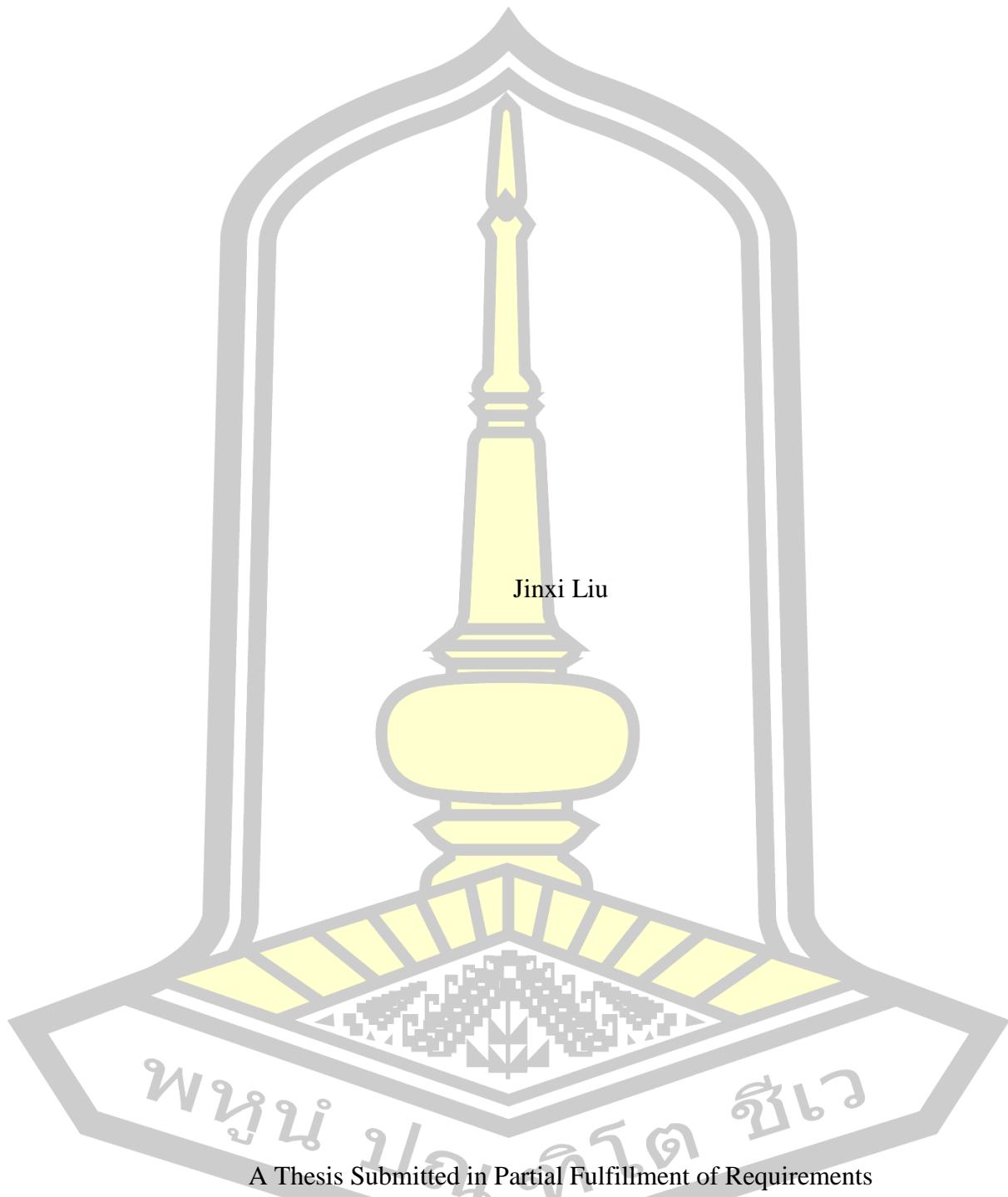
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Comparative Study of Selected Bronze Drums Between Thailand and Southwest China



A Thesis Submitted in Partial Fulfillment of Requirements
for Doctor of Philosophy (Music)

February 2024

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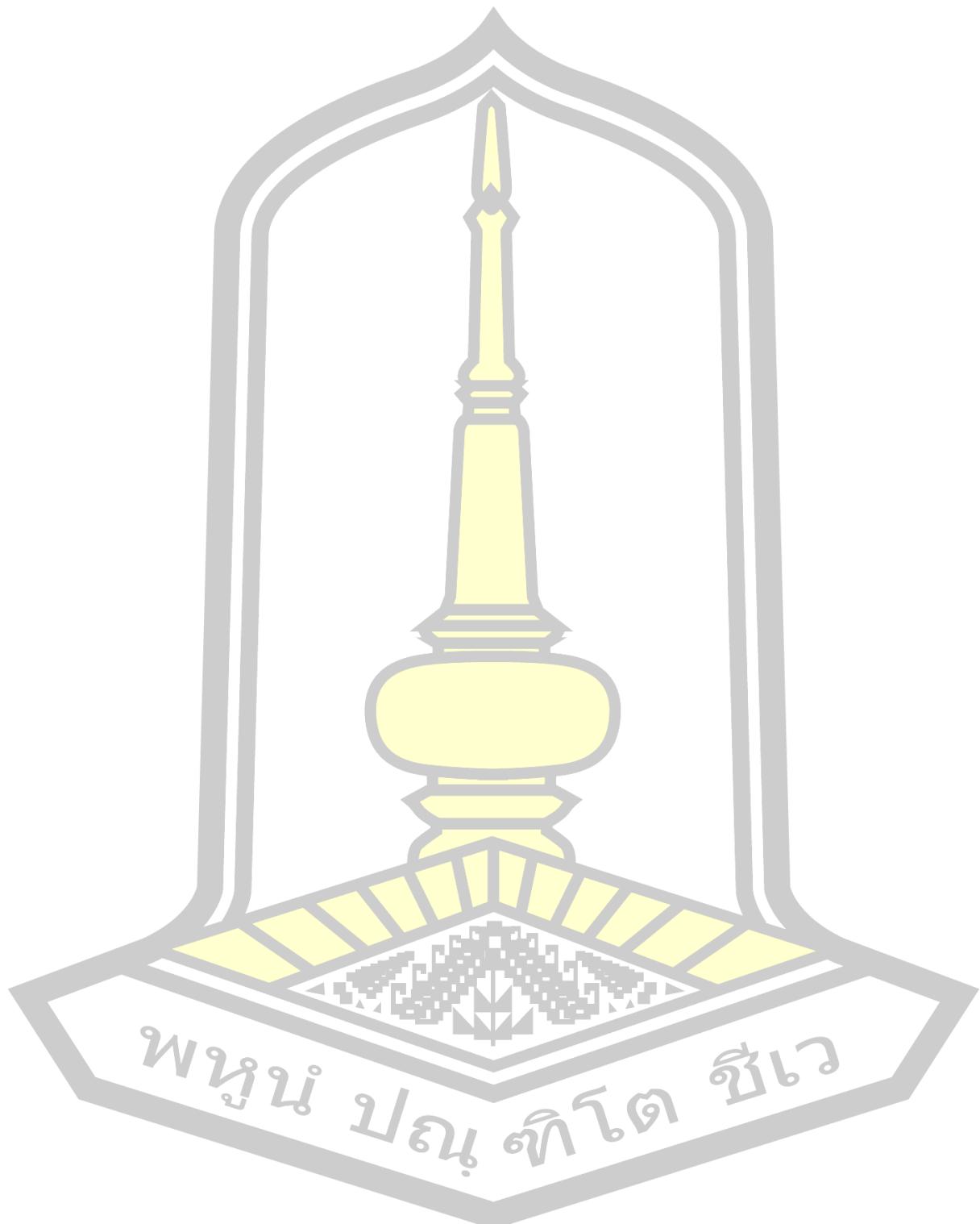
TITLE	Comparative Study of Selected Bronze Drums Between Thailand and Southwest China		
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ABSTRACT

This dissertation takes the comparative study of selected bronze drums between Thailand and Southwest China as the research topic. The objective were as follows: 1) To describe the distribution and the classification of selected bronze drums in Thailand and southwest China. 2) To compare the organological features of selected bronze drums in Thailand and southwest China. 3) To analyze characteristics of selected music examples of bronze drums in southwest China and Thailand. The research utilized document, investigation, iconography and typology forms, and questionnaires with ten key informants as research tools, the results of this research reveal the following:

1. There are Heger I and Heger III two types of bronze drums visible in Thai collections, corresponding to the types of bronze drums in southwest China, they are H_I - SZS (Shizhaishan type), H_I - LSC (Lengshuichong type), H_{III} - XM (Ximeng type) bronze drum.
2. There may be three main transmission paths of bronze drums spreads to Thailand. Most of the H_I-SZS type in southwest China looks earlier than H_I-TA type in Thailand. The H_I-LSC type looks later than H_I-TB type bronze drum or two different paths of development. There is little difference between H_{III}-XM in southwest China and H_{III}-TC in Thailand.
3. There are changes in function and musical performance characteristics of each of the five periods. The ancient bronze drum in southwest China has gone through a long development process from musical instrument to national importance instrument to ritual instrument to sacred instrument. The ancient bronze drums in Thailand migrated and settled with their owners. After a period of glory and silence, it finally followed the Tai people and continued to be a national importance instrument ritual instrument and musical instrument in the imperial court for thousands of years. In modern times, bronze drums in Thailand pay more attention to their symbolic meaning of worshiping and connecting deities, but in southwest China are mostly used in folk festivals and ceremonies. Musical performance characteristics are different.

Keyword : Select bronze drums, Southwest China, Thailand, Comparative



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The smooth writing of the dissertation is inseparable from the large amount of research results accumulated by previous scholars. Therefore, the researcher would like to express my sincere respect to the archaeologists and researchers in the references.

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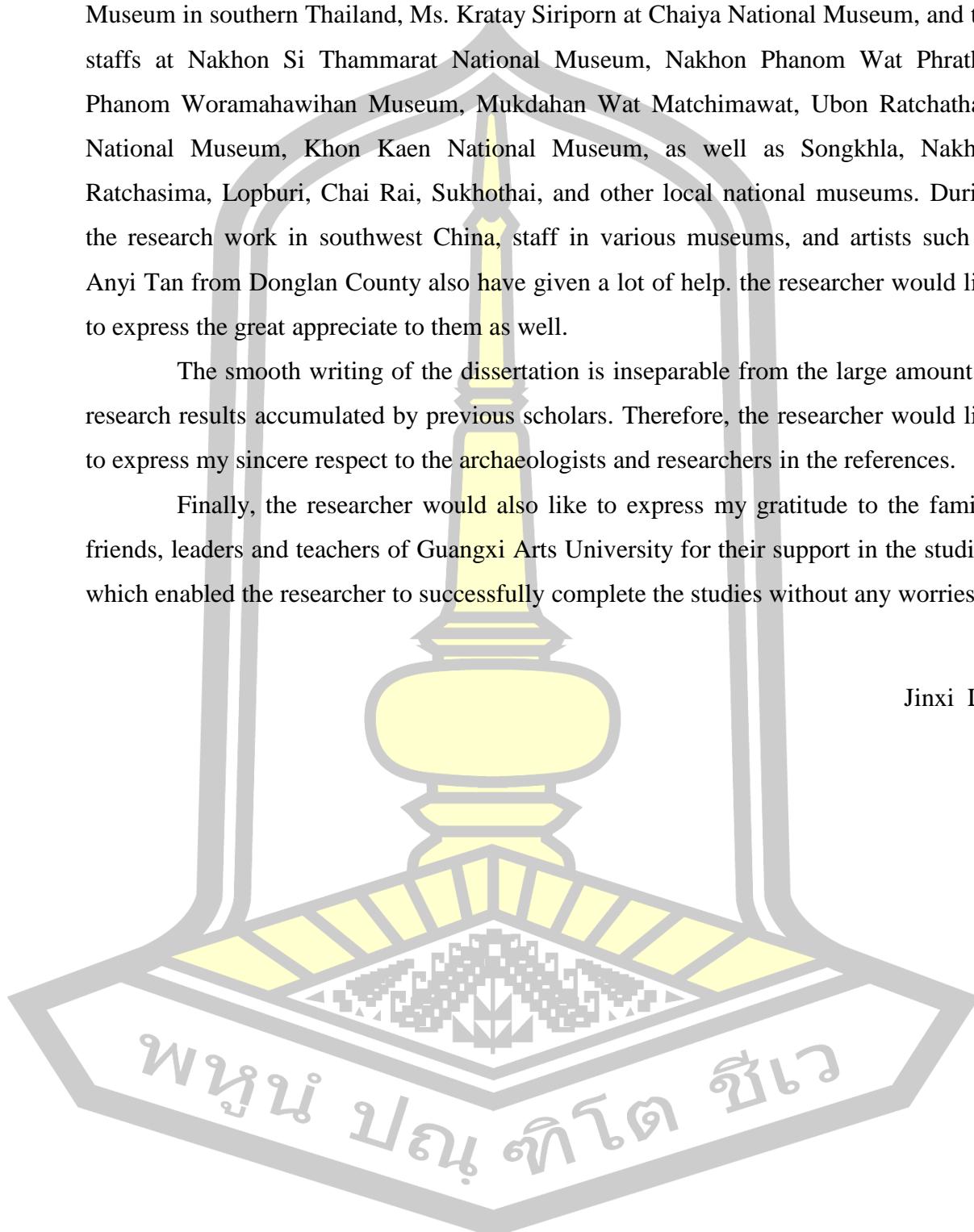


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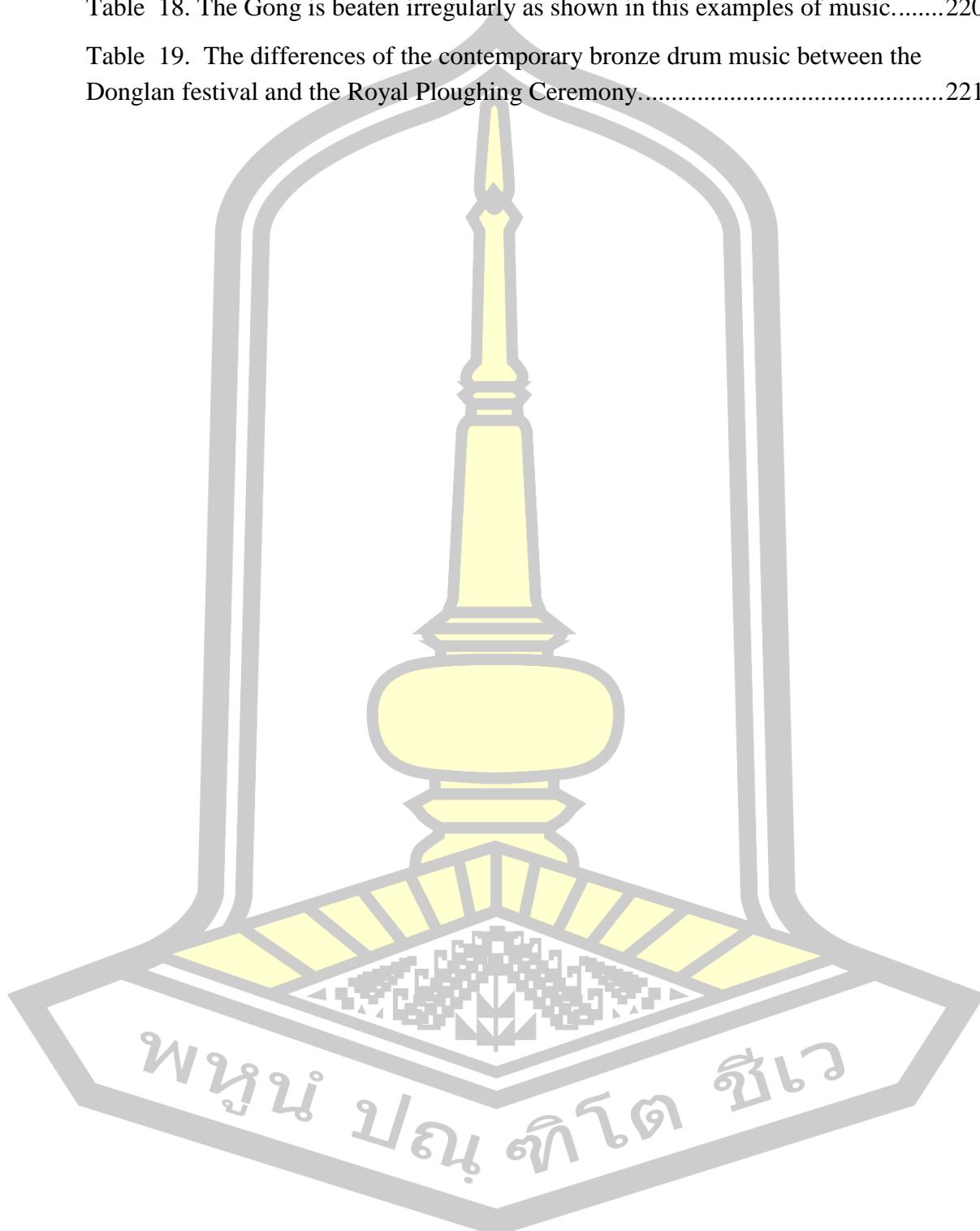
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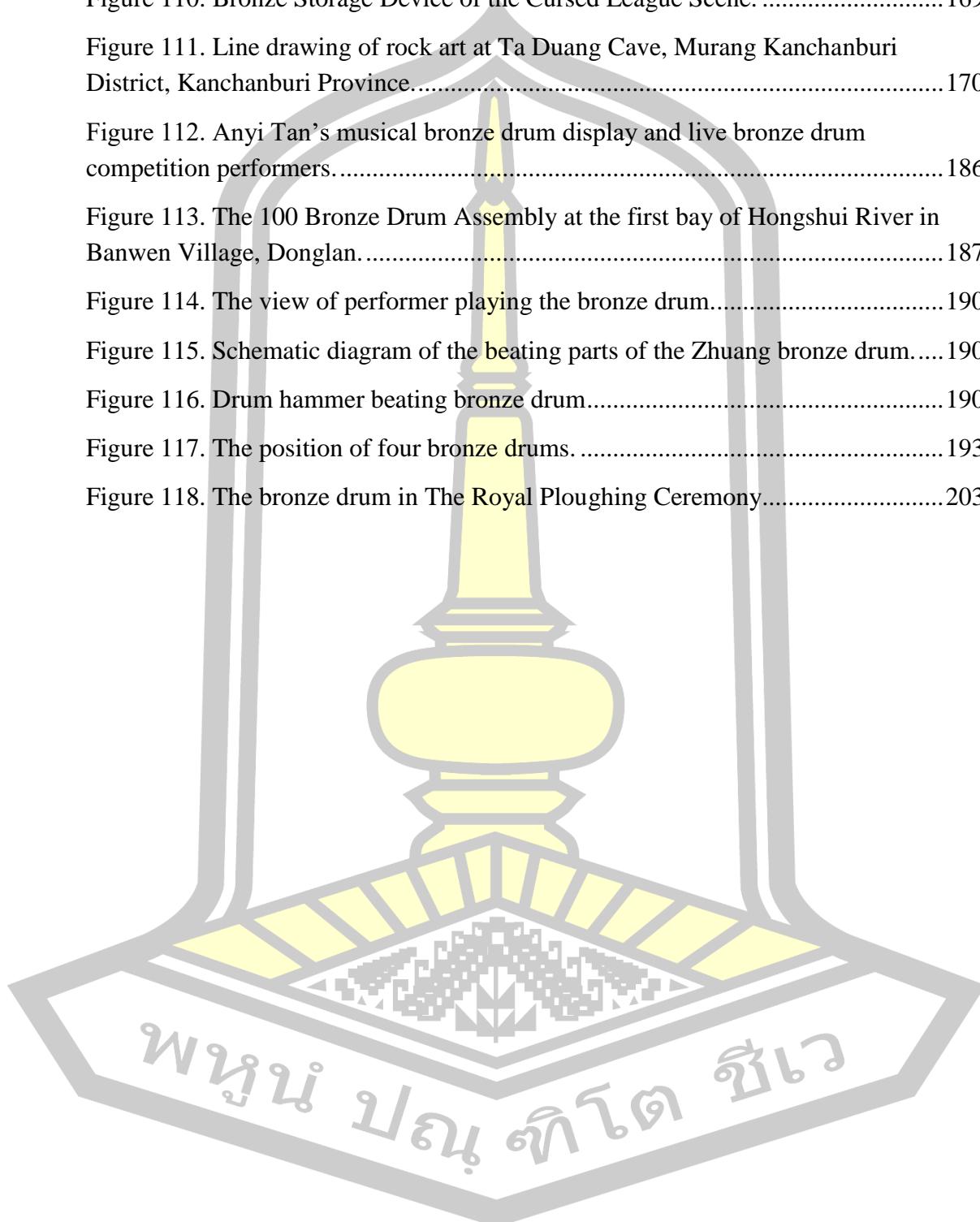
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CHAPTER I

Introduction

1. Background and problem of research

This dissertation is a comparative study of selected bronze drums between Thailand and Southwest China. Geographically, southwest China and Thailand are connected with each other on the land mass consisting of Burma and Laos. Recent researches on bronze drums in Thailand and southwest China have documented many drums that have been excavated, analyzed and published. Based on this body of published literature, this study will be complemented by field studies in Thailand and southwest China. The comparison will focus on the following questions. What are the general types of bronze drums in southwest China and Thailand, and what are their general characteristics? Similarly, this study will describe the similarities and differences in physical appearance of selected bronze drums between the two countries in terms of shape, ornamentation, metallurgy and function. A further question is to describe the bronze drum's culture and contemporary bronze drum culture in both countries. (Danfang Wei, 2015)

The bronze drum is a legendary national historical artifact. It integrates culture, art and music, and is an important material for studying the music history and culture of southwest China and Southeast Asia. From about the 7th century BC, it has been spread and used for more than 2,600 years (Heger, 1902). The bronze drum currently seen is mainly distributed in the south and southwest China (in Guangxi, Yunnan, Guizhou, Sichuan, Hunan, Guangdong) and Southeast Asia (particularly in Vietnam, Thailand, Cambodia, Myanmar, Malaysia, Laos, and Indonesia). (Fuqiang Li, 2022)

The first dynasty after Thailand became an independent country, the Sukhothai Dynasty (from 1238 to 1438), is recorded in ancient books: *Muhorutuek* (*the bronze drum was called 'Muhorutuek' in the Sukhothai dynasty*) has a unique and exquisite sound. The sound is rich and resonant, and the ensemble of big gongs, small gongs, drums, trumpets, conches and bells is very beautiful. Over time, the drum has been given different names in various Thai dynasties. For example, in the

Ayutthaya dynasty (from 1351 to 1767), the drum was changed to Horutuck and used in royal ceremonies. In the Rattanakosin dynasty of Bangkok (from 1782 to 1932), the drum was eventually renamed Mahoratuek, a name that has been used to this day and is still used in royal ceremonies. (*The Bronze Kettle Drum in Thailand*, 2003; Fubin Wan, Danfang Wei, 2022)

The term ‘Bronze Drum’ (铜鼓 Tong Gu) in China was first seen recorded in the Eastern Han Dynasty Ban Gu's *Book of the Later Han Ma Yuan Biography*. Bronze drums have been popular for more than 2600 years, with wide distribution and various categories. In the process of research and expression, people divide them into different types. From the late nineteenth century to the late twentieth century, there has yield many classifications. For example: Heger's bronze drum classification, Vietnamese archaeologists' Dong Son drum classification (they identified the Heger I type as the Dong Son drum, named after the type-site of the Dong Son culture), Chinese eight classification (Chinese Association for the study of Bronze Drums proposed which named after the main archaeological site where the bronze drums were found, 1980). American scholar Emma Bunker (1972) first time named the original bronze drums found in Yunnan, China and Dongshan, Vietnam as the Pre-Heger I type, then Imamura (1973,1979) also proposed and proved the Pre-Heger I type and further subdivided the bronze drum into five types. Bernet Kempers (1988) discussed the bronze drum in their entire distribution and added a pejeng type that only found in Indonesia (Bernet Kempers disagreed that Heger's Tokyo drum was the earliest drum, Yunnan was not the cradle of Heger I type. He believed that northern Vietnam was the birthplace of the Pre-Heger I type, and all kinds of bronze drums had their own development channels). (Chinese Ancient Bronze Drum Research Association, 1980; Imamura, 1979; Heger, 1902; Bernet Kempers, 1988.)

According to the topic needs, two classification systems are mainly used: the Heger bronze drum classification (Heger, 1902) and the Chinese bronze drum classification. (Chinese Ancient Bronze Drum Research Association, 1980; Heger, 1902.)

First, Heger's bronze drum classification. Heger used his rich knowledge of utensil classification to give a detailed description of the 165 bronze drums (he collected 22 bronze drums and 143 bronze drums' records, rubbing or photos, from

appearance to decoration), and divided them into four main types according to the evolution of shape and decoration (Type I, II, III, IV) and 3 transitional types (Type I_{IV}, I_{II}, II_{IV}). (Heger, 1902)

Second, Chinese bronze drum classification. In China, at the Ancient Bronze Drum Symposium in 1980, scholars from all over the world have repeatedly discussed, and finally most scholars tend to use the classification method of bronze drums named after the land from which the standard was excavated. The drum is divided into eight types: 1) Wanjiaba type, 2) Shizhaishan type, 3) Lengshuichong type, 4) Zunyi type, 5) Majiang type, 6) Beiliu type, 7) Lingshan type, and 8) Ximeng type. (Chinese Ancient Bronze Drum Research Association, 1980)

Chinese scholars compared the Chinese bronze drum's classification with Heger's, and believed that China's Wanjiaba type is the pre-Heger I type, which was also proved by Japanese scholar Keiji Imamura in 1974 and 1979. Shizhaishan and Lengshuichong type are Heger I type (including I_{IV}, I_{II}), China's Beiliu and Lingshan type correspond to Heger II type (including II_{IV}), China's Ximeng type corresponds to Heger III type, and China's Zunyi and Majiang type correspond to Heger IV type (Keiji Imamura, 1979; Tingyu Jiang, 1988; Kunsheng Li, 2019; See Table No. 1, Chapter 2)

According to archaeological data and various historical documents in China, the earliest bronze drum is the Wanjiaba-type (Pre-Heger I type) bronze drum unearthed in Wanjiaba, Yunnan Province, which can be dated to more than 2,600 years ago. Judging from the historical scenes depicted by the three-dimensional sculptures on the bronze drums shell storage unearthed in Yunnan Shizhaishan, from the Spring and Autumn Period to the Qin and Han Dynasties, the bronze drum was also a national importance instrument and ritual instrument used by rulers in southwest China to show their dominance and identity. (Unearthed report of Shizhaishan ancient site in Jining, Yunnan, 1959) In the Wei-Jin-Southern and Northern Dynasties, the taller the bronze drum, the more valuable it is, and became a symbol of the status of rich and noble families. After the Wei-Jin Dynasties, it gradually entered the folk culture and became a ritual instrument and musical instrument for festivals and sacrifices. At present, there are a large number of bronze

drums unearthed in China. Wanjiaba (Pre-Heger I type) and Shizhaishan types (Heger I type) are mainly unearthed in Yunnan and Guangxi, while Lengshuichong type (Heger I type), Beiliu and Lingshan type (Heger II type) is most found in Guangxi, Ximeng type (Heger III type) is most found in Yunnan, Zunyi type (Heger IV type) is most found in Guizhou, Majiang type (Heger IV type) is most found in Guangxi, Guizhou and Yunnan. All Heger bronze drum classification types can be found in China. (Tingyu Jiang, 2018)

Thailand is an important area for the distribution of bronze drums, but there are relatively few historical documents about bronze drums. Therefore, the understanding of bronze drums in Thailand is basically excavated from archaeological unearthed materials. According to Charles Higham's report of *Danish Sorensen's excavation in Wang Platong*, Kanchanaburi Province, Thailand in 1973 and 1988, there were 19 boat coffins made of local hardwood in the Wang Platong site, decorated with birds on the stern, and among the accompanying objects were six bronze drums are placed in or next to the coffin. The age of the coffin was dated by 14C as 403 BC -25 CE which can be used as the lower limit of the bronze drum in Wang Platong. According to the inference of Chinese scholar Yanli Liang, the six bronze drums date no later than the middle Western Han Dynasty, that is, from the third century BC to the first CE. Judging from the richness of the funerary objects, the bronze drum at that time in Thailand also be a symbol of the noble status of the tomb owner. (Charles Higham, 1973/1988; Yanli Liang, 2016)

In addition, according to the statistics of *The Bronze Kettle Drums in Thailand* published by the Office of National Museums and The Fine Arts Department in 2003, a total of 48 ancient bronze drums have been found in Thailand. Six of them were found in Central Thailand, eight in Northern Thailand, seven in Northeastern Thailand, eleven in Southern Thailand, fifteen in Provenance Unknown, and one in Laos. The book described the bronze drum's history, the discovery and current location, appearances, condition, size, general classification and cultural characteristics, etc.. Judging from the pictures of bronze drums seen so far, the researcher believed that most of them are Heger I type and Heger III type. (Miss Matinee Jirawattana, *The Bronze Kettle Drum in Thailand*, 2003)

Today, bronze drums are still used in some important ceremonies in the Royal Palace of Thailand. Through practical investigations and online resource inquiries, we found that bronze drums are still used in the annual Royal Ploughing Ceremony. This ceremony is divided into two parts, one is the blessing ceremony, the other is the plowing ceremony and commendation meeting for outstanding farmers. In the plowing ceremony, two bronze drums and one gong are placed at the end of the field, facing the rostrum of the king and the queen, when the Royal Ploughing Ceremony begins, the conch is blown, and the gong is struck, then the bronze drum is struck until the end of the ploughing ceremony. In addition, bronze drums are also played in royal ceremonies such as the royal barge parade in Thailand, the enthronement ceremony of previous kings, and the annual dates for changing the Costume of the Emerald Buddha in Bangkok. Thailand is the only country in Southeast Asia that still uses bronze drums as national importance instrument, ritual and musical instruments. (Fubin Wan, 2022)

This study focuses on the several selected types of bronze drums in Thailand and southwest China, with the following questions:

1. What types of bronze drums in Thailand are there? What are their general characteristics? What are the characteristics of bronze drums in China of the select type?
2. What are the similarities and differences in the types of the select bronze drums between the two countries, particularly with regards to shape, decorations, metallurgy, function?
3. What are the similarities and differences between the bronze drum's music in southwest China and Thailand?

The above three problems are the main focus in the study of the relationship between the selected types of bronze drums in Thailand and Southwest China. Examining the above problems, we can better understand the bronze drums cultural connotation of those two countries, the development of the different types of bronze drums, their transmission routes, their integration with the local ethnic culture, and the study of the two countries' musical history.

2. Research Objectives

- 2.1 To describe the distribution and the classification of selected bronze drums in Thailand and southwest China.
- 2.2 To compare the organological features of selected bronze drums in Thailand and southwest China.
- 2.3 To analyze characteristics of selected music examples of bronze drums in southwest China and Thailand.

3. Research Questions

- 3.1 What are the distribution and the classification of bronze drums in Thailand and southwest China?
- 3.2 How to compare the organological features of selected bronze drums in Thailand and southwest China?
- 3.3 How to analyze characteristics of selected music examples of bronze drums in southwest China and Thailand?

4. Research Benefit

- 4.1 Acquire the exactly bronze archaeological and handed down information of bronze drums in Thailand. Understand the distribution and the classification of bronze drums in Thailand and southwest China.
- 4.2 Understand the similarities and differences organological features of selected bronze drums in Thailand and southwest China.
- 4.3 Analyze the bronze drum's music history and the selected music examples of bronze drums contemporary in southwest China and Thailand, understand the similarities and differences musical culture between those two countries.

5. Definition of Terms

5.1 Bronze drum

The bronze drum is a bronze culture treasure integrating manufacture technology, art and music. Bronze drum are composed of tympanum, drum body and drum lugs, hollow and bottomless, all-over exquisite patterns, some drum tympanums and drum bodies have high-relief motifs. The material is mainly composed of copper,

lead and tin alloy. The bronze drum belongs to an Idiophone instrument which is used its own shape body as the sound source and is struck to produce sound. Generally, players beat the center or the edge of the tympanum, or the waist of the drum to play specific rhythms, which are used in different situations. In ancient times, the bronze drum was an important ceremonial instrument, mainly used for banquets, music and dances, and military commands, and so on, it is a symbol of the power and status of the rulers and nobles, now it is mainly used in folk culture activities.

5.2 The selected bronze drum's type in those two countries

The type of bronze drums involved in this dissertation are mainly H_I type and H_{III} type, while the corresponding ones in southwest China are mainly Shizhaishan, Lengshuichong and Ximeng type bronze drums.

5.3 Characteristic of bronze drum music in southwest China and Thailand

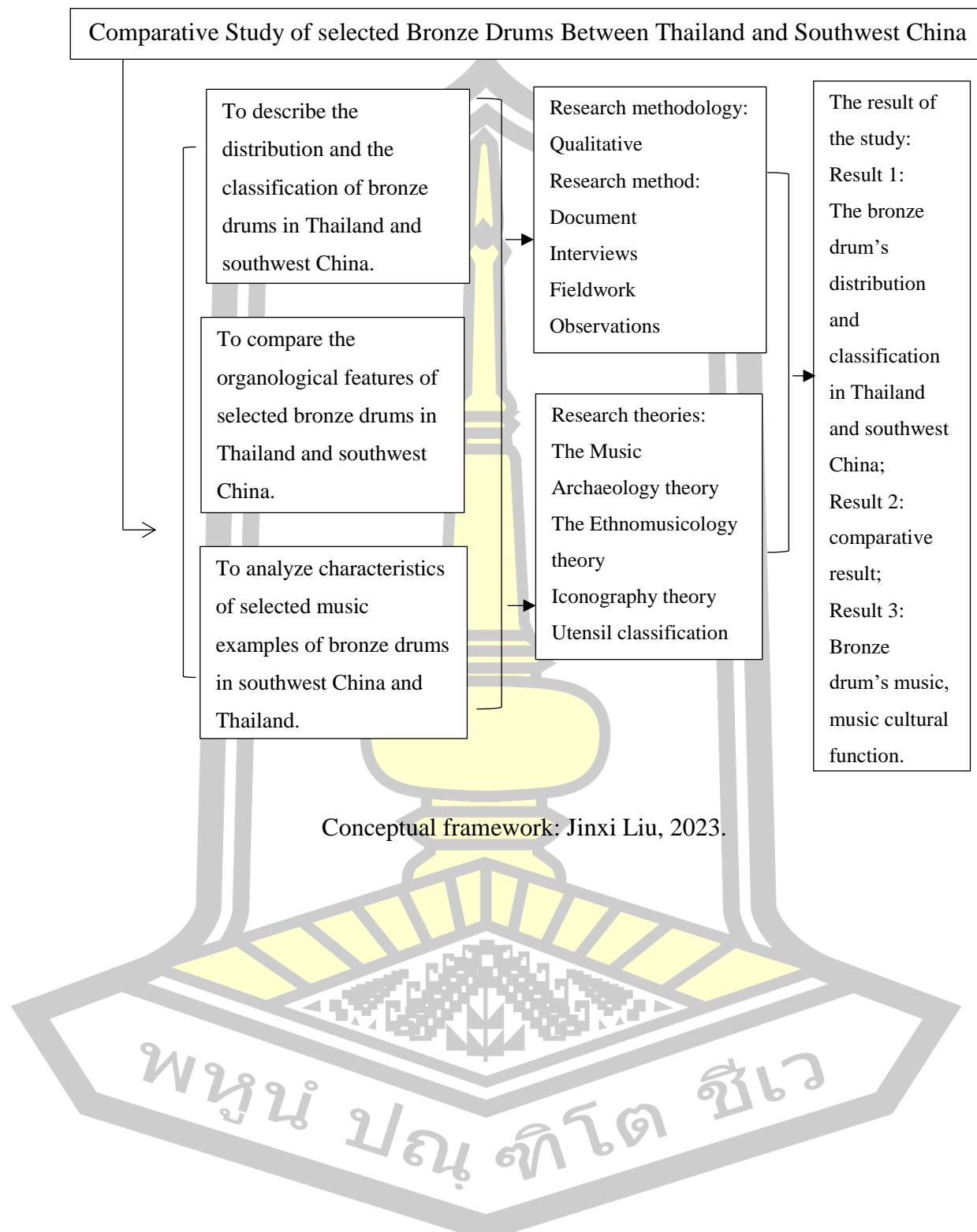
The discussion on the characteristics of bronze drum music is mainly divided into two parts: ancient and contemporary. It is no longer possible to listen to the ancient bronze drum music, but we can learn from historical classics the different musical functional characteristics it had in different historical periods. Contemporary bronze drum music characteristic is mainly compared and analyzed from the types of bronze drums used, music performance occasions, instrument combinations, playing methods, percussion methods, rhythmic characteristics, beating patterns, and score analysis, etc..

5.4 Organological of the bronze drum

The organological feature analysis of the bronze drum includes the shape of the bronze drum, the decorations on the drum tympanum and drum body, the high-relief motifs on the drum tympanum and drum body, and the casting technique (alloy content) and musical performance.

6. Conceptual Framework

This dissertation uses the select bronze drums in Thailand and southwest China as the research object. In order to achieve the three objectives, we need a large amount of research data. The data is mainly obtained through four research methods: qualitative research methodology, which are explained by using Music Archeology, Ethnomusicology, Iconography, and Artifact classification.



CHAPTER II

Review of Literature

In the subject about Research on the comparative study of selected bronze drums between Thailand and Southwest China, the researcher reviewed the document to obtain the most comprehensive information for this thesis. This chapter will be divided into six topics to review various documents related to the subject:

1. The distribution of bronze drums.
2. The research on classification of bronze drums.
3. The research on decorations of bronze drums.
4. The research on bronze drums in Southeast Asia.
5. The research on bronze drums in China.
6. The research on bronze drums in Thailand.

1. The distribution of bronze drums

As a kind of cultural carrier, the bronze drum has a large number, wide distribution, long continuation time, many nationalities, and complex types and decorations, with rich connotations. Its use and circulation, with the migration of ancient peoples and cultural exchanges are closely related. Wherever there is a use of bronze drums of the national life of the place, will leave traces of bronze drums.

The distribution map of the bronze drum is like a history of the spread of ancient nations. With the increase of investigation and research on the unearthed and handed down bronze drums, the distribution area of the bronze drums is basically clear at present. Bronze drums are mainly distributed in Lingnan and southwest provinces of China, as well as Vietnam, Myanmar, Laos, Cambodia, Thailand, Brunei, Malaysia, Indonesia and other countries adjacent to southwest China. (Danfang Wei, 2008)

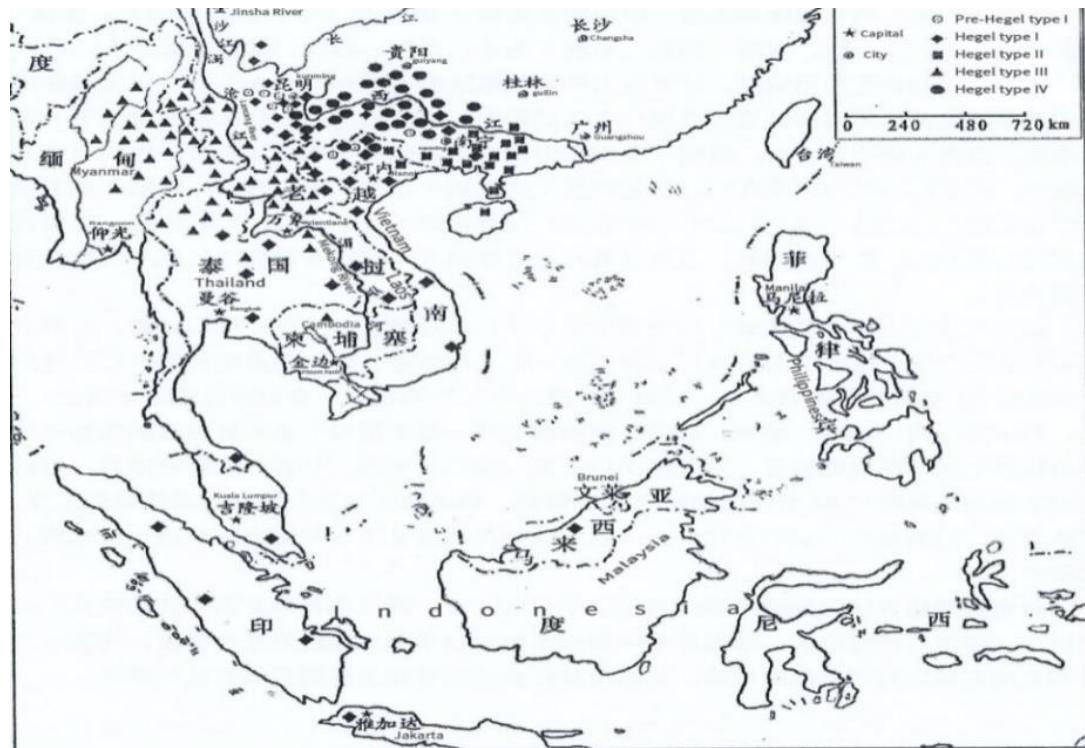


Figure 1. Distribution map of bronze drums in southwest China and Southeast Asia.

Source: Danfang Wei. (2008). A study on Bronze Drums of the Khmuic in Laos to Those of the Same Type in Its Neighboring Nations. Doctoral Dissertation of University of Science and Technology Beijing. p.6.

This dissertation mainly focuses on the research on bronze drum in Southwest China and Thailand. Therefore, specifically, the distribution of bronze drums in those two countries is roughly as follows:

In China, bronze drums were mainly distributed in the south and southwest of the country, covering today's provinces of Guangdong, Hainan, Guangxi, Yunnan, Guizhou, Sichuan, Chongqing and Hunan, etc.. (Tingyu Jiang. 1988; *A General Introduction to Ancient Chinese Bronze Drums*, p.37). Among them, Guangxi, Yunnan and Guizhou, the three southwestern provinces of China, are the most densely distributed.

Guangxi, the distribution of bronze drums in a wide range of areas, Guangxi southeast, southwest cities and counties, northeast from Hezhou, Zhaoping, south of Mengshan, northwest from Longsheng, Sanjiang along the Guiqian, Guangxi Yunnan border cities and counties have bronze drums have been unearthed. Only a few

counties in northern Guangxi did not find bronze drums. Guangxi bronze drums unearthed the most intensive area is Yulin, Qinzhou, Wuzhou south, Liuzhou and Nanning area, the most heirloom bronze drums is Hechi, Baise area. (Tingyu Jiang, 1988)

Yunnan, which is considered to be the birthplace of bronze drums, around Dianchi, such as Chuxiong, Changning, Maidu, Qujing, Jinning, Jiangchuan, Guangnan unearthed bronze drums from the Han Dynasty and before, is a concentrated area of ancient bronze drums. The western China-Burma border is the late bronze drum distribution area, such as the west of the Dehong Autonomous Prefecture, south to Lancang, Yulian, Menghai, Simao, Pu'er, Jinghong, Mengla and other cities and counties, east to Wenshan Zhuang, Miao Autonomous Prefecture, Guangnan, Funing and so on. Among them, Ximeng and Cangyuan Wa areas have the most heirloom bronze drums. (Tingyu Jiang, 1988)

Guizhou, the distribution of bronze drums is also very wide, almost all over the province, Guiyang, Zunyi, Anshun, Bijie, Xingyi, Qiannan, Qiandongnan, Liupanshui, Tongren and other eight regions, which is most concentrated in the four regions of Qiandongnan, Xingyi, Anshun and Guiyang. (Tingyu Jiang, 1988)

In Thailand, bronze drums are found in the Northeast, East, Central, South, and North regions of Thailand, including today's Ubon Ratchathani, Nakhon Phanom, Mukdahan, Khon Kaen, Nong Bua Lam Phu, Nakhon Ratchasima, Prachinburi, Pathum Thaya, Trat, Bangkok, Lop Buri, Ratchaburi, Chumphon, Surat Thani, Nakhon Si Thammarat, Songkhla, Krachanaburi, Tak, Sukhothai, Uttaradit, Nan, Chiang Rai, Chiang Mai and other provinces. (*The Bronze Kettle Drum in Thailand*, 2003)

2. Research on classification of bronze drums

At present, the classification method of bronze drums commonly used in the world is still determined by Austrian scholar F•Heger more than hundred years ago. He analyzed the bronze drums that he had collected from appearance to decoration, and divided them into four main types according to the evolution of shape and decoration (Type I, II, III, IV) and 3 transitional types (Type I_{IV}, II_{II}, II_{IV}). (Heger, 1902) In addition, in 1972, the American scholar Emma Bunker named the original

bronze drums found in Yunnan, China and Dongshan, Vietnam as *first Heger I type drums* in her article *Relationship between the Yunnan and Dongshan Cultures*. In 1974 and 1979, the Japanese scholar Imamura Keir successively published research articles, listing eleven bronze drums found in Yunnan, Vietnam and Thailand, and analyzing and comparing them from the scientific testing of archaeological excavation to the decoration and the geographical area where they were unearthed, and arguing that this kind of bronze drums is the *Pre-Heger I type bronze drums* which are earlier than the Heger I type drums. Since then, the classification of Pre-Heger I type bronze drums has been widely accepted and used by scholars. (Heger, 1902; Keiji Imamura, 1979)

Chinese scholars also played great attention to the classification of bronze drums. Since 1950s, scholars and research institutions such as You Wen, Yunnan Provincial Museum, Zengqing Huang, Hong Sheng, Ningsheng Wang, Weiqing Li, and Li Ding had worked on the basis of Heger's bronze drum classification, and do the Classification research on bronze drums in southern China. Until 1980, at the Ancient Bronze Drum Symposium held in Nanning, Guangxi, scholars discussed and determined the method of classifying the place names with standard instruments, and divided the ancient bronze drums in China into eight types. Namely: Wanjiaba type, Shizhaishan type, Lengshuichong type, Zunyi type, Majiang type, Beiliu type, Lingshan type, and Ximeng type. The first five types are namely popular in Yunnan, Guangxi, and Guizhou. Mr. Tingyu Jiang called them the Dian-Gui system. Because they are distributed in the west of Lingnan in China, they are also called Western styles. The latter three types are mainly popular in Guangdong, Guangxi, and Hainan, it became the Yue-Gui system, and because it is distributed in the eastern part of Lingnan, China, it is also called the Eastern style. In the following decades, Chinese scholars have been using this classification of bronze drums to study, and produced many research fruits. However, due to the limited understanding of Chinese bronze drums in various countries and influence of the regional politics of the times, the current classification of bronze drums in China has not been recognized and accepted by scholars in some countries in the world. Therefore, this research will continue to use Heger's bronze drum classification method so that readers can better understand

bronze drums in China. (Chinese Ancient Bronze Drum Research Association, 1980. Tingyu Jiang, 2018)

Vietnam also unearthed a large number of bronze drums. Since the discovery of the Dong Son culture, research on bronze drums in Vietnam has yielded fruitful results. In the 1980s, Vietnamese scholar Fan Mingxuan divided the Dong Son bronze drums in Vietnam into 5 groups of 22 styles based on the research on Dong Son bronze drums and similar bronze drums in China and Southeast Asia. Later, some Vietnam's scholars divided the Dong Son bronze drums into five groups chronologically. (Fan Mingxuan, 1987; Fubin Wan, 2022)

In Thailand, in the article *Supplement on Bronze Drums and Dongshan Culture*, the father of Thai Archeology Khun Chin You-di divided the Heger I type into three kinds: Ia The drum tympanum and body have feathered-figure and animal patterns. Ib The animal patterns are only on the drum tympanum, and the feathered-figure pattern is only on the drum body or not. Ic— The drum tympanum and body are only decorated with geometric patterns, and the animal pattern on the drum tympanum is only a heron. (Yanli Liang, 2017). However, this classification method hasn't been popularized.

In conclusion, although Vietnam, China and other bronze drum distribution areas developed their own classification system, but Heger's bronze drum classification is still widely used in the world. In order to present the similarities and differences between Heger's, Vietnam and China's bronze drum classification methods more clearly, the comparison of the two bronze drum classifications is now made into a table. (Danfang Wei, 2015; Kunsheng Li, 2019).

Table 1. Bronze drum classification correspondence table.

Classifier	classification							
	Type I (including: I _{II} I _{IV})		Type II (including II _{IV})		Type III		Type IV	
Heger (1902)								
Chinese Bronze Drum Research Association (1980)	Wanjia ba type (Pre-Heger)	Shizhaishan type	Lengshuichong type	Beiliu type	Lingshan type	Ximeng type	Zunyi type	Majiang type

Vietnam (Dong Son bronze drum) (Prof. Fan Mingxuan et al. Classion) (1990)	D type	A type B type	C type	Classification with Heger	E type	
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Source: Danfang Wei (2015), Kunsheng Li (2019).

3. Research on decorations of bronze drums

At present, there are two books in China that have systematically organized, named and published bronze drum decorations, *Ancient Bronze Drums Measurements and Records Compilation in China* edited by Guangxi Museum of Nationality and Chinese Ancient Bronze Drum Research Association (2014), and *Decoration Art of Ancient Bronze Drum* (2018) edited by Chongji Wu and Luo Kunxin, etc. in Guangxi Museum of Nationality and Chinese Ancient Bronze Drum Research Association. (Tingyu Jiang, 2014; Chongji Wu, etc., 2018)

Ancient Bronze Drums Measurements and Records Compilation in China was formed in 1979 by the Museum of Guangxi Zhuang Autonomous Region. Experts from many disciplines including archaeology, ethnology, history, history of science and technology formed an ancient bronze drum investigation team to conduct detailed measurements on ancient bronze drums in the Chinese collection. Observe and record the precious information and data obtained. It is also based on this investigation that the ancient Chinese bronze drums have a fixed classification, clarifying the chronological sequence of bronze drums in various periods. In 2014, Mr. Tingyu Jiang led the young scholars of Guangxi National Museum to observe, record and photograph 769 bronze drums in 62 cultural relics collection units in 52 counties (cities) in Guangxi, and unified the names of the various patterns of bronze drums. It laid the foundation for the study of bronze drum decoration. (Tingyu Jiang, 2014)

The decoration art of ancient bronze drum, scientifically sorted and edited bronze drums collected in Guangxi and Yunnan Museums, and divided the bronze drum decoration into two categories: plane decoration and three-dimensional statues,

including realistic patterns, geometric decorations, drum back line carving patterns, corruption patterns together for comparison provides an important reference for research. (Chongji Wu, etc., 2018)

To sum up, there are many researches on the bronze drum decoration at present, but due to the different regional cultures, different countries or regions have different names for the bronze drum decoration, which is easy to cause cognitive confusion. Therefore, the bronze drum decoration still needs more detailed comparison and cultural Connotation research.

4. Research on Bronze drums in Southeast Asia

Among the studies on bronze drums in Southeast Asia, bronze drums in Vietnam are the most studied. In the 1950s, Vietnamese scholars once took the initiative in the study of bronze drums, represented by Li Venlan, Ruan Venxuan, Fan Mingxuan, Ruan Venhao, etc., and published many books successively. Among which Li Wenlan, Ruan Wenjing and others co-authored *Vietnamese the first relics of the Bronze Age* (1963), *Dong Son Bronze Drum Discovered in Vietnam* by Ruan Wenxuan (1975), *Dong Son Bronze Drum* by Fan Mingxuan (1987), *Dongshan Bronze Drum in Vietnam* are the most representative and influential. Li Wenlan's work introduced in detail the bronze cultural sites and Bronze Age relics discovered in Vietnam until the early 1960s, analyzed the Heger I type bronze drum discovered in Vietnam, and speculated on the age of its production. Ruan Wenxuan's *Dong Son Bronze Drums Discovered in Vietnam* introduced 52 Dong Son bronze drums found in Vietnam and classified them. Discussed the origin, distribution, ornamentation, use and other issues of the bronze drum, and is considered to be the master of the study of the Vietnamese bronze drum in the 1970s, reflecting the basic views of the Vietnamese academic circles on the bronze drum. Fan Mingxuan's two books on Dong Son Bronze Drum also made detailed records and researches on Dong Son Bronze Drum found in Vietnam, and drew clear and detailed line diagrams, and divided Dong Son Bronze Drum into 5 groups according to his own classification 22 styles. (Fubin Wan, 2022)

Chinese scholars have done the most research on southeast Asian bronze drums compared with Vietnamese bronze drums. The scholars are represented by

Kunsheng Li, Derong Huang, Chong'an Xie, etc.. The research content involves the origin of the bronze drum, the shape and decoration, the bronze culture, and the transmission route. There are several archaeological works in China involved in the study of bronze drum in China-Vietnamese, such as: *bronze civilization in Yunnan, China and Vietnam*. In this book, the researcher conducts a staged and regional comparative study of the bronze age in Yunnan and Vietnam, and compares the Wanjiaba type (Pre-HI type) bronze drum in Yunnan and Vietnam, the shape, decoration, origin of the bronze drums and the propagation route, and do a more detailed instruction and comparative research of the Shizhaishan type bronze drums in Yunnan and Vietnam. (Kunsheng Li, Guo Chen, 2013).

Another book is a study of *Ancient Culture and Ethnic Groups in Dian-Gui and northern Vietnam*. The author combined archaeological discoveries in ancient times with research on ethnic history, made the comparative studies on the ethnic groups, the origin and type of the bronze civilization, the relationship between regional ethnic groups in Dian-Gui and northern Vietnam. The book refers to the bronze drum archaeological data, the regional ethnic group and regional culture are consistent with the research theme of our study, however, due to the extensive content of archaeology, there is no intensive and reasonable analysis and research on bronze drum and its music culture. So, this research results can be used as reference materials for our music culture research. (Chong'an Xie, 2010)

Since the 1980s, there are some representative works on bronze drum research in Southeast Asia, such as: *The Distribution of Bronze Drums in early Southeast Asia and Trails of Bronze Drums Across early Southeast Asia: Exchange Routes and Connected Cultural Spheres* by Ambra Calo (2009, 2014). In these two books, Ambra Calo studied the distribution of early Dong Son bronze drums, from their center of production in north Vietnam throughout Mainland and Island Southeast Asia, and identified specific regional clusters, discussed the chronology, routes of transmission, the geographical extent of trade networks, and the new local bronze casting traditions arising from the influence of the imported bronze drums. He did a inclusive survey of bronze drum culture, and provided a comprehensive summary of ritual bronze drum museum holdings and archaeological excavations in south China and Southeast Asia,

also provided the first comprehensive artefact documentation of the earliest Southeast Asia riverine and oceanic trade routes (Ambra Calo, 2009, 2014). Another important book is *The Kettledrums of Southeast Asia: A bronze Age World and Its Aftermath* by A.J. Bernet Kempers (1988). Bernet Kempers' work represents the new achievements of Western scholars in the study of bronze drums in Southeast Asia after the publication of Heger's *Ancient Metal Drums in Southeast Asia*. He has written in detail on the bronze drum's origin and distribution, the discovery and research of bronze drums in Southeast Asia, the shape and structure, the musicology, the functions, the decoration, the manufacture process, the art of the Bronze Age, and the art of Dong Son. (1986) This book is rich and complex in content. It is a brief history of bronze drum research in Southeast Asia and a summary of Western scholars' research on bronze drums in Southeast Asia in the 1980s. (Tingyu Jiang, 2020; Bernet Kempers, 1988)

In the past two years, China's research on Southeast Asian bronze drums is represented by Fubin Wan, Danfang Wei, and Fuqiang Li. Danfang Wei's dissertation *Research on Laos Kemu Drums and Similar Types of Bronze Drums in Adjacent Areas* conducted field investigations on 64 bronze drums in Laos, investigated the same type of bronze drums in neighboring Myanmar, Thailand, Vietnam and Yunnan, China, and collected 154 H_{III} type bronze drums. A comparative study of The H_{III} bronze drums in Laos and its adjacent areas was carried out. In addition, through the manufacture technology analysis of nearly a hundred bronze drums and the electron microscope analysis of the slag samples of the *Bronze Drum manufacture Site* in Laos, she put forward a personal opinion on the origin and development of the Heger III type bronze drum. (Danfang Wei, 2008)

Research on the Preservation and Transmission of Bronze Drum Culture in China and Southeast Asia (2022), co-authored by Fubin Wan and Danfang Wei, investigates the status quo of bronze drum culture in China and Southeast Asian countries, and proposed suggestions for the preservation and transmission of bronze drum culture. (Fubin Wan, Danfang Wei, 2022)

Fuqiang Li has published several editions of Southeast Asian Bronze Drum Catalogue and conducted on-the-spot investigations and photographed introductions to the bronze drums currently seen in cultural and museum institutions in Southeast

Asian countries. And the results of the investigation were compiled into a book and published *Communication and Innovation: Investigation of Bronze Drum Culture in Southeast Asia* (2022), which will be helpful to study the bronze drum culture of Laos, Vietnam, Cambodia, Thailand, Myanmar, and Indonesia in Southeast Asia. (Fuqiang Li, 2022)

To sum up, as the concentrated area of bronze drum discovery in Southeast Asia, there have been many research results. Taking Dong Son bronze drum as a typical representative, the research content has included origin, classification, distribution, function, ethnic group, transmission route, smelting process, decoration, In terms of protection and inheritance, more and more different fields experts are paying attention to the Southeast Asian bronze drums, and gradually formed a bronze drum research culture circle.

5. Research on bronze drums in China

In ancient Chinese literature, there are inexhaustible books about the bronze drum, including official history, unofficial history, notebook novels, poems and songs, which record the discovery, use, spread and customs of the bronze drum from different angles. The first record about the bronze drum in Chinese history appeared in the *Later Han Dynasty Biography* of Ma Yuan by Fan Ye of the Eastern Han Dynasty *Ma Yuan, good at riding and identifying famous horses, getting Luoyue's Bronze Drum at Jiao Zhi....* We can also inquire about these regions' historical and cultural of the Pre-Qin and Han Dynasties from other ancient and modern historical books, such as: Xuanling Fang's *Jin Shu*, Zheng Wei and Wuji Zhangsun's *Sui Shu* (Volume 15, Volume 31), You Do's *Tong Dian* (Music Department Volume 14), Xu Liu's *Book of Old Tang Dynasty* (Volume 29, Volume 197), Ouyang Xiu's *Book of New Tang Dynasty* (Volume 21, Volume 22, Volume 222), Xun Liu's *Ling Biao Lu Yi*, Fang Li's *Taiping Guangji* (Volume 205, volume 567, volume 528, volume 785, volume 786, volume 788). Records of *Taiping Huanyu* (Volume 157, volume 167), Ouyang Xiu's *Book of New Tang Dynasty* (Volume 21, Volume 22, Volume 222), Chengda Fan's *Guanghai yuhengzhi* (volume 205, volume 567, volume 528, volume 785, volume 786, volume 788). *Records of Taiping Huanyu* (Volume 157, volume 167), Chengda Fan's *Guanghai yuhengzhi* (*ZhiQi*), Zhenfang Wu's *Lingnan Miscellany*,

Diaoyuan Li's *the notes of Nanyue*, Annam and Shilian Wu's *the Whole book of Dayue History*, etc. (Tingyu Jiang, 1988)

In 1936, Shihu Zheng wrote and published Monograph on the study of the bronze drum, which initially collected the historical records of the bronze drum, and for the first time introduced the situation of foreign scholars on the study of bronze drum. Scientific research on Ancient Bronze Drum in China by Fubin Wan, research on Bronze Drum and Its Patterns by Weiqing Li, Ancient Bronze Drum in China by Chinese Ancient Bronze Drum research Association, etc.. The above works have a systematic study on the origin, family, decoration, function, type, communication, casting and manufacture technology, protection and application of the bronze drum. (Shihu Zheng, 1936. Chinese Ancient Bronze Drum research Association, 1985. Fubin Wan, 1992; Weiqing Li, 2000)

After the 1980s, the research results of the Ancient Chinese Bronze Drum research Association were the most prominent, editing and publishing the Ancient Bronze Drum Academic Symposium Collection, Chinese Ancient Bronze Drum Newsletter, etc., collecting academic papers by scholars from various countries into a book, the content related to the origin of the bronze drum. Issues such as family, type, age, plastic arts, music performance, smelting and manufacture technology, alloy composition and metal material, and cultural inheritance have had an important impact on the study of bronze drums in ancient China. Led by Tingyu Jiang, he has edited and published Ancient Bronze Drum in China, Bronze Drum History, Bronze Drum Art research, Ancient Bronze Drum Theory, Lingnan Bronze Drum, Bronze Drum in Guangxi, Bronze Drum in Zhuang Nationality research, Bronze Drum Culture, etc.. In addition, Fubin Wan's *Scientific research on Bronze Drums* in Ancient China conducts experimental research on bronze drums from the perspective of science and technology, which is consistent with archaeological and academic research, making the research on bronze drums more scientific. In the past two years, Fubin Wan, Tingyu Jiang, Danfang Wei, Jiang Ying, co-authored *Bronze Drums of Great Qi: Development, Transmission and Protection of Bronze Drum Culture*, which is an important work on the study of the Transmission culture of bronze drums. (Tingyu Jiang, Fubin Wan, Danfang Wei, 2022)

At present, the researcher has sorted out a total of more than 500 papers and books on the study of bronze drums in China. Taking 2000 as the watershed, before 2000, the research on bronze drums focused more on the origin, family, ornamentation, function, type, smelting and casting technique, research on mineral materials, musical instrument performance, etc., and after 2000, pay more attention to the investigation, ornamentation, bronze drum culture, bronze drum cultural and creative products, bronze drum dissemination, transmission and protection, and comparative study of bronze drums in southeast Asia and bronze drums in China, etc.. Due to the large number and complicated content, it is not necessary to give examples here.

6. Research on bronze drums in Thailand

There are many relatively documents related to bronze drums in Thailand. For example, in China, Fuqiang Li, Zhen Li, Yanxiong Wei, Xin Xu, Wenhan Lu, co-authored *Communication and Innovation: Investigation and research on Bronze Drum Culture in Southeast Asia* (Commercial Publishing House, April 2022) introduced the bronze drum in Thailand culture that symbolizes royal power, in *research on the Protection and Inheritance of Bronze Drum Culture in China and Southeast Asia* co-authored by Fubin Wan, Danfang Wei, Xu Xin, and Wenhan Lu, introduced that Fuqiang Li's team investigated bronze drums in Thailand twice in 2015 and 2019, also introduced the types and geographical distribution of Bronze Drum in Thailand, as well as the clan and cultural status of bronze drum in Thailand. In terms of the translation of bronze drum in Thailand research results, Yanli Liang should be pushed for a more detailed research and introduction to ancient bronze drums in Thailand. She has translated and published a few papers related to *bronze drum in Thailand Non Nong Ho — Bronze Drum Casting Site — Excerpts from New Progress in the Investigation of Bronze Drums in the Shawanke River Basin of Mukdahan* by Sukanya Baona, and edited by Yanli Liang, which briefly introduces the excavation of the Non Nong Ho Site in Thailand and the decoration of the bronze drum. *Investigation Report on the Excavation of the Bronze Drum at Thongnajalenno Temple, Duanzhi District, Pisa Mansahan County, Ubon Ratchathani Province, Thailand* (2010) written by the 11th Archaeological Group of the Arts Department of

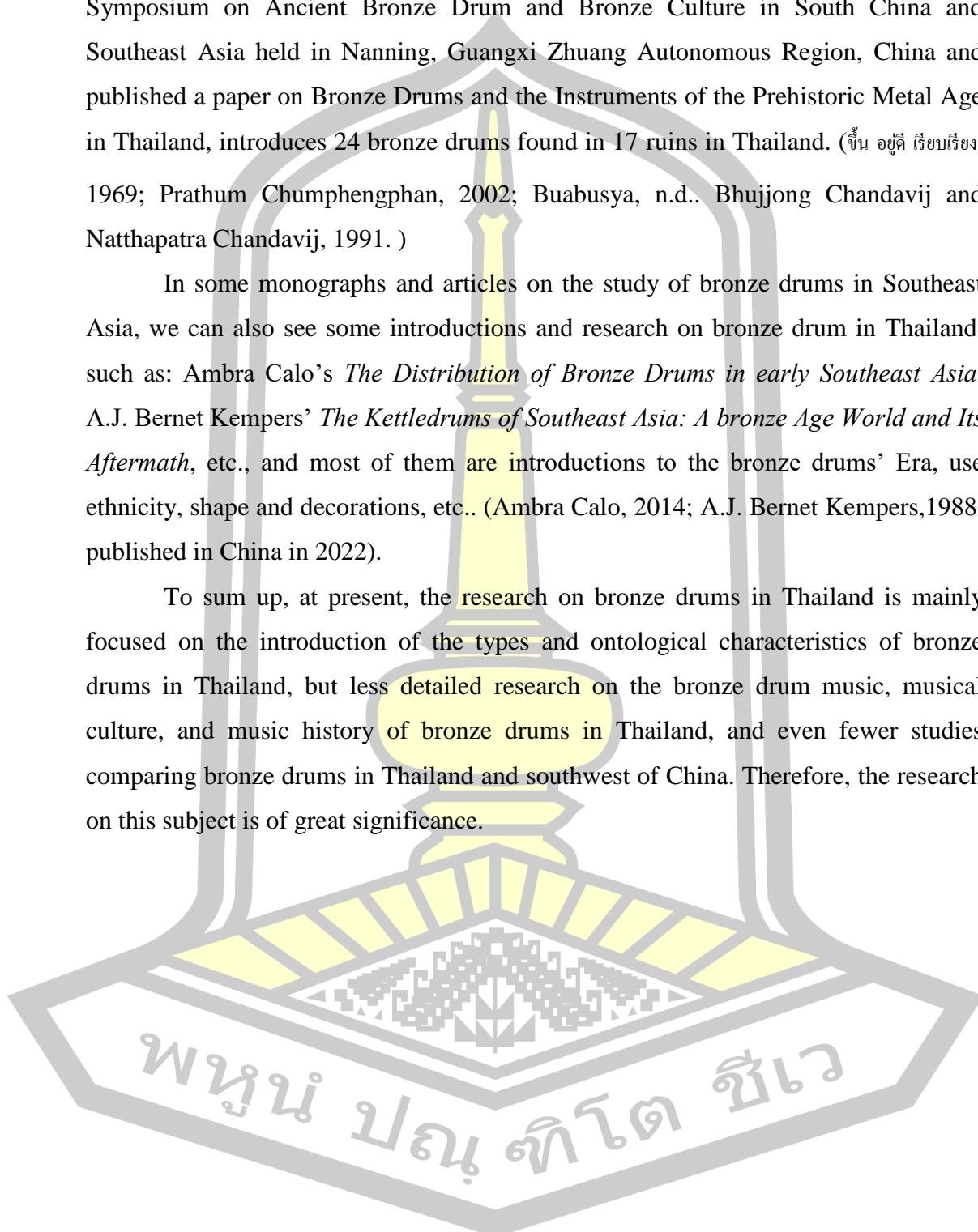
Ubon Ratchathani, Fine Arts Department, Ministry of Culture, Thailand, and translated by Yanli Liang. The report introduces the discovery of the bronze drum in Mansahan District, Ubon Ratchathani Province, and the dating of the bronze drum were carried out. The Fraction and Comparative Study of the Heger I type Bronze Drum in Thailand. In this article, the researcher takes *The Bronze Kettle Drums in Thailand* published by the Fine Arts Department in 2003 as a reference (this book is the most comprehensive introduction to bronze drum in Thailand, which introduced in detail the 48 bronze drums excavated in Thailand up to that time), a comparative study is made with the Heger I type bronze drums in China and Vietnam, and the age, development characteristics and relationship with the Heger I type bronze drums in China and Vietnam are further discussed. (Yanli Liang, 2019)

At present, there are also many introductions and researches on bronze drums in Thailand. คณก่อนประวัติศาสตร์ ในประเทศไทย (*Prehistory People in Thailand*) in 1969 written by ขัน อัญจิ เรียนเรียง and published by The Fine Arts Department (printed for monks and novices who visited the Museum of Yati, Bangkok and the National Library in the festival of Buddhist Lent), introduced in Uttaradit Province, Surat Thani Province, Kanchanaburi Province, Kalasin Province and Nakhon Si Thammarat Province several Mahorathuk (bronze drums) discovered, believed to be the relics of immigrants from China to northern and northeastern Thailand about 2216-2115 years ago in the late bronze age of Thailand. (Later Metal Age Dong Son Culture). Otherwise, in *Civilization history of South Historical and Archaeological Sites Important in Thailand* which was written by Prathum Chumphengphan in 2002, referred one later Mahoratuk in one rice shop, Chaiya District Market, Surat Thani Province and two Mahoratuk in Nam Rop Sub-district and Phun Phin District. They were all proofs of Dong Son culture exchange in Mueang Wiang Sa district, Surat Thani. In addition, Mahorathuk (bronze drums) excavated in several provinces (such as: Kanchanaburi Province, Uttaradit Province, Surat Thani Province, Chiang Mai, etc..) were also mentioned in P. Buabusya's monograph *The Oldest Center of world Civilization*, study results -research 1836-1977 , and he was believed that the bronze drum was transform from a stone drum, which is used in prayer ceremonies, summoning and sending off the soul of the dead. In 1991, Thai scholars Bhujong

Chandavij and Natthapatra Chandavij participated in the Second International Symposium on Ancient Bronze Drum and Bronze Culture in South China and Southeast Asia held in Nanning, Guangxi Zhuang Autonomous Region, China and published a paper on Bronze Drums and the Instruments of the Prehistoric Metal Age in Thailand, introduces 24 bronze drums found in 17 ruins in Thailand. (ចំណាំ អង្គភាព និយបនីយ, 1969; Prathum Chumphengphan, 2002; Buabusya, n.d.. Bhujong Chandavij and Natthapatra Chandavij, 1991.)

In some monographs and articles on the study of bronze drums in Southeast Asia, we can also see some introductions and research on bronze drum in Thailand, such as: Ambra Calo's *The Distribution of Bronze Drums in early Southeast Asia*, A.J. Bernet Kempers' *The Kettledrums of Southeast Asia: A bronze Age World and Its Aftermath*, etc., and most of them are introductions to the bronze drums' Era, use ethnicity, shape and decorations, etc.. (Ambra Calo, 2014; A.J. Bernet Kempers, 1988, published in China in 2022).

To sum up, at present, the research on bronze drums in Thailand is mainly focused on the introduction of the types and ontological characteristics of bronze drums in Thailand, but less detailed research on the bronze drum music, musical culture, and music history of bronze drums in Thailand, and even fewer studies comparing bronze drums in Thailand and southwest of China. Therefore, the research on this subject is of great significance.



CHAPTER III

Research Methodology

This chapter provides a systematic framework and tools for the comparative study of bronze drums in southwest China and Thailand, thereby ensuring the scientificity and standardization of research content. Includes the following basic parts:

1. Research scope.
 - 1.1 Scope of content
 - 1.2 Scope of research site
 - 1.3 Scope of time three points
2. Research process.
 - 2.1 Selected research site
 - 2.2 Key informant
 - 2.3 Research tools
 - 2.4 Data collecting
 - 2.4 Data management
 - 2.5 Data analysis
 - 2.6 Data presenting

1. Research Scope

1.1 Scope of content

This study aims to describe the distribution and the classification of bronze drums in Thailand and southwest China, formulate the criteria for the comparative analysis of shape, form and decoration, and casting technique of selected bronze drums in Thailand and southwest China. It will also describe cultural function, the current situation and characteristics of selected music examples of bronze drums in southwest China and Thailand.

1.2 Scope of research site

This research site mainly includes the following locations: Museums, Cultural Management Department, excavated sites, foundry sites, and the places where bronze drums are performed and played today.

In Thailand, bronze drums were mostly found in northern Thailand and Northeast Thailand, Central Thailand, South Thailand and East Thailand.

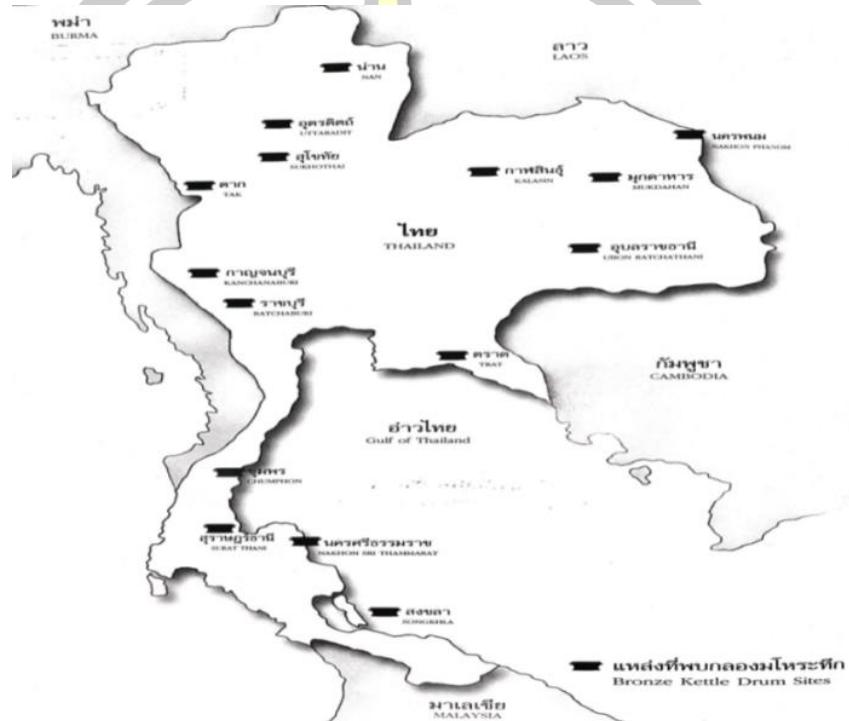


Figure 2. Distribution map of bronze in Thailand.

Source: The Bronze Kettle Drums in Thailand, 2003.

In southwest China, bronze drums were mostly unearthed in Guangxi, Yunnan, and Guizhou provinces.

1.3 Scope of time

The study scope time is from July 2021 to March 2023. The dissertation completion plan and estimated time to complete each section is as follows:

Table 2. The dissertation completion plan.

Sections	Topic(s)	Months
1	Introduction	2
2	Literature Review and Practical research	8

3	Conceptual research Framework	2
4	Methodology	4
5	Sort out materials and Do Analysis	8
6	Discussion	6
7	Conclusions, limitations and future research, Implications	6
	Total	36

Source: Jinxi Liu.

2. Research Process

2.1 Selected research site and key informant.

(1) Selected research site.

In Thailand, the selected research sites include two parts, first is the museums that collect ancient bronze drums, contains the National Museum in Bangkok, Nakhon Phanom, Khon Kaen, Ubon Ratchathani, Chiang Mai, Mukdahan, Nakhon Si Thammarat, Tak, Trat, Ratchathani, Kanchanaburi, Nan, Uttaradit, Nakhon Ratchasima, Pathum Thani, Lopburi, Songkhla, Chumphon, Surat Thani, etc.. The second selected research site is the Sanam Luang Ceremonial Ground, a performance venue where bronze drums are used in The Royal Ploughing Ceremony.

In southwest China, the selected research sites contain the Museums in Nanning, Guigang, Chongzuo, Hechi, Baise, Laibin, in Guangxi. Kunming, Wenshan, Chuxiong, Yuxi, in Yunnan. Guiyang, Qianxinan, in Guizhou. And the selected modern bronze drum performance place: the first bay of Hongshui river, in Donglan county, Hechi city, Guangxi province.

(2) Key informants

In China:

-Archaeologist: Tingyu Jiang, Qingping Yang (Guangxi institute of Archeology).

Mr. Tingyu Jiang is the leader of bronze drum research in Guangxi. He graduated from Peking University majoring in archeology in 1964. He used to be the

curator of the Museum of Guangxi Autonomous Region, the director of the Chinese Archaeological Society, and the director of the Chinese Ancient Bronze Drum research Association. The main research directions are Guangxi archaeology and bronze drum research. The relatively influential works related to the study of bronze drums include: *Bronze Drum History* (1982), *Bronze Drum* (1985), *Bronze Drum Art research* (1988), *A General Theory of Ancient Bronze Drums* (1999), *Bronze Drum Culture* (co-authored with Mingjun Liao, 2012), *Measurements of Ancient Chinese Bronze Drums. Records and Compilations* (co-authored 2014), *Lingnan Bronze Drums* (2018), *Guangxi Bronze Drums* (2016), *Intangible Cultural Heritage of Guangxi: Guangxi Bronze Drums—Drum Sound Through the Millennium* (2022), etc..

Mr. Tingyu Jiang has studied bronze drums for more than 40 years. He systematically sorted out the records of bronze drums in Chinese literature and classics, made a detailed field investigation and sorting out the bronze drums found in Lingnan and their collections, and made the most systematic and scientific introduction to the classification of bronze drums. He has been done In-depth research on sculpture art, manufacture technology, Chinese inscriptions, ethnic groups, distribution and outflow, function, bronze drum music and dance, bronze drum literature, and bronze drum transmission. Selecting Mr. Tingyu Jiang as the key interviewee will be of great help to the research of the subject.



Figure 3. Mr. Tingyu Jiang.

source: Tingyu Jiang, 2023.

Qingping Yang: Graduated from the Department of Archeology of Peking University in 1994, he is the leader of the Chinese National Archaeological Excavation Team, and concurrently serves as a postgraduate tutor for Guangxi Minzu University, an evaluation expert for the National Social Science Fund, and Guangxi Expert of the Third Cultural Relics Appraisal Committee, Distinguished researcher of Guangxi Ethnic Culture Protection and Inheritance research Center. He is an expert in archaeological research in the Zuojiang River Basin in Guangxi. He has presided over and participated in the archaeological excavation of dozens of important sites in the Zuojiang River Basin in Guangxi. Participated in the application of the cultural landscape of Huashan Rock Paintings in Zuojiang to the World Cultural Heritage, and undertook the hosting of all archaeological topics in the application process. His published works related to this topic include: *Archaeology of Zuojiang Youjiang River Basin* (2015), *research on the Correlation between Zuojiang Rock Paintings and Related Archaeological Remains* (2020). Huashan rock paintings are now a world-class intangible cultural heritage. The bronze drums and music and dance images in the rock paintings are the cultural relics of the ancestors of Luoyue in Guangxi. Professor Yang is very familiar with the archaeological remains of the Zuojiang River Basin in Guangxi, and made systematic statistics and analysis of the early archaeological materials in the distribution area of the Luoyue ancient tribe and the northern part of Vietnam. Professor Qingping Yang, as the key informant of this study, can provide archaeological data related to Huashan murals for this study, and provide scientific guidance for the archaeological investigation of the project.



Figure 4. Professor Qingping Yang.

Source: Professor Qingping Yang, 2023.

-Scholars: Fubin Wan, Fuqiang Li, (Guangxi Minzu University).

Fubin Wan: Former Vice President of Guangxi Minzu University. Part-time doctoral supervisor of the Institute of History of Natural Science, Chinese Academy of Sciences. Since 1992, he has enjoyed the special government allowance issued by the State Council of China. He is an expert in natural scientific research on bronze drums. He has scientifically and systematically studied the sources of ore materials, manufacture sites, acoustic characteristics, textual research on lead isotopes of bronze drums, the protection, transmission and development of bronze drum culture, etc., which has opened up a new era for scientific research on bronze drums new situation. The student Danfang Wei trained has also become a leader in the field of Chinese bronze drum research. His representative achievements include: research on the source of ore materials and foundry sites of the Beiliu-type bronze drum (1988), the research on the lead isotope of the source of the ancient bronze drum materials (1992), the scientific research on the bronze drums in ancient China (1992), Beiliu Exploring the Type Bronze Drums (1993), Bronze Drums of Great precious utensils: research on the Development, Transmission and Protection of Bronze Drum Culture (2013), research on the Protection and transmission of Bronze Drum Culture in China and Southeast Asia (2021). Professor Fubin Wan will provide guidance and help for this topic of Southeast Asian bronze drum research.



Figure 5. Professor Fubin Wan.

Source: Jinxi Liu, 2023.

Fuqiang Li: He is currently a professor and doctoral supervisor at Guangxi Minzu University, director of the Ethnic Studies Center of Guangxi Minzu University, and leader of the disciplines of ethnic history, Zhuang and Yao studies. His main contribution to the study of bronze drums is the investigation and research on bronze drums in Southeast Asia. Representative works such as: *Communication and Innovation: Investigation and research on Bronze Drum Culture in Southeast Asia* (2022), *China-Southeast Asia Bronze Drum Laos Volume* (2016), *China-Southeast Asia Bronze Drum Cambodia Volume* (2018). He can provide inspection experience and guidance for this topic.



Figure 6. Professor Fuqiang Li
Source: professor Fuqiang Li, 2022.

-Museum worker: Qiuyan Lu (Guangxi Museum of Nationalities)

Qiuyan Lu, research librarian, Ph.D. candidate in the history of science and technology at University of Science and Technology Beijing. She is currently the deputy director of the Ethnic History research Department of the Guangxi Museum of Nationalities, and the director of the Bronze Drum research Center of the Guangxi Museum of Nationalities. At the same time, she is the secretary-general and legal representative of the Ancient Chinese Bronze Drum research Association, and a member of the Bronze Drum Culture Professional Committee of the Chinese Culture Promotion Association. The research direction has changed to focus on the history of metallurgy and science and technology. She has rich experience in mining and metallurgy site investigation and metal laboratory analysis. Participated in the Investigation of Bronze Drum Collection in the Region's Collection project organized

by the Department of Culture of Guangxi Autonomous Region. Qiuyan Lu has provided many helps and guidance for the research on bronze drums in Guangxi Museum of Nationalities.



Figure 7. Qiuyan Lu

Source: the internet of Guangxi National Museum

-Drum artist: Anyi Tan (Bancai village, Donglan county, Hechi city, Guangxi province)

Anyi Tan is a teacher at Donglan National Middle School. He is not only the developer and manufacturer of musical bronze drums, but also the promoter and inheritor of musical bronze drum. During the researcher's inspection of Donglan Bronze Drums, Mr. Tan was assisting in the preparation of 100-person Bronze Drum Competition at the Donglan first bay of Hongshui River, with the help of Mr. Tan, the researcher was able to collect bronze drum music from Donglan.



Figure 8. Anyi Tan

Source: Jinxi Liu, 2023.

In Thailand

-Executive Director: Nitaya Kanokmongkol

Ms. Nitaya Kanokmongkol has served successively as a director in Chiang Mai National Museum, Ramkhamhang National Museum, the National Gallery of Thailand, The National Museum Bangkok, and now she is the Executive Director of Office of National Museums Fine Arts Department Thailand. She accepted our visit and provided guidance and facilitation for our visit to the National Museum of Thailand.



Figure 9. Ms. Nitaya Kanokmongkol
Source: Jinxi Liu, 2023.

- Curator: Ruetaiwan Manosa

Ms. Ruetaiwan Manosa, an curator of the Office of The National Museums Thailand Fine Arts Department in Bangkok. She studied art history in Sipakorn University, and studied Environmental science in Kasetsart University. She had provided many help to measure three bronze drums in the National Museum of Thailand.



Figure 10. Ms. Ruetaiwan Manosa

Source: Jinxi Liu, 2023.

-Archaeologist: SuKanya Baonoed

Ms. Sukanya Baonoed, currently working in Fine Arts Department, an archeologist researcher. She participated in the excavation of bronze drums in Thailand and published New progress in bronze drum archaeology in the Shawanke river basin of Muklahan. She can help to complete the research on the excavation and research on the bronze drum in the Fine Arts Department in Thailand.



Figure 11. Sukanya Baonoed

Source: Sukanya Baonoed's Facebook, 2023.

-Museum manager: Panomkorn Nawasalao

Mr. Panomkorn Nawasalao: an manager of the Office of The National Museums Thailand Fine Arts Department in Bangkok. He has in-depth research on

Thai art and culture, and has some personal opinions on the study of bronze drums. He had provided many help to measure the three bronze drum in the National Museum of Thailand.



Figure 12. Mr. Panomkorn Nawasalao
Source: Jinxi Liu, 2023.

Data collection schedule:

- In China: March - December 2022, May - June 2023;
- In Thailand: March- April, July-November 2023
 - Khon Kaen Province, March 2023.
 - Trat Province, April 2023.
 - Mukdahan Province July 2023.
 - Bangkok April 2023.
 - Chiang Rai Province March 2023.
 - Ratchathani Provinc August 2023
 - Nakhon Sri Thammarat September 2023.

Duration of Time:

- March 2021 to January 2024

2.2 Research Tools

The research tools used in this dissertation are mainly investigation, interview, document, iconography and typology. Based on the bronze drum images recorded in the literature, the researcher will conduct on-the-spot investigation and verification, make a bronze drum survey data table. In order to better sort out the history of bronze drums, it is necessary to use document method to read through relevant historical

books, archaeological reports and research materials. The use of iconography is to decompose the images and meanings represented by different patterns in the bronze drum images to reveal the social, cultural and historical background and significance. In this dissertation, we also use typology to define and classify different types of bronze drums, that is Heger's bronze drum classification, the Chinese eight-classification and Thai's bronze drum's classification will be put under this classification system, so as to make a more accurate and comprehensive analysis of bronze drums of the two countries.



Figure 13. Pre-Hi type (Wanjiaba type)

Source: Dong Son Drums in Vietnam. 1990. p.206-208.



Figure 14. Hi type (Shizhaishan type)

Source: Guangxi Zhuang Autonomous Region Museum. (1991). Catalog of Bronze Drums in Guangxi. Beijing: Cultural Relics Publishing House. p.56-57.



Figure 15. H_I type (Lengshuichong type)

Source: Guangxi Zhuang Autonomous Region Museum. (1991). Catalog of Bronze Drums in Guangxi. Beijing: Cultural Relics Publishing House. p.87.



Figure 16. H_{II} type (Lingshan type)

Source: Guangxi Zhuang Autonomous Region Museum. (1991). Catalog of Bronze Drums in Guangxi. Beijing: Cultural Relics Publishing House. p.36.



Figure 17. H_{II} type (Beiliu type)

Source: Guangxi Zhuang Autonomous Region Museum. (1991). Catalog of Bronze Drums in Guangxi. Beijing: Cultural Relics Publishing House. p. 4.

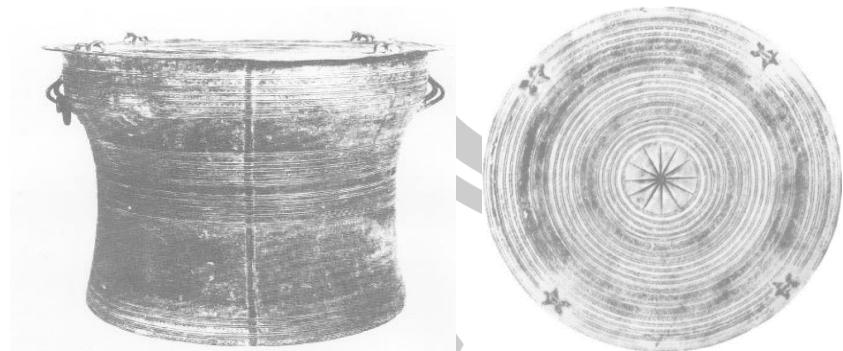


Figure 18. H_{III} type (Ximeng type)

Source: Yunnan Provincial Museum. (1959). Catalog of Bronze Drums in Yunnan Provincial Museum. Kun Ming: Yunnan People's Publishing House. p. 23.



Figure 19. H_{IV} type (Zunyi type)

Source: Yunnan Provincial Museum. (1959). Catalog of Bronze Drums in Yunnan Provincial Museum. Kun Ming: Yunnan People's Publishing House. p.35-36.



Figure 20. H_{IV} type (Majiang type)

Source: Guangxi Zhuang Autonomous Region Museum. (1991). Catalog of Bronze Drums in Guangxi. Beijing: Cultural Relics Publishing House. p.126.

2.3 Data collecting

the researcher will collect data by document and fieldwork. First, Using the bronze drum as a keyword, search archaeological reports, books, documents, videos, and pictures related to Thailand, Southeast Asia, and China on various Chinese and foreign academic websites and video websites. Then, Classify, read, and organize the collected materials, and summarize the bronze drums' materials related to the topic, recorded them, so as to facilitate the later comparative research. Secondly, the researcher must go to the place where the bronze drum is displayed, observe, measure, take pictures, video, record, and make detailed records of the utensils accompanying the bronze drum too. Docking informants to have a comprehensive understanding of the collection and preservation of the bronze drum, as well as the local geography, history and culture, and the performance of the people after the bronze drum was excavated, so as to prepare for the later analysis and comparison. All in all, during field visits, we must observe carefully and meticulously record, measure, and photograph. In the investigation, not only should pay attention to the general content, such as age, texture, shape, color, etc., but also pay special attention to the content that is easily overlooked and indirectly related to music, such as the subtle characteristics of the shape of the instrument, the traces of use, and the playing technique, etc..

2.4 Data Management

After completing the data collection, we need to perform data management. the researcher uses the method of classifying and checking for the collected data. First, organize the archaeological data according to the location, age, physical data, decorations, type, discover time and place, cite source, etc.. Second, make archaeological cards, notes, statistical tables, and drawings, compare the sorted text data with physical pictures, classify and file. Third, complete the investigation report, record the research process, research results, experience, etc..

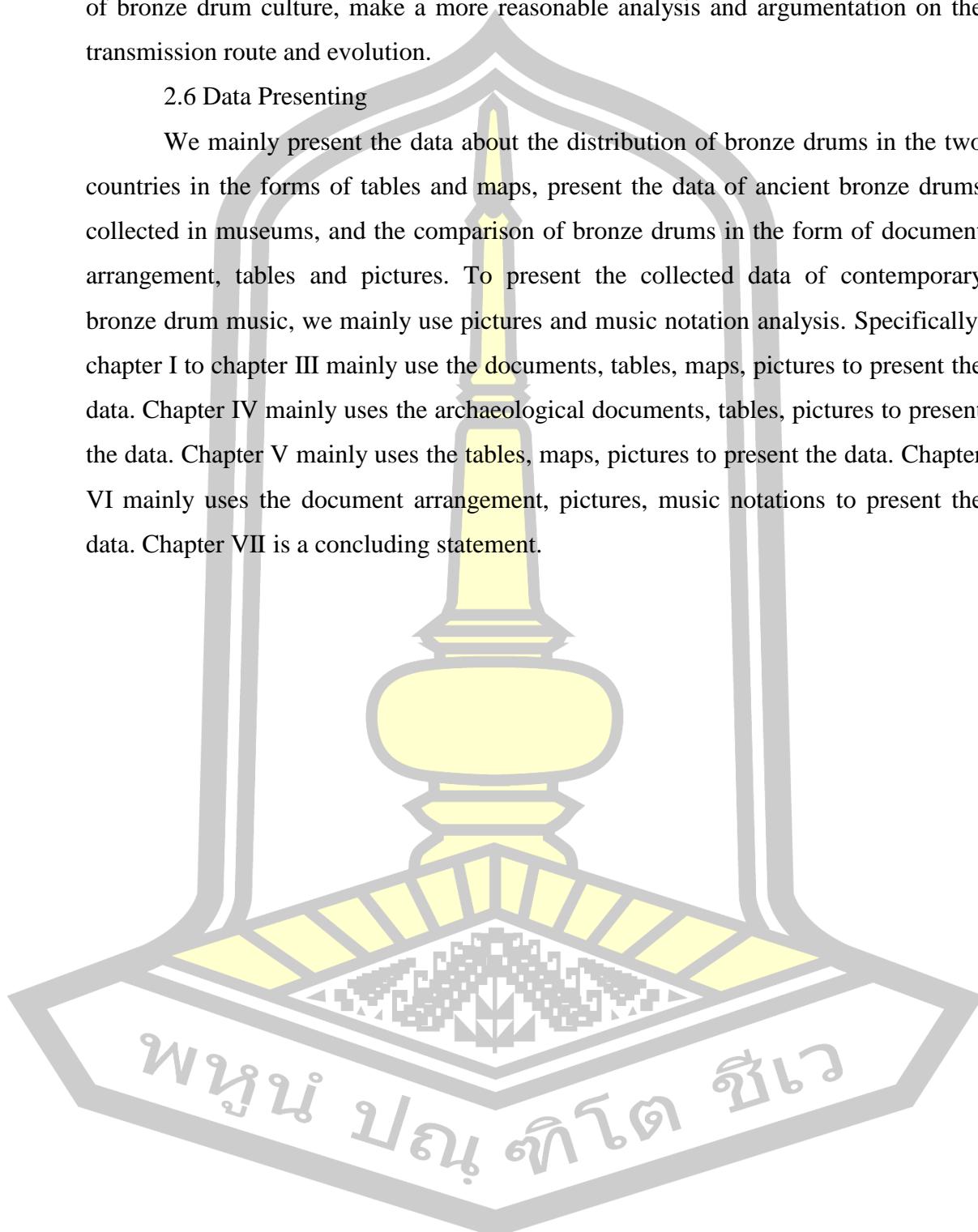
2.5 Data Analysis

In order to analyze the data reasonably, the researcher used the comparative method, comparative study of the appearance and related data, decoration, casting technique (alloy content) and musical performance of selected bronze drums in southwest China and Thailand, so as to classify them reasonably, analyze them

scientifically, find their similarities and differences, and thus contribute to the spread of bronze drum culture, make a more reasonable analysis and argumentation on the transmission route and evolution.

2.6 Data Presenting

We mainly present the data about the distribution of bronze drums in the two countries in the forms of tables and maps, present the data of ancient bronze drums collected in museums, and the comparison of bronze drums in the form of document arrangement, tables and pictures. To present the collected data of contemporary bronze drum music, we mainly use pictures and music notation analysis. Specifically, chapter I to chapter III mainly use the documents, tables, maps, pictures to present the data. Chapter IV mainly uses the archaeological documents, tables, pictures to present the data. Chapter V mainly uses the tables, maps, pictures to present the data. Chapter VI mainly uses the document arrangement, pictures, music notations to present the data. Chapter VII is a concluding statement.



CHAPTER IV

Distribution and the Classification of Select Bronze Drums in Southwest China and Thailand

The research on the classification of bronze drums in this chapter is based on Heger's classification method. Classification is the foundation of the study of bronze drums. Heger's Ancient Metal Drums of Southeast Asia contains 165 bronze drums, and according to the shapes and patterns of these drums, they are divided into 4 basic types and 3 transitional types by archaeological classification. Scholars collectively call these four basic types Heger's four divisions. After more than a hundred years, Heger's bronze drum four divisions was verified to be basically correct, so until today, this classification system is still in use. Although scholars from various countries have proposed other classifications based on the general characteristics of the bronze drums excavated in their own countries, they have not jumped out of the basic framework of Heger's four divisions. Chinese Ancient Bronze Drum research Association divides bronze drums into eight types, which is also a refinement and extension of Heger's four divisions.

This chapter divides into two sections. In the first section, we mainly introduce the selected three types bronze drums in China. In the second section, we introduce two types bronze drums currently found in Thailand. In each section, we will combine the survey data to analyze the geographical distribution, overall characteristics, main halo decorations, and casting technique of each type of bronze drum, and judge the musical instrument performance of different types of bronze drums according to their alloy content. The reason for interpreting the appearance characteristic, decoration of the bronze drum is because the bronze drum, as a musical instrument, carried the beliefs and aesthetics of the ethnic groups who used the bronze drums in that era, as well as the changes in ethnic folk culture caused by changes in the political and economic environment. It is the key in our interpretation of that period of history and humanities, and an important carrier for us to explore the ancient music culture in the era of bronze drum support.

In order to facilitate the reader's reading and understanding, this article will discuss the types of bronze drums in Southwest China by presenting the Heger - Chinese classifications, and the bronze drums found in Thailand by using the Heger classification. Heger's four basic types, which we denote by H_I , H_{II} , H_{III} , H_{IV} ($H=Heger$), are expressed in the following way instead of the three Chinese types of bronze drums: H_I -SZS (SZS=Shizhaishan type), H_I -LSC (LSC =Lengshuichong type), C_{III} - XM (XM=Ximeng type), which facilitates the reader to correspond the Heger classification to the Chinese bronze drum types.

This chapter contains the following topics:

1. Distribution and the classification of bronze drums in southwest China.
2. Distribution and the classification of bronze drums in Thailand.

1. Distribution and the classification of bronze drums in southwest China

1.1 H_I type bronze drum

1.1.1 The distribution of H_I type bronze drum in southwest China

Based on the bronze drum materials Heger had in hand, Heger inferred that basic H_I type drums were mostly found in the southern provinces of China, and some appeared in Tokyo and the Malay Archipelago (Heger, 1903). With the increase of archaeological excavations and bronze drum research materials, the distribution area of H_I type bronze drums can be roughly outlined: including Yunnan, Guangxi, Sichuan, and Guangdong provinces in southwest China, as well as Vietnam, Thailand, Malaysia, and Indonesia in Southeast Asia vast areas within.

H_I type bronze drums are further divided into two types in China: Shizhaishan type and Lengshuichong type, which we denote by H_I -SZS (SZS=Shizhaishan type) and H_I -LSC (LSC =Lengshuichong type) respectively.

H_I -SZS, the early H_I type, is represented by a batch of bronze drums unearthed from the tombs of the Han Dynasty in Shizhaishan, Jinning, Yunnan. According to the survey, a total of about 81 bronze drums of the Shizhaishan type have been found in China, of which , Yunnan 58, Guangxi 12, Guangdong 1, Sichuan 2, Guizhou 3, Hainan 1, Shanghai 2, Hangzhou 1, Hainan 1 (Cao Liang, 2015). Among the 81 bronze drums, 44 bronze drums were unearthed from tombs (there are 34 in Yunnan, 8 in Guangxi, 1 in Guizhou, and 1 in Zhejiang), and many artifacts

were unearthed with the bronze drums. The age is accurate, mainly from Shizhaishan, Lijashan, Tianzimiao, Yangfutou, Batatai in Yunnan. Guixian, Xilin, Baise in Guangxi. Haozhang in Guizhou and Anji in Zhejiang. In addition, it is a single bronze drum unearthed or handed down from generation to generation. A total of 21 single drums were unearthed, 12 in Yunnan, 4 in Guangxi, 1 in Guizhou, 2 in Sichuan, and 2 in Hainan. 12 in Yunnan come from Liangwangshan in Jinning, Guangnan, Wenshan, Masupo, Yun County, Tengchong County, Zhaotong City, and Yuanjiang County. 3 in Guangxi come from Baise, Longlin, and He County respectively. The 2 in Sichuan come from Huili County and Yanyuan County respectively. Most of the handed down items are collected by museums from different sources in various places, and the provenance is unclear. From the perspective of distribution area, H_I-SZS bronze drums are found in the largest number in Yunnan, and the distribution locations are relatively wide, but in general, they are densely distributed in the Dianchi Lake area. Jinning, Jiangchuan, Kunming, and Chenggong are the concentrated areas, with this as the center, there are Tengchong and Yunxian to the southwest, Wenshan, Guangnan, Masupo, Funing and other places to the southeast, and Zhaotong to the northeast, this type of bronze drum all has been found. Guangxi is also an important distribution area of H_I-SZS, and the excavations of bronze drums are also concentrated in Xilin, Longlin, Baise, Tiandong and other areas bordering Yunnan in the west. Although such bronze drums have also been found in eastern and northern regions such as Shanghai and Hangzhou, they should have been carried and spread in the past, rather than local artifacts. (Tingyu Jiang, 1988; Fubin Wan, 1993; Kunsheng Li, Derong Huang, 2008; Guangxi Museums of Nationalities, 2015/2018.)

H_I-LSC bronze drum, late stage of H_I type, is represented by the bronze drum unearthed in Lengshuichong, Hengcun, Mengjiang Town, Teng County, Guangxi. At present, there are a total of 139 H_I-LSC bronze drums with records in China. Among them, there are 7 in Beijing, 1 in Shanghai, 1 in Zhejiang, 1 in Jiangsu, 1 in Hubei, 1 in Hunan, 14 in Guangzhou, 107 in Guangxi, 1 in Chongqing, 3 in Sichuan, and 1 in Yunnan. The distribution area of Guangxi H_I-LSC bronze drums includes Liuzhou, Wuzhou, Tiandong, Cenxi, Daxin, Rongxian, Guixian, Yongning, Binyang, Wuxuan, Xiangzhou, Laibin, Yizhou, Pingnan, Guigang, Mengshan, Nanning, Shanglin, Wuming, Hengxian, Pingnan, Jinxiu, Guiping, Tengxian and

other places are mainly distributed on both sides of the Yongjiang-Yujiang-Xunjiang-Xijiang River, covering more than half of Guangxi, among which Guiping and Pingnan, Tengxian area is the most concentrated. Most of the H_I-LSC bronze drums were unearthed from a single drum, with few accompanying objects. The popular period was from the late Eastern Han Dynasty to the Sui and Tang Dynasties, and it was the most prosperous in the Jin and Southern Dynasties. (Tingyu Jiang, 1988)

1.1.2 General characteristic of H_I type bronze drum

Heger introduced 35 H_I type drums in his *Southeast Ancient metal Drums*, and outlined the characteristics of H_I type drums: almost all of them are large or extra-large drums. The star in the center of the tympanum is generally twelve-pointed, and the edge of the tympanum has four single ones protruding upwards, or the patterns are decorated with frogs of different heights. Sometimes there are two statues of equestrians. Most tympanum protrude significantly from the outside of the drum. The drum body is clearly divided into three sections from top to bottom, the upper part is protruding, the middle part is concave, and the lower part is vertical or retracted first and then stretched, forming an outwardly inclined cone. Conventionally, there are generally four drum lugs, and they are arranged in pairs. There is a braided pattern on the lug, and there are often gaps on the central axis, and sometimes the gaps are divided into two parts. There are also some drums that have two auxiliary lugs next to the four drum lugs of another style. On the surface of the drum body, there are slightly alternate and even regularly arranged patterns. They are more primitive than the patterns on other types of drums. The decorative patterns of other types of drums evolved from it. H_I type is the basic type of all drums, and other types are gradually evolved in the spread of it in new areas.

When Heger analyzed the decoration of H_I type drums, he followed his inspection of decoration patterns, first studied the main decorations of the drum tympanum and drum body, established a fixed framework, and then analyzed the fixed points according to their order. According to the theory of analyzing the halo decorations between the bronze drums (Heger, 1903), the drum tympanum and drum body decorations of each bronze drum are described in detail. Heger selected the main halo of the star in the center of the drum tympanum, a figure image, or a patterned image of the same kind (this main halo is usually in the middle of the drum

tympanum) as a fixed point to compare with the corresponding halo patterns on other drums, and believed that the main halo on the tympanum of this type of bronze drum and the two large halos attached to the chest and waist of the drum body contain the same type of drum and other similar patterns of figures and ships on the drum. It is believed that these pictures seem to show some scenes and events in the life of the owner of the bronze drum. The portraits are all facing the center of the circle in a anti-clockwise direction, in a standing state. The drum body also has a main halo and a secondary halo. There is a certain internal connection between the main halo decoration on the drum body and the main halo decoration on the drum tympanum.

In Heger's classification of bronze drums, the original drums with and without frogs are grouped together as a type of discussion. In the final analysis, it is because of his theory leading that the main decorative features are used as the basis for the classification of bronze drums. In order to present the modeling and decoration features of this kind of bronze drum more clearly, we will break it down and put it in H_I-SZS and H_I-LSC for detailed analysis.

Because the shape of the H_I type bronze drum is richer and more exquisite than that of the pre-H_I type bronze drum, in order to better describe the shape and decoration, we still make a simple illustration of the names of every part of the H_I type bronze drum:





Figure 21. The structural name of the H_I type bronze drum.

Bronze drum Source: Bronze Drums in Guangxi. p.71.

1.1.3 H_I-SZS type (Shizhaishan type bronze drum)

H_I-SZS is represented by the bronze drum unearthed from the tombs of the Han Dynasty in Shizhaishan, Jinning, Yunnan Province, and is an earlier bronze drum in the H_I type. The H_I-SZS type was officially named by the Ancient Chinese Bronze Drum Research Association at the Nanning Academic Conference in 1980. It was named after the bronze drums excavated from the Dian Tomb in Shizhai Mountain, Jinning, Yunnan Province in 1955 and 1956. The tombs in this area were excavated 5 times, and only 17 bronze drums were found in the first and second excavations. (Tingyu Jiang, 1988; Kunsheng Li, 2009.)

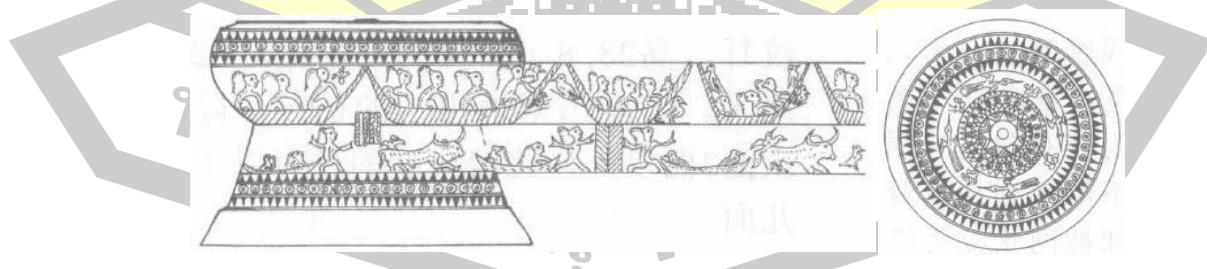


Figure 22. Shizhaishan M1:58 Drum.

Source: Ancient Bronze Drums in China and Southeast Asia. p.107.

1.1.3.1 Investigation data of Hi-SZS bronze drum

the researcher collected a total of 81 pieces of Hi-SZS bronze drum data, from which we selected 43 bronze drums with relatively complete dimensions or special decorations, and made a statistical table of the main dimensions and main decorations of Hi-SZS bronze drums (see the appendix table 1 for specific survey data). Judging from the statistical data, we can get the following information:

(1) Dimensional features: The tympanum diameter is medium wide, most of which are between 30 and 45cm.

(2) The main halo patterns are flying heron pattern, feathered-figure pattern, and rowing pattern. Most of the main halos on the tympanum are herons flying anti-clocking patterns, among the 43 bronze drums, 30 have herons flying anti-clocking patterns, and only a small amount drums have thunder patterns, cow patterns, banquets, etc.. Feathered-figure rowing boat pattern is the main halo decorations on the bulging chest. Of the 43 bronze drums, 28 are decorated with this pattern.

Most of the drum waists are divided into vertical grids, with the most vertical divisions being 8 grids, totaling 20. There are 13 decorated with feathered-figure patterns, 17 decorated with cow patterns, and 9 are plain. In addition, there are also 1 each with a picture of a heron bird, a picture of wing figure, a picture of a deer, and a picture of splitting a cow.

The drum tympanum and drum body's pattern are mostly separated by 1 string or 2 strings, and the most center light body of drum tympanum have 8,10,12 awns. It shows that the Hi-SZS bronze drum tympanum light body has gradually moved forward in the direction of standardization. Most of the halos on the drum tympanum are below 10 halos. Generally, the larger the drum tympanum, the more halos.

(3) The bulging chest is convex, the diameter of the drum is slightly larger than the diameter at breast height, and the diameter of the tympanum is larger than the height of the drum body. The body shape is symmetrical, flat and short.

(4) There are two joint lines on the drum body, 11 bronze drums have gasket marks on the whole body, and 2 bronze drum gasket marks on the foot. The description is still using the mold casting method. There are also 2 bronze drums, the

drum body has no matching line, which are Tu 282 and Tu 283 drums unearthed in the bronze drum tomb in Xilin, Guangxi.

(5) The appearance beauty of any practical utensil is constantly changing according to the aesthetic habits of different times and nations. The general intention is to try to make all parts well-proportioned and harmonious in proportion. People of later generations have found in practice that the value usually around 0.618 to 0.714 are in line with the category of aesthetic proportions (Tingyu Jiang, 1988). Through the calculation of the ratio of the drum height to the tympanum of the H_I-SZS type bronze drum, we found that the ratio of the H_I-SZS type bronze drum is nearly half of the ratio between 0.55 and 0.75, which shows that the casters attention has been paid to the aesthetic norms of bronze drum modeling.

1.1.3.2 Appearance features of H_I-SZS bronze drum

Combining data analysis and the research results of bronze drum researchers, we can summarize the appearance characteristics of H_I-SZS bronze drums as follows:

The drum tympanum is wide, no high-relief motifs. The drum tympanum is connected with the drum body which is divided into three parts, namely drum chest, drum waist and drum foot. Most of the drums chests are protruding, the bulging waist is slightly extravagant and tapered, and the foot are short. The tympanum, chest and waist are richly and gorgeously decorated with delicate depictions and symmetrical layout. Four lugs, which arranged in pairs, and are equidistantly distributed at the junction of the drum chest and the drum waist. Most of the decorations on the lug handles are braided patterns. The drum body has two joint molding lines, and some have gasket marks.

The light body in the center of the tympanum is integrated with the awns, mainly 8, 10 or 12 awns, with the oblique lines filled in between the awns. The decoration was separated by 1-2 raised ring-shaped strings into about 10 halos. The narrow halo is decorated with jagged (zigzag), circle patterns, dot patterns and other pattern belts. The wide halo is the main halo, most of the tympanum is decorated with herons flying anti-clockwise, most of the chest is decorated with feathered-figure rowing boat pattern, the waist has grids formed by vertical strips. The grids are

decorated with images of feathered-figure dancing patterns or cattle or ritual paintings or deer, etc..

Generally speaking, the main halo of the Hi-SZS bronze drum is a realistic pattern, with the light body as the center, and when the center of the drum is beating, a large-scale life, entertainment, and natural scene of circular motion scenes in people's images, majestic and gorgeous.



Figure 23. M1:10 Bronze Drums of the Han Dynasty Tomb in Luobowan, Guangxi.

Source: Bronze Drums in Guangxi. p.58.



Figure 24. The Bronze Drum of Tianzimiao in Chenggong, Yunnan.

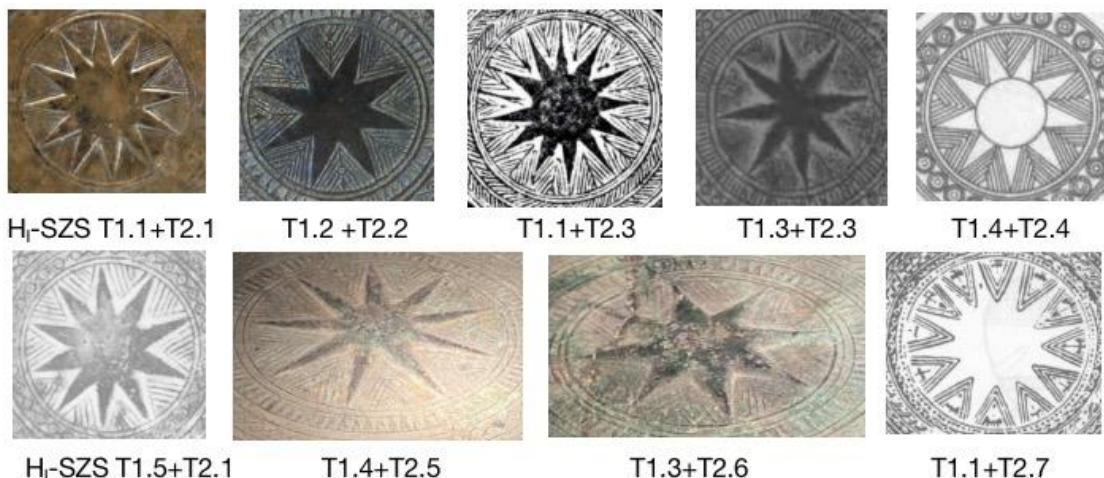
Source: Jinxi Liu, Yunnan Provincial Museum, 2021.

1.1.3.3 Analysis of main decoration of H_I-SZS bronze drum

(1)Light body

The light body is the most important decoration on the drum tympanum, it runs through the entire history of the bronze drum, and it is in sync with the development of the shape of the bronze drum.

In the H_I-SZS bronze drum, the light body has been greatly improved compared with the Pre-H_I-WJB type. The awns are mostly an acute triangle, which is integrated with the light body, they are mostly 8 awns, 10 awns, and 12 awns. There are mainly six kinds of awn decorations, one is oblique lines, second is feather patterns, third is feather pattern alternate with a circle with a dot in the middle of the feather pattern, forth is Zhui-shaped pattern (Zhui, is the pronunciation of the Chinese character 墜. The pattern like the eye shaped peacock tail pattern, we all use the Zhui-shaped pattern to represent later in the text), fifth is multi-angle pattern, sixth is multi-angle pattern + circle with a center dot. These patterns and the light body form one void and one solid, which makes the three-dimensional effect of the light body more prominent and the visual effect more beautiful. Only a small number of H_I-SZS bronze drum in southwest China are decorated with two kinds of patterns in rotation, and most of them are oblique lines, multi-angular patterns and feathers pattern. Among them, the Guangxi Tiandong Guogailing Drum and He county Longzhong Drum unearthed through scientific excavation are tombs of the Warring States Period. The jagged (zigzag) pattern is a common pattern on bronze drums in the late Pre-H_I-WJB type. Gradually transformed into elongated jagged (zigzag) pattern, and finally, it became a short vertical comb line. The continuation and change of this pattern reflects the historical evolution of the bronze drum. Therefore, the oblique line pattern should be the awn pattern of the earliest H_I-SZS bronze drum. This kind of decoration has continued to appear on the tympanum of the bronze drums unearthed in the early Western Han Dynasty (such as M1:10, M1:11 unearthed from the Han Dynasty Tomb in Luobowan, Drum No. 280 from the Xilin Bronze Drum Tomb, Guangxi, etc.). Later, there appeared multi-angular patterns, feather patterns, circle patterns with a center in the middle of the feather patterns, and at last Zhui-shaped patterns.



Remark: T=Tympanum, T1 = Tympanum light body, T1.1 = Tympanum 12 awns light body, T1.2 = Tympanum 8 awns light body, T1.3 = Tympanum 8 awns light body, T1.4 = Tympanum 9 awns light body, T1.5 = Tympanum 10 awns light body. T2 = Between awns pattern, T2.1 = Between awns pattern 1, oblique line pattern. T2.2 = Between awns pattern 2, feather pattern alternate with a circle with a dot in the middle of the feather pattern. T2.3 = Between awns pattern 3, feather pattern. T2.4 = Between awns pattern 4, overlap oblique line pattern. T2.5 = multi-angle pattern+ a dot in circle center. T2.6 = multi- angle pattern. T2.7 = Zhui-shaped pattern (like peacock tail feathers, also called peacock tail feathers pattern).

Figure 25. The bronze drum's light body.

T1.1+T2.1, Xilin No. 280.

T1.2+T2.2, Hexian Longzhong Drum.

T1.1+T2.3, Shizhaishan M11: 2.

T1.3+T2.3, Guigang High School Drum.

T1.4+T2.4, M69:171 in Lijiashan.

T1.5+T2.1, M14:1 in Shizhaishan, Yunnan.

T1.4+T2.5, 60.2.6712 in Hezhang, Guizhou .

T1.3+T2.6, M153:1, in Hezhang, Guizhou .

T1.1+T2.7, Kaihua bronze drum in Yunnan.

Source: Decoration Art of Ancient Bronze Drums, p.22 (the first two), p.34. Catalog of Bronze Drums in Guangxi, p.57. Ancient Bronze Drums in China and Southeast Asia, p. 91. p.83. Jinxi Liu, 2021 (two figures). Ancient Bronze Drums in China and Southeast Asia, p.95.

(2) Main halo decoration on the drum tympanum

Heger called the central halo with the light body on the tympanum and the halo with the main decoration, and the halos with the main decoration in the upper two sections of the drum body as the main halo. This pattern generally appear on the widest halo of the tympanum, halfway between the center and the rim of the drum tympanum.

From the collection and arrangement of H_I-SZS bronze drum materials, we can find that most of the H_I-SZS bronze drum tympanum have main halo patterns ranging from one halo to two halos. The most common is a circle of main halo, decorated with anti-clockwise flying herons pattern four, five, six, seven, ten, eighteen, twenty, etc., of which four and six are the most common. The more flying herons there are, the more gorgeous and majestic the drum tympanum will be. The flying herons on the tympanum of the H_I-SZS bronze drum is basically even in number, and the odd number is relatively rare. There are 5 flying herons on the drum tympanum of Shizhaishan M11:2. This is considered to be an error during manual molding (Chongji Wu, 2018). There is no decoration in the middle of the egret, a few add mallards in the middle of the flying herons pattern (Shizhaishan M1:58), some herons hold fish in the beak (such as Luobowan M1:10), and some have four cows with sharp peak shoulder and two flying herons (such as Yunnan Funing Mengmei No. 1 bronze drums), a small number of bronze drums are decorated with two rings of main halos, such as Yunnan Kaihua drums, one string is divided into halos, a total of sixteen halos, the main The halos are the seventh and the eleventh halo respectively. The seventh halo is decorated with 2 groups of dancers, and each group has 4 musicians (including those who play calabash and sheng and drums), 7 unarmed dancers, and another choreographer. There is one gong, two stilt-style houses, and a big bird on the roof. Inside the house, there are bronze drum stands, pots, geese and other containers; the eleventh halo is decorated with 18 flying herons. The scene depicted on the entire drum tympanum is magnificent, just like a large-scale sacrificial music and dance. The No. 280 bronze drum in Pu Tuo Bronze Drum Tomb in Xilin, Guangxi has two halos as the main halo (if you don't consider the prime halo as the main halo). The third and fourth halos on the drum tympanum of No. 280 are

the main halos. The third halo is the pattern of hooked clouds, and the fourth halo is the pattern of twenty flying herons.

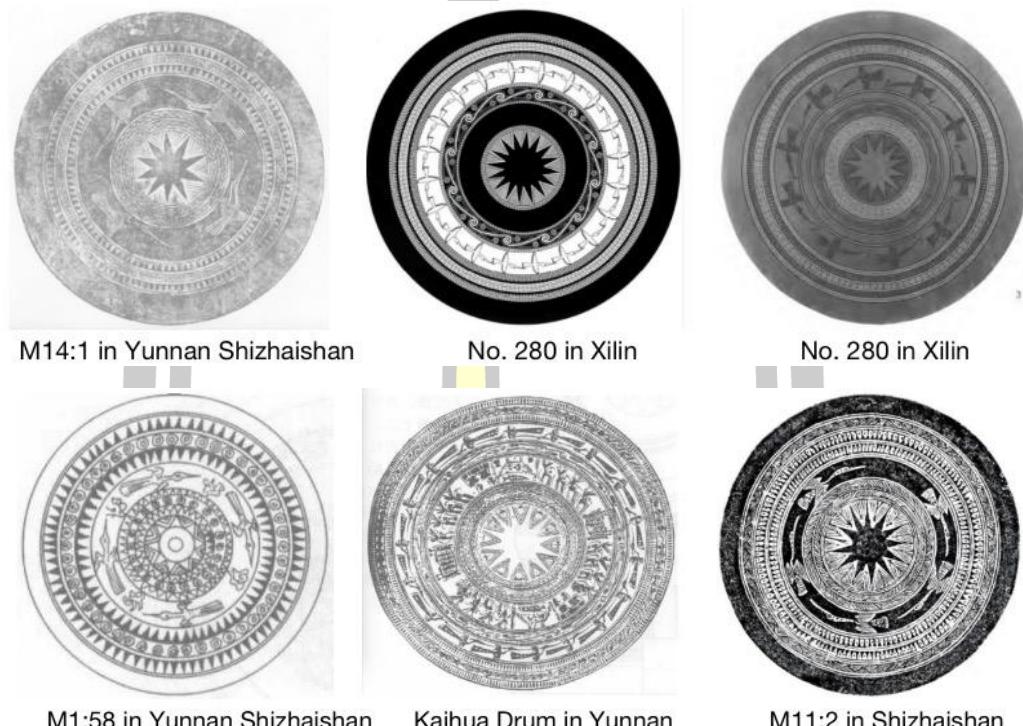


Figure 26. Main halo decoration on the Hi-SZS drum tympanum.

Source: Catalogue of Bronze Drums in Yunnan Museum, p.8; Catalog of Bronze Drums in Guangxi, p.61, 57; Ancient Bronze Drums in China and Southeast Asia, p. 81, 95; Decoration Art of Ancient Bronze Drums, p.34.

The flying herons pattern in the Hi-SZS bronze drum also has different shapes, but most of them are flying with long beaks and wings. Some people think that these flying birds are cormorants, because cormorants have long beaks and are good at fishing. Water, fishing was a way of life for people at that time. Some people also think it is a heron, because in ancient times, there was a lot of water in the south, and there were many egrets in the field lakes. The egret has beautiful feathers, and the head is decorated with two strips of feathers. In ancient times, people used bird feathers as headdresses to represent their status, and to express the image of nobility, mystery and holiness, and free flight. M11: 2 drum unearthed in Shizhaishan has a more realistic image of flying birds, which is a typical image of cormorants. In M1:10 of the bronze drum of Luobowan Han Dynasty, the flying birds hold fish on the

tympanum, and the feathered figures with bulging waists also have images of flying birds on their heads, there is a pouch under the bird's beak, which is also a realistic form of a cormorant cormorant, but the long beak and long tail image of M1:13 is indeed more likely to be regarded as a peacock. Therefore, the image of flying birds should be related to the beliefs and totems of different ethnic groups.



Remark: H₁-SZS T=Tympanum, W=Waist. W2=Flying heron pattern on waist. W2.1=Flying heron pattern with a sac under the mouth. H₁-SZS T3=Tympanum main halo pattern, flying herons. T3.1=flying herons mouth with fish, T3.2=flying herons pattern 2, and so on.

Figure 27. Flying heron pattern on H₁-SZS.

T3.1, W2.1, M1: 10 Luobowan Drum, Guangxi.

T3.2, Tu 1611, Guigang High School Drum, Guangxi.

T3.3, M11:2 Shizhaishan, Yunnan.

T3.4, M1:58 Shizhaishan, Yunnan.

T3.5, No. 280 Xilin, Guangxi.

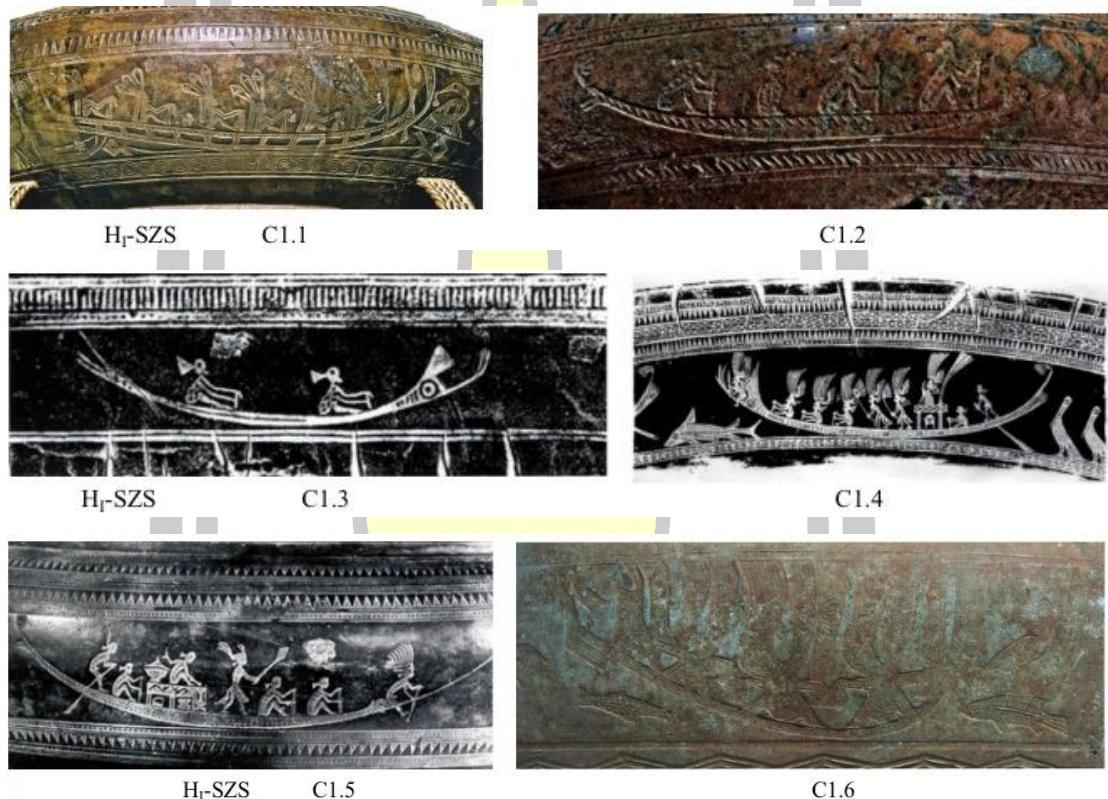
T3.6, M1:13 Luobowan, Guangxi.

Source: Bronze Drums in Guangxi, p.59 (two figure), p.57, 61; Decoration Art of Ancient Bronze Drums, p.34, 35, 28.

(3) Main halo decoration on the drum chest

Most of the main halo decorations on the chest of H₁-SZS bronze drums are feathered-figure rowing boats. The bow and tail of the most boat are

decorated with birds pattern. People are arguing about the characters and events on the boat. Some say it is a competitive ferry boat, some say it is a sacrificial boat, and some say it is a sea ferry boat. The researcher think it cannot be generalized. Ethnic groups live in different regions, use different boat tools, and use them in different situations. Comprehensive research should be based on the land where the bronze drum was excavated and the ethnic groups who used it, as well as local archaeological data.



Remark: H₁-SZS C= Bronze drum's Chest, C1= feathered-figure rowing the boat pattern. C1.1= feathered-figure rowing the boat pattern 1, C1.2= feathered-figure rowing the boat pattern 2, and so on.

Figure 28. Rowing boat pattern.

H₁-SZS C1.1, M1:10 in Luobowan, Guigang, Guangxi.

H₁-SZS C1.2, Longzhong drum, in He county Guangxi.

H₁-SZS C1.3, M1:11 in Luobowan, Guigang, Guangxi.

H₁-SZS C1.4, Xilin 280 drum in Guangxi.

H₁-SZS C1.5, Guangnan bronze drum, Yunnan.

Hi-SZS C1.6, Can 0003, in Jingxi, Guangxi.

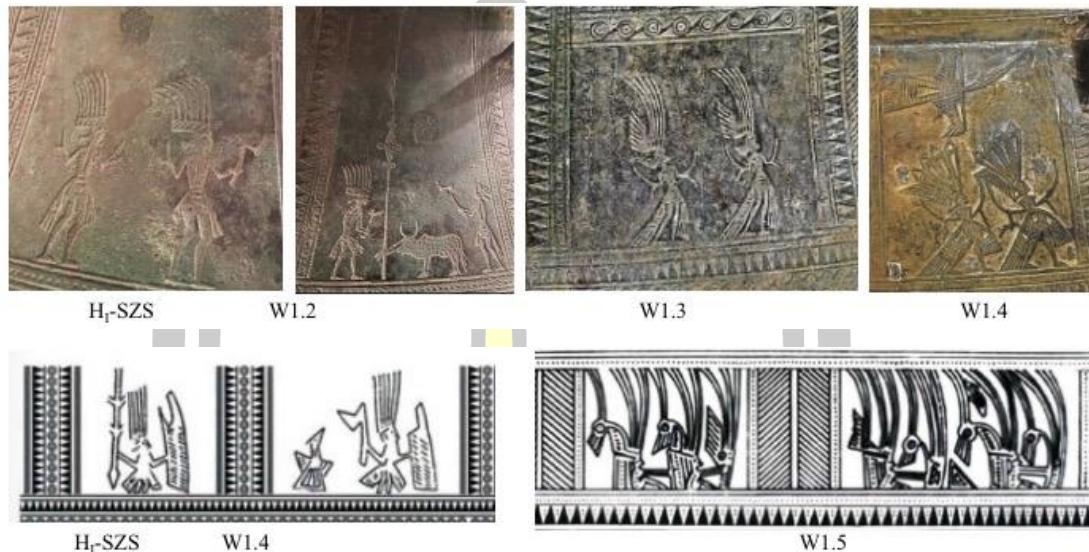
Sources: Jinxi Liu, 2021/2023; Bronze Drums in Guangxi, p.56, 60; Decoration Art of Ancient Bronze Drums, p. 58, 61, 64, 70.

Judging from the above pictures, the ship patterns of Hi-SZS bronze drums are different, but each ship pattern is the bow and the stern are raised high, the bow has patterns similar to bird's eyes, and the stern is like a bird's tail feather. There are big ones and small ones, only one person rowing in the smallest one, and more than ten people in the big one. The characters on the boat are of different shapes, some are naked with a bun, and some are naked or wear uniform costumes and feather ornaments on their heads. People who row boats face the same direction, hold paddles in both hands, and move in a uniform, serious and orderly manner. Those who don't row boats have weapons like spear in their hands, and feather shields in their hands. In the bronze drum drum pattern of Xilin No. 280, there is a person standing on the square chair in the middle of the boat, there is a feather-like decoration on the back of the chair, which seems to be the leader. Behind the chair are two naked little men without feather crowns, who seem to be slaves. There is another person sitting on the bird's head of the bow, which seems to command in the boat. It can be seen that different boat patterns represent different events. The ethnic groups in different regions have different costumes. The cruise activities are either for racing, marching or offering sacrifices, the types of boats are different, depicting the rich water activities of that era. Judging from the changes in ornamentation, we can clearly see the evolution from figurative depiction to increasingly graphic ones. And the flourishing of water sacrificial activities.

(4) Main halo decoration on the drum waist

Most of the Hi-SZS bronze drums' waist are divided into upper and lower two parts. the upper part is divided into vertical grids (with the most vertical divisions being 8 grids). This lattice decoration obviously inherits the decorative features of the Pre-Hi-WJB bronze drum in the later period, and fully proves the continuity of the two types of bronze drums. Most of the compartments are decorated with patterns of feathered-figure, cattle or plain, and there are also patterns of egrets,

birds, deer, playing swing and killing cattle, etc.. The content mainly shows wealth, folk customs.



Remark: H₁-SZS W=H₁-SZS Bronze drum's waist. W1=Feathered - figure pattern. W1.1=Feathered - figure pattern group 1, W1.2 = Feathered-figure pattern group 2, and so on.

Figure 29. Feathered - figure pattern.

H₁-SZS W1.1, Guangnan bronze drum, feathered -figure dancing and killing cow pattern.

H₁-SZS W1.2, Xilin No. 280 with drum, feathered-figure dancing pattern.

H₁-SZS W1.3, Luobowan M1:10 Drum, feathered -figure dancing and flying herons Pattern.

H₁-SZS W1.4, Shizhaishan M14:1, feathered-figure Holds a ax or sslug and a shield.

H₁-SZS W1.5, Jiangchuan M24:36, feathered-figure Pattern.

Source: Jinxi Liu, 2021, Yunnan province Museum; Bronze Drums in Guangxi, p.65, 59; Decoration Art of Ancient Bronze Drums, p.99, 92.

In the H₁-SZS bronze drum and waist grid, there are generally 1-3 dancers in the pattern decorated with feathered-dancers, wearing tall feather crowns, or bending elbows and four fingers together to dance, or sitting and holding a feathers shield, or holding an ax in one hand and a shield in the other. All the dancers lean forward or backward, and their foot are marching, as if they are performing. There is a

record in *Zhou Li* (classics of the Zhou dynasty), *He is in charge of teaching soldiers to dance, leads the dances and the sacrifice, worship the mountains and rivers.* This is consistent with the image representation of the bronze drum body.

In addition, the waist of the bronze drum No. 280 in Xilin has 12 square grids with geometric patterns. Each grid is divided into upper and lower layers. In ancient China, deer was regarded as a sacred object, and in the Han Dynasty, deer patterns were also regarded as auspicious patterns and were widely popular. The deer, like the egret, were cast on the bronze drum, which should be the meaning of the tribal leaders praying for the prosperity at that time.



Remark: H₁-SZS W = H₁-SZS Waist. W3 = Deer pattern. W4 = Cow pattern. W4.1 = Cattle pattern 1, W4.2 = Cow pattern 2, and so on. W5 = Swing pattern.

Figure 30. Deer, Cow, and Swing patterns on H₁-SZS.

W3.1, Xilin No. 280

W4.1, Lijiashan M24:42A

W4.2, Longzhong bronze drum, in He county, Guangxi.

W4.3, Bianya bronze drum, in Longlin county, Guangxi.

W4.4, M1:58, in Shizhaishan, Yunnan.

W5.1, M24:42A, in Lijiashan, Yunnan.

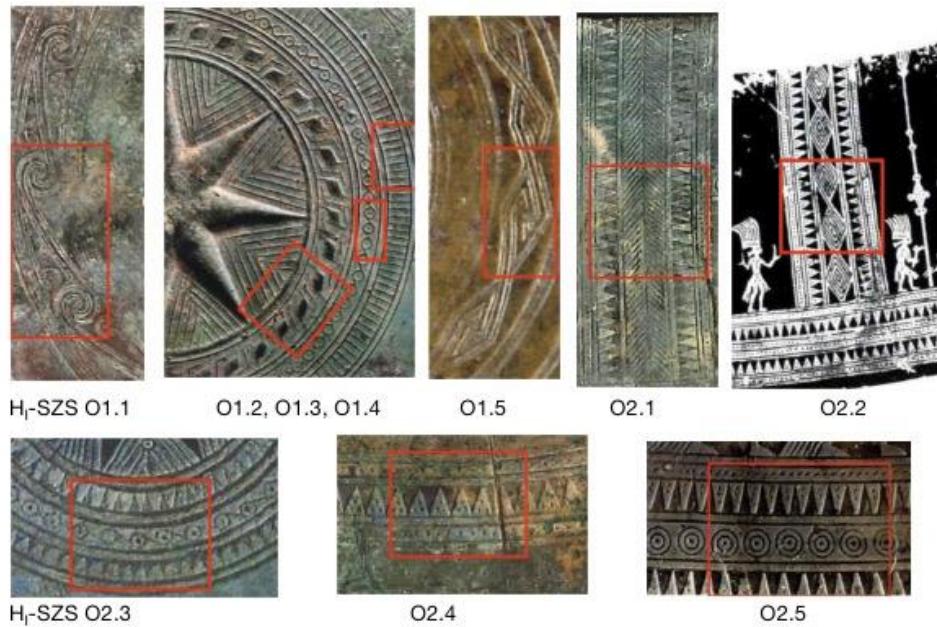
Source: Bronze Drums in Guangxi. p.65; Jinxi Liu, Yunnan province museum, 2021; Decoration Art of Ancient Bronze Drums, p. 107, 106.

Most of the ox patterns decorated are bulls, with sharp peaks shoulder and long horns, which are very majestic. Some have egrets standing on the backs of cattle. In ancient times, cattle were a symbol of family wealth, and they also played a very important role in large-scale national sacrificial ceremonies (such as disaster relief, blessing, conquest, etc.). Because, in the eyes of the ancient Chinese, cattle were spiritual animals that could communicate with deities. Therefore, in major sacrificial ceremonies, cattle with horns that are upright and specially raised in advance must be used as animals in major sacrificial ceremonies. *Book of Li Ji Qu Tian Xia*, a key classic of the Zhou Dynasty in China, records: *All sacrifices... the emperor sacrificed pure-colored cattle, the princes sacrificed fat cattle, the officials used selected cattle, and the scholars used sheep and hogs. The major event of the country lies in the worship and the army*, which is also vividly expressed in the main halo of the drum body of the H_I-SZS type bronze drum.

(5) Other geometric patterns

The geometric pattern was created from scratch in Pre-H_I-WJB, and it is simple to complex in H_I type. In the H_I-SZS type bronze drum, the geometric patterns appearing mainly include: cloud pattern, slash pattern, dot pattern, zigzag pattern, concentric circle pattern, feather pattern, thunder pattern, comb pattern and so on.

Combination decorative belt pattern is composed of several halos. There are two types of combination decorative belt pattern: vertical straight combination decorative belt and horizontal circle combination decorative belt pattern. The former is used as drum waist vertical grids, and the latter is used for drum tympanum and body decoration. The combination decorative belt pattern is very important in the bronze drum. It uses the combination of halos to produce a sense of rhythm and achieve a moving artistic effect. (Weiqing Li, 1999; *Bronze Drum and Its Decoration*. p. 116.)



Remark: H_I-SZS O = H_I-SZS Other patterns. O1 = Other single pattern. O1.1 = Hook link cloud pattern, O1.2 = Hook link thunder pattern (like Z), O1.3 = Tangent circle with center dot. O1.4 = Comb line, O1.5 = Hook link thunder pattern (opposite cross). O2 = Combination decorative belt pattern. O2.1 = Opposite slash pattern between jagged (zigzag) pattern. O2.2 = Thunder pattern between jagged (zigzag) pattern. O2.3 = Tangent circle with center dot between jagged (zigzag) pattern. O2.4 = jagged (zigzag) pattern between dot pattern. O2.5 = Concentric circles with center dot between jagged (zigzag) pattern.

Figure 31. H_I-SZS other geometric patterns.

H_I-SZS O1.1, Xilin 280, Guangxi Bronze Drum Essence, p.61.

H_I-SZS O1.2 - O1.4, Tu282, Xilin, Guangxi.

H_I-SZS O1.5, M1:10, Luobowan, Guigang, Guangxi.

H_I-SZS O2.1, Tu 280, Xilin, Guangxi.

H_I-SZS O2.2, Guangnan bronze drum, Yunnan.

H_I-SZS O2.3, Gonghecun bronze drum, Longlin, Guangxi.

H_I-SZS O2.4, Longzhong bronze drum, He county, Guangxi.

H_I-SZS O2.5, M1:10, Luobowan, Guigang, Guangxi.

Source: Bronze Drums in Guangxi, p.58, 61, 62, 66; Decoration Art of Ancient Bronze Drums, p.91.

In short, judging from the decorative pattern of the H_I-SZS bronze drum, compared with the Pre-H_I-WJB bronze drum, the decoration is enlarged, and only the drum foot remains plain. In terms of layout, the regularity of halo and division gradually strengthens. The pattern increases, and the regionalism and the flavor of the times are very strong. The drum-casting craftsman also mastered the aesthetic laws of this era, expressing the opposite factors such as subject and object, movement and stillness, virtual and reality, etc. on a bronze drum. Through the pattern arrangement methods such as repetition, hooking, continuity, and interchange, the rhythmic layout is unified with the shape of the bronze drum to form a harmonious and vivid visual effect. (Weiqing Li, 2000) This simple and clear way of expressing the theme made the bronze drum at that time a treasure of aristocratic culture, carrying the memory of that era.

1.1.3.4 Casting technique and musical performance

Since 1983, Beijing Iron and Steel Institute, Guangxi Museum and Yunnan Museum have cooperated to conduct a relatively systematic study on the metal composition of bronze drums, and analyzed the composition of ninety-six different types of bronze drums in Guangxi and Yunnan. From 1986 to 1991 Guangxi University for Nationalities, University of Science and Technology of China and Guangxi Museum also conducted component analysis on 90 different types of bronze drums during the process of conducting lead isotope research on the source of bronze drums. Among the 96, there are 22 H_I-SZS. The experimental group pointed out, according to the standards that the lead and tin content less than 2% is red copper. The tin content is more than 2%, the lead content is less than 2%, it is tin bronze. The lead and tin are more than 2%, it is the tin-bronze. Among the bronze drums, 11 are lead-tin bronze drums, and 8 are tin bronze. (Fubin Wan, 1993) According to the records of *Kao Gong Ji*, a classic in the Warring States period of China: *There are seven parts of alloy, six parts of which are copper and one part is tin, which is called Zhong Ding zhi qi.* That is to cast bells and tripods, copper costs six cents and tin equals one cent, and after calculation, the tin content is about 14.3%. During the Spring and Autumn Period and the Warring States Period, chime bells were an important instrument for ritual music performance. According to the test results, Guangnan drum and Shizhaishan 1:33, M12:159, Jiangchuan Lijiashan M17:30,

M24:36, and Guixian Luobowan Han Tomb M1:11, M1:10, No. 280 bronze drum in the Xilin Bronze Drum Tomb is in line with the ratio of musical instruments. It can be confirmed that the H_I-SZS bronze drum at this time already has good musical instrument performance.

The H_I-SZS bronze drum adopts the center top injection casting method. The drum tympanum light body pattern is used as the casting gate. There are two matching lines on the drum body, and the patterns are clearly separated, which proves that the drum body was cast in mold-casting technique. There are many irregular square or circular gaskets marks on the H_I-SZS Bronze Drum. These gaskets were used by the drum maker to control the wall thickness and supported the inner and outer molds to ensure that the wall thickness of each part was uniform. Judging from its traces, the gaskets were arranged evenly and densely. For example, drum M1:11 of the Han Dynasty Tomb in Luobowan, Guixian County has a tympanum diameter of 33 cm, which belongs to small and medium-sized bronze drums. Thirty-seven gaskets marks were present. (Fubin Wan, 1993)

1.1.4 H_I-LSC type (Lengshuichong type)

The H_I-LSC bronze drum is a middle and late bronze drum of the H_I type. Take the bronze drum unearthed in Mengjiang Township, Teng County, Guangxi Zhuang Autonomous Region as the standard artifact. The popular period was from the Eastern Han Dynasty to the Northern Song Dynasty (about the 1st century AD to the 12th century AD). The use of H_I-LSC bronze drums is concentrated in Tengxian, Guiiping, Pingnan and Binyang in Guangxi.

1.1.4.1 Investigation data of H_I-LSC

In China, the researcher has collected a total of 139 H_I-LSC bronze drum data, of which 109 are in Yunnan, Guizhou, and Guangxi provinces in southwest China, mainly distributed in Guangxi. 12 bronze drums with incomplete data were removed, leaving a total of 97 bronze drums for comparative analysis. the researcher only keeps 37 to make analysis (see the appendix table 2 for specific survey data). Judging from the statistical data, we can get the following information:

(1) Compared with the H_I-SZS, the H_I-LSC type has a wider drum tympanum. In the above table, there are 11 drums with a diameter of 80-90 cm, 16 drums with a diameter of 70-80 cm, 8 drums with a diameter of 60-70 cm, 2 under

50 cm. It can be seen that the tympanum diameter of H_I-LSC bronze drum is mostly more than 60 centimeters. The change of H_I-LSC body size is related to the change of bronze drum's function, and the bigger the body size, the stronger the braggadocio wealth.

(2) Compared with the H_I-SZS type bronze drum, the drum tympanum light body has a more fixed number of awns. In the above table, 31 are 12-awns. Guangxi H_I-LSC bronze drums still have 9-awns, 10-awns, 11-awns, 13- awns, and 14-awns bronze drums, and 10-awns bronze drums have about 5. It can be seen that the H_I-LSC bronze drum has its evolution and development process in Guangxi.

(3) The halos on the tympanum also gradually increased from 10 halos in the H_I-SZS to 9-26 halos, among which 16-20 halos are the most common, and the most common is 18 halos. In addition to the increase in halos caused by the increase of the tympanum, one of the reasons is that the drum tympanum decoration changes, and the drum tympanum is filled with halos to make it more gorgeous.

(4) According to the golden rule ratio, any ratio between 0.618 and 0.714 is in line with the aesthetic ratio category, and the ratio of the drum height to the drum tympanum of the H_I-LSC bronze drum is mostly within this ratio, indicating that the shape of the H_I-LSC bronze drum has already in line with the aesthetic norms and makes people have a pleasing aesthetic feeling.

(5) Compared with the H_I-SZS bronze drum, the H_I-LSC type has another very important point, which is its drum lug. The H_I-LSC also has four lugs, which are paired and attached to both sides of the bronze drum. It is also a flat lug, but it is wider than the H_I-SZS type. There are two rectangular holes on the top and bottom of the lug, and a part (about 29%) of the bronze drum is equipped with a small solid half hoop lugs on both sides of the drum body. It should also be due to the larger size of the H_I-LSC bronze drum, which is a new component for suspension safety.

(6) In some cases, the breast diameter is larger than the tympanum diameter, and the bulging breast slightly protrudes from the drum tympanum, and some bulging breasts are smaller than the tympanum diameter, which should be due to the protruding eaves of the drum tympanum. In addition, the waist

diameter is also wider, the foot diameter is mostly smaller than but close to the tympanum diameter, and a small amount is larger than the tympanum diameter, indicating that the bulging foot are restrained but not extravagant, showing its dignified and atmospheric shape.

1.1.4.2 Appearance features of the H_I-LSC type bronze drum

Combining data analysis and the research results of bronze drum researchers, we can summarize the appearance characteristics of H_I-LSC bronze drums as follows:

Tall and thin. The tympanum is broad, not outgoing edged or slightly outgoing edged. The bulging chest is slightly larger than or equal to the tympanum diameter, slightly inflated, the upper part of the bulging waist is slightly straight, the smallest diameter is in the middle, and the bulging foot are higher, slightly equal to the height of the chest. Four wide and flat Drum lugs, decorated with braid patterns, some also have a pair of small arched lugs with semicircular stems. The general feature of Decoration is magnificent and complicated. The light body pattern in the center of the tympanum is basically fixed at 12 awns. between the awns are sandwiched with Zhui-shaped pattern, and there are high-relief squatting frogs on the edge of the tympanum, and the frog's back has line patterns. Some of them are decorated with other animal statues such as horses, bullocks, waterfowl, and turtles among the frogs.



Figure 32. Drum No. 730715 in the Palace of Nationalities in Beijing

Source: Decoration Art of Ancient Bronze Drums, p.202.

1.1.4.3 Analysis of main decoration of H_I-LSC type bronze drum

(1) Light body

By the time of the H_I-LSC bronze drum, the role of the light body in the decoration of the bronze drum had fundamentally changed. From the budding stage Pre-H_I-WJB type, the light body is the only decoration on the tympanum, it is in the "commander" position in the tympanum. By the time of the H_I-SZS Bronze Drum, the combination of the light body and the main halo was more subtle, but the two sides were still in an equal relationship. As far as the H_I-LSC is concerned, it can be clearly seen that the light body in the center of the tympanum has solidified, and the fixed combination of twelve lights seems to weaken its vitality. Although it still remains in the center of the tympanum, it no longer plays a decisive role.

Among the 139 bronze drums counted by the researcher, the H_I-LSC have 12 rays of light, accounting for more than 90%. The degree of normalization is higher. The reason why the light body is stable at 12 points may be related to the ancient 12 zodiac signs, that is, use the 12 zodiac signs to record the year, month, day, and hour. The southwestern region still uses this age-recording method, and some neighborhoods are also represented by 12 zodiac animals in Yunnan, such as cow Street, Sheep Street, Dog Street, Pig Street... This is the same as Nakon Si Thammarat in southern Thailand, which uses 12 zodiac animals to represent its 12 towns within the jurisdiction are approached in a remarkably similar manner.

The pattern between the awns of the H_I-LSC bronze drum has basically been finalized. More than 80% of the awns are decorated with Zhui-shaped patterns. The variants derived from the Zhui-shaped pattern are called pendant-shaped patterns with plumes, and heart-shaped patterns without plumes. In Guangxi, there are mainly Zhui-shaped pattern, with a small amount of heart-shaped and vertical patterns alternated, and Zhui-shaped pattern and feather-shaped patterns alternated. From the Eastern Han Dynasty to the Tang Dynasty, there were more pendant patterns, and from the Tang and Song Dynasties, they were gradually replaced by heart-shaped patterns. (Tingyu Jiang, 2018)

The shape of the light body is also divided into several types: ① The light body is connected with the awn, the light body is larger and the awn is

wider, similar to the H_I -SZS light body, the number of this kind of light body is less, generally less than 10 awns. ② The light body is connected to the awn, the awn is an acute angle, and the tip of the awn is slender, which generally has 12 awns, and the shape is fixed. ③ The light body is connected to the awn, but the light body is small, and the awn becomes ray-like, the distance between the awns is different, which seems to be caused by mistakes. There is only one example, such as the Gaodui village drum in Mengshan, Guangxi.



Remark: H_I -LSC T= H_I -LSC (Lengshuichong type) tympanum. T1=light body. T1.1=awns light body pattern 1, T1.2=10 awns light body pattern, and so on. T2 = Pattern Between awns. T2.1=protruding Zhui-shaped with plums pattern+feather pattern, T2.2=protruding Zhui-shaped with plums pattern, T2.3=vertical patterns, T2.4 = multi-line heart-shaped pattern+vertical line pattern between the awns.

Figure 33. H_I -LSC Light body pattern.

H_I -LSC T1.1+T2.1, Guiping Licun Drum (No. 451 in Guiping).

H_I -LSC T1.2+T2.1, Yizhou Hanxing Bronze Drum with Heron Pattern (small).

H_I -LSC T1.3+T2.2, Zu 0102.

H_I -LSC T1.4+T2.2, Zu 0123.

H_I -LSC T1.5+T2.3, Gaodui Village Drum in Mengshan, Guangxi .

H_I -LSC T1.6+T2.4, No. 580 Changling Bronze Drum .

Sources: Bronze Drums in Guangxi, p.106, 108, 71, 76, 93, 95.

(2) Main halo decoration on the tympanum

① Trans-formed feathered-figure pattern

The trans-formed feathered-figure pattern is the main decoration on the tympanum and waist of the H_I -LSC drum. Evolved from the realistic feathered-figure patterns, the original slender curved lines, feathery short

lines, and bird-eye-shaped concentric circles were simplified in detail, adjusted in proportion, decomposed the structure, and gradually trans-formed, and finally formed the image of a dancer with a bird-like crown. (*Decoration Art of Ancient Bronze Drums*, 2018)



Remark: H-LSC T3= Tympanum main halo pattern, trans-formed feathered- figure pattern.

H-LSC T3.1=trans-formed feathered- figure pattern 1, H-LSC T3.2=trans-formed feathered-figure pattern 2, H-LSC T3.3=trans-formed feathered- figure pattern 3, and so on.

Figure 34. Trans-formed feathered- figure pattern on tympanum.

H-LSC T3.1, Zu 0100.

H-LSC T3.2, Xiakang drum, in Mashan county, Guangxi.

H-LSC T3.3, Zu 158.

H-LSC T3.4, 0058 Dongqiu drum (崇丘鼓).

H-LSC T3.5, Guiping 451 Licun Drum.

H-LSC T3.6, Yizhou flying herons pattern drum.

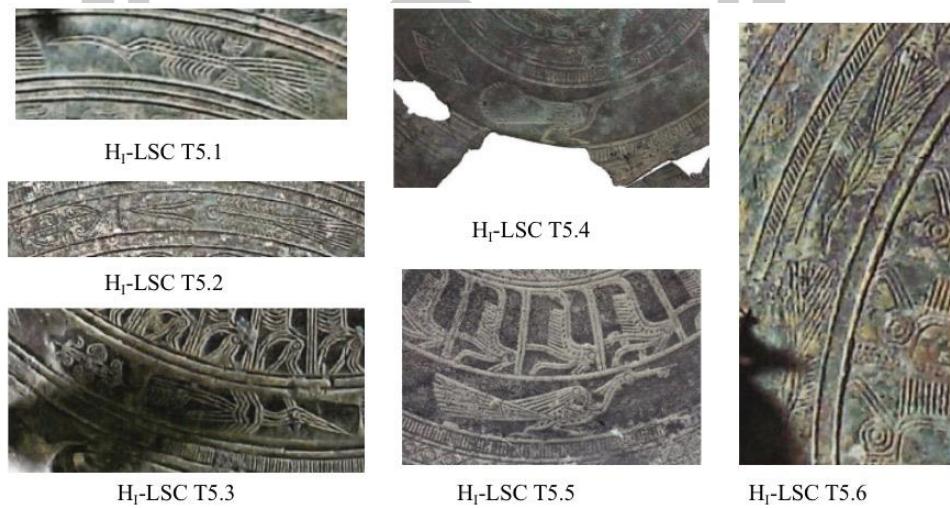
Sources: *Decoration Art of Ancient Bronze Drums*, p.207; *Bronze Drums in Guangxi*, p.85, 80.

②Trans-formed flying herons pattern and Dingsheng pattern

Flying herons pattern changes to abstraction slightly slower than feathered-figure pattern. We can see this phenomenon in Guiping Licun Drum and Yizhou flying herons pattern Bronze Drum. When the feathered-figure

pattern has been trans-formed to only the crest remains, it still maintains the image of a heron with a long beak, two wings, and a long tail. (Chongji Wu, 2018) It just changed from a flying posture to a walking posture. After that, the birds became simplified figures like skeletons, and the arrangement became more and more dense. Some bird patterns are connected end to end, and some bird patterns are interspersed with Dingsheng patterns.

The Dingsheng pattern is a unique decoration on H_I-LSC bronze drums. It often appears in the main halo of the drum tympanum alternately with the trans-formed flying herons pattern, there is a single or two Dingsheng pattern between two birds, or two Dingsheng patterns between two birds.



Remark: T5=Tympanum trans-formed flying herons pattern.

Figure 35. Trans-formed flying herons pattern on tympanum.

H_I-LSC T5.1, Zu 0102.

H_I-LSC T5.2, Total No. 0058 (Dongqiu drum).

H_I-LSC T5.3, Fenglin Village Drum.

H_I-LSC T5.4, Yizhou Hanxing Heron Pattern Bronze Drum (small).

H_I-LSC T5.5, Licun Bronze Drum (No. 451 Guiping).

H_I-LSC T5.6, Total No. 0208, Yuncong 04.

Source: Bronze Drums in Guangxi, p.71, 80, 81, 84, 108, 106.



Remark: T4=Tympanum Dingsheng pattern.

Figure 36. Dingsheng pattern on the tympanum.

H1-LSC T4.1, Guiping Licun bronze drum.

H1-LSC T4.2, Shanglin Yuncong No. 205.

H1-LSC T4.3, No. 080 Guigang Niuaoshan.

H1-LSC T4.4, Zu 54.

Sources: Decoration Art of Ancient Bronze Drums, p.157-158.

The abstraction of the main halo pattern weakens the meaning of the motif, and the numerous, dense, and strange abstract patterns also make the bronze drum more mysterious. So far, we have been unable to decipher more folklore information of that era from the patterns of the bronze drum, and have lost the majestic, magnificent and sacred atmosphere shown by the H1-SZS bronze drum.

(3) Main halo decoration on the drum chest

Most of the chest's main halo pattern of the H1-LSC bronze drum is a trans-formed boat pattern. It is gradually evolved from the realistic boat pattern. The circle with the center dot is used to represent the face of the feathered-figure on the boat, and the feathered crown on the head of the feathered-figure and the props in the hands are exaggerated as much as possible. As time goes by, the abstraction of the pattern becomes more and more serious. The pattern is designed, but the main image in the decoration can basically be seen. After the development period, the bow and stern decorations were discarded, and a water ripple belt was used as the boundary.

One upside one down are called reflection boat pattern. (Chongji Wu, etc., 2018) The fish that were originally in the water also appeared in the boat. The abstraction is getting stronger and stronger, and it has moved away from the original decorative motif. Many trans-formed ship patterns look similar, but upon closer inspection, the patterns are different.



Remark: H_I- LSC C=H_I- LSC (Lengshuichong type) Chest.

C1= Chest trans-formed boat pattern. C1.1=Trans-formed boat pattern 1 on the chest, C1.2= Trans-formed boat pattern 2 on the chest, and so on.

Figure 37. Trans-formed boat pattern on drum chest.

H_I- LSC C1.1, Zu 0103.

H_I- LSC C1.2, total No. 0727 (Xiangzhou Luohan Village Drum).

H_I- LSC C1.3, Tengxian No. 4 (Mengjiang).

H_I- LSC C1.4, total No. 0751 Xiangzhou Dapuhua Drum.

H_I- LSC C1.5, Zu 0111.

H_I- LSC C1.6, Drums in Beijing National Culture Palace.

Source: Decoration Art of Ancient Bronze Drums, p. 197-198; Bronze Drums in Guangxi, p.72, 84.

(4) Main halo decoration on the drum waist

The trans-formed feathered-figure pattern on the drum waist is thinner and longer than the one on the tympanum, probably to fill the waist, densely arranged, the original shape can no longer be seen, and it has become an abstract pattern that has lost its original meaning. The deformation and abstraction of the feather pattern makes the waist grids unnecessary and gradually disappear.



Remark: H_I-LSC W=H_I-LSC type waist pattern. W1=Waist main halo pattern transformed feathered-figure pattern. W1.1=Trans-formed feathered-figure pattern 1, W1.2=trans-formed feathered-figure pattern 2, and so on.

Figure 38. Trans-formed feathered-figure pattern on drum waist.

H_I-LSC W1.1, Eastern Han Dynasty bronze drum with trans-formed feathered human pattern (Wuxuan No. 1).

H_I-LSC W1.2, Zu 0166.

H_I-LSC W1.3, Zu No. 103.

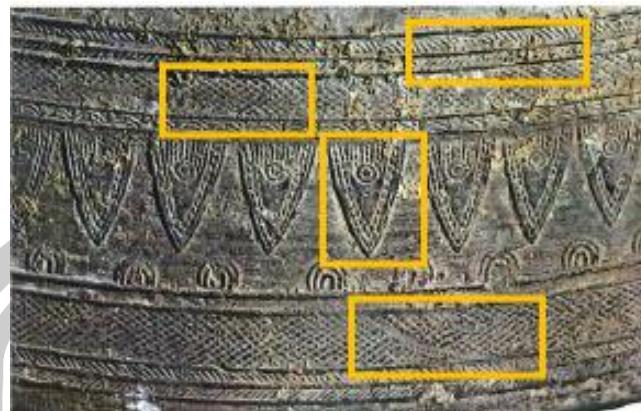
H_I-LSC W1.4, Total No. 00050 Manlv Drum.

H_I-LSC W1.5, Teng No. 05 (Zhicheng Village Drum).

Source: Bronze Drums in Guangxi, p.87, 92; Decoration Art of Ancient Bronze Drums, p.202.

(5)Main halo decoration on the drum foot

The foot of the H_I-LSC drum was increased in size, the main halo pattern is the weeping-leaf pattern. The halos above and below the vertical leaf pattern may be decorated with eye patterns, or decorated with mat pattern, Water ripples and feather patterns generally echo the patterns on the tympanum. The vertical leaf pattern also seems to add a skirt to the drum foot, making the whole drum body looks more gorgeous.

H_I-LSC O1.1, O1.2, F1.1

Remark: F=Foot main halo pattern. F1=Weeping leaves pattern. F1.1=Weeping leaves pattern 1 (half multi-circle pattern). O = Other patterns. O1.1=Feather pattern. O1.2= Mat pattern.

Figure 39. Main halo pattern on drum foot .

H_I-LSC O1.1, O1.2, F1.1, GuPengping Bronze Drum (Pingnan No. 2).

Source: Bronze Drums in Guangxi, p.97, 185.

(6)Other geometric patterns

The geometric pattern on the tympanum and drum body has been increased. New motifs such as triangular multi-line cross pattern, rope pattern (that was popular on bronze objects in the Spring and Autumn and Warring States Periods), feather pattern, and eye pattern appeared. Comb pattern instead of jagged (zigzag) pattern.

H_I-LSC O1.4-1, O1.5, O1.6, O1.7

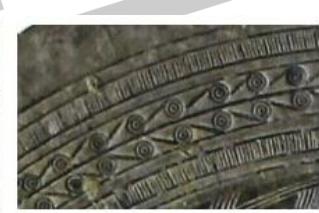
O1.4-2



O1.4-3

H_I-LSC O2.3

O2.1



O2.2

Remark: O=Other patterns, O1=Other single pattern. O2=Combination decorative belt pattern. O1.4=Multi-line triangular opposite cross pattern. O1.4-1=Multi-line triangular opposite cross pattern 1. O1.4-2=Multi-line triangular opposite cross pattern 2. O1.4-3=Multi-line triangular opposite cross pattern 3. O1.5=Comb line. O1.6=Multi-concentric circle. O1.7=Water ripple pattern. O2.1=Two rows concentric circle pattern between comb line. O2.2=Mirror symmetry tangent concentric circle between comb pattern. O2.3=Eyes pattern + feather pattern.

Figure 40. Other geometric patterns on H_I-LSC.

H_I-LSC O1.4-1, O1.5, O1.6,O1.7, Zu 0110.

H_I-LSC O1.4-2, Teng 03, Pingfu bronze drum.

H_I-LSC O1.4-3, Xiakang bronze drum.

H_I-LSC O2.3, Zu 0100.

H_I-LSC O2.1, Xiakang bronze drum.

H_I-LSC O2.2, Total 0058, Dongqiu bronze drum.

Source: Bronze Drums in Guangxi, p.73, 85; Jinxi Liu, 2021.

There is no new motif in the figurative pattern, but exaggeration, deformation, omission, and partial replacement are used to gradually corrupt the main halo of the drum tympanum, drum body, and drum waist into abstract patterns. The H_I-LSC bronze drum has a delicate beauty in general. The layout is full, and the changes in abstract patterns and arrangements are more than the unified characteristics of the H_I-SZS. The increase in the number of patterns and halos has changed the sparse layout of the H_I-SZS bronze drum. The boat patterns on the chest disappeared after corruption, leaving only the combination decorative belt pattern. The densely packed trans-formed dancers on the waist were mixed with the straight combination decorative belt, making the boundaries of the grid blurred and finally disappeared. (Weiqing Li, 2000) Due to the proportion of the three sections of the drum body. Similarly, the foot are raised, and combination decorative belt pattern and weeping leaf pattern appearing on the drum foot have also become important features of this drum.

1.1.4.4 High - relief motifs

(1) High - relief frogs

H_I-LSC bronze drums have the most abundant drum tympanum standing sculptures. The frog, as its main body, carry the totem belief of the people who use the bronze drum, so it is also called the frog drum. Typical frog drums are basically concentrated in Guangxi (Tingyu Jiang, 2018). The frog ornaments on the bronze drum are carefully designed and shaped. H_I-LSC bronze drum, there are 4 High-relief frogs on the drum tympanum, arranged anti-clockwise around the drum edge, with sharp snouts and round eyes, some have two small nostrils on the snout, two round buttocks, and some have a dent on the buttocks, showing its muscular vigor. The earliest frog body decorations should have no lines on the body, no protruding eyes, and the pointed snout is upturned. Later, horizontal and vertical stripes were gradually decorated on the frog body, the pointed snout is still upturned, and the eyes are round and convex, a small number of squatting birds, shrimps or snails appeared on the back of a small number of frogs, and the shape was more realistic and vivid. Finally, it developed into a huge and round buttocks, a sharp snout that curves forward down, and double-string braids (also called lug grain pattern) on the front, rear legs and waist, the whole shape looks very vigorous and majestic. The appearance of frog ornaments contains the desire of the rice-growing nation for a good harvest.



Remark: H_I-LSC TH=H_I-LSC tympanum high-relief motif. TH1.1=High-relief frog 1, TH1.2=High-relief frog 2, TH1.3=High-relief frog 3, TH1.4=High-relief frog 4, and so on.

Figure 41. High-relief frog on H_I-LSC drum tympanum.

H_I-LSC TH1.1, Laibin Gufanggu.

H_I-LSC TH1.2, Total No.000050, Manlv bronze drum.

H_I-LSC TH1.3, Zu 0324.

H_I-LSC TH1.4, Fenglin Village Drum.

H_I-LSC TH1.5, Total No. 0205 (Yun Cong No.1).

H_I-LSC TH1.6, Zu 0100.

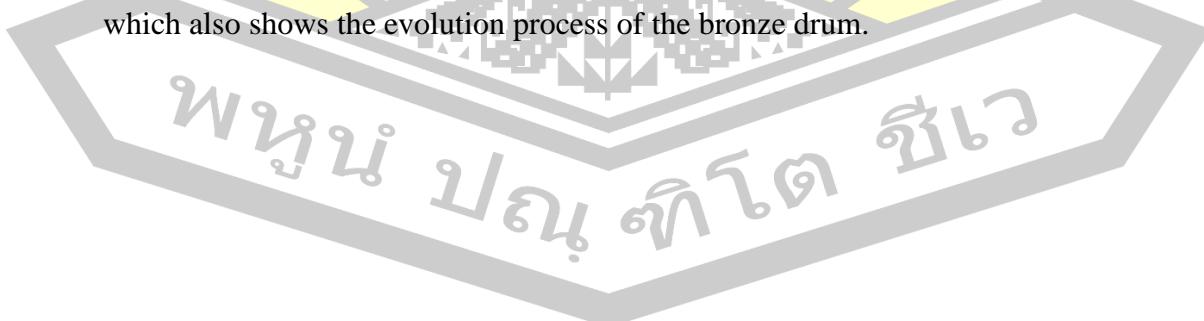
H_I-LSC TH1.7, Total No. 0580 (Guigang Changling Drum).

H_I-LSC TH1.8, Total No. 0207 (Yun Cong No. 3 Drum).

Sources: Bronze Drums in Guangxi, p.110, 115, 79, 81, 82, 83, 89, 70.

(2) Other high-relief motifs

The most distinctive feature of the H_I-LSC type is that in addition to the standing frogs on the drum, there are various other animals, figures and high - relief statues related to human affairs and life between the two frogs, such as: riding (people ride the horse), cows, turtles, and snails, horses, water birds, barns, fighting frogs, etc., the images are simple, witty and vivid. The appearance of these vertical ornaments also shows that the function of the bronze drum has changed a lot at this time. Among them, the statues of people and horses combined are the most, with rich shapes. There are single riders with one person and one horse, and double riders with two people side by side. After the Western Han Dynasty, under the influence of the Central Plains, the horse breeding industry in Lingnan developed. Horses had become the favorite animal power of the southern peoples, and were known as a symbol of wealth and status. (Chongji Wu, etc., 2018) These vertical ornaments grew from scratch on the H_I-LSC to become more and more abundant, which also shows the evolution process of the bronze drum.





Remark: H_I-LSC TH2=H_I-LSC tympanum high-relief other motifs. TH2.1=H_I-LSC tympanum high-relief other motifs 1. TH2.2=H_I-LSC tympanum high-relief other motifs 2, and so on.

Figure 42. Other high-relief motifs on H_I-LSC.

H_I-LSC TH2.1, Zu 0100, Riding Standing motif on the tympanum.

H_I-LSC TH2.2, Zu 0103, Beef pulling skid motifs on the tympanum.

H_I-LSC TH2.3, Shentang Village Drum (Pingnan No. 1304), Standing Barn motif on tympanum.

H_I-LSC TH2.4, Total No. 0205 (Yun Cong No. 1 Drum), Standing Animal motif on tympanum.

H_I-LSC TH2.5, Total No. 2406, Wuduo Drum, with snail motif on the tympanum.

H_I-LSC TH2.6, Total No. 000613 (Guiping Zhang Lingpeng Bronze Drum), man petunias motif.

H_I-LSC TH2.7, Total No. 0208 (Yun Cong No. 4 Drum), child hugging turtle motif on the tympanum.

H_I-LSC TH2.8, Bronze Drum with Feathered and Human Patterns (Wuxuan No. 1) of Eastern Han Dynasty Viewing Fighting Frogs Standing motif.

Source: Bronze Drums in Guangxi, p.70, 72, 98, 82, 100, 107, 84, 87.

1.1.4.5 Casting technique and musical performance

The beauty of appearance of any practical utensil is constantly evolving. Even if different regions and different nationalities have different aesthetic tastes, they will still evolve to a harmonious proportion. The H_I-LSC bronze drum is tall, light and thin, with a very dignified appearance. It can be seen from the examples that the ratio of height to tympanum diameter is mostly between 0.63 and 0.71, with little fluctuation, and the shape design has been gradually standardized. The special shape of the H_I-LSC bronze drum and the exquisite beyond compare decoration on the bronze drum show that the drum craftsman's casting skills are already very sophisticated. According to the detection of scientific personnel, the alloy elements of the H_I-LSC type drum, the copper content is 65%~70%, the tin content is 5~15%, the lead content is 10~25%, which belongs to the lead-tin bronze drum with high lead. (Fubin Wan, 1993) High lead content will attenuate the sound vibration and reduce the sound effect of the drum, making the sound dull and deep. Compared with the H_I-SZS, its musical instrument performance is reduced.

In the casting technique, by observing the shape of the H_I-LSC bronze drum, we can see that its drum body has two molded lines, which should also be the mold-casting method. However, the high-relief frogs and other three-dimensional figures on the tympanum have no casting lines, so they should be cast by the wax-lost method. There are no welding marks between these standing decorations and the drum body, but the parts where they touch the tympanum are relatively rough, the pattern is intermittent. According to Mr. Tingyu Jiang's judgment, it should be the muddy casting method of combining multiple models. The four flat lugs and the two circular lugs of the drum body have no traces of welding, and the same with the base of the lugs and the drum body. It is possible that the lugs were first cast and then embedded into the outer shell of the drum. When casting the drum body, the root of the metal drum lug is cast and connected with the drum body as a whole. The decorative patterns on the tympanum are also made in a variety of ways, such as engraving, rolling, and imprinting to make various exquisite geometric patterns and vivid pictures. Some of the bronze drums body have gasket marks, which are traces left to control the wall thickness of the bronze drum and support the outer frame. (Fubin Wan, 1993; Tingyu Jiang, 2018)

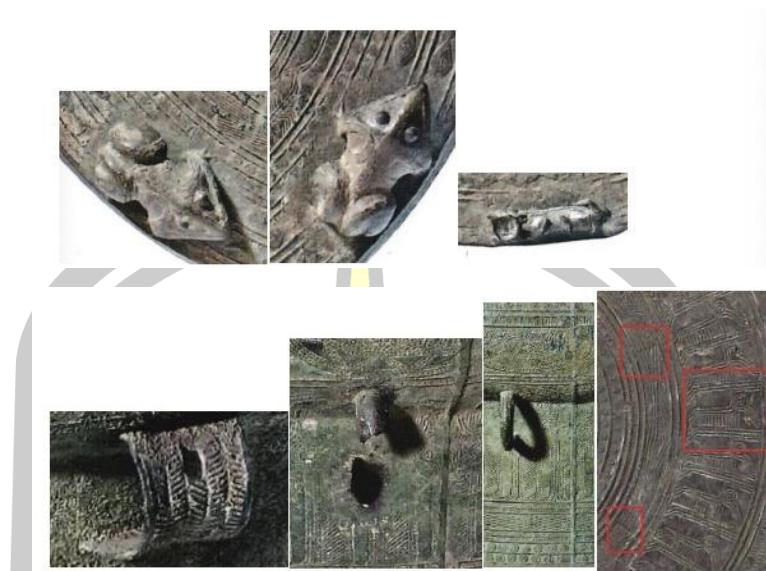


Figure 43. Casting marks on H_I-LSC drum.

Source: Bronze Drums in Guangxi, p.72. 75, 74, 76, 96.

The body of the drum has a standard line. The semi-circular lug and wide flat lugs have no standard line. The vertical decoration on the drum body has no standard line, but some of the decorations are transformed at the junction of the vertical decoration and the drum body. And the imprint method makes geometric patterns.

1.2 H_{III}-XM Type (Ximeng type)

China's naming of the H_{III} bronze drum is representative of the bronze drum still used in the Wa area of Ximeng, Yunnan Province. That is Ximeng type bronze drum (H_{III}-XM). The upper limit of its age is in the middle of the Tang Dynasty, and the lower limit is still casting and using such bronze drums until modern times, that is, from the 8th century AD to the present, and it has been popular for more than 1,200 years. (Tingyu Jiang, 1988)

1.2.1 Distribution of H_{III} Type bronze drums

Heger considered the H_{III} drum to be the most exquisite of all types. Heger believed that the H_{III} type drums appeared in today's Burmese red and white Karen, and some drums appeared in Bangkok. They belonged partly to the king of the country and partly scattered in various temples, but there was no doubt that they also

came from Shangliao and Shan states. He said this kind of drum had never been seen in China or the Malay Archipelago.

With the deepening of archaeological excavations and ethnic investigations, many H_{III} drums have also been found in China. Its early type was found in Longzhou and Jingxi in southwest Guangxi, while the middle and late type were mainly distributed in western Yunnan and its adjacent Myanmar, Laos and Thailand. This kind of bronze drum is popular in the Wa nationally area of Yunnan, mainly distributed in Ximeng Wa Autonomous County and nearby Menglian, Lancang, Cangyuan, Gengma and other Dai, Wa and Lahu autonomous counties. (Danfang Wei, 2008)

1.2.2 Investigation data of H_{III}-XM drum (Ximeng type)

Mr. Kunsheng Li mentioned in his book *Ancient Bronze Drums in China and Southeast Asia: According to incomplete statistics, so far, there are 377 ancient and modern H_{III} bronze drums collected in various provincial institutions in Yunnan*. However, no works or materials containing these bronze drum data have been found for the time being. *Compilation of Measured and Recorded Data on Ancient Bronze Drums in China* records data on 40 H_{III}-XM type bronze drums. Among them, 1 in Guangxi and 35 in Yunnan. Two pictures of H_{III}-XM bronze drums in Guangxi were newly included in *Bronze Drums in Guangxi*. However, because we have very few physical pictures of this type of bronze drum, so we only selected 20 bronze drums from these materials for comparative analysis (see the appendix table 3 for specific survey data). Judging from the statistical data, we can get the following information:

(1) Medium size. Most of the tympanum diameters are between 40-60.

(2) The number of awns on the tympanum is mostly 8 awns and 12 awns. The number of strings on the tympanum is variable, with 16 or 17 halos being the majority. It shows that the halo on the tympanum is relatively narrow, and the decoration changes greatly, reflecting the exquisite and gorgeous style.

(3) According to the general aesthetic perception of the public, the 20 H_{III}-XM bronze drums selected have a ratio of drum height to tympanum between

0.46-0.80, nearly 50% of which are close to the aesthetic ratio and within the range, so H_{III}-XM bronze drums pursue the overall feeling of being pleasing to the eye.

(4) The standing frogs on the tympanum are basically arranged anti-clockwise. Which shows that the H_{III}-XM bronze drums also inherit more of their original cultural elements.

(5) There are more single frog drums than squatting frog drums.

1.2.3 Appearance features of H_{III} type bronze drum.

Combining data analysis and the research results of bronze drum researchers, we can summarize the appearance characteristics of H_{III}-XM bronze drums as follows:

The body is tall and thin, the tympanum is wide, and the edge protrudes outwards. It is common for one frogs, a small mount of two, or three frogs to squat in a anti-clockwise circle. The light body on the tympanum is generally 7, 8 or 12 awns, and the tympanum are divided into halos by three strings, the halos are dense. The main halo decorated with group petal pattern, birds pattern, fish pattern, thunder pattern, rice grains pattern, etc.. The body of the drum is large and small, almost straight, with no dividing line between the chest, waist and foot. The drum body has a different number of simulated combined model lines, which run through the drum body from top to bottom, and some drum bodies are lined with exquisite reliefs such as three-dimensional elephants, snails, and trees.

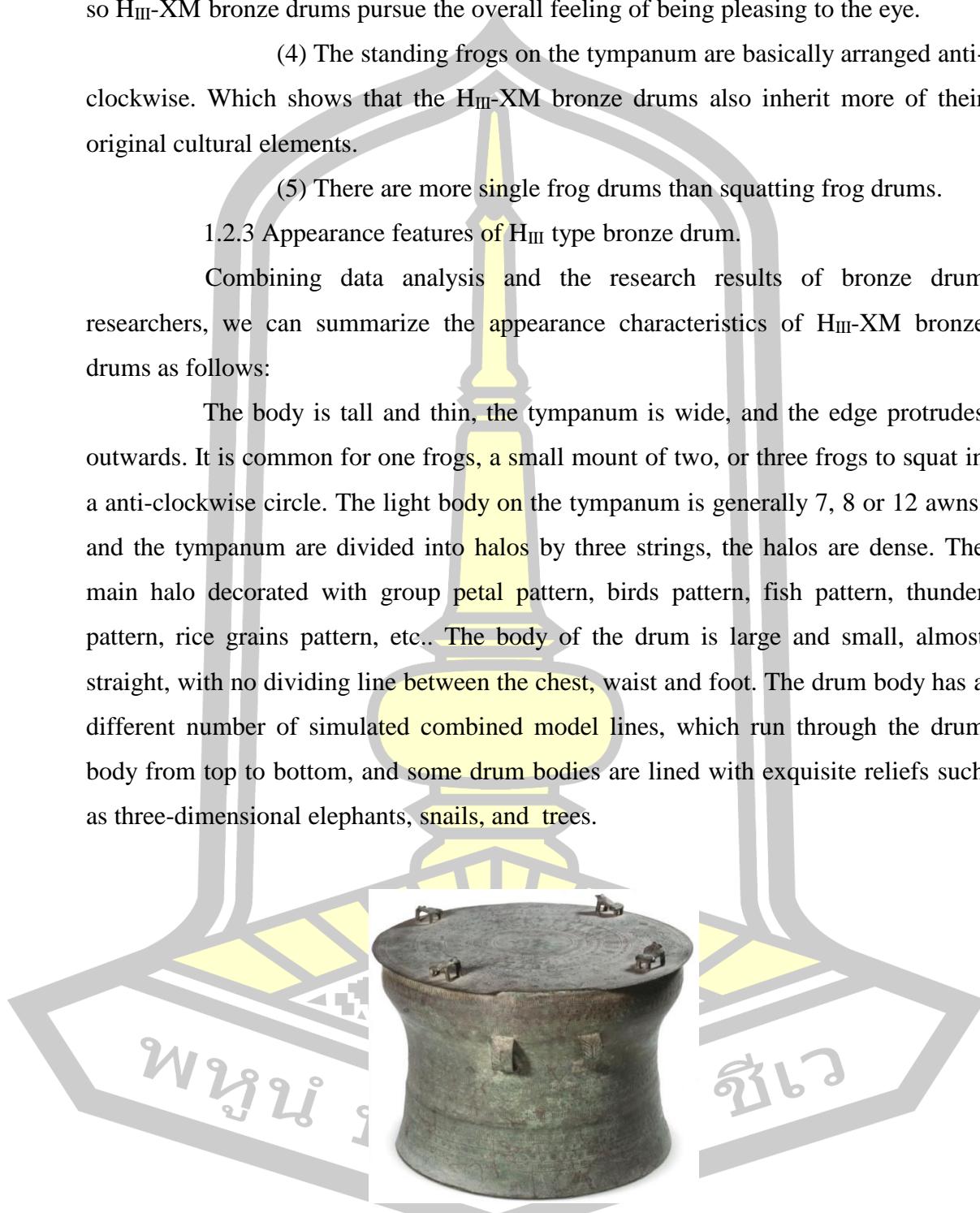


Figure 44. Zu 0031.

Source: Bronze Drums in Guangxi, p. 230.



Figure 45. Zu 0332.

Source: Bronze Drums in Guangxi, p. 232.

Drum lugs

The lugs of the H_{III}-XM are the most beautiful of all bronze drums. There are four drum lugs, arranged in pairs, with decorative patterns on the lugs. The lugs decoration and shape of No. 0031 are already close to H_{III}-XM type bronze drum. But we can also see some characteristics similar to H_I-LSC bronze drums, such as bridge-shaped flat lugs with small square holes on the upper and lower sides, and a little distance between the two lugs. This drum is different from the later period of H_{III}-XM. The lugs of drum No. 0332 are a representative type of H_{III}-XM bronze drum. The drum lugs are longitudinally straight and raised, with the two lugs close together, and the base of the lugs is partly forked. There are also some bronze drums, which are decorated with three-dimensional sculptures under the braid pattern, with exquisite and graceful shapes.



Figure 46. No. 0031 drum lugs

Source: Bronze Drums in Guangxi, p. 231.



Figure 47. No. 0332 drum lugs.

Source: Bronze Drums in Guangxi, p. 232.

1.2.4 Analysis of main decoration of the H_{III}-XM bronze drum

(1) Light body

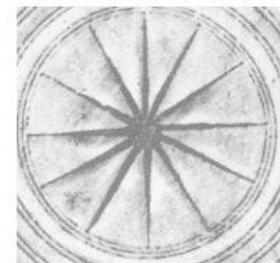
There are three types of H_{III}-XM drum light body, large, medium and small. The larger one is shown in Hg00038 (T1.2). It is in a transitional state and does not yet have the morphological characteristics of the H_{III}-XM bronze drum. The Zu 0332 (T1.1) also belongs to the type with a larger light body in the H_{III}-XM bronze drum. The tips are decorated with small cluster petals pattern, and the gap between the Zhui-shaped pattern and the cluster pattern is not filled like other types of bronze drums before. The bronze drum in the Yunnan Provincial Museum (T1.3) is an example of a relatively small light body. At this time, the light body shrinks and is called the assembly point of the root of the awn.



H_{III}-XM T1.1+T2.1+T3.1



T1.2



T1.3

Remark: H_{III}-XM T=Tympanum, T1=Tympanum light body. T2.1=Zhui-shaped pattern between awns. T3.1=Group petal pattern.

Figure 48. Light body of H_{III}-XM

H_{III}-XM T1.1+T2.1+T3.1, Zu 0332.

H_{III}-XM T1.2, No. Hg00038.

H_{III}-XM T1.3, the twenty-fourth picture, Bronze Drums in Yunnan provincial Museum.

Source: Bronze Drums in Guangxi, p.232, 233; Bronze Drums in Yunnan Provincial Museum, the twenty-fourth picture.

(2)Main halo pattern

Heger believed that the main pattern (the main halo) was generally the widest halo on the tympanum, and most of them were in the middle of the tympanum. However, judging from the H_{III}-XM bronze drums seen so far, its main halo pattern is mainly arranged on the edge of the tympanum. The main halo patterns mainly include bird patterns, fish patterns, and group petal patterns. Heger also used the trans-formed feathered-figure pattern as its main pattern, but because not all H_{III}-XM bronze drums have trans-formed feathered-figure patterns, some scholars believed that, this pattern should not be regarded as the main halo pattern of the H_{III}-XM bronze drum.



H_{III}-XM T4.1, T5.1, T5.2

T4.1, T5.3

T5.4+T3.2+T6.1

Remark: T3=Tympanum group petal pattern. T4=Trans-formed feathered-figure pattern on tympanum . T5=Bird pattern on the tympanum. T6=Fish pattern on the tympanum.

Figure 49. Group petal pattern.

H_{III}-XM T4.1, T5.1, T5.2: No. 0031.

H_{III}-XM T4.1, T5.3: No. Hg00038.

H_{III}-XM T5.4+T3.2+T6.2: Liuzhou Eastern Han High-relief Frog with Bird Patterns on tympanum.

Source: Bronze Drums in Guangxi, p.231, 233; Decoration Art of Ancient Bronze Drums, p. 47.

1.2.5 High-relief motif

H_{III} -XM standing frogs are very different from other types of high-relief frogs in terms of body shape and decoration style. The frog has a pointed snout, small and thin body, and the edge line is particularly thick and hard, making it look long and thin. Some have frog toes. There are 4 single frogs along the edge of each drum, or 4 groups of stack squatting frogs. Some single-frog frogs have no decoration, and some have a straight or braided spine ridge from the mouth to the buttocks. The two-layer squatting frogs drum decorations are mostly decorated with concentric circular patterns on the buttocks, with symmetrical oblique lines (like feather pattern) on both sides of the middle line from the mouth to the buttocks. The three-layer squatting frogs are similar with the two layer frogs.

H_{III}-XM TH1.1

TH1.2

TH2.1

TH3.1

Remark: H_{III} -XM TH= H_{III} -XM Type tympanum high-reliefs. TH1=Tympanum Single high-relief frog. TH2=two-layer high-relief frog on the tympanum. TH3=Three-layer high-relief frog on the tympanum .

Figure 50. High-relief frog on H_{III} -XM.

H_{III} -XM TH1.1, No. 0031.

H_{III} -XM TH1.2, No. 0332.

H_{III} -XM TH2.1, LSB-5752.

H_{III} -XM TH3.1, unknown No., Yunnan Ximeng type three-layer squatting frogs.

Source: Bronze Drums in Guangxi, p.231, 232; Decoration Art of Ancient Bronze Drums, p.253.

1.2.6 Casting technique and musical instrument performance.

From 1986 to 1991, Guangxi University for Nationalities, University of Science and Technology of China, and Guangxi Nationality View conducted alloy composition analysis on 90 different types of bronze drums, including 8 H_{III} -XM

bronze drums. Samples were taken from the edge of the foot and the fragments of the waist, chest, and foot, and the test results were as follows:

The average content of copper, tin and lead alloys are: copper 72.89%, tin 5.35%, 17.43%, belonging to high lead low tin ternary alloy bronze drum. The higher the lead content, the worse the acoustic effect of the bronze drum. This shows that the nationalities who use this type of bronze drum do not have high requirements for the sound of the bronze drum. They were mainly used as ritual vessels, and people payed more attention to the vivid and beautiful decoration of the bronze drum. It has become the bronze drum with the most beautiful decoration among all types.

The tympanum of the H_{III}-XM type bronze drum is smooth, and there is no gasket mark on the tympanum. The mold casting line in the early stage of the drum body indicates that it was made by the clay-mold method. To the middle and late stages, the bulge similar to the mold casting line was a decorative Masculine line, which can be seen from the horizontal pattern on it, or the decorative reliefs such as snails and elephants. These H_{III}-XM bronze drum was made by the lost-wax method. The so-called mix-casting method is that some bronze drum lug molds were made separately, combined with the drum body mold, and cast at one time with the mix casting method, while the lug was decorated with flowers to cover the supplementary mold traces of processing. (Fubin Wan, 1993)

Summary of this section:

In the vast history of 2600 to 700 years, looking at the history of the use of bronze drums, it may be just an occasional song and dance celebration where a primitive man turned the copper kettle upside down to beat the festival carnival, but it was very popular and gradually became more and more popular. It was used as a percussion instrument, and the caster also catered to the people's pleasure, and gradually separated it from the tableware, and transformed it into a musical instrument suitable for playing on the ground or suspended in the air, and in the following two thousand years history, with the ups and downs of the functions given by the ethnic groups that use it. Ancient bronze drum casters are also tirelessly carrying out various creative activities on this bronze drum. From no pattern to different patterns, and then to different shapes. With the change of the aesthetic habits

of the nation and region, as well as the unique aesthetic perception and aesthetic judgment, the bronze drum is constantly being recreated, making the bronze drum appear in a situation of competing for beauty and becoming a brilliant wonderful flower blooming in the southwest corner of China.

In terms of shape features, the H_I -SZS is exquisite and elegant, the H_I -LSC is luxurious, and H_{III} -XM is graceful. The beautiful shape and exquisite decoration not only require the skilled painting and sculpture skills of the foundries, but also require their superb casting skills. According to the different music performance needs of different periods, we have been constantly exploring and grasping the ratio of casting drum alloys, from red copper in the Pre- H_I -WJB period to tin bronze and lead-tin bronze in H_I -SZS. Different historical periods, different types of bronze drums, different musical functional changes lead to subtle changes in the alloy ratio. From the Spring and Autumn Period, the Warring States Period to the Wei and Jin Dynasties (Pre- H_I -WJB, H_I -SZS, H_I -LSC early, and Middle Period) the copper content continued to decrease, and the tin content Continuously increasing. From the Southern Dynasties to the Sui and Tang Dynasties (late H_I -LSC) copper increased slightly, while tin decreased slightly. From Tang Dynasty to Qing Dynasty (H_{III} -XM type) copper content is becoming more and more stable and consistent, and the tin content is also basically stable (Fubin Wan, 1993). Every step of the change reflects the chameleon taste demand of the drum-using nation.

The casting technique also changes with the change of metallurgical technology. We can't get a glimpse of the casting site of the ancient casting masters, but there are a lot of casting information left on the surface of the bronze drum, that provides basis for the analysis of the casting technique. The square or round gasket marks on the surface of the bronze drums are mostly left on the drum bodies of Pre- H_I -WJB, H_I -SZS, H_I -LSC, etc., however, there are no such gasket marks holes in the H_{III} -XM type bronze drums, which shows the change of their casting technique. The matching line of the bronze drum body is an important clue to distinguish the matching mold casting from the lost-wax method casting.

The decoration on the tympanum of the bronze drum, from the Pre- H_I -WJB with no patterns to simple geometric patterns, to the coexistence of realism and geometric patterns in the H_I -SZS, to the complex and beautiful trans-formed abstract

patterns of H_I-LSC, then re-back to the realism and geometric patterns of H_{III}-XM, they also reflect the beauty taste and function changed according to the different periods and different ethnic groups. Those decorations may be engraved, or the printing method (such as various geometric patterns, trans-formed patterns, etc.), or use rolling method (such as tympanum, drum body comb pattern, etc). Drum casting craftsmen create exquisite Bronze drums, ingenious ideas, have been passed down from generation to generation to form rich casting experience, and use wisdom to compose a splendid bronze drum culture.

2. Distribution and the classification of bronze drums in Thailand

2.1 Geographical distribution of bronze drums in Thailand

In order to understand the current situation of bronze drums in Thailand, the researcher has conducted a survey on the bronze drums in Thailand's collections since April 2023. Table 31 is the statistical table of bronze drums in the collection of Thailand.

Table 3. Statistical Table of Bronze Drums in Thai Collections (Parts in Private Territories, but with Official Remarks)

Type	Excavated location		No.	Save location
H _I	Nan Province	Bo Luang	1	Nan National Museum
	Uttaradit Province	Tha Sao Sub-district	2※	The Bangkok National Museum
		Tha Sao Sub-district	1	The Bangkok National Museum
		Tha Sao Sub-district	1	Prachinburi National Museum
	Tak Province	Uttaradit-Ban Noen Kuang 6, Khambon Na In District	1	Ms. Jamchan Phadungwiang's land
		Ban Na Bot	1	Ramkhamhaeng National Museum, Sukhothai Province
	Sukhothai Province	Na Choeng Sub-district	1	Ramkhamhaeng National Museum, Sukhothai Province
		Huai Mae Kong Khai, Mr. Charoen Mahawan's Land	1	Ban Wang Hat, Talingchan Sub-district.
	Trat Province	Ban Sam Ngam, Mueang District	2	Wat Buppharam Museum
		Mu 6, Wang Kra Chae Sub-district, Mueang District	1	Mr. Samoe Imthasan's land
	Kanchanaburi Province	Khao Saphai Raeng	1	Niwitrat Uppatham School
	Ratchaburi Province	Khu Bua Archaeological site	1	Ratchaburi National Museum
		Ban Nong Wua Dam, Mu11, Thung Luang Sub-district, Pak Tho District	1	Ratchaburi National Museum

		(p120)		
Mukdahan Province	Wat Matchimawat (Wat Klang)	1	Wat Matchimawat (Wat Klang)	
	Kham Cha-E Police Station	1	Mukdahan Kham Cha-E Police Station	
	Mueang District	1	Nakhon Phanom-Wat Phra That Phanom Woramahawihan Museum	
Ubon Ratchathani Province	Ban Chi Thuan	1	Ubon Ratchathani National Museum	
		1	Ubon Ratchathani National Museum	
	Khai Konok Sub-district, Phibun Mangsahan District	1	Ubon Ratchathani-Wat Thung Na Charoen Nok	
Kalasin Province	Ban Sahatsakan	1※	Kalasin? (Thalang National Museum)	
Chumphon Province	Khao Sam Kaeo	3	Chumphon National Museum	
	Khao Sek	1	To be verified. Unmarked (Thai-French joint archaeological excavation project of Thailand University of the Arts, discovered in 2015)	
Surat Thani Province	Wat Taling Phang (Wat Khiriwongkaram)	1	Chaiya National Museum	
	Chaiya District	1	Chaiya National Museum	
	Wat Khi Lek	1	Nakhon Sri Thammarat National Museum	
Nakhon Si Thammarat	Ban Liakkai	1	Nakhon Sri Thammarat National Museum	
	In the Kut Duan Cannal, Chawang District	1	Nakhon Sri Thammarat National Museum	
	Sa Kaeo Sub-district,Tha Sala District	2	Songkhla-Gallery of Historic - Ethnographic Exhibits Institute of Southern Studies, Sri Nakharinwirot University	
	Ban Pa Krai	1	Songkhla-Loha-Lohat (the Metallurgy Artifacts) Gallery, Institute of Southern Studies, Sri Nakharinwirot University, Songkhla Campus	
	Khlong Kut Dan	1	Prachinburi National Museum	
Songkhla Province	Cha Nong Sub-district	1	Songkhla National Museum	
	Cha Na District	1	Songkhla-Loha-Lohat (the Metallurgy Artifacts) Gallery, Institute of Southern Studies, Sri Nakharinwirot University, Songkhla Campus	
Bangkok	Brought from the storage room of National Museum Bangkok in 1988 to be displayed at Thalang National Museum, Phuket	1※	Didn't find it in Thalang National Museum, but there are related pictures in the book <i>Bronze kettle Drum in Thailand</i> .	
	Osotsapha Co., Ltd. (Obtained it from Om Koi	1	Osotsapha Co., Ltd. Head Office 2100, Ramkhamhaeng Road, Hua	

		District, Chiang Mai Province in 1985)		Mak Sub-district, Bang Kapi District, Bangkok
		Originally be preserved at Praphat Phiphitthaphan Storage Room, National Museum Bangkok. In 1999, it was sent to National Museum of His Majesty the King's Golden Jubilee, Pathum Thani Province	4	Pathum Thani - National Museum of His Majesty the King's Golden Jubilee.
	Nakhon Ratchasima Province	Origin was obscure	1	Nakhon Ratchasima-Maha Weerawong national Museum
	Nong Bua Lam Phu Province	Phu Taek	1	Nong Bua Lam Phu-Wat Siritham Pattana
H _{III}	Nan Province	BO Luang	1	Nan National Museum
	Nakhon Phanom Province	Klam Riverbank	1※	Khon Kaen National Museum, Haven't found it, but have the picture.
		Unmarked	2	Nakhon Phanom - Wat Phra That Phanom Woramahawihan Museum
	Mukdahan Province	Ban Dong Yang	1	Pathum Thani-National Museum of His Majesty The King's Golden Jubilee
	Laos	Vientiane	1	Nakhon Phanom-Wat Phrathat Phanom Woramahawihan Museum
	Bangkok	Be presented to the National Museum Bangkok in 1926 by Prince Burachatra Jayakara (Prince Kamphaengphet)	1	Bangkok National Museum
		A bronze drum used in royal ceremonies, (King Rama VII gave it to Bangkok National Museum)	1	Bangkok National Museum
		Bangkok National Museum	1※	Khon Kaen National Museum. Haven't found it, but have the picture.
	Lop Buri Province	Originally displayed at the National Museum Bangkok	1	Lop Buri-Somdet Phra Narai National Museum
		Be presented to Somdet Phra Narai National Museum by Major Wisan Sopharak	1	Lop Buri-Somdet Phra Narai National Museum
	Chiang Rai Province	Be confiscated by Chiang Khong Police officers from Mr. Inchan Yuenyong, 304 Mu9, Ban Don Mahaw	1	Chiang Rai-Chiang Saen National Museum-1
		Same as above	1	Chiang Rai-Chiang Saen National Museum-2
	Chiang Mai	Initially kept in Praphat Phiphitthaphan Storage	1	Chiang Mai National Museum

		Room, National Museum Bangkok		
Tak Province	Tha Song Yang	1	Wat Aranyawat, Mae Tan District	
Ubon Ratchathani Province	Ban Chi Thuan	1	Ubon Ratchathani National Museum	
Abn orma 1 shap e	Nakhon Phanom	Don Nang Hong sub-district, Ban Nong Ben 4.	1	Pratuang Srimaneerat's grandmother Oonta Angwong (As haven't seen the real drum yet, don't make a comment)

Remark: ※ According to the storage location described in *The Bronze Kettle Drums in Thailand*, the bronze drum was not found.

Tabulator: Jinxi Liu, 2023.

Source: Some data comes from *The Bronze Kettle Drums in Thailand*, some data comes from ความสัมพันธ์ทางวัฒนธรรม สมัยก่อนประวัติศาสตร์ กรมศิลปากร กลองโobreทีก (the Fine Arts department, 2531), and some come from the researcher's investigation.

From the above table, there are 45 of H_I type bronze drums with official notes in Thai museums or private collections, 16 of H_{III} type bronze drums, and 1 of special-shaped bronze drums similar to the paste type, a total of 62.

H_I-type bronze drums have been unearthed in northern Thailand, central Thailand, northeast Thailand, east Thailand, and south Thailand. The specific unearthed data are as follows:

A total of 9 were unearthed in northern Thailand: 5 were unearthed from Uttaradit Province, 1 was unearthed from Nan Province, 2 were unearthed from Sukhothai Province, and 1 was unearthed from Tak Province.

A total of 9 were unearthed or collected in central Thailand: 1 was unearthed in Kanchanaburi Province, and 4 were allocated to Pathum Thani from the original collection of Bangkok, 2 were found in Bangkok, 2 was unearthed in Ratchaburi Province.

A total of 9 were unearthed in Northeastern Thailand: 1 from Nong Bua Lam Phu Province, 3 from Mukdahan Province, 1 from Kalasin Province, 3 from Ubon Ratchathani Province, and 1 from Nakhon Ratchasima.

A total of 3 were unearthed in eastern Thailand: all were unearthed in Trat Province.

A total of 15 were unearthed in southern Thailand: 4 from Chumphon Province, 3 from Surat Thani, 6 from Nakhon Si Thammarat Province, and 2 from Songkhla Province.

H_{III} type bronze drums have been found in northern Thailand, northeastern Thailand, and central Thailand. Because some H_{III} type drums are handed down from ancient times or have unknown sources, only the statistics of the location are made.

Northern Thailand: 1 from Nan Province, 2 from Chiang Rai Province, 1 from Tak Province, 1 from Chiang Mai.

Northeast Thailand: 4 in Nakhon Phanom Province (1 was unearthed, records show that it was handed over to Khon Kaen National Museum, and 1 was sent from Laos). 1 side was unearthed in Mukdahan Province. 1 was unearthed in Ubon Ratchathani Province.

Central Thailand: 2 in Lop Buri Province (according to records, it was originally in Bangkok National Museum), 3 in Bangkok National Museum.

The original collections unearthed or handed down are concentrated in northern Thailand, northeast Thailand near Laos, and the capital Bangkok.



Figure 51. Bangkok National Museum, collection of bronze drums.

Source: Jinxi Liu, 2023.

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Figure 52. Ubon Ratchathani National Museum's collection of bronze drums.

Source: Jinxi Liu, 2023.



Figure 53. Nakhon Phanom Wat Phrathat Phanom Woramahawihan Museum's collection of bronze drums

Source: Jinxi Liu, 2023.



Figure 54. Mukdahan Wat Matchimawat's collection of bronze drums.

Source: Jinxi Liu, 2023.



Figure 55. Nakhon Si Thammarat National Museum's collection of bronze drums.

Source: Jinxi Liu, 2023.



Figure 56. Chaiya National Museum's collection of bronze drums.

Source: Jinxi Liu, 2023.



Figure 57. Chumphon National Museum's collection of bronze drums.

Source: Jinxi Liu, 2023.

2.2 H_I type bronze drum in Thailand

2.2.1 Investigation data of H_I type bronze drum in Thailand

The researcher collected a total of 45 pieces of H_I type bronze drums data in Thailand, and made a statistical table of the main dimensions and main decorations (see the appendix table 4 for specific survey data). The serialization of the bronze

drums in the table is a new code set by the researcher for the convenience of the later description. For convenience of expression, we use A to represent no high-relief motifs on the tympanum, and B to represent high-relief motifs on the tympanum. Other than that, it does not mean anything. Judging from the statistical data, we can get the following information:

(1)The number of H_I drums in Thailand currently counted: 45 in total, including 35 category A and 10 category B. It shows that the number of H_I early drums in Thailand is relatively large. It is also an important distribution area of H_I bronze drums.

(2)tympanum features: Among the 45 bronze drums, there are 24 category A relatively complete. The diameter of the tympanum is acceptable, of which 5 are 70-80 cm, 9 are 60-70 cm, and 5 are 50-60 cm, 40 to 50 centimeters on 1, and 1 may be a sacrifice drum, and the diameter of the tympanum is less than 20 centimeters. There are 10 category B bronze drums, and the diameter and size of the tympanums are relatively complete. Among them, 1 is 50-60 cm, four are 60-70 cm, 3 are 70-80 cm, and 1 is 80-90 cm. It shows that the tympanum of H_I drums found in Thailand are basically over 50cm, and the tympanums category B are obviously larger than category A, which belong to large or extra large drums.

(3)Appearance aesthetics: Among the 45 category A bronze drums, 13 are relatively complete, 2 of which have a ratio of height to tympanum diameter between 0.618 and 0.714, and 7 of which are between 0.73 and 0.80, There are 4 above 0.80, indicating that the drum is high. From the actual pictures, we can also see that the foot of this type of bronze drum are generally extravagant and high. Among the 10 category B bronze drums, 5 bronze drums are relatively complete. One of which have a ratio of height to surface diameter between 0.618 and 0.714, two is 0.72, one is 0.73, one is 0.76, and one is 0.8. Relatively speaking, its shape proportion is more in line with the aesthetic habits of the public, and it is more beautiful.

(4)Tympanum light body and halo: For bronze drums category A, most of the tympanum was divided 7-11 halos by 2 strings. The awns number of light body, 13 with 12 awns, 4 with 10 awns, 3 with 14 awns, 2 with 16 awns, 1 with 8 awns, and 1 with 32 awns. It shows that during this period, 12 awns were prevailing. The stability of light body awns number is an important manifestation of the stability

of decorative features. The category B's tympanum was divided 10-12 halos by 1 string, 2 strings or 1-2, 2-3, 1-2-3 strings. It shows that the main halo is wide and the tympanum has a strong theme. There are 14 with 12 awns, 3 with 14 awns, and 2 with 10 awns. It is also gradually dominated by 12 awns. This also shows that category A and category B bronze drums may be in a stage of cross-development, but the number of the category B decreased significantly, indicating that category B was also on the wane in Thailand.

(5)Tympanum high-relief motifs: divided into frog and snail high-relief motifs. Among them, there are 8 drums decorated with frogs and 2 drums decorated with snails. On the category B bronze drum, there are four frogs on the tympanum, arranged in a anti-clockwise circle.

(6)Main halo pattern on the tympanum: 22 category A tympanum can roughly distinguish the main halo pattern, of which only flying herons has 14, 6 have both flying herons and feathered-figure, and 1 fish pattern. Bronze drum A-28, due to the fuzzy decoration on the tympanum, we can see the pattern of feathered-figure, which is probably a combination of flying herons and feathered-figure. Only 2 of the category B drums have the main halo flying herons, 5 with both flying herons and feathered-figure, 1 with trans-formed feathered-figure, flying herons and trans-formed altar patterns, and 1 can clearly distinguish the feathered-figure pattern, but the other main halo is blurred, but there are some egret tail patterns, which should be a combination of flying herons and trans-formed feathered-figure patterns (B-7), and the last 1 is blurred.

(7)The main halo of the drum body: category A, only 16 bronze drums can see clearly the information of the halo patterns on the chest. Among them, 6 with feathered-figure rowing boat pattern, and 1 with cow pattern. Most of the stripes on the upper part of the chest are concentric circles between comb line patterns, or tangential circle patterns, etc.. 25 bronze drums can distinguish the main halo pattern on the bulging waist, including 3 with the trans-formed feathered-figure pattern and 4 with the trans-formed rowing pattern, 17 with the vertical plain grids. One with the richest decoration, it is divided into upper and lower grids, the upper grids are the flying herons pattern, and the lower grids are the trans-formed feathered-figure pattern. Category B's drum chest: only 1 is decorated with trans-formed

feathered-figure rowing patterns, and most of the others are decorated with comb patterns sandwiching concentric circles, tangential circle patterns, etc.. Category B's waist: only one decorated with trans-formed feathered-figure pattern, 3 have vertical plain grids , others are basically damaged or the decoration is unclear.

(8)Drum foot: Drum foot are basically smooth and without lines.

(9)Casting technique: The drum body has two molded lines, indicating that it is mold casting. In addition, the tympanum and the 17 of the drum body with gasket marks, except for some damaged parts where the gaskets of the drum body cannot be seen, it can be confirmed that the use of gaskets to control the thickness of the drum wall is the popular method of bronze drum casting at this time.

2.2.2 Appearance features of H₁ type bronze drum in Thailand

According to the statistics, collation and analysis of the investigation results, combined with Heger's overall overview of the H₁ type bronze drum, we can roughly describe the general characteristics of the H₁ bronze drum that was passed to Thailand as follows:

They are all large or super-large drums, most of which have 12 awns in the center of the tympanum, and some have four anti-clockwise single frogs or snails decorations on the edge of the tympanum. The body of the drum is obviously divided into three sections, the drum chest is obviously protruding, the drum waist is contracted, the drum foot are slightly protruding outwards, and the drum foot are generally high. There are four or four pairs of bridge-shaped large flat lugs between the chest and waist. Some have regular or irregular gasket marks.

According to its appearance characteristics, combined with the physical objects, we can roughly divide them into four following categories:

(1)The tympanum is wide and no high-relief motif, the largest diameter of the drum chest is on the upper side, the drum waist is high and almost cylindrical in shape, the drum waist and drum foot are connected to form a relatively smooth outward arc. Such as A-3, A-6, A-11, A-12, A-15, A-16, A-17, A-18, A-19, A-20, A-28. Distributed in Prachinburi, Chumphon, Chaiya, Nakhon Sri Thammarat, Bangkok, Trat, Mukdahan, Ubon Ratchathani, Northeast Thailand, East Thailand, and South Thailand, close to Vietnam. And this category can be further

subdivided into two categories: larger foot diameter, larger outward edge and smaller foot diameter, relatively smaller outside edge. As shown below:



Figure 58. A-17.

Source: Jinxi Liu, Chumphon National Museum, 2023.



Figure 59. A-12.

Source: Jinxi Liu, Ubon Ratchathani National Museum, 2023.

(2) The tympanum is wide and no high-relief motif, the largest diameter of the chest is in the middle or slightly above, the upper part of the drum waist is cylindrical, the lower part is curved and connected with the drum foot, and the drum foot is slightly outside, the overall is thick and dignified. For example, A-1, and A-8 are small in quantity and are mainly distributed in Ratchaburi, Bangkok and other places in northern Thailand and central Thailand.

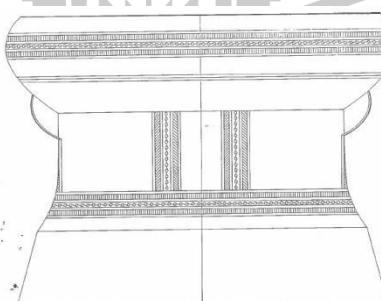


Figure 60. A-1.

Source: The Bronze Kettle Drums in Thailand, p.54.

(3) The tympanum is wide and has vertical decorations. The largest diameter of the chest is slightly upward, the upper part of the drum waist is nearly cylindrical, and the lower part is relatively curved to meet the drum foot, which is slightly outside. Such as B-1, B-3, B-10, these are relatively few, mainly distributed in northern Thailand such as Nan, Sukhothai, Nong Bua Lam Phu and other places.



Figure 61. B-10.

Excavated from Nong Bua Lam Phu province.

Source: ความสัมพันธ์ทางวัฒนธรรม สมัยก่อนประวัติศาสตร์ กรณีศึกษา กลองมีหระทึก, p.77.



Figure 62. B-3.

Source: The Bronze Kettle Drums in Thailand, p.65.

(4) The tympanum is wide and has vertical decorations. The largest diameter of the chest is in the middle or on the upper side, the drum waist is

nearly cylindrical, the drum foot is outside, the foot diameter is large, and the curvature of the connection with the drum waist is small. Such as B2, B-5, etc., mainly distributed in Thailand, Northeast Thailand, such as Bangkok, Mukdahan and other places.



Figure 63. B-2.

Source: Jinxi Liu, Bangkok National Museum, 2023.



Figure 64. B-5

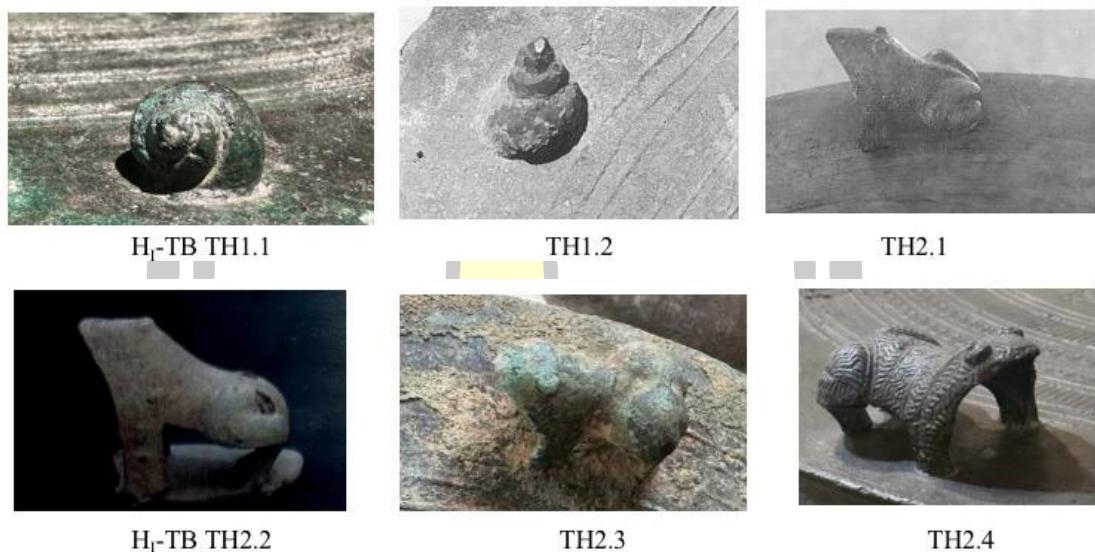
Source: The Bronze Kettle Drums in Thailand, p.124.

In the following analysis, we also collectively refer to the types of tympanum without high-relief motifs as category A, represented by H_I -TA, and the types of tympanum with high-relief motifs as category B, represented by H_I -TB.

2.2.3 High-relief motif

In the middle and late period of the H_I type, the High-relief motif appeared on the tympanum. The bronze drum found in Thailand has two kinds of frogs or snails on the tympanum. They are all on the edge of the drum, and there are

four of them. The heads of the frogs are all facing anti-clockwise. The shape of the frog can also be divided into several categories: the first category, their legs are curled up, squatting standing, the frog's head is upturned, their eyes are round and convex, and the frog's snout is triangular, as if singing, such as B-3. The second, the frog's head is raised upwards, and the frog's eyes are round and convex, like B-9. The third, their buttocks is big and round, the rear legs are straight, and the body of the frog is plain, like B-7. The fourth is the big and round buttocks, and the back legs are straight, the frog body is richly decorated, such as B-8, and the decoration on the body is similar to the thunder pattern.



Remark: $H_1-TB = H_1$ type bronze drum with high-relief motif in Thailand. TH= Tympanum high-relief motifs. TH1=Tympanum high-relief snails. TH2=Tympanum high-relief frogs.

Figure 65. H_1-TB High-relief frog.

H_1-TB TH1.1, B-2.

H_1-TB TH1.2, B-6.

H_1-TB TH2.1, B-3.

H_1-TB TH2.2, B-9.

H_1-TB TH2.3, B-7.

H_1-TB TH2.4, B-8.

Source: Jinxi Liu, National Museum Bangkok, 2023; The Bronze Kettle Drums in Thailand, p.239, 69; Kraty, Chaiya National Museum, 2023; Jinxi Liu,

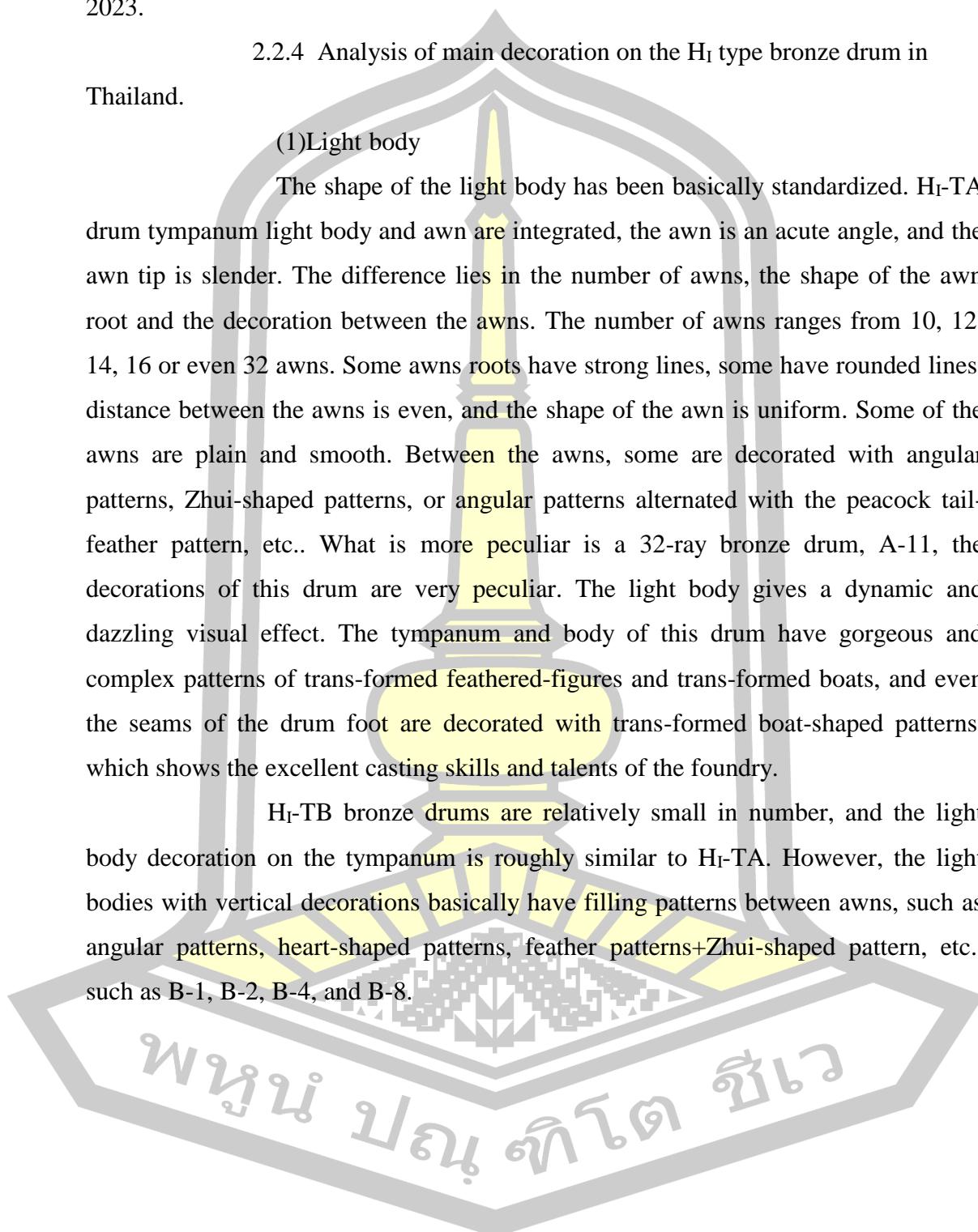
Nakhon Phanom National Museum, 2023; Nakhon Sri Thammarat National Museum, 2023.

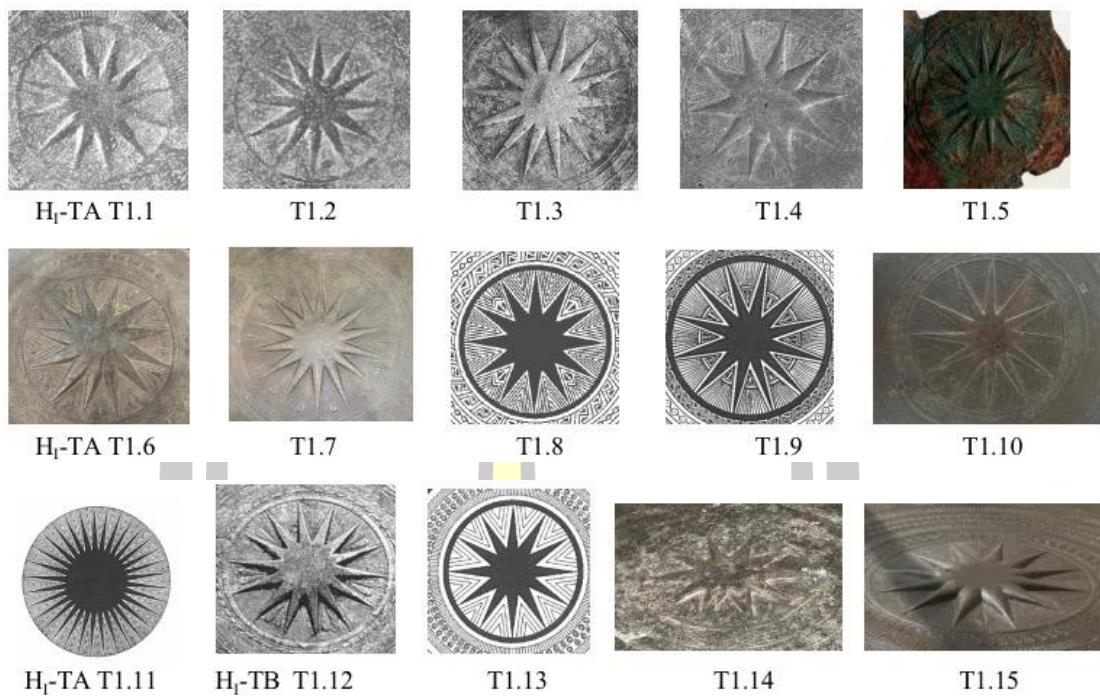
2.2.4 Analysis of main decoration on the H_I type bronze drum in Thailand.

(1)Light body

The shape of the light body has been basically standardized. H_I-TA drum tympanum light body and awn are integrated, the awn is an acute angle, and the awn tip is slender. The difference lies in the number of awns, the shape of the awn root and the decoration between the awns. The number of awns ranges from 10, 12, 14, 16 or even 32 awns. Some awns roots have strong lines, some have rounded lines, distance between the awns is even, and the shape of the awn is uniform. Some of the awns are plain and smooth. Between the awns, some are decorated with angular patterns, Zhui-shaped patterns, or angular patterns alternated with the peacock tail-feather pattern, etc.. What is more peculiar is a 32-ray bronze drum, A-11, the decorations of this drum are very peculiar. The light body gives a dynamic and dazzling visual effect. The tympanum and body of this drum have gorgeous and complex patterns of trans-formed feathered-figures and trans-formed boats, and even the seams of the drum foot are decorated with trans-formed boat-shaped patterns, which shows the excellent casting skills and talents of the foundry.

H_I-TB bronze drums are relatively small in number, and the light body decoration on the tympanum is roughly similar to H_I-TA. However, the light bodies with vertical decorations basically have filling patterns between awns, such as angular patterns, heart-shaped patterns, feather patterns+Zhui-shaped pattern, etc., such as B-1, B-2, B-4, and B-8.





Remark: H_I -TA= H_I type bronze drum without high-relief motif in Thailand.
 T=Tympanum. T1=Tympanum light body.

Figure 66. Tympanum light body of H_I type in Thailand.

H_I -TA T1.1, A-2, 12 awns.

H_I -TA T1.2, A-1, 12 awns.

H_I -TA T1.3, A-5, 14 awns.

H_I -TA T1.4, A-6, 10 awns.

H_I -TA T1.5, A-35, 16 awns.

H_I -TA T1.6, A-15, 12 awns.

H_I -TA T1.7, A-17, 14 awns.

H_I -TA T1.8, A-14, 12 awns. With angular patterns+Zhui-shaped patterns.

H_I -TA T1.9, A-9, 12 awns. Peacock tail-feather pattern between the awns.

H_I -TA T1.10, A-19, 12 awns, angular pattern between awns.

H_I -TA T1.11, A-11, 32 awns, with multi-angular pattern between awns.

H_I -TB T1.12, B-4, 14 awns, feathers pattern+Zhui-shaped patterns.

H_I -TB T1.13, B-1, 12 awns, angular pattern between awns.

H_I -TB T1.14, B-2, 10 awns, angular pattern between awns.

H_I -TB T1.15, B-8, 12 awns.

Source: The Bronze Kettle Drums in Thailand, p.56, 50, 91, 99; Jinxi Liu, 2023; Jinxi Liu, Chumphon National Museum (two bronze drums), 2023; The Bronze Kettle Drums in Thailand, p152, 123; Jinxi Liu, Chaiya National Museum, 2023. The Bronze Kettle Drums in Thailand, p135, 73, 36; Jinxi Liu, Bangkok, 2023; Jinxi Liu, Nakhon Sri Thammarat, 2023.

(2)The main halo decoration on the tympanum.

We can clearly distinguish the main halo decoration on the H_I type drum's tympanum found in Thailand.

In the survey data of bronze drums in Thailand, we can see that there are 22 H_I-TA bronze drums that can distinguish the main halo patterns on the tympanum. The main halo patterns mainly include three kinds: flying herons, flying herons and feathered-figures pattern, fish pattern (only 1). Among the 10 H_I-TB drum tympanum, the main halo decorations are divided into two kinds: flying herons, flying herons and feathered-figure. Let's make a brief analysis of flying herons pattern and feathered-figure pattern respectively:

① Fish pattern. There is only one case of the main halo of H_I-TA fish pattern, such as A-4, with simple decoration and exquisite conception.

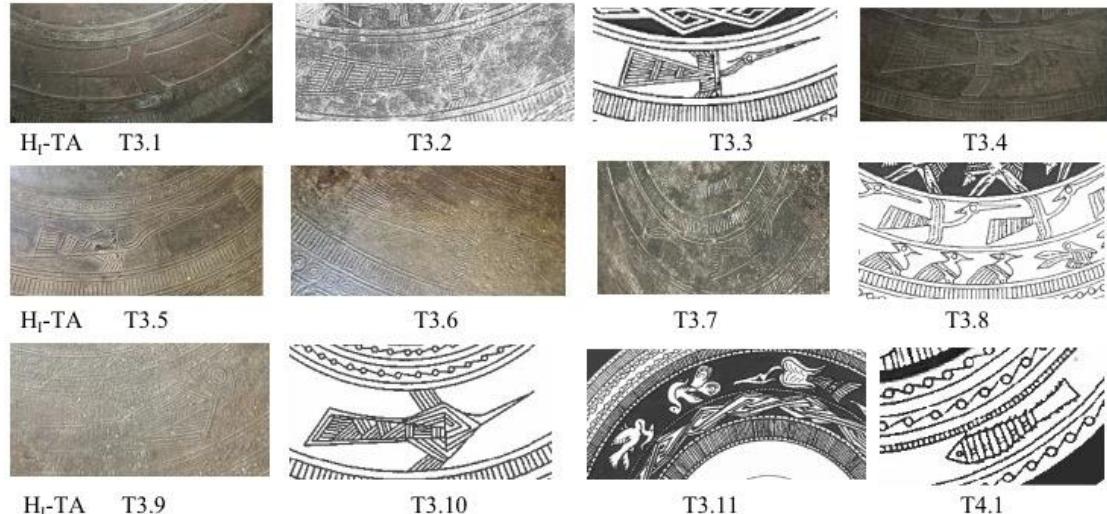
② Flying heron pattern. The main halo of the H_I-TA flying herons pattern can be roughly divided into the following kinds:

First, the heron is represented by the surface. The decoration is simple and plain, and the bird body has no decoration. Such as A-19.

Second, express heron in the form of circles, dots, lines, and planes: gorgeous decorations and different postures are the mainstream forms of heron decorations. Such as A-1, A-9, A-15, A-17, A-18, A-2, A-6, A-17, A-23, etc.. Among them, the bird's eye is represented by a circle or a circle with a center dot. The head has a crown, a long beak, and a long tail, which depicts the graceful posture of the heron spreading its wings and flying. This kind of decoration can be divided into two kinds, one is relatively realistic, and the other is more geometric decoration, such as A-17 (the fifth halo trans-formed bird pattern) and A-23. This type of ornamentation developed to a later stage, and a space symbol, four-petal pattern was added in the middle of the herons, such as: A7. While the decoration was further

strengthened, it also showed that the meaning of the ornamentation was also undergoing subtle changes.

Third, realistic depiction, placing the posture of the heron standing, spreading its wings, and flying in a halo, showing the graceful dynamics of the heron. Such as A-27.



Remark: T3 = Flying heron pattern on the tympanum. T4 = Fish pattern on the tympanum.

Figure 67. Flying heron pattern, fish pattern on the Hi-TA drum tympanum.

Hi-TA T3.1, A-19.

Hi-TA T3.2, A-1.

Hi-TA T3.3, A-9.

Hi-TA T3.4, A-18.

Hi-TA T3.5, A-15.

Hi-TA T3.6, A-17.

Hi-TA T3.7, A-2.

Hi-TA T3.8, A-6.

Hi-TA T3.9, A-17, trans- formed birds pattern.

Hi-TA T3.10, A-23, trans- formed herons pattern.

Hi-TA T3.11, A-27.

Hi-TA T4.1, A-4.

Source: Jinxi Liu, Chaiya National Museum, 2023; The Bronze Kettle Drums in Thailand, p.51, 123; Jinxi Liu, Chaiya National Museum, Chumphon

national museum (two bronze drums), and Bangkok, 2023; The Bronze Kettle Drums in Thailand, p.51; Jinxi Liu, Chumphon national museum, 2023; The Bronze Kettle Drums in Thailand, p.204, 219, 87.



H_I-TA T3.12+T5.1

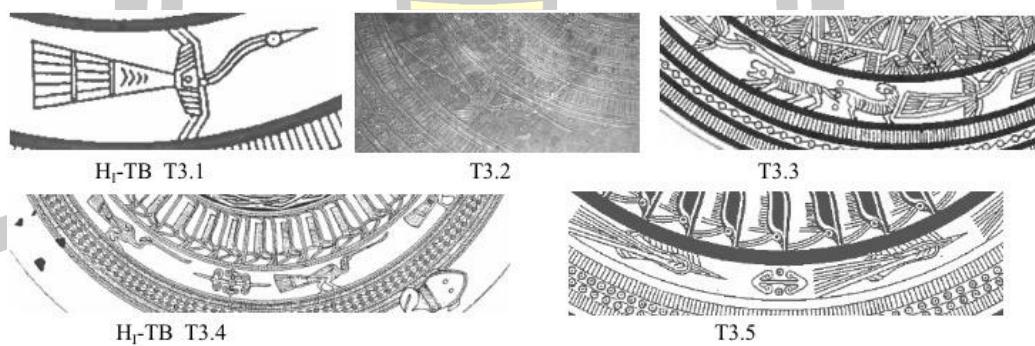
Remark: H_I-TA T5=Dingsheng pattern on H_I-TA drum tympanum .

Figure 68. Dingsheng pattern on H_I-TA drum tympanum.

H_I-TA T3.12+T5.1, A-7. Flying herons pattern+Dingsheng pattern.

Source: The Bronze Kettle Drums in Thailand, p.109.

The main halo of the H_I-TB flying herons pattern can be roughly divided into two kinds: one is the same as the H_I-TA drum, using circles, dots, lines, and planes to describe the shape of flying egrets, such as B-2, B-8, etc.. Second, Standing, walking or abstract flying egrets, with Dingsheng pattern or animal in the middle, such as B-3, B-1.



Remark: BT3 = Category B, tympanum flying heron pattern or trans-formed flying heron pattern.

Figure 69. Flying heron pattern on H_I-TB drum tympanum.

H_I-TB T3.1, B-2.

H_I-TB T3.2, B-8.

H_I-TB T3.3, B-6.

H_I-TB T3.4, B-3.

H_I-TB T3.5, B-1.

Source: The Bronze Kettle Drums in Thailand, p.48, 195, 242, 70, 36.

③Feathered-figure pattern

The H_I type bronzes drum in Thailand have rich feathered-figure patterns on the tympanum, which are mainly divided into the following categories:

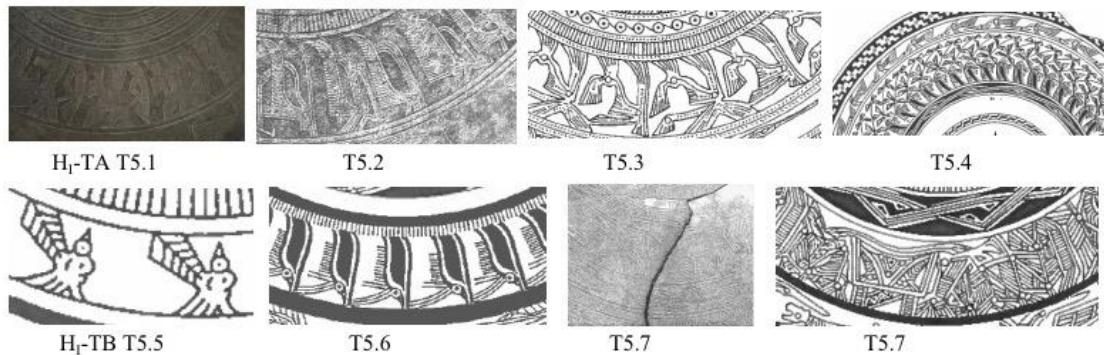
First, a feathered-figure pattern with a high degree of human simulation, holding a feather shield, wearing a feather ornament on the head, and wearing a feather sword. Such as A-18, B-2.

Second, the human head is represented by a circle, the head feathers are exaggerated and elongated, and the image of holding a feather shield or weapon can still be seen, and the degree of abstract imagery is enhanced. Such as A-1, A-7.

Third, complete abstraction, the head of the feathered figure is represented by a circle with a center dot, and the body is further simplified and only replaced by feather ornaments. Such as A-32, B-1, B-6.

On the whole, H_I-TB bronze drums are similar to the transformed feathered human patterns in the later period of H_I-TA, but the degree of abstraction is higher. Among the H_I-TB bronze drums, there is a combination of transformed feathered-figure patterns+trans-formed altars, such as B-6, which also explains the changing law of ornamentation. Drum-casting craftsmen have carried out extremely creative changes with the changes in the beauty appreciation of the times and the functions of bronze drums.

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Remark: T5 = trans-formed feathered-figure.

Figure 70. Trans-formed feathered-figure on H_I-TA or H_I-TB drum tympanum.

H_I-TA T5.1, A-18.

H_I-TA T5.2, A-1.

H_I-TA T5.3, A-7.

H_I-TA T5.4, A-32

H_I-TB T5.5, B-2

H_I-TB T5.6, B-1.

H_I-TB T5.7, B-6.

H_I-TB T5.7, B-6.

Source: Jinxi Liu, Chaiya National Museum, 2023; The Bronze Kettle Drums in Thailand, p.51, 109, 296, 48, 36, 241.

(3)Main halo decoration on the drum body.

From the statistical data of bronze drums discovered in Thailand, we can see that the decorations on drum chests are mainly divided into two kinds: one main halo pattern is feathered-figure rowing boat, some have cow or bird pattern between the boat, another is decorated the same combination decorative belt pattern with the tympanum, such as comb pattern with concentric circle pattern or comb pattern with tangent circle pattern,etc.. Most of them are decorated on the drum body of H_I-TA drum.

The drum waist is generally divided into upper and lower parts, the upper part is divided longitudinally by the decorative belt, and the lower part is the horizontal decorative belt similar to the drum chest and tympanum. There are roughly four types of ornamentation between the upper compartments: one is decorated with

trans-formed feathered-figure patterns, the other is decorated with trans-formed feathered-figure patterns and bird patterns (only one drum is found to be the most rich and colorful, and within the drum-waist grid, it is also divided into upper and lower grids, the upper grid is flying herons pattern, and the lower grid is trans-formed feathered-figure pattern), the third is decorated with trans-formed feathered-figure rowing pattern, the fourth is vertical plain grid (that is, the drum waist is divided into several grids by the vertical stripes, and there is no pattern in the grid) .

Generally speaking, the drum chest is decorated with feathered-figure rowing boat pattern, and the drum waist is roughly the same as the tympanum, decorated with feathered-figure or flying-herons pattern. As shown in the following pictures:

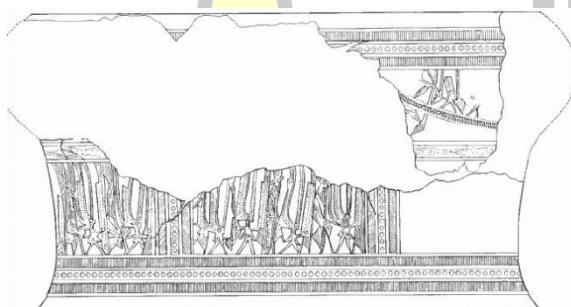


Figure 71. A-29, main halo pattern on the drum body.

Bronze drum chest: trans-formed feathered-figure rowing pattern.

Drum waist: trans-formed feathered-figure pattern.

Source: The Bronze Kettle Drums in Thailand, p.285.

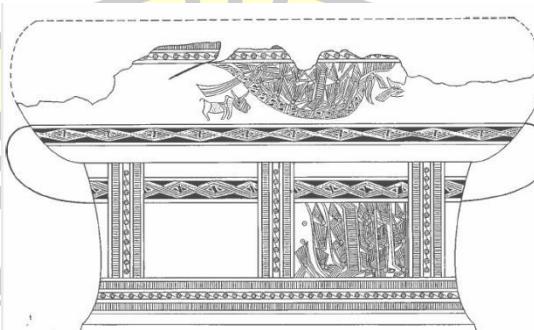


Figure 72. A-31, main halo pattern on the drum body.

Drum chest: cow pattern, trans-formed feathered-figure rowing pattern, bird pattern.

Drum waist: trans-formed feathered-figure pattern.

Source: The Bronze Kettle Drums in Thailand, p.292.

The shape of the cow pattern in the image is also the shape of a peaked cow with a huge head, curved horns, and raised shoulders. Poke dots on the body to enhance the decoration.

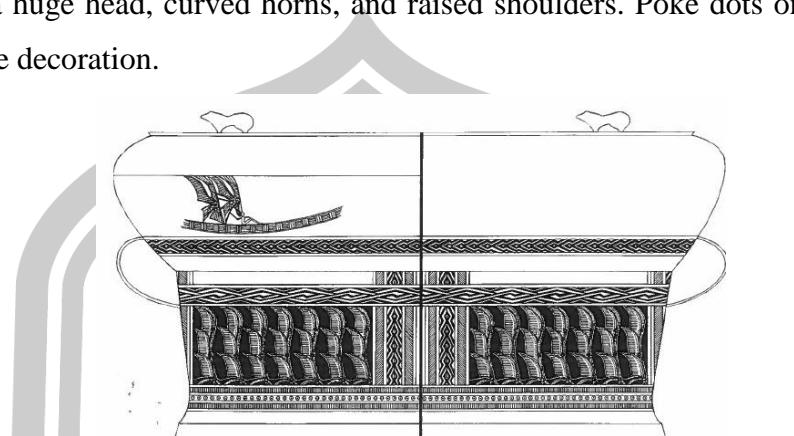


Figure 73. B-5, main halo pattern on the drum body.

Rowing boat pattern on the drum chest.

Trans-formed feathered-figure Pattern on the drum waist.

Source: The Bronze Kettle Drums in Thailand, p.129.

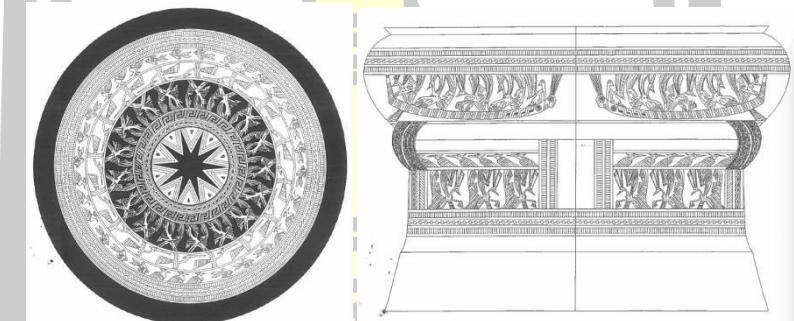


Figure 74. A-6, main halo pattern on the drum body.

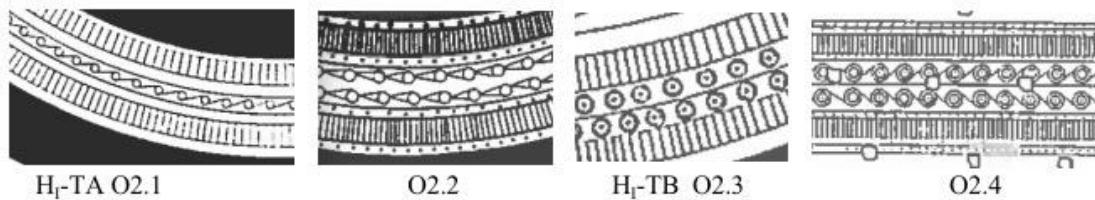
Feathered-figure pattern on the drum chest. Feathered-figure pattern on the drum waist and the patterns of standing-herons are consistent with the similar patterns on the tympanum.

Source: The Bronze Kettle Drums in Thailand, p.102-103.

(4) Other decorations

In addition to the main halo decoration on the tympanum and drum body, there are many other geometric decorations, which are composed of dots, lines, squares, circles and other elements to set off the main halo decoration, such as comb patterns, circle patterns with a center dot, thunder pattern, tangent concentric circle

with center dot pattern, oblique line pattern, etc., through different combinations such as mirror symmetry, repeated symmetry, horizontal row, vertical row, and variants, they make themselves full of rhythm, resulting in fascinating artistic charm. Such as, comb-line and circle combination.



Remark: O = Other pattern. O2 = Other combination decorative belt pattern.

Figure 75. Other pattern.

H_i-TA O2.1, A-4. Tangent circle between comb line.

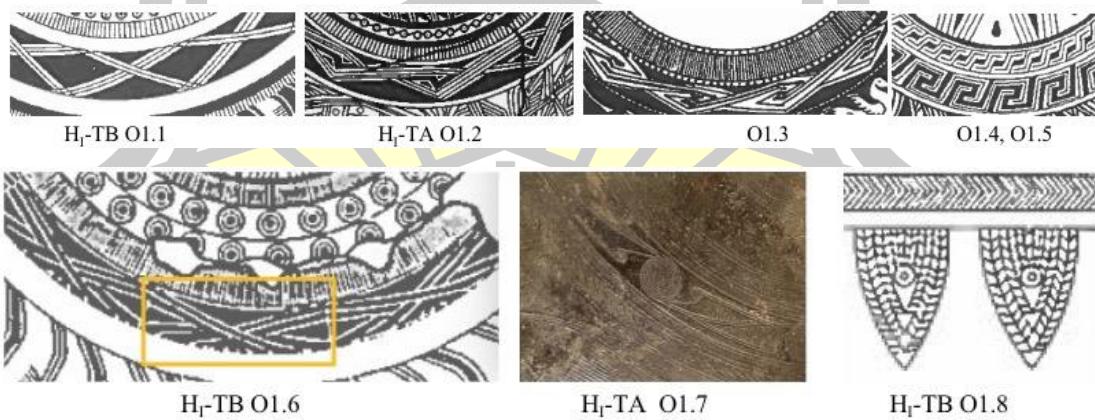
H_i-TA O2.2, A-27. Angled Circle between comb line (Mirror Symmetry).

H_i-TB O2.3, B-1. Circle with center dot between comb line (Mirror Symmetry).

H_i-TB O2.4, B-3. Tangent concentric circle between comb line (Mirror Symmetry).

Source: The Bronze Kettle Drums in Thailand, p.87, 219, 36, 72.

Multi-angular pattern:



Remark: O1 = Other single pattern.

Figure 76. Multi-angular pattern.

H_i-TB O1.1, B-1. Multi-angular crossing pattern1.

H_i-TB O1.2, B-6 . Multi-angular crossing pattern2.

H_i-TA O1.3, A-27. Linked thunder pattern 1.

H_I-TA O1.4 - O1.5, A-6. Linked thunder pattern 2 -3.

H_I-TB O1.6, B-7, Multi-line crossing pattern.

H_I-TA O1.7, A-17. Linked circus cloud pattern.

H_I-TB O1.8, B-1. Drum foot Vertical Leaf Pattern.

Source: The Bronze Kettle Drums in Thailand, p.36, 241, 219, 102, 163; Jinxi Liu, Chumphon national museum, 2023; The Bronze Kettle Drums in Thailand, p.36.

2.2.4 Casting technique and musical instrument performance of H_I bronze drum in Thailand

There are two methods of casting bronze drums in ancient times, one is cast by the mold casting method, and the other is cast by the lost-wax method. Judging from the pattern lines on both sides of the H_I drum body found in Thailand, it can be roughly divided into two categories: one is the obvious pattern line, and the traces of the pattern line blocking the drum body decoration. The second is that there is a joint line, but there are decorations on the joint line, and there are very few such bronze drums, such as A-11 and A-19. Among the H_I type bronze drums that the researcher has come into contact with, there is no such case of casting lines with decorative patterns. Because the researcher has not touched the actual drum of A-11, so will not speculate for the time being, but for A-19, the decoration on the molding line is obvious, and the decoration does not appear to the blocked traces. The drum body is smooth, very similar to the H_{III} type drum body. The traces of conformity are inferred to be cast by the lost-wax method, and further verification is needed.

According to the *Bronze Drum Making Method* in Burmese collected by the National Library of Thailand, the mold method used in casting bronze drums is made of cow dung and rice husks as admixtures. Traces of rice husks were found in the A-4 bronze drum fragments in Thailand, which is a demonstration of this historical recording method and is of great significance.

In addition, there are 17 bronze drums with round or square gaskets traces left on the outer edge of the tympanum or on the drum body. Some are even covered with gasket marks all over the body. This shows that casters also use gasket to control

the wall thickness and support the inner and outer molds to ensure uniform thickness of the wall.

The Department of Mineral Resources (a research conducted by the Mineral Resources Analysis Division) tested the alloy composition of some bronze drums. We took 5 from the H_I-TA bronze drum and 3 from the H_I-TB bronze drum. Copper, Tin, and lead content ratio average is as follows:

H_I-TA (A-3, A-4, A-6, A-7.A-27) alloy detection average is: copper 73.19%, lead 6.45%, tin 11.39%.

The average value of H_I-TB (B-1, B-3, B-4) alloys is: copper 69.74%, lead 7.60%, tin 14.48%. From the numerical point of view, they all belong to high-tin and low-lead bronze drums. According to the records of *Kao Gong Ji*, a classic of Chinese craftsmanship in the Spring and Autumn Period, when casting bells and tripods, the alloy distribution ratio is *sixths of the copper and one of the tin*, that is, the proportion of tin should account for 1/7, from the above alloy ratio, the music performance of H_I-TA is higher than that of H_I-TB.

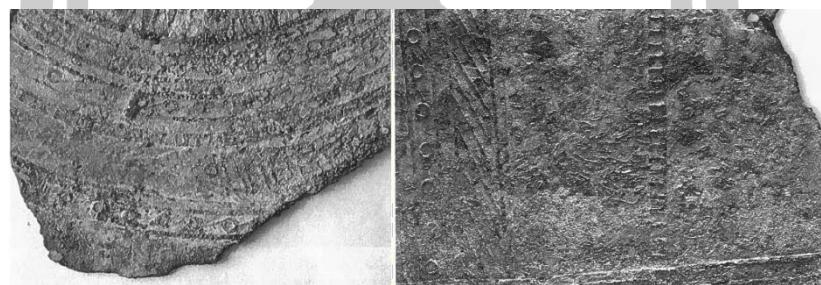


Figure 77. A-4, An evidence of Husk on the side of the drum.

Source: The Bronze Kettle Drums in Thailand, p.85.



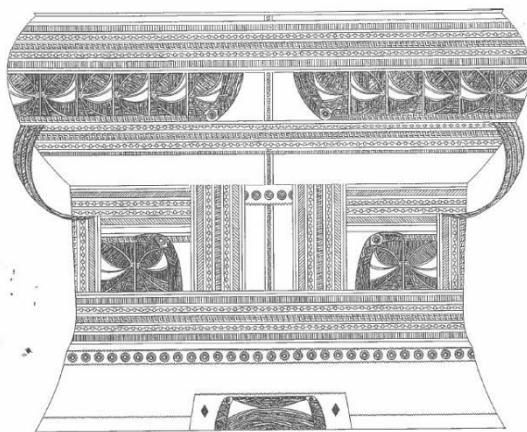


Figure 78. A-11. Mold casting line, but the chest and waist are decorated on top of the seams, and the foot also are decorated.

Source: The Bronze Kettle Drums in Thailand, p.136.



Figure 79. A-19. Drum body pattern seams, but the chest and waist are decorated on top of the pattern seams.

Source: Jinxi Liu, Chaiya National Museum, 2023.

2.3 H_{III} type bronze drums in Thailand

2.3.1 Investigation data of H_{III} type bronze drums in Thailand

the researcher collected a total of 16 pieces of H_{III} type bronze drums data in Thailand, and made a statistical table of the main dimensions and main decorations (see the appendix table 5 for specific survey data). The serialization of the bronze drums in the table is a new code set by the researcher for the convenience of the later description. For convenience of the later description, we use H_{III}-TC (H_{III}=Heger III type, T=Thailand, C=Category C) type to represent H_{III} type bronze drum in Thailand. Other than that, it does not mean anything. Judging from the statistical data, we can get the following information:

(1)High-relief motif on the tympanum: Currently, there are a total of 16 H_{III} type bronze drums in Thailand, 2 of which are damaged. Among the 14 bronze

drums, there are 7 of a high-relief squatting frog on the tympanum, and 1 with 2 layer stack squatting frogs. 8 with 3 layer stack squatting frogs.

(2)Tympanum diameter: 16 bronze drums, 2 with a tympanum diameter of 30-40cm, 1 with a tympanum diameter of 40-50m, 4 with a tympanum diameter of 50-60cm, 8 with a tympanum diameter of 60-70m, and 1 with a tympanum diameter of 70-80m. It can be seen that most of the H_{III} type drums passed to Thailand have a tympanum diameter between 50 and 70 cm, and the tympanum diameter is medium to large among all types of bronze drums.

(3)Ratio of tympanum to height: remove the damaged two bronze drum, 8 of the 14 H_{III} type drums with a ratio of drum height to tympanum diameter between 0.618 and 0.714, 4 between 0.72 and 075, and 0.80 or more there are 2, which shows that the H_{III} type drum conforms to the aesthetic habits of the public and has the most beautiful appearance.

(4)String halo on the tympanum: the tympanum is generally divided by two or three strings, and the number of halos ranges from 10 to 28. Among them, the number of halos on the tympanum of only one high-relief frog is between 10 and 17, the number of halos on the tympanum of two layer squatting frogs is 17, and the number of halos on the tympanum of three layer squatting frogs is generally 17 to 19. It shows that with the stability of the shape, the number of halos on the tympanum and even the decoration also appear in a stable state.

(5)Tympanum light body: the tympanum light body is between 6 and 16 awns, of which 12 awns have 9, and 6, 7, 8, 10, and 16 awns each have 1. Among the 8 bronze drums with 12 awns, 7 belong to 3 layer squatting frog bronze drums. 1 belongs to 2 layer squatting frogs, which shows that the tympanum of 1 squatting frog is the early form of H_{III} type drum.

(6)High-relief motif on the drum body: excluding 2 broken bronze drums, among the 14 H_{III} type drums, there are 10 drums with High-relief motif on the drum body. Among the bronze drums with a squatting frog on the tympanum, there are 2 drums with high-relief motif on the drum body. There are high-relief motif on the drum body of all two or three stack squatting frogs. There are 3 bronze drums with High-relief motif on both sides of the drum body. The High-relief motif on one side drum body includes: 3 elephants + 3 snails + 1 tree, 3 elephants + 3 snails, 3

elephants + 2 snails + 1 tree, 3 elephants + 3 snails + 1 animal, 3 elephants + 2 snails, 1 elephant +2 snails. the high-relief motifs on both sides of the drum include: 3 elephants + 3 snails + 1 tree + 2 carps.

(7)Casting line: the drum body has 2-4 casting lines or casting decorative line.

2.3.2 Appearance features of H_{III}-TC drum

According to the statistics, collation and analysis of the investigation results, combined with Heger's overall overview of H_{III} bronze drum, we can roughly describe the general characteristics of the H_{III}-TC as follows:

The wall is light and thin, the body is tall, the tympanum is wide, and the edge extends outward. It is common to see single frogs and three frogs stack squatting with anti-clockwise. Most of the light bodies on the tympanum are twelve awns, and generally the tympanum is divided into halos by two to three strings, and the halos are many and dense. The top of the drum is large and the bottom is small, and the bottom of the drum is almost straight. Most of the bronze drums have no obvious dividing line between the chest, waist and foot. There are four drum lugs, arranged in pairs, most of which are decorated below the lugs. There are different numbers of imitated combined model lines on the body, which run through the drum body from top to bottom, and some of the drum bodies are lined with exquisite carvings such as elephants, snails, tree, carp, etc..

According to its shape characteristics and combined effects, we can roughly divide the H_{III}-TC into the following categories :

(1)Single frog drum: 7 in total, including C-1, C-2, C-3, C-10, C-13, C-15, and C-16. Judging from its characteristic shape, it can be roughly divided into three categories: ①single frog drum, the edge of the tympanum extends outwards, and the drum body is divided into three sections. Such as: C-10, distributed in Ubon Ratchathani. ②Single frog drum, the edge of the tympanum extends outwards, the tympanum is relatively fat, the drum body is divided into two sections, the drum chest is convex, there is no dividing line between the drum waist and the foot, and the drum body is wider, such as C-2, C-3, distributed in Khon Kaen (to be verified), Pathum Thani. ③Single frog drum, the edge of the tympanum extends outwards, the standing frog body is small and thin, the bulging chest is small, and there is almost no

separation from the drum waist, and the upper and lower sides are almost straight, such as C-1 and C-13. C-15, C-16, distributed in Nan, Chiang Rai, Chiang Mai, Tak. From the above distribution of drum types, ① and ② are mainly distributed in eastern and northeastern Thailand, and ③ is mainly distributed in northern Thailand. From the point of view of form alone, its time development sequence should be: ②→①→③.



Figure 80. C-10, H_{III}-TC drum with single frog.

Source: Jinxi Liu, Ubon Ratchathani National Museum, 2023.



Figure 81. C-2, H_{III}-TC drum with single frog.

Source: The Bronze Kettle Drums in Thailand, p.137.



Figure 82. C-15, H_{III}-TC drum with single frog.

Source: Wei Qingbing, Chiang Mai National Museum, 2023.

(2) Double stack squatting frog: only one. From the characteristic of this drum's appearance, the drum has a wide tympanum, the edge of the drum protrudes outwards, the upper and lower sides of the drum lugs are decorated with exquisite patterns, the upper and lower sides of the drum body are almost straight, and there are three-dimensional decorations of 3 elephants + 3 snails + 1 tree on one side of the drum body. *The Bronze Kettle Drums in Thailand* marked its location as Bangkok National Museum.



Figure 83. C-7, HIII-TC drum with double stack Squatting frogs.

Source: *The Bronze Kettle Drums in Thailand*, p.220.

(3) Three stack squatting frogs: 8 in total. Including: C-4, C-5, C-6, C-8, C-9, C-11, C-12, C-14. It is mainly divided into 2 categories from its appearance. ① The bulging chest shrinks inward rapidly, the boundary between the bulging chest and the bulging waist and foot is obvious, the drum body is slender and straight, and there are high-relief motifs on both sides of the drum body. This type of drum has only 2, C-5, C-6, both in Nakhon Phanom province. ② The shrinkage of the drum chest to the drum waist is relatively small, and it is cylindrical under the drum chest, most drum body have high-relief motifs on the side, and the combinations of vertical decorations are various.



Figure 84. C-6, with three stack Squatting frogs.

Source: Jinxi Liu, Nakhon Phanom, 2023.



Figure 85. C-7, with three stack Squatting frogs.

Source: Jinxi Liu, National Museum Bangkok, 2023.

2.3.3 Analysis of main decoration of Hm bronze drum in Thailand

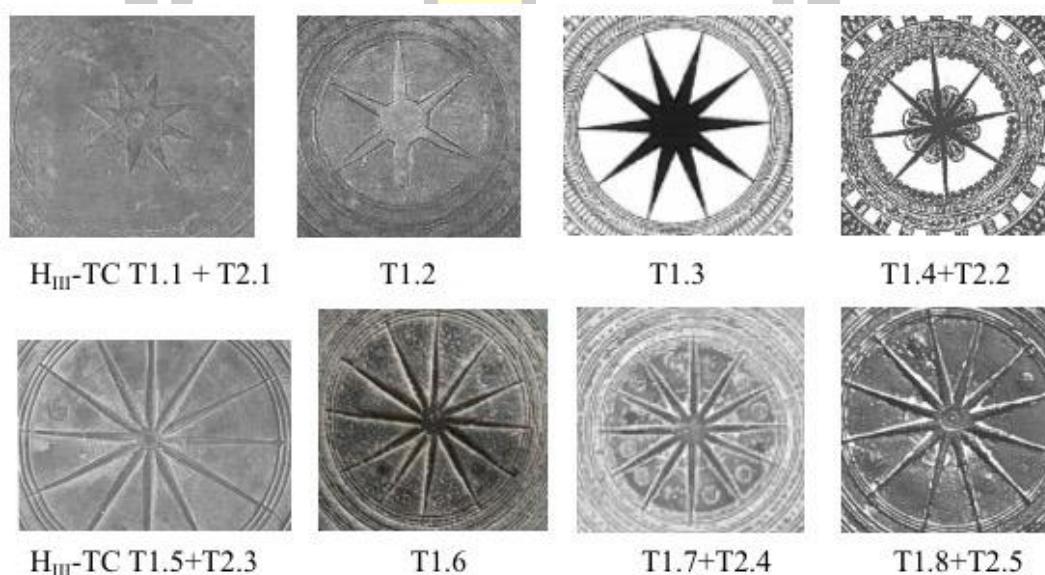
(1)Light body

Single frog drum light body: various shapes, ranging from 5 awns, 6 awns, and 8 awns. Such as: C-3, C-13, C-1, and C-15. Judging from its decorative features, C-3 is still a light body and awns as a whole, the awns are triangular, there are heart-shaped patterns between the roots of the awns, and the awns are unevenly spaced, which is relatively simple. The light body of C-13 is round, and the awn roots are spaced and evenly spaced, which is more delicate than C-3. The light body of C-1 is already round, and the awns are elongated and triangular, and the awns are sharp. C-15 is a relatively stable light body shape, with a small light body circle center,

cone-like awns, and heart-shaped petal patterns between the roots of the awns, with gorgeous decorations.

Double stack squatting frogs drum light body: such as C-7, the light body of the tympanum becomes a dot, the awn is slender and long like a cone, the root of the awn is contracted, relatively round, and the root of the awn is decorated with heart-shaped leaf veins, the whole is soft and beautiful.

Three stack squatting frogs drum light body: such as C-9, C-4, and C-11. C-9 and C-4 drums have almost the same shape, both of which have 12 awns, and the awns are like cones. The light body of C-11 is printed with a round flower pattern, and the size and shape of the light body are roughly the same as those of the first two bronze drum. It can be seen that the shape of the light body, the number of awns, and the shape of the awns are basically stable, the difference is the decoration between the awns and on the light body. Generally speaking, three stack squatting frogs drum has tended to be standardized.



Remark: $H_{III}-TC = H_{III}$ type bronze drum in Thailand, T1 = tympanum light body. T2 = Tympanum patterns between awns.

Figure 86. Light body on $H_{III}-TC$ drum .

$H_{III}-TC$ T1.1+T2.1, C-3. 8 awns light body+heart-shape pattern.

$H_{III}-TC$ T1.2, C-13. 6 awns light body.

$H_{III}-TC$ T1.3, C-1. 10 awns light body.

H_{III}-TC T1.4+T2.2, C-15. 8 awns light body+heart-shape pattern+group petal pattern.

H_{III}-TC T1.5+T2.3, C-7. 12 awns light body+heart-shape pattern .

H_{III}-TC T1.6, C-4. 12 awns light body.

H_{III}-TC T1.7+T2.4, C-9. 12 awns light body+heart-shape pattern+group petal pattern.

H_{III}-TC T1.8+T2.5, C-11. 12 awns light body+heart-shape pattern.

Source: The Bronze Kettle Drums in Thailand, p.156, 263, 32, p.276, 223.

Jinxi Liu, Nakhon Phanom, 2023. The Bronze Kettle Drums in Thailand, p.231, 251.

(2)Main halo decoration

The main halo decoration on the tympanum of the H_{III}-TC drum is not as easy to distinguish as that of the H_I drum, because the width of the halo on the tympanum is roughly similar, the same halo interior has the same pattern, and repeated continuous in the halo. Sometimes at a distance, separated by other halos, sometimes closely connected. Generally, there are combinations and repetitions of several decorations in a halo, or a repeated decoration is within a larger halo, and we consider it to be the main halo. This kind of decoration is generally bird pattern, fish pattern, group petal pattern, traveling flag (Tao flag) pattern and so on. They are no longer limited to the middle of the tympanum, but are adjusted for aesthetics, sometimes near the light body, sometimes at the edge of the tympanum. The decorations in the halo are mostly pressed with molds. Now, we still analyze according to the category of the single frog, double frog stack squatting and three frogs stack squatting respectively.

Single frog drum: the main halo pattern on the tympanum is clear, with bird patterns, fish patterns, group petal patterns, thunder patterns, and traveling flag patterns as the main ones, which are simple and easy to distinguish. For example, in C-2, the edge of the drum is decorated with bird patterns. Each pair of bird patterns has a diamond-shaped pattern (also called diamond-shaped thunder pattern) as the interval. The light body of the tympanum has no pattern or has been worn away. The travelling flag (Tao flag) pattern in the fifth halo, the bird pattern in the seventh halo, and the diamond-shaped pattern between the bird patterns in the tenth halo can all be regarded as the main halo pattern. And the circle pattern is the interval decorative

pattern of the main halo pattern , so the main halo pattern of the C-2 drum is the Tao flag pattern+ bird pattern+fish pattern. In this way, the main halo pattern of the C15 tympanum is: bird pattern+fish pattern+group petal pattern, the main halo pattern of the C1 tympanum is: diamond-shaped thunder pattern+group petal pattern+bird pattern. The main halo pattern of the C13 tympanum is: bird pattern+fish pattern+rice grain pattern+group petal pattern.

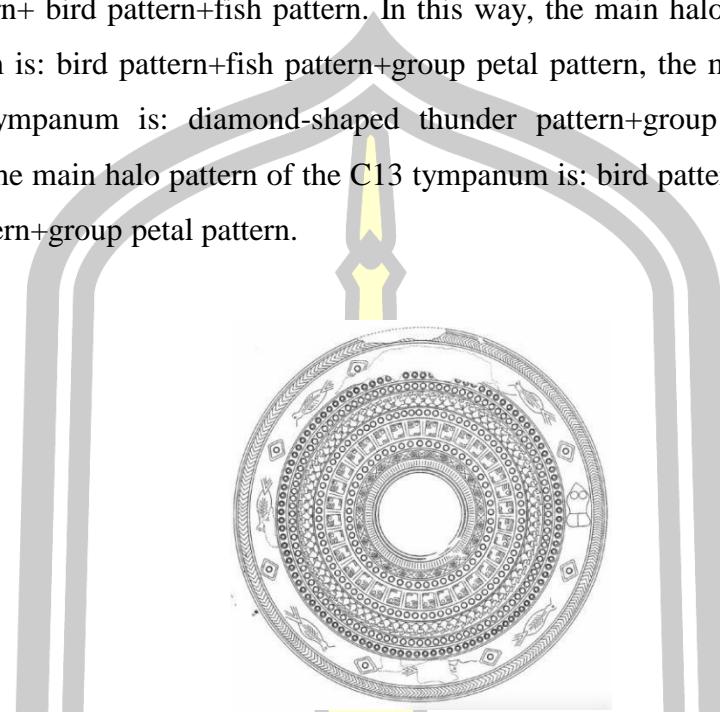


Figure 87. C-2, main decoration on H_{III}-TC tympanum .

Source: The Bronze Kettle Drums in Thailand, p.42.

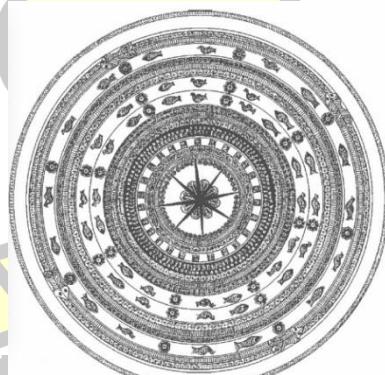


Figure 88. C-15, main decoration on H_{III}-TC tympanum .

Source: The Bronze Kettle Drums in Thailand, p.276.

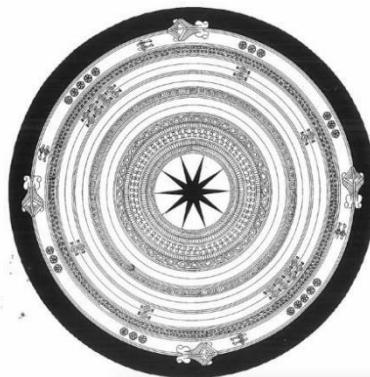


Figure 89. C-1, main decoration on H_{III}-TC tympanum .

Source: The Bronze Kettle Drums in Thailand, p.42.

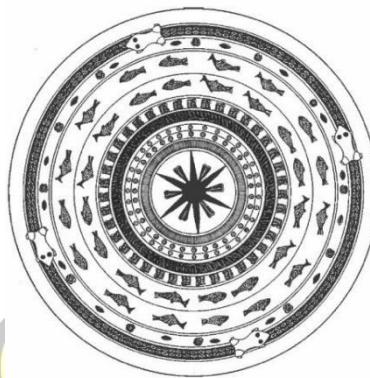


Figure 90. C-13, main decoration on H_{III}-TC tympanum .

Source: The Bronze Kettle Drums in Thailand, p.265.

The three frogs stack squatting drum has 8, of which the main halo pattern is group petal pattern+bird pattern+diamond-shaped thunder pattern: C-5, C-6, C-14, C-11, C-12. Bird pattern+diamond-shaped thunder pattern: C-4. The ones with bird pattern + group petal pattern: C-8, C-9.

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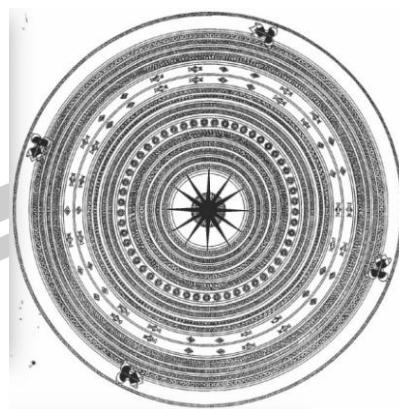


Figure 91. C-7, main decoration on H_{III}-TC tympanum.

Source: The Bronze Kettle Drums in Thailand, p.42.



Figure 92. C-14, main decoration on H_{III}-TC tympanum .

Source: The Bronze Kettle Drums in Thailand, p.271.

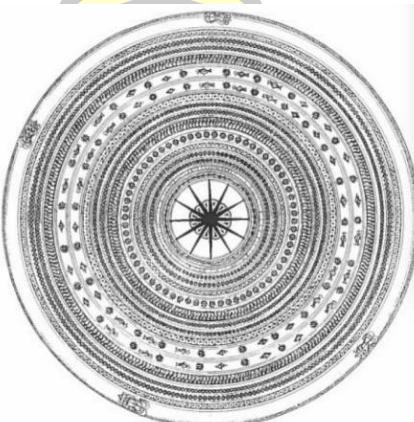


Figure 93. C-11, main decoration on H_{III}-TC tympanum .

Source: The Bronze Kettle Drums in Thailand, p.252.

(3) High-relief motifs

① High-relief frogs

Single high-relief frogs bronze drum: there are two types, one is the frog body is strong and fat, the hind legs stand up, such as C-10, the limbs are strong, the body is flat and slightly forward, and the C-3 is relatively light and thin. It looks closer to the H_{III} type frogs decoration style than C-10. The other type is small and thin, with various frog body decorations, most of which are braided patterns in the middle of the frog body or single-line longitudinal divisions, mostly oblique lines on both sides, and frog hips have concentric circles to represent muscles, a triangular head with a pointed snout, and rounded eyes. Such as C-15, C-13, C-1, etc., are all of this type.

There is not much difference between double frogs drum and three frogs drum. All are stack squatting series, the difference lies in the number of tired squatting frogs. The three standing frogs drum has basically been finalized.



Remark: H1 = One high-relief frog. H2 = Two high-relief frogs. H3 = Three high-relief frogs.

Figure 94. High-relief frog on H_{III}-TC tympanum.

H_{III}-TC H1.1, C-10.

H_{III}-TC H1.2, C-3.

H_{III}-TC H1.3, C-15.

H_{III}-TC H1.4, C-13.

H_{III}-TC H1.5, C-1.

H_{III}-TC H2.1, C-10.

H_{III}-TC H3.1, C-4.

H_{III}-TC H3.2, C-5.

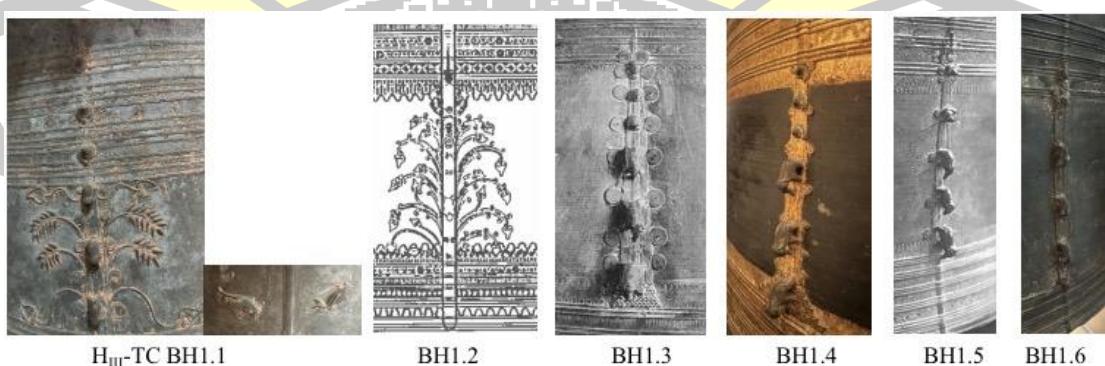
H_{III}-TC H3.3, C-8.

Source: Jinxi Liu, Ubon Ratchathani National Museum, 2023; The Bronze Kettle Drums in Thailand, p.154; Jinxi Liu, Nakhon Phnom, 2023; The Bronze Kettle Drums in Thailand, p.260, 42, 223; Jinxi Liu, Nakhon Phnom (two), National Museum Bangkok, 2023.

(2)The high-relief motif of the drum body

The single frog drums are only distributed in C-15 of Chiang Mai and C-16 of Tak with three-dimensional sculptures on the side of the drum body. Among them, the Tak drum is 3 elephants + 3 snails, but because it is a newly discovered bronze drum in recent years, the recorded information is not comprehensive enough, and its specific situation needs further research. C-15 drum body is decorated with 1 elephant + 2 snails.

The most abundant decoration on both sides of the drum body is the three stack squatting frogs drum. Although the number is limited, each drum has their different vertical decorations. For example, C-5 and C-6 drums have decorations on the joint seam and both sides. One side is 3 elephants+3 snails+1 tree, and the other side is 2 goldfishes. The standing frogs, the standing decorations on the drum body and the decorations on the tympanum and the drum body are all almost the same, and they should be cast at the same time. C8 is 3 elephants+3 snails+1 tree, C-11 is 3 elephants+2 snails+1 tree, C4 is 3 elephants+3 snails, C12 is 3 elephants+2 snails, C9 is 3 elephants+3 snails+1 animal, C-14 is missing under the bulging chest, so it is impossible to judge the status of the standing decoration.



Remark: BH = Body high-relief motifs.

Figure 95. High-relief motifs on H_{III}-TC drum body.

H_{III}-TC BH1.1, C-5 and C-6. 3 elephants+3 snails+1 tree, 2 carps.

H_{III}-TC BH1.2, C-12. 1 flower trees+3 elephants+3 snails.

H_{III}-TC BH1.3, C-7. 3 elephants+3 snails+1 tree.

H_{III}-TC BH1.4, C-8. 3 elephants+3 snails+1 tree.

H_{III}-TC BH1.5, C-11. 3 elephants+2 snails+1 tree.

H_{III}-TC BH1.6, C-4. 3 elephants+3 snails.

Source: Jinxi Liu, Nakhon Phanom, 2023. The Bronze Kettle Drums in Thailand, p.259, 223. Jinxi Liu, National Museum Bangkok, 2023. The Bronze Kettle Drums in Thailand, p.253. Jinxi Liu, Nakhon Phanom, 2023.

2.3.4 Casting technique and musical instrument performance of H_{III}-TC drum.

At present, there is only one Department of Mineral Resources testing data on the H_{III} drum alloy, that is, the C-1 unearthed in Nan province. The alloy ratio of the drum body is as follows: copper 60.04%, lead 20.78%, tin 5.83%.

This drum is a typical high-lead and low-tin bronze drum, with high lead content and good smoothness on the tympanum, but its sound is dull and unsuitable for musical performance. It can be seen that emphasis on pattern decoration, despite sound quality requirements are the common features that are ubiquitous.

Judging from the smoothness of the drum body and the line of the drum body, the H_{III} type two high-relief stack squatting frogs and three high-relief frogs stack squatting drums found in Thailand are basically cast by the lost-wax method, the center light body of the tympanum is used as the casting port which is called the central top-injection casting method to cast. The mix casting technique is to make the drum lugs mold separately, combine it with the drum body mold, and cast it at one time. The lug is decorated with flowers. In this way, the traces of supplementary processing are covered. The protruding mold casting line on both sides of the drum body should also be a decorative pattern, which can be seen from the tree pattern on it and the decorative snails, elephants and other reliefs.

Summary of this section:

Through the comprehensive analysis of 45 H_I type drums and 16 H_{III} type drums found in Thailand, we can know that the number of bronze drums without high-relief motifs on the tympanum of early H_I drums is significantly more than that of bronze drums with vertical ornaments on the drums of the middle and late periods. Although only a dozen or so of the H_{III} type drum have been found, it has been handed down for more than a thousand years, and there are still surviving drums that continue to be used. This shows that in the era when the early H_I drums appeared, bronze drums were more popular in Thailand from north to south. It was an important gathering place for H_I drums except for southwest China and Vietnam. However, due to factors such as the historical environment, it gradually declined in the late H_I type era. Even disappear. The subsequent H_{III} drums gradually became the mainstream and have maintained their vitality to this day, which has a lot to do with their function as ritual vessels in the court.

Geographically, we found that the H_I type drums found in Northeast Thailand, East Thailand, and South Thailand have stronger similarities in characteristics, while some bronze drums in northern Thailand and central Thailand have stronger similarities, and the number of discovery of the former is significantly more than that of the latter, which has a lot to do with the fact that Northeast Thailand, East Thailand, and South Thailand are closer to Vietnam. The H_{III} drums are mainly found in northern Thailand, northeast Thailand, and central Thailand, and the drum body shape, frog shape, and tympanum decoration of the single frog drum in northeast Thailand are also significantly different from those in northern Thailand. The characteristics are more like a branch evolution of the H_I type in the middle and late stage, while the single frog H_{III} type drum in northern Thailand is a later development form with more fixed appearance characteristics. This may also be related to the use of bronze drum type features in the adjacent area and the similar living habits of ethnic groups. However, in regions that are not far apart, we can find the continuity of development between them, which is also a question worthy of investigation.

In terms of casting technology, most of the H_I drums found in Thailand are mold-casting, but there are also a few cases that have the characteristics of lost-wax casting. Moreover, in the bronze drum fragments found, it is also found that the chaff was used as an admixture to make the mold evidence is of great significance.

CHAPTER V

Compare the Organological Features Selected Bronze Drums in Thailand and Southwest China

This chapter is based on Chapter IV, and conducts a comparative study on the similarities and differences between the H_I and H_{III} type bronze drums in southwest China and Thailand. Through comparison we can understand the chronological order, style characteristics, cultural similarities and differences of the same type of bronze drums in these two countries, and then explore the transmission route of bronze drums. The topics mainly include:

1. Geographical relationship between the distribution of H_I and H_{III} type bronze drums in southwest China and Thailand.
2. Comparative study of H_I type bronze drums in southwest China and Thailand.
3. Comparative study of H_{III} type bronze drums in southwest China and Thailand.

1. Geographical relationship between the distribution of H_I and H_{III} type bronze drums in southwest China and Thailand

The H_I and H_{III} bronze drums are located in different regions in southwest China and Thailand. To clarify the relationship between the two, we need to study the geographical relationship between the locations of the two types of bronze drums, that is, to explore the propagation path of the bronze drums.

The earliest bronze drum discovered so far was a bronze drum with a smoked appearance unearthed from the Wanjiaba ancient tombs in Yunnan in the 1970s. The Chinese Ancient Bronze Drum Research Association used this as a standard instrument and named it the Wanjiaba type bronze drum, foreign scholars called it the pre-H_I type bronze drum. In addition to a bronze drum found in Tomb No. M1:1 of Wanjiaba, a bronze cauldron modified from a bronze drum was also found. In the bronze coffin tomb of Xiangyun Dabona, there are even cases where bronze drums and bronze cauldrons coexist. Therefore, the bronze drums originated from the bronze

cauldron, which has become a general consensus among Chinese bronze drum archeology and academic circles. It also becomes an indisputable fact that Yunnan is the birthplace of the pre-H_I type bronze drum. The distribution center and dense zone of H_I type drums are from central to southwest Yunnan.

H_I-SZS drum is the development continuation of the pre-H_I type (Wanjiaba type, we represent it with Pre-H_I-WJB) bronze drum. Based on the Pre-H_I-WJB type bronze drum, H_I-SZS drum is centered in central Yunnan and extends to the southeast, southwest, south, west and spread in western and southwestern Guangxi. Southeastern Yunnan and southwestern Guangxi border with northern Vietnam. The ethnic groups living there are closely related. Inland water systems are crisscrossed. The sea transportation from southern Guangxi to Vietnam is also very convenient, which creates rich soil for the spread of bronze drum by land and sea. The H_I type bronze drum discovered in Thailand is mainly distributed in northeast Thailand, east Thailand, central Thailand and southern Thailand, and is more similar to the bronze drums found in Henan, Thanh Hoa, Nghe An, Hung Yen, Hanoi and other provinces in Vietnam from the perspective of the shape and decoration of the drum body. From the perspective of geographical location, Vietnam's three provinces of Henan, Thanh Hoa and Nghe An are connected by water systems. Ancient ethnic groups can reach the Mekong River directly from Nghe An Province to Nakhon Phanom, Mudahan, Ubon Ratchathani and other provinces in northeastern Thailand along the Mekong River. The Mae Nam Mun River in Ubon Ratchathani is connected to the Mekong River and the water systems in central Thailand, northern Thailand, and eastern Thailand. The bronze drums can spread to Thailand along the tributaries of these river systems from Vietnam. The bronze drums and drum shell storage vessels found in Xilin, Guangxi, and Lijiashan, Yunnan are also very similar to the bronze drums in these provinces in Vietnam. It shows that the use of H_I-SZS and H_I-TA drums in southwest China and Thailand has certain ethnic origins. Relying on water and sea routes, the cultures of the two places have a certain connection (we will introduce this in further detail in the later comparison).

Although Thailand and southwestern China are not connected, there is also an important waterway connecting northeast and northern Thailand and southwestern Yunnan. The Mekong River (called Lancang River in China) originates from Tibet,

China, and passes through western and southwestern Yunnan and Laos to northern and northeastern Thailand. H_{III} type bronze drums are mainly distributed in areas inhabited by the Wa and Dai ethnic groups such as Ximeng, Lancang, Cangyuan and Xishuangbanna in southwest Yunnan, just near the Lancang River basin, and belong to the same ethnic group as the Tai ethnic group in Thailand. According to the investigation, the H_{III} type bronze drum with elephants high-relief motifs on the drum body found in Yunnan maybe come from Thailand (Danfang Wei, 2008). In the Tang Dynasty, the Pyu State national music entered the Tang Dynasty, and the bronze drum was among the donations. It is more likely that the Pyu envoys entered the Tang Dynasty via the Mekong River (Chapter 6 will have relevant introduction). This can also provide evidence for the spread of H_{III} bronze drums between southwest China and Thailand via waterways.



Figure 96. Geography map of Thailand and Southwest China.

Source: <http://m.onegreen.net/maps/html/23811.html>

Through the above analysis, we can speculate on three main transmission paths of bronze drums: the first one maybe that the H_{III} bronze drums in China, Myanmar and Laos spread to northern Thailand via the Mekong River, the second one maybe that the H_I bronze drum spreads to Vietnam then from Henan, Thanh Hoa, Nghe An and other provinces in Vietnam via the Mekong River to northeastern Thailand, the third maybe that the H_I type bronze drums directly spread to southern Thailand via sea route from Vietnam. All these, provide evidence for research on the spread of bronze drums in Thailand.

2. Comparative study of H_I type bronze drums in southwest China and Thailand

the researcher has currently collected a total of 45 H_I type bronze drums in Thailand, including 35 H_I-TA drums and 10 H_I-TB drums. There are 209 H_I type drums in Southwest China, including 70 H_I-SZS drums and 139 H_I-LSC drums. the researcher will use the 43 H_I-SZS type and the 37 H_I-LSC type listed in the first section of Chapter 4 as comparison objects to conduct comparative research with the H_I type drum discovered in Thailand. This paper makes a comparative analysis of the bronze drums of these two countries based on the size data of the bronze drum, the light body of the drum tympanum, the main halo pattern of the drum tympanum, the main halo patterns of the drum chest, drum waist and drum foot, as well as the alloy content and casting techniques of the bronze drums. According all these we can try to explore the developmental sequence and transmission routes between the H_I type drums of the two countries.

2.1 H_I-SZS vs H_I-TA

H_I-SZS vs H_I-TA all belong to H_I type drum without vertical decoration on the drum tympanum.

2.1.1 Comparison of appearance and related data.

There are 13 H_I-TA drums and bronze drums with a relatively complete height and 25 drums with a relatively complete size. But one of the drums has a head and a height of less than 20 cm. It seems to be a burial object drum, so it was not included. A relatively complete sized bronze drum with 40 in China.

Table 4. Comparison table of drum tympanum and drum height dimensions between H_I-TA bronze drums and H_I-SZS bronze drums.

Measured Data	H _I - SZS		H _I -TA	
	T-D	H	T-D	H
20~29cm	8	21	-	-
30~39cm	14	12	-	1
40~49cm	13	3	5	4
50~59cm	3	4	6	6
60~69cm	3	-	8	1
70~80cm	2	-	5	-
A-S	41.26	30.36	59.64	49.3
H&T.R	0.77		0.77	

Mark: A-S = Average size. T-D = Tympanum Diameter. H=Height. H&T.R=Height to Tympanum Diameter Ratio.

Tabulator: Jinxi Liu, 2023.

As can be seen from the table 4, the measured data of those two countries is different. Most H_I-SZS bronze drums have a tympanum diameter of 30-50 cm and a drum height of 20-40 cm. Most H_I-TA drums have a tympanum diameter of 50-70 cm. The height is mostly 40-60 cm. Regardless of the average drum tympanum or drum height, the H_I-SZS type is much smaller than the H_I-TA bronze drum. Most of the drum tympanums of the Pre-H_I-WJB drums are between 30 and 50 centimeters. The average diameter of the eight Pre-H_I drums unearthed in Vietnam is 38.94cm, the tympanum diameter is mostly between 30-50cm, the average drum height is 32.42cm, and the drum height dimensions are mostly between 20-40cm, which is roughly the same size as the Pre-H_I-WJB in southwest China. It can be seen that the size of the H_I-SZS type bronze drum is the continuation of the Pre-H_I type bronze drum, while the H_I-TA type bronze drum in Thailand is a medium and large bronze drum, and its size is roughly similar to that of the H_I-TB drum. Therefore, its age should be later than H_I-SZS type bronze drum from southwestern China.

There are roughly four types of Hi-SZS bronze drums, as shown below. Among them, Total No. 08329 (Tu 1611) was unearthed in Guigang, with a tympanum diameter of 42.5 and a height of 24.5. The foot are outward-spreading, the foot diameter is larger than the tympanum diameter, and the body is flat and short. This type of drum is also very rare in China, and similar bronze drums have not yet been found in Thailand. Total No.19785 (Tu No.10992) was unearthed from the Han Dynasty Tomb in Luobowan, Guangxi, with a tympanum diameter of 28.8 and a height of 24.4. This type of bronze drum is relatively common in China. The drum waist section is tapered, and the larger drum tympanum diameter reaches 78.2 centimeters (such as Total No. 06998, also known as Xilin Drum No. 280). Currently, there are no similar examples among the same type of bronze drums in Thailand.

But judging from the appearance, the last two bronze drums seem to be related to the Hi-TA drums in Thailand, especially Xilin No. 07001 drum (also known as Xilin No. 283). Xilin No.283 drum was unearthed from the Xilin Bronze Drum Tomb in Guangxi, with a diameter of 52cm, the height is 40.2cm, the ratio of height to tympanum diameter is 0.77, the waist is cylindrical, the foot is high and outward-spreading. The appearance of this drum is very similar to the A-1, A-2 collected in the Thailand National Museum and the A-17 in the Chumphon National Museum, except that the shapes of these drums in Thailand are larger than the Xilin No. 283 drum. For example, A-1 has a tympanum diameter of 69.5, a height of 53.5, and a height-to-tympanum diameter ratio of 0.77. It is almost the enlarged version of the Xilin No. 283 drum. A-2 (No. KP.4), has a tympanum diameter of 61.5, a height of 42, and a height-to-tympanum diameter ratio of 0.68. The shape is slightly flatter than the Xilin No. 283 drum, but it can be seen that it belongs to the same type of drum. Lijiashan M68:285, unearthed in Lijiashan, Yunnan, has a tympanum diameter of 25.5cm and a height of 21cm. It is relatively small in shape, with a convex chest. Although the waist is tapered, the waist and foot are relatively high. The chest part of the drum is very similar to the A-13 drum in the Ubon Ratchathani National Museum in Thailand, but the A-13 drum is missing its foot, so we cannot get a full picture of it for a more detailed comparison. In addition, the corded bridge-shaped flat lugs of Xilin No. 283 Bronze Drum are similar to the Hi-TA drums of Thailand. For example, A-2 and A-15

are both corded, distributed in groups of two on the joint chest and waist. That should all be developed from braided and flat lugs.



Figure 97. Four kinds of Hl-SZS bronze drum in southwest China.

Source: Bronze Drums in Guangxi, p.57, 60, 63. Jinxi Liu, 2023.



Figure 98. The Hl-TA bronze drum in Thailand similar to Xilin 0283 in southwest

China.

Source: Jinxi Liu, 2023.

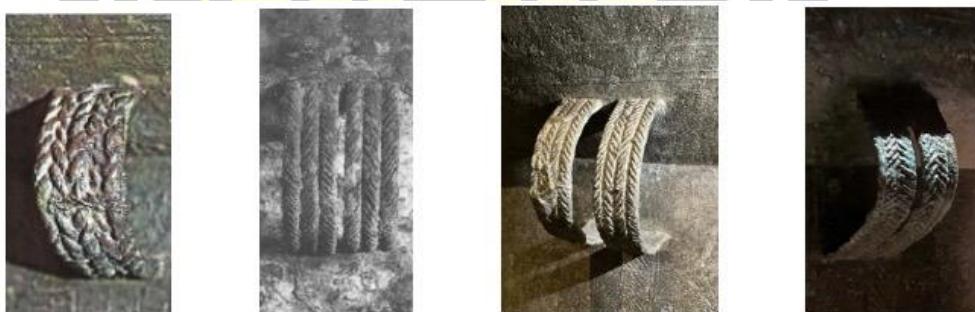


Figure 99. Hl-SZS lugs vs Hl-TA lugs.

Source: Bronze Drums in Guangxi, 2018; Catalog of Bronze Drums in Guangxi, 1991;

Jinxi Liu, 2023.

In addition, we also discovered an interesting phenomenon, that is, the shapes of the shell storage vessels unearthed from the Lijiashan ancient tombs in Yunnan are mostly similar to the H_I-TA drums in Thailand. For example, the shell storage vessel M51:262 unearthed from Tomb No. 51 in Lijiashan has a 12-ray light body in the center of the drum tympanum, four pairs of flat lugs with rope patterns, and a slender zigzag band on the chest and waist. This kind of decoration is the The zigzag triangle pattern is elongated. This pattern was further developed and simplified to become the comb pattern, which is the main geometric decorative pattern on the H_I-TA and H_I-TB bronze drums in Thailand. The copper sacrificial scene shell storage vessel unearthed from Tomb No. 69 in Lijiashan is very similar to the H_I-TA drum in both the shape of the drum body and the lugs, the difference is also that the decorative pattern is a zigzag pattern (we will compare the patterns later and discuss in detail).



Figure 100. Shell storage vessel unearthed from Lijiashan, Yunnan.

Source: Minrui, Yunnan Provincial Institute of Cultural Relics and Archeology, 2022.

In summary, we can infer that the bronze drums and shell holders unearthed in Lijiashan, Yunnan, China, and Xilin, Guangxi, may have the same origin as the H_I-TA drums in Thailand. Judging from the pattern evolution rules, the bronze drums and shell storage vessels unearthed in Lijiashan and Xilin No. 283 drum are earlier than the H_I-TA drums. From a geographical perspective, Xilin is located in the

southwest of Guangxi, bordering Yunnan. Lijiashan and Xilin are about 400 kilometers apart. They are both clustered along the Nanpan River, an ancient waterway in ancient times. The Lijiashan Tomb dates from around the Warring States Period. The period from the end of the Western Han Dynasty to the middle of the Western Han Dynasty (Zengqi Zhang, *Excavation Report of the Lijiashan Ancient Tombs Group in Jiangchuan, Yunnan*, 1975) was the period of the rule of the Dian Kingdom. The Xilin Tomb and the Lijiashan Tomb are roughly similar in age. They were also in the early Western Han Dynasty and were within the scope of activities of the Gouding Kingdom. Beginning with the Qin Dynasty, Qin Shihuang sent a large army to unify Lingnan. In the second year of Yuanfeng, Emperor Wu of the Western Han Dynasty, *The King of Dian... the whole country surrendered... Only Yelang and Dian were granted the royal seal.* The war forced some ethnic groups living here to go south. This migration also prompted the bronze drums to spread further south, which should also be a path for the H_I type drums to spread to Thailand.

2.1.2 Comparison of the bronze drum's decoration

All the decorative elements of the bronze drums in Thailand and southwest China, such as: the light-body, the flying-heron pattern, the feathered-figure pattern, the rowing boat pattern, the comb line, the concentric-circle pattern, the Zhui-shaped pattern, etc.. So, this is the biggest similarities of the bronze drums in those two countries. In the comparison below, we will not mention again.

(1)Tympanum light body

Judging from the shape of the light body, the H_I-SZS light body has various shapes, but it is similar to the H_I-TA. It is basically an angular light body. The difference lies in the number of awns and the pattern between the awns.

Table 5. Comparison table between H_I-TA and H_I-SZS drum tympanum light body.

Comparative Item	H _I - SZS	H _I - TA
awns of light body	8,9,10,12,13,14,16,21,8,10 are the most.	10,12,14,16,32. 12 and 14 are the most.
Decoration between awns	①Diagonal pattern+multi-line angular pattern. ②Feather pattern+angular pattern	Angular pattern, most of them are Zhui-shaped pattern.

	and circle pattern with center dot. ③Feather pattern and circle pattern with center dot+Zhui-shaped pattern.	
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Tabulator: Jinxi Liu, 2023.

From the table 5, the number of rays of the H_I-SZS type bronze drum in southwest China is relatively unstable, while the number of rays of the H_I-TA type bronze drum in Thailand is relatively fixed, and the number of fixed awns is more than that of the same type of bronze drum in China. The decoration between the awns is also relatively fixed, and is mainly the pendant pattern that has developed to the final stage.

(2)Comparison of main decorations and other geometric pattern combinations.

Whether it is H_I-TA type drum in Thailand or H_I-SZS type drum in southwest China, the decoration of the drum tympanum and drum body has a certain regularity.

Table 6. Comparison of main decorations and other geometric pattern combinations between H_I-TA in Thailand and H_I-SZS in southwest China.

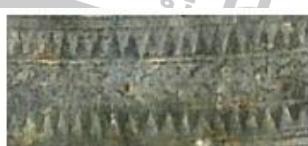
Comparative Item	H _I - SZS	H _I - TA
Tympanum main decoration +combination decoration	①Flying heron pattern+tangent circle pattern+zigzag pattern. ②Flying heron pattern+hooked curling cloud pattern+zigzag pattern+tangent circle pattern. ③Flying heron pattern+dot pattern+zigzag pattern+thunder pattern. ④Flying heron pattern+thunder pattern+comb pattern+tangent circle pattern. ⑤Flying heron pattern+feather	①Fish pattern+comb line pattern+tangent circle pattern. ②Flying heron pattern+feathered figure pattern+comb line pattern+circle pattern with center dot. ③Flying heron pattern+comb line pattern+tangent circle pattern. ④Flying heron pattern+feathered figure pattern+hooked thunder

	pattern + mat pattern.	pattern+tangent circle pattern between comb line pattern (or tangent concentric circle pattern).
Chest main decoration +combination decoration	<p>①Feathered-figure pattern rowing boat+zigzag pattern, dot pattern.</p> <p>②Cattle pattern+lone zigzag pattern, dot pattern+tangent circle pattern.</p> <p>③Zigzag pattern+dot pattern or tangent circle pattern or thunder pattern.</p>	<p>①Trans-formed feathered figure rowing boat pattern+comb line, tangent circle pattern, hooked thunder pattern.</p> <p>②Feather pattern, tangent circle pattern between comb line pattern.</p> <p>③Tangent circle pattern between diagonal pattern.</p>
Waist main halo decoration +combination decoration	<p>①Feathered figure dancing pattern in grids+concentric circle pattern between comb line pattern.</p> <p>②Feathered figure dancing pattern in grids, deer pattern+comb line pattern+diagonal pattern+tangent circle pattern.</p> <p>③Feathered figure dancing pattern in grids+flying heron pattern+zigzag pattern+dot pattern+tangent circle pattern.</p> <p>④Zigzag patterns+plain in grids, etc..</p>	<p>①Trans-formed feathered figure rowing boat pattern+tangent circle pattern (or comb line pattern), tangent circle pattern, thunder pattern.</p> <p>②Feather pattern, tangent circle pattern between comb line pattern.</p> <p>③Tangent circle with center dot pattern between comb line pattern.</p>

Tabulator: Jinxi Liu, 2023.

Through comprehensive combing, we found that the main halo of the H_I-SZS bronze drum tympanum in southwest China is dominated by the flying heron pattern, and other geometric patterns are mainly zigzag patterns, dot patterns, and tangent circle patterns. In the later period, the zigzag pattern was replaced by the comb pattern, among which the zigzag pattern, dot pattern is a relatively primitive pattern. But the main halo patterns of H_I-TA drums in Thailand are mainly flying herons and feathered figures (some have been deformed), and other geometric patterns are mainly comb patterns, hooked thunder patterns, and tangent circle patterns. This also proves that H_I-TA should be later than H_I-SZS type bronze drum, and it is a mid-to-late period of H_I without vertical decoration. For example, among the four-sided bronze drums unearthed from the Xilin Bronze Drum Tomb, Tu 0282 and Tu 0283 are decorated with thunder pattern+flying heron pattern+comb line pattern+tangential circle pattern with center dot, while Thailand's A-2 (KP.4), the drum is decorated with flying heron pattern+comb line pattern+tangent circle with center dot pattern.

Except for the thunder pattern, the other patterns are very similar. Although the flying heron pattern is slightly different, the herons all have crests and flying wings feather patterns are also very similar. In addition, the flying herons, comb patterns and circle patterns in Thailand's A-9, A-15 and A-18 are also very similar to drums Tu 0282 and 0283 in the Xilin Bronze Drum Tomb. It's hard not to think of instruments belonging to the same group. In the Xilin Bronze Drum Tomb, the four sides of the bronze drums not only have comb patterns, but also zigzag patterns, such as drum Tu 0280. This shows that in the early Western Han Dynasty, the zigzag patterns had been transformed into comb patterns and were in the stage of symbiosis. Therefore, although most of the H_I-SZS type drums are older than the H_I-TA type, the time span should not be too large.



Zigzag pattern



Long zigzag pattern



Comb line

Figure 101. Conversion from zigzag pattern to comb line pattern.

Source: Bronze Drums in Guangxi, p.61, 65, 57.

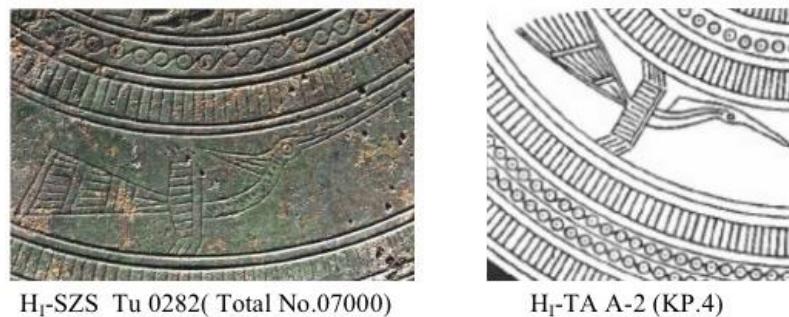


Figure 102. The tympanum decoration on H_I - Szs Xilin Tu 0282 vs H_I - TA A-2(KP.4) .

Source: Bronze Drums in Guangxi, p.62; The Bronze Kettle Drums in Thailand, p.57.

The main halo decoration of the drum chest is that the H_I-Szs type bronze drum in southwest China is mainly composed of boat patterns, zigzag patterns and dot patterns, while the H_I-TA type drums in Thailand are mainly composed of boat patterns, comb patterns and tangent circle patterns (with or without circle centers dots) are dominant, while drums with ship patterns are less common. Comparing the two types of drum's rowing boat pattern, most of the H_I-Szs drums' are more realistic, while for H_I-TA drums, only three of the bronze drums' rowing boat patterns are relatively complete. They are all trans-formed images and have typical ethnic regional characteristics.

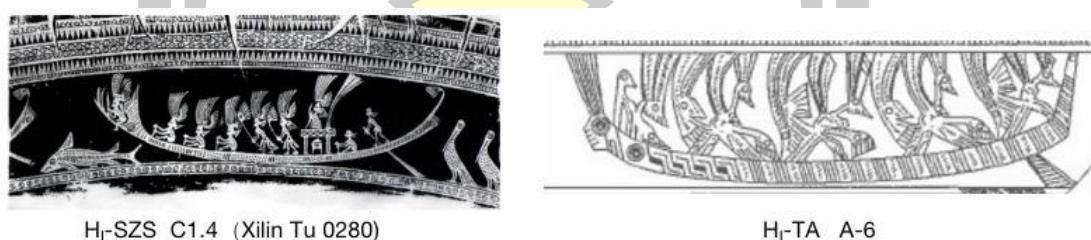


Figure 103. Rowing boat pattern on H_I-Szs vs H_I-TA.

Source: Decoration Art of Ancient Bronze drums, p.66. The Bronze Kettle Drum in Thailand, p.103.

The main halo decoration of the drum waist is that the H_I-Szs type bronze drum in southwest China is mostly divided into grids vertically by strips composed of zigzag patterns, dot patterns, concentric circles, or comb patterns (or diagonal lines), tangent circle patterns, etc.. Some bronze drum's main patterns in

grids are feathered-figure dancing pattern, cow patterns, heron patterns, flying heron patterns, etc., there are no patterns in some grids. The H_I-TA drums in Thailand are mostly divided into grids vertically with a stripe composed of comb lines (or diagonal lines) and tangent circles. The grids generally have no lines, and some have deformed feathered rowing patterns.

In general, the H_I-TA drums in Thailand have fewer halos, and the decorations on the drum tympanum and drum bodies are relatively simple. Although a small number of them have rich decorative patterns, the feathered figures and boat patterns on the drum tympanums and drum bodies are mostly distorted. But the H_I-SZS drum tympanum and drum body in southwest China have relatively rich patterns. From the drum tympanum to the drum body, the light body on the drum tympanum center - the anti-clock heron flying in the sky - the feathered-figure rowing boat on the water - the land feathered-figure dancing, deer and cattle that symbolize wealth and happiness, and some folk celebrations activities, etc., forming a dynamic three-dimensional scene of river, land and air to express the prosperity of the tribe, a large-scale event scene.

2.1.3 Comparison of casting technique (alloy content) and musical performance

The average alloy content of H_I-SZS type bronze drums in the table below is calculated based on the testing data of 18 H_I-SZS type bronze drums out of 90 bronze drums from Guangxi University for Nationalities, University of Science and Technology of China and Guangxi Museum from 1986 to 1991. The average alloy content of H_I-TA drums in Thailand is calculated based on the detection data of 5 bronze drums by the Department of Mineral Resources.

Table 7. Comparison of drum alloy content between H_I-TA in Thailand and H_I-SZS in southwest China.

Comparative Item	H _I - SZS	H _I - TA
The average content of copper, tin, lead	Copper 76.54%, Lead 8.29%, tin 10.95%	Copper 73.19%, lead 6.45%, tin 11.39%.
Alloy type and musical	High tin bronze drum,	High tin bronze drum,

performance	musical performance is good.	musical performance is good
Casting technique	Mold-casting, use gaskets to control the drum wall thickness.	Mold-casting, use gaskets to control the drum wall thickness. Some one maybe adopted the lost-wax method. An evidence of husks as admixtures to make mold.

Tabulator: Jinxi Liu, 2023.

The three alloy contents of H_I-SZS type bronze drums in southwest China are still unstable. Some drums have very low tin and lead contents, while some drums have very high lead and tin contents. Only a small number of bronze drums have alloy contents that meet the alloy specifications for making musical instruments and are suitable for use in musical instruments to play music. The alloy content of H_I-TA type bronze drums in Thailand is relatively stable. The average content of copper and tin can basically meet the musical instrument production requirements of *sixth of gold and one of tin*, and its musical performance is significantly higher than that of H_I-SZS type in southwest China. The bronze drum shows that the casting technology is relatively mature.

Summary of this section:

From the above comparison, it can be seen that the H_I-TA drum in Thailand and the H_I-SZS drum in southwest China are both different and related in appearance characteristics and decorative patterns. The bronze drums and bronze drum shell storage vessels unearthed from Xilin, Guangxi (total No.07001, also known as Tu 0283) and Lijiaoshan, Yunnan have many similarities with the H_I-TA bronze drums in Thailand, indicating that the two places have strong ethnic cultural origins and are worthy of continued exploration and research. The decorative elements (such as all have light-body, feathered-figure pattern, rowing boat pattern, flying heron pattern etc.) are roughly similar. H_I-TA drum casting technology is also significantly more mature, and its musical performance is also better. H_I-SZS type drum is the

inheritance and development of the Pre-H_I-WJB type bronze drum, which is older than the H_I-TA.

2.2 H_I-TB vs H_I-LSC

2.2.1 Comparison of appearance and related data

H_I-TB drum in Thailand has a relatively complete 10 bronze drum. H_I-LSC bronze drum in southwest China has a relatively complete drum surface size of 37 drums.

Table 8. Comparison table of drum tympanum and drum height dimensions between H_I-TB bronze drums and H_I-LSC bronze drums.

Measured Data	H _I - LSC		H _I -TB	
	T-D	H	T-D	H
Below 50 cm	1	11	-	1
50~59cm	-	13	1	3
60~69cm	8	6	4	1
70~79cm	16	-	3	-
80~90cm	11	-	2	-
A-S	74.31	51.94	70.26	54.2
H&T.R	0.60		0.74	

Remark: A-S = Average size. T-D = Tympanum Diameter. H= Height. H&T.R = Height to Tympanum Diameter Ratio.

Tabulator: Jinxi Liu, 2023.

As can be seen from the table 8, most H_I-LSC bronze drums in southwest China have a tympanum diameter of 60 to 90 cm, and most drum heights are 40 to 60 cm. Most H_I-TB bronze drums in Thailand have a tympanum diameter of 60 to 80 cm. The height of the drum is mostly 40-60 cm. The size data of these two types of bronze drums are roughly similar.

Most of the H_I-LSC type drum lugs are four cord-patterned wide flat lugs with a small rectangular hole on the top and bottom of the flat lugs. Some bronze drums also have a pair of small arched lugs with semicircular stems. The H_I-TB B-1 tympanic lugs are similar to the H_I-LSC type in southwest China, besides this, most of

them are still large flat lugs with arched braid patterns and two lugs juxtaposed into one.

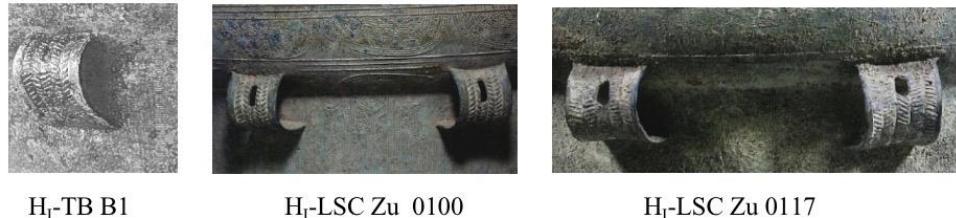


Figure 104. Lugs of H_l-TB B-1 is similar with H_l-LSC (such as Zu 0100 and Zu 0117).

Source: The bronze kettle drum in Thailand, p.35; Bronze Drums in Guangxi, p.70, 75.

In addition, judging from the shape of the waist, foot and lugs of the bronze drum, the waists of the H_l-TB type in Thailand and the H_l-LSC type in southwest China are nearly cylindrical. However, H_l-TB has a larger waist band, while H_l-LSC has a smaller waist band and a larger waist diameter. Most of H_l-TB type drums in Thailand are large outward in foot and basically have the same appearance as H_l-TA, while H_l-LSC type drums are relatively smaller outward. For example: the H_l-TB B-10, drum is somewhat similar in appearance to the H_l-LSC Han dynasty walking heron pattern bronze drum, and H_l-TB B-1((N.1/39)1/2539) is similar with the H_l-LSC (for example: Zu No.0320 Qincun bronze drum). However, the decoration of B-1 is different from that of H_l-LSC and it belongs to the intermediate development form of H_l-TB transitioning to H_l-LSC. It shows that these two types of bronze drums are also related. But whatever it is Han dynasty walking heron pattern bronze drum or Zu No.0320, they all both are the earlier type of H_l-LSC, even so, their appearance characteristics are still later than those of the H_l-TB, and it is more like a changing and developing form of H_l-TB. From this we can infer that there should be an intermediate connection zone between H_l-TB and H_l-LSC, that may be the Vietnam Dong Son type C. This requires more archaeological data to prove and analyze the connection between them.



Figure 105. H₁-TB vs H₁-LSC bronze drum's appearance.

Source: ความสัมพันธ์ทางวัฒนธรรม สมัยก่อนประวัติศาสตร์ กรณีศึกษา กล่องมหะทีก, p.77; Bronze Drums in Guangxi, p.108, 78; The bronze kettle drum in Thailand, p.37.

2.2.2 Comparison of the drum decorations

One drum has one casting-mold, so each drum has its own characteristics. But All the decorative elements of the bronze drums in Thailand and southwest China are similarities, such as: the light-body, the trans-formed flying-heron pattern, transformed feathered-figure pattern, trans-formed rowing boat pattern, the comb line, the concentric-circle pattern, the Zhui-shaped pattern, etc.. In the comparison below, we will not mention again.

(1) Comparison of drum tympanum light body

From the perspective of the shape of the light body, the shape of the H₁-LSC light body is gradually becoming stable. It is roughly similar to the H₁-TB, both of which have relatively uniform radioactive angular awns. The difference lies in the number of awns and the decoration between the awns.

Table 9. Comparison table between H₁-TB and H₁-LSC drum tympanum light body

Comparative Item	H ₁ - LSC	H ₁ -TB
Awns of the light body	10,12. 12 awns are the most.	10, 12, 14, 16. 12 awns are the most, followed by 14 awns.
Decoration between awns	Mainly Zhui-shaped pattern.	Angular pattern, Zhui-shaped pattern. Feather pattern + Zhui-shaped pattern.

Tabulator: Jinxi Liu, 2023.

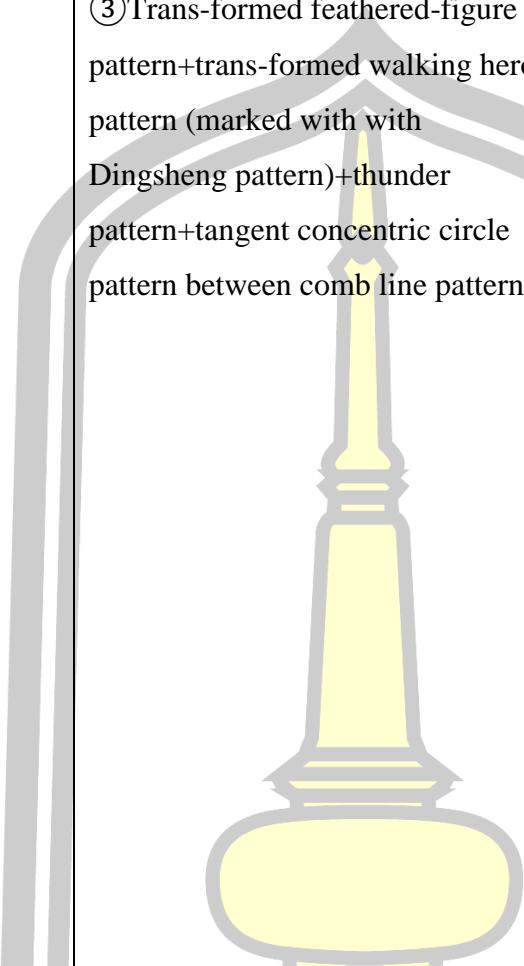
Judging from the table 9, the number of rays on the H_I -LSC bronze drum in southwest China has been basically fixed, and the decoration between the awns is mainly Zhui-shaped pattern. The number of awns of H_I -TB in Thailand is variable, and the pattern between the awns is similar to that of H_I -TA, but it also tends to develop to 12 awns. It can be seen that H_I -TB and H_I -TA in Thailand are in a cross-development stage. H_I -LSC type in southwest China is in the finalization stage of development. There are two development paths for different branches.

(2) Comparison of drum tympanum, drum body main halo patterns and other pattern combinations.

Whether it is a H_I -TB type drum Thailand or a H_I -LSC type drum in southwestern China, the decoration of the drum tympanum and drum body has gradually become stable and has a certain regularity.

Table 10. Comparison of drum tympanum and body main decorations between H_I -TB in Thailand and H_I -LSC in southwest China.

Comparative Item	H_I - LSC	H_I - TB
Tympanum main halo decoration+combination decoration.	<p>① Trans-formed feathered-figure pattern+trans-formed flying heron pattern (some are marked with Dingsheng pattern)+multi-line cross angle pattern+eye pattern+feather pattern+concentric circle between comb line pattern (or+water ripples pattern).</p> <p>② Trans-formed feathered-figure pattern+trans-formed flying heron pattern (mostly are marked with Dingsheng pattern)+multi-line cross angle pattern+concentric circle with dot pattern between comb line pattern.</p>	<p>① Trans-formed feathered-figure pattern+trans-formed flying heron pattern (some are marked with Dingsheng pattern)+concentric circle with dot pattern between comb line pattern.</p> <p>② Trans-formed feathered-figure pattern+concentric circle pattern between comb line pattern.</p>

	<p>pattern.</p> <p>③Trans-formed feathered-figure pattern+trans-formed walking heron pattern (marked with with Dingsheng pattern)+thunder pattern+tangent concentric circle pattern between comb line pattern.</p> 	<p>③Trans-formed feathered-figure pattern+trans-formed walking heron pattern (marked with Dingsheng pattern)+thunder pattern+comb line, feather pattern, tangent concentric circle pattern.</p> <p>④Trans-formed feathered-figure pattern trans-formed flying heron pattern (marked with Dingsheng pattern) + multi-angle pattern + concentric circle pattern between comb line pattern.</p> <p>⑤Flying heron pattern +hooked thunder pattern concentric circle pattern between comb line pattern.</p>
Chest main halo decoration+ combination decoration.	<p>①Ripple pattern+concentric circle with dot pattern between comb line pattern +up-down ship pattern.</p> <p>②Concentric circle pattern between comb line pattern+mat pattern+transformed boat pattern. Concentric circle pattern between comb line pattern.</p>	<p>①Trans-formed boat pattern+thunder pattern.</p> <p>②Concentric circle (or circle with dot) pattern between comb line pattern.</p> <p>③Horizontal pattern composed by concentric circle (or circle with dot) pattern between comb line pattern.</p>

Waist main halo decoration+ combination decoration.	<p>① Trans-formed feathered-figure pattern+feather pattern+concentric circle pattern between comb line pattern+ripple pattern.</p> <p>② Trans-formed feathered-figure pattern+feather pattern+concentric circle pattern between comb line pattern+fine checkered pattern.</p> <p>③ Grids were divided by the vertical stripes composed by tangent (or no tangent) concentric circle pattern between comb line pattern, grids are plain. Under the grids are the same horizontal stripes.</p>	<p>① Trans-formed feathered-figure pattern+diagonal pattern, vertical thunder pattern+horizontal pattern composed by concentric circle pattern between comb line pattern.</p> <p>② Strips composed by tangent concentric circle pattern between diagonal (or comb line) pattern.</p>
Tympanum main halo decoration + combination decoration.	<p>① Fine checkered pattern+feather pattern (or water ripple pattern)+ circle center hanging leaf pattern + eye pattern.</p> <p>② Feather pattern+fine checkered pattern+circle center hanging leaf pattern (some add water ripple pattern).</p> <p>③ water ripple pattern (or fine checkered pattern)+circle center hanging leaf pattern.</p>	No decoration

Tabulator: Jinxi Liu, 2023.

It can be seen from the table 10 that the main halo patterns on H_I-TB and H_I-LSC drums tympanum are mostly trans-formed feathered-figure patterns and trans-formed flying heron patterns, but the pattern details are different. The trans-formed feathered-figure of H_I-TB type drums are more diverse, while the trans-formed feathered-figure of H_I-LSC type bronze drums have mostly shown a fixed pattern, that

is, the feathered-figure is replaced by an elongated feather headdress and a circle pattern with a center dot. The heron patterns are mostly in the shape of fish bones. Only a few bronze drums and herons found in the Eastern Han Dynasty still have realistic appearance. For example, Guiping Licun drum (total No. 000451) and Yizhou Han walking heron pattern small bronze drum. Among them, the drum tympanum of Guiping Licun Drum has trans-formed feathered-figure pattern, walking heron pattern, and Dingsheng pattern very similar to B-3 found in Tak Province, Thailand. The walking heron pattern on the Yizhou Han small bronze drum with walking heron pattern is also similar to the B-3 drum. It should belong to the same period and has a certain origin of transmission.

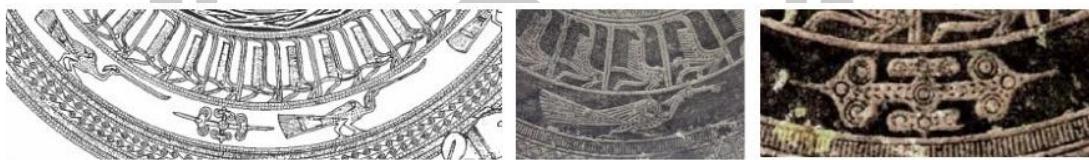


Figure 106. The walking heron, Dingsheng and transformed-figure Pattern on H_I-TB B-3 vs H_I-LSC (Guiping Licun bronze drum).

Source: The bronze kettle drum in Thailand, p.71; Bronze Drums in Guangxi, p.106.

In addition, judging from the H_I-LSC drum tympanum patterns in the above table, the pattern combinations can be roughly divided into three categories. The difference between the first two categories is the pattern belt composed of Dingsheng pattern, eye pattern, comb pattern and tangent circle pattern. Generally, those with comb lines and tangent circle lines do not have eye lines. The Dingsheng pattern generally appears in a type of bronze drum with tangent circle patterns on the drum surface (such as Guigang Changling Bronze Drum, Guangxi Bronze Drum Essence, p. 95). The emergence of Dingsheng pattern should be closely related to the emergence and spread of Taoism from the Western Han Dynasty to the Eastern Han Dynasty in China. Most of the H_I-TB drum tympanum in Thailand have Dingsheng patterns. Its era overlaps with that of Chinese H_I-LSC bronze drums. And the comb pattern sandwiched between tangential circle patterns (or circle patterns) of the H_I-TB type drum tympanum is basically the same as the H_I-LSC type.

Judging from the main halo patterns of the drum body, drum waist and drum foot. H_I -LSC drums still continue the tradition of H_I -SZS bronze drums decorated with boat patterns on the chest and feathered-figure patterns on the drum waist. At the same time, they also enrich the drum foot decoration, while H_I -TB drums also continue the characteristics of H_I -TA drums. Drums with H_I -LSC still belong to two propagation paths, but there is a small amount of intersection. This shows that the ethnic groups using this type of bronze drum are more stable.

2.2.3 Comparison of drum high-relief motifs between H_I -TB in Thailand and H_I -LSC in southwest China.

The biggest difference between H_I -LSC and H_I -TB bronze drums is the high-relief motif on the drum tympanum. The H_I -LSC type bronze drum has the most abundant tympanum decorations among all types of bronze drums. In addition to the counterclockwise high-relief frog, it is also decorated with characters, animals, plants, insects and objects related to human life, such as barns, bullock carts, etc.. It expresses people's wishes for a prosperous and stable social life. There are generally four high-relief frogs. From the original variety, they gradually evolved into a shape with large and round buttocks, a strong frog body, a pointed snout that bends forward and down, and grain spike patterns on the front and rear legs and waist. The image of the standing frog of H_I -TB in Thailand is similar to that of H_I -LSC in southwest China, but there are also differences. The H_I -TB type drum has four high-relief frogs or snails on the drum tympanum, but there are no other high-relief decorations. Moreover, the images of high-relief frogs are quite diverse. Some have their hind legs curled up, and some stand with their hind feet side by side. Among them, B-7 (Figure 78. H_I -TB TH2.3) and B-8 (Figure 78. H_I -TB TH2.4) are related to Binyang's clan 0324, Wuming's Fenglin village drum, Nanning Mashanxiakang drum, etc., B-7 is highly similar to the squatting frog of Yuncong No. 1 (total 0205) in Shanglin County. Moreover, the H_I -TB drum frog discovered in Thailand has round and convex eyes and a pointed snout that is forward and upward, which is very similar to the early frog ornaments of H_I -LSC.

2.2.4 Comparison of casting technique (alloy content) and musical performance

The average alloy content of H_I-LSC type bronze drums in the table below is calculated based on the testing data of 29 H_I-LSC type bronze drums out of 90 bronze drums from Guangxi Minzu University, University of Science and Technology of China and Guangxi Museum from 1986 to 1991. The average alloy content of H_I-TB drums in Thailand is calculated based on the detection data of three-sided bronze drums by the Department of Mineral Resources.

Table 11. Comparison of drum alloy content between H_I-TB in Thailand and H_I-LSC in southwest China.

Comparative Item	H _I - LSC	H _I - TB
The average content of copper, tin, lead	Copper 71.43%, tin 10.8%, lead 11.98%.	Copper 69.74%, lead 7.60%, tin 14.48%.
Alloy type and musical performance	Most of them contain higher lead content than tin and are high-lead lead-tin bronze drums with good musical performance.	High tin bronze drum, musical performance is good.
Casting technique	Mold-casting+lost-wax method for high-relief motifs.	Mold-casting+lost-wax method for high-relief motifs.

Tabulator: Jinxi Liu, 2023.

Judging from the testing data, the lead content of H_I-LSC type in southwest China is relatively high in the early and middle stages, while the tin content of some bronze drums increases in the middle and late stages. Generally speaking, its copper and tin alloy content is more in line with the alloy ratio of musical instruments requirements than H_I-SZS. But it is still a lead-tin bronze drum with a high lead content. It is suitable for musical performance, but the sound is dull and low. H_I-TB bronze drums have a relatively stable alloy content and a high tin content. They are high-tin bronze drums. High tin can easily darken high frequencies, mix low frequencies, cause the sound to diverge, and the overall sound effect is relatively fuzzy. But its musical performance is better.

From the above comparison, it can be seen that the H_I-TB drums in Thailand and the H_I-LSC drums in southwest China are quite different in appearance, drum tympanum, drum body decorative patterns, and vertical decorations. However,

some early H_I -LSC drums are different from the H_I -LSC drums. H_I -TB type drums have many similarities in body shape, drum tympanum pattern, and vertical decoration, and there are traces of cross-transmission. Their casting technology is inherited from H_I -TA, and their musical performance is also better. Generally speaking, the H_I -TB type drum seems to be earlier than the H_I -LSC type drum, and is in the cross development stage of the early and late H_I types. But with the H_I -LSC type there are still two propagation routes. This has a lot to do with the beauty and customs of the ethnic group.

Summary of this section:

To sum up, the H_I -SZS type bronze drum discovered in southwest China and the H_I -TA drum in Thailand are both similar and different. Among them, the bronze drum and shell storage vessels unearthed in Lijiashan and Xilin have a certain connection with the H_I -TA drum Thailand in terms of shape and decoration. However, most H_I -SZS type bronze drums and H_I -TA drums have their own characteristics in the shape and decoration of the bronze drums. The decorative geometric patterns of H_I -SZS are mainly zigzag patterns and dot patterns that appeared earlier. H_I -TA is dominated by comb lines that appear later. The main halo patterns on the drum tympanum and drum body are mostly flying herons, feathered-figures, and boat patterns, but the styles of these patterns are different. Bronze drums at that time were ritual and important vessels that represented the rights and status of rulers. This not only shows that the regions where the same type of bronze drums and similar patterns appear, their political environment, national beliefs, living customs, and living environment belong to a common cultural circle. The number of H_I -type drums unearthed in southwest China and Thailand is relatively large, indicating that they are the center of this cultural circle or a key area close to the center. The different patterns and styles reflect the different folk customs and aesthetic tastes in different regions. Under the commonality, they also show their respective regional characteristics. At the same time, it also shows that the bronze drums of the two places with large differences in details should have an intermediate communication zone.

From the comparison between H_I -LSC type and H_I -TB type, it can be seen that although the number of H_I -TB type is small, the drum body shape, drum tympanum

pattern and vertical decoration are in a state of change. The early appearance of H_I -LSC type is similar to that of H_I -TB type. The H_I -TB type subsequently declined, while the H_I -LSC type showed a trend of peak prosperity, blooming unique and gorgeous flowers on both sides of the Yongjiang-Yujiang-Xunjiang-Xijiang River in Guangxi. The high-relief motifs of the drum tympanum and the altered patterns on the drum tympanum and drum body fully reflect the intelligent creativity of the ethnic groups in the region where the drum was used. The prominent decorative features also make it difficult for future generations to see the power of the original ruling ethnic group reflected in the H_I -SZS type on the drum tympanum. It illustrates the changes in the political structure at that time and the transfer of the function of the bronze drum, and changes in people's ideological and economic lives.

3. Comparative Study of H_{III} Type Bronze Drum in southwest China and Thailand

For the comparison of the H_{III} type, the researcher will use the 17 H_{III} bronze drums collected so far from Thailand and the 20 H_{III} -XM type bronze drums in southwest Chinese listed in Chapter 4 as the comparison object. Based on the size data of the bronze drum, the drum Comparative contents include the tympanum light body, the main halo patterns on the drum tympanum, the main halo patterns on the drum chest, drum waist, and drum foot, as well as the alloy content and casting process of the bronze drums. A comparative analysis of the bronze drums of the two countries is made.

3.1 Comparison of appearance and related data

From the appearance point of view, the drum tympanum of H_{III} -XM and H_{III} -TC bronze drums are wider than the drum body and have an protruding lip. the researcher has measured four bronze drums from the National Museum of Thailand and Nakhon Phanom Wat Phra That Phanom Museum. The edge of the drum tympanum protruding from the drum chest is 2.5cm. The comparison of drum tympanum and drum height dimensions between H_{III} -XM and H_{III} -TC bronze drums is as follows:

Table 12. Comparison table of drum tympanum and drum height dimensions between H_{III}-XM bronze drums and H_{III}-TC bronze drums.

Measured Data	H _{III} - XM		H _{III} - TC	
	T-D	H	T-D	H
20~30cm	-	-	3	1
30~40cm	2	3	1	3
40~50cm	6	10	4	9
50~60cm	7	5	8	1
60~70cm	5	1	1	-
70~80cm	-		-	-
A-S	53.02	57.79	37.56	43
H&T.R	0.72		0.73	

Remark: A-S = Average size. T-D = Tympanum Diameter. H= Height. H&T.R = Height to Tympanum Diameter Ratio.

Tabulator: Jinxi Liu, 2023.

As can be seen from the above table 12, the tympanum diameter of H_{III}-XM bronze drums in southwest China is mostly 40-70 cm, and the drum height is mostly 30-50cm. The tympanum diameter of Thai H_{III}-TC drums is mostly 50-70 cm. The height of the drum is mostly 30-50 cm. Judging from the above data, the H_{III}-TC drum is larger than the H_{III}-XM.

Through the analysis of the appearance characteristics of H_{III}-type bronze drums in southwest China and Thailand in Chapter 4, we can understand that single-frog drums in southwest China can be divided into 2 categories, while single-frog drums in Thailand can be roughly divided into 3 categories. Through comparison, we can see that the drum No. 0031 unearthed in Longzhou, Guangxi is very similar in appearance to the C-2 from Thailand. The drum lugs and their patterns are also the same. Except for these two drums, H_{III}-TC, C-10 and Guangxi Liuzhou Eastern Han Dynasty standing frog drum (Hg00038), other single frog drums and double frogs and triple frogs squatting drums are generally similar or identical in shape.



Figure 107. Early similar appearance examples of H_{III}-TC and H_{III}-XM.

Source: Jinxi Liu, 2023. The Bronze Kettle Drum in Thailand, p.137. Bronze Drums in Guangxi, p.230, 233.

The stack-squatting frog on the drum tympanum and the shape of the drum body of the H_{III} type drum are very similar to the evolution of the H_{II}-LS type, but it also has the characteristics of the H_I-LSC type bronze drum, such as the C-10 drum in Thailand. The pattern on the drum body can be distinguished. Close to the H_{III} type, but the drum shape is very similar to the H_I-LSC type.

3.2 Comparison of main halo decoration

3.2.1 Comparison of tympanum light body

From the perspective of light body shape, H_{III}-XM light body in southwest China has various shapes, but it has similarities with H_{III}-TC in Thailand.

Table 13. Comparison table between H_{III}-XM and H_{III}-TC drum tympanum light body.

Comparative Item	H _{III} -XM	H _{III} -TC
Awns of light body	6,7,8,10,12, Most are 8,12 awns.	6,7,8,10,12,16. Most are 12 awns.
Decorations between awns	Group-flower pattern, heart pattern, Zhui-shaped pattern.	Group-flower pattern, heart pattern, Zhui-shaped pattern.

Tabulator: Jinxi Liu, 2023.

Judging from the table 13, the shape and number of awns of the single frog drum tympanum of H_{III}-XM in southwest China and H_{III}-TC in Thailand are not

fixed. But in the later stage, 12 awns were basically the main ones. The shapes of the two types of drum awns and the patterns between the awns are also roughly similar.

3.2.2 Comparison of tympanum main decoration

Whether it is a H_{III} -TC type drum in Thailand or a H_{III} -XM type drum in southwestern China, the main halo patterns on the drum tympanum have certain regularity.

Table 14. Comparison of drum tympanum and drum body main decorations between H_{III} -TC in Thailand and H_{III} -XM in southwest China.

Comparative Item	H_{III} -XM	H_{III} -TC
Main halo decoration on single high-relief frog tympanum+composed decoration	<p>① Trans-formed feathered-figure pattern+Dingsheng pattern between birds pattern.</p> <p>② Birds pattern+group-flower pattern+fish pattern.</p> <p>③ Trans-formed feathered-figure pattern+birds pattern+group-flower pattern.</p> <p>④ Trans-formed feathered-figure pattern+birds pattern+group-flower pattern+fish pattern.</p> <p>⑤ Birds pattern+fish pattern.</p>	<p>① Trans-formed feathered-figure pattern+birds pattern + diamond-shaped pattern.</p> <p>② Birds pattern+fish pattern+group-flower pattern+trans-formed feathered-figure pattern.</p> <p>③ Group-flower pattern+diamond-shaped pattern between birds pattern.</p> <p>④ Trans-formed feathered-figure pattern+fish pattern+birds pattern+rice pattern between group-flower pattern.</p>
Main halo pattern on double high-relief frogs tympanum+composed decoration	<p>① Trans-formed feathered-figure pattern+diamond-shaped pattern between birds pattern.</p> <p>② Group-flower pattern+diamond-shaped</p>	<p>① Group-flower pattern+diamond-shaped pattern between birds pattern.</p>

	pattern between birds pattern.	
Main halo pattern on triple high-relief frogs tympanum+composed decoration	<p>①Group-flower pattern+ diamond-shaped pattern between birds pattern.</p> <p>②Birds pattern.</p>	<p>①Group-flower pattern+diamond-shaped pattern between birds pattern.</p> <p>②Birds pattern.</p>

Tabulator: Jinxi Liu, 2023.

Since the bronze drum's chest, waist and foot are basically a combination of drum tympanum decorations, they are not listed for comparison. From the table above, we can see that the main patterns of the two countries are basically different combinations of trans-formed feathered-figures, bird patterns, group-flower patterns, and fish patterns. Although the combination is different, the appearance and style are basically the same.

Generally speaking, H_{III} -TC drums in Thailand and H_{III} -XM drums in southwest China have the most identical or similar features. From the H_{III} type drums discovered in Laos and other countries, in addition to the tall and thin shape of the drum, the shape of the drum body and the pattern of the drum tympanum are also roughly similar or identical.

3.2.3 Comparison of drum tympanum and drum body decoration

Drum tympanum decorations: Among the 17 H_{III} drums in Thailand, there are 7 single-frog drums, 1 double-frog drum, and 8 triple-frog drums. Among the 20 H_{III} drums in China, there are 19 bronze drums with standing frog data, of which 16 are single frog drums, 1 double squatting frog drum, and 2 triple squatting frog drums. There are relatively many single frog drums in China. In addition to the early drums, the shape and decoration of the high-relief frog are also very similar (such as Fig.50. H_{III} - XM TH1.2, No. 0332. and Fig.94. H_{III} -TC H1.4, C-13, H_{III} - XM TH3.1 and H_{III} -TC H3.2, C-5).

Drum body vertical decorations: Among the 20 H_{III} -XM drums, only 4 bronze drums have drum body vertical decoration. There are three combinations: tree +elephant+snail, tree+snail, and elephant+snail+fish. Chinese scholars believe that the

H_{III} -XM bronze drums in China with three-dimensional elephant images were purchased from Laos or Thailand (Danfang Wei. 2015. *Research on the Kemu drums in Laos and the same type of bronze drums in adjacent areas*. p.81.). However, most bronze drums in Thailand have elephant patterns. Among the 16 H_{III} -TC drums, 6 drums have no standing sculptures, while the remaining 10 drums have 3 standing elephant sculptures in all combinations of standing decorations. Other decorations include snails, fish and trees. In addition, among the Chinese H_{III} drums introduced by Danfang Wei, there is a drum body decorated with an ox head (Mengdong drum). According to Mr. Ningsheng Wang's investigation, the ox is a symbol of wealth in the Ximeng Wa society and plays a role as a medium of exchange. Danfang Wei believed that it may be the result of the influence of Wa culture.

Overall, the three-dimensional decorations of H_{III} -TC drums in Thailand is richer and more gorgeous than that of H_{III} -XM drums in southwest China. This should be related to the Thai royal family's use of bronze drums in court ceremonies.

3.3 Comparison of casting process (alloy content) and musical performance of H_{III} type bronze drum.

The average alloy content of the H_{III} - XM type bronze drums in the table below is calculated based on the testing data of 8 H_{III} - XM type bronze drums out of 90 bronze drums from Guangxi University for Nationalities, University of Science and Technology of China and Guangxi Museum from 1986 to 1991. The alloy content of H_{III} -TC type drum in Thailand is the testing data of a bronze drum by the Department of Mineral Resources.

Table 15. Comparison of drum head and body decorations between Thailand H_{III} -TC and southwest China H_{III} -XM

Comparative Item	H_{III} - XM	H_{III} -TC
The average content of copper, tin, lead	Copper 72.89%, tin 5.35%, lead 17.43%.	Copper 60.04%, lead: 20.78%, tin:5.83%.
Alloy type and musical performance	High-lead low-tin. Musical performance is not good.	High-lead and low-tin, Musical performance is not good.

Casting technique	The early ones were cast by the mold-casting method, and the others were cast by the lost-wax method.	The early ones were cast by the mold-casting method, and the others were cast by the lost-wax method.
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Tabulator:Jinxi Liu, 2023.

Judging from the testing data, H_{III}-XM type in southwest China and H_{III}-TC type in Thailand are both high-lead and low-tin drums, and the musical performance of the bronze drums is poor. This shows that this type of bronze drum pays more attention to the beauty of its appearance and decoration, but has lower requirements for sound quality. In ritual use, more attention is paid to its status and significance in the ritual.

Summary of this section:

From the above comparison, it can be seen that there is not much difference between the H_{III}-TC type drum in Thailand and the H_{III}-XM type in southwest China in terms of appearance, drum tympanum, decorative patterns and vertical decorations of the drum body, casting technology and musical performance. There are even early forms of drums that are rarely seen in Laos and other places, and the shapes and decorations are also very similar. This shows that the H_{III} type drum users in Thailand and southwest China are stable and have similar customs, so they should have relatively close exchanges with each other. But overall, the H_{III} type drum has a higher status in Thailand. It has exquisite decorations and exquisite craftsmanship. Some bronze drums also have a gold-plated appearance, which fully demonstrates its status and function as a national important and ritual vessel. So the transmission route maybe that the H_{III} bronze drums in China, Myanmar and Laos spread to northern Thailand via the Mekong River.

CHAPTER VI

Analyze Characteristics of Selected Music Examples of Bronze Drums in Southwest China and Thailand

This chapter discusses and compares the music functional characteristics and music performance characteristics of ancient and contemporary bronze drum in southwest China and Thailand. The mainly contents are as follows:

1. Comparison of the history of bronze drum in southwest China and Thailand.
2. Contemporary Bronze Drum Music of southwest China and Thailand.

1. Comparison of the history of bronze drum in southwest China and Thailand

The sound produced by ancient bronze drums has passed away. We cannot understand the rhythm and melody of their playing, but we can get a glimpse of the form and function of their playing from historical records. Different types of bronze drums appeared in different historical periods, and their music. The performance is different, and the functions are also changed. In order to better understand the development of ancient bronze drum music in southwest China and Thailand, we try to use the time range of the popularity of the five bronze drum types in southwest China as the staging standard and divide them into five historical periods: the embryonic period, the prosperity period, the development period, the popularization period, and the decline period.

However, there are only two types of bronze drums in Thailand: H_I type and H_{III} type. Through the comparison in the previous chapter, we learned that the early H_I type $H_I\text{-TA}$ drum in Thailand is later than the $H_I\text{-Szs}$ type in southwest China, while the late $H_I\text{-TB}$ drum in Thailand is earlier than the $H_I\text{-LSC}$ type drum in southwest China. The H_{III} type drum in Thailand spans a thousand years of history from its inception to maturity and has been used in the Thai royal palace and among the people. Therefore, the development context of its ancient bronze drum music is clearer than that of southwest China. According to the stages of southwest China, Thailand's ancient bronze drum music history can be classified into four stages: prosperity period, development period, popularization period and decline period.

However, there are very few historical records about bronze drums in Thailand, and only a few records have been found in Chinese classics. Although there is no strong proof material, we can still get a glimpse of it because of the common characteristics of national culture.

1.1 The embryonic period

(1) Time range

The embryonic period of bronze drum music refers to the period when Pre-H_I type bronze drums were actively used. Because most of the bronze drums in this historical period are archaeological excavations, it can be clearly inferred that their active time was roughly from the 6th to 7th century BC to the 3rd or 4th century BC.

Regarding Pre-H_I type bronze drum in Thailand, we have only found relevant introductions to the three handed down drums in some articles, but they are relatively brief, and we have not yet seen actual pictures or more detailed information. Therefore, we have not seen the embryonic bronze drum music. No discussion for now.

(2) Bronze drum musical performance form and the using ethnic groups

The research on the musical performance form of bronze drums mainly refers to the musical instruments and audio testing of the same tombs. For example, four bronze drums (M23:158, M23:159, M23:160, M23:161) were unearthed from tomb M23 in Wanjiaba, Yunnan, China. After sound measurement, the pitches of the four bronze drums were different (as followed: #d-11 cents, #f+4 cents, #g-4 cents, f+12 cents), percussion can form a musical melody. In addition, a bronze drum, a set of six ram's Yangjiaoniu bells and 20 little bronze bells were unearthed from the M1 tomb in Wanjiaba. A bronze drum, 2 bronze gourds and shengs, and 1 bronze bell were unearthed from the Dabona wooden-bronze coffin tomb in Xiangyun, Yunnan. The combination of musical instruments is typical of the regional style of southwest China. A bronze drum and a Chu-Han style bronze bell unearthed from Dalingpo, Tiandong and Tongcun, Guangxi, represent the exchange and fusion proofs of music between ethnic groups living in the southwest and Chu-Han. This batch of unearthed musical cultural relics dates from the mid-to-late Spring and Autumn Period to the early Warring States Period, and it is speculated that this type of bronze drum was

popular during the same period. Based on mutual confirmation of archaeological data and literature, Chinese scholars speculate that the ethnic group that uses this type of bronze drum is the Pu people (*Ancient Bronze Drum in China*. 1988. Edited by the Ancient Chinese Bronze Drum Research Association, Beijing: Cultural Relics Press).

(3) Music function of bronze drum in the embryonic period

The embryonic stage of the bronze drum was in the Bronze Age, a period when rituals and ritual music flourished. Judging from the specifications of the tombs where the bronze drums were unearthed, the bronze drums already had the function of distinguishing the noble, the humble, and the rank. According to the *Book of Yizhou-Wang Huijie: Zhengnan Ou, Deng, Guiguo, Huizi, Chanli, Baipu, Jiujun, plead use pearl turtle, tortoise shell, elephant tooth, rhinoceros, green feather, fungus Cranes and short dogs are offered as offerings*. The *Ou* mentioned in it refers to Ou Luo, which includes Guangxi and Vietnam, and the *Baipu* includes Yunnan. The second volume of the *Zhu Shu Ji Nian* records that in the 25th year of King Cheng of Zhou, there was a *gathering of princes at the eastern capital, and guests from all over the world*, indicating that in the early years of the Western Zhou Dynasty, various branches of the Yue nationality also participated in the political activities of the Central Plains dynasty. Although there is no clear documentary record, it can be seen from the characteristics of the tombs in Wanjiaba, Dabona, Tiandong and other places, as well as the characteristics of the funerary objects (such as the shape of weapons, jades, decorations, etc.) that they were influenced by the Shang and Zhou cultures of the Central Plains. Therefore, the researcher believes that the ritual and music system implemented since the Western Zhou Dynasty should also have an impact on Dian Yue and Luo Yue. Although the orchestra formation for the enjoyment of the ruling class cannot be as hierarchical as the Yuexuan system of the Western Zhou Dynasty or as majestic as the chimes in the tomb of Zenghouyi, the accompanying bronze bells, ram's Yangjiaoniu bronze bells, bronze gourds, bronze drums, and Yong bells, the arrangement of musical instruments and music can also give a glimpse of the etiquette and music enjoyment and music style of the upper slave-owning class.

To sum up, in its embryonic period, bronze drum music was used by Puyue rulers in ceremonial ceremonies. It could be played in the same ensemble or with other musical instruments. Only tribal leaders with a high-status could enjoy it.

1.2 The prosperity period

1.2.1 Time range

The prosperous period of bronze drum music was the period when the early H_I type bronze drums (ie H_I-SZS, H_I-TA) were actively used. There are basically no standing frogs on the drum tympanum of the bronze drums of this period. Most of them are still archaeological excavations, and the accompanying cultural relics are relatively rich. It can be speculated that their active time was roughly from the Warring States Period to the Eastern Han Dynasty, that is, from about the 4th century BC to the 2nd century AD. We designate it as a prosperous period because the bronze drums of this period were used extensively by rulers in various political activities, demonstrating the status of the ruler in an outstanding and noble manner. The main feature of the drum tympanum and body is realistic decoration characteristics, which records the various sacrificial ritual activities hosted by the rulers at that time, and truly depicts the music and dance performances at that time. This is completely different from the later bronze drum decoration style. It is a true portrayal of the activities of the ethnic group before they were completely conquered.

1.2.2 Bronze drum's musical performance form and the using ethnic groups

(1) In southwest China

We can still learn about the musical performance form of bronze drum in China from the musical instruments buried with it, the standing sculptures on the bronze drum storage containers, the realistic patterns on the bronze drums and related rock paintings.

First of all, judging from the musical instruments that accompanied the bronze drum at this stage, the bronze drum still had the form of ensemble performance with other instruments. The ensemble instruments were more abundant and had the characteristics of regional integration. For example, the bronze drums unearthed from tombs M13, M15, M16, and M17 in Shizhaishan, Jinning, Yunnan, China, were accompanied by musical instruments such as copper gourds and shengs,

bronze dancing figurines, musical and dancing bronze ornaments, and copper chimes. Two bronze drums were unearthed from Tomb No. 24 of the Lijiashan ancient Tombs Group in Jiangchuan, Yunnan Province, along with two bronze gourds and shengs. In addition, among the unearthed bronze drum-shaped treasure storage vessels, the Bronze Storage Vessel of the Cursed League Scene (Shizhaishan M12:26) contains a bronze drum and a three-dimensional statue of Chun Yu. Two large and small bronze drums were unearthed from the No.1 Han Dynasty Tomb in Luobowan, Guixian County, Guangxi, respectively, in the west pit and east pit of the Utensil tomb. In the west pit M1:10, bronze drum accompanied by a wooden drum (only the drum cavity is left), and in the east tomb pit M1 :11, the bronze drum is accompanied by 1 musical instrument gong, 1 ram's horn bell, 2 straight bronze bells, and 1 wooden leather drum. Among them, the east tomb pit musical instrument combination has obvious traces of inheriting the Yunnan Dian Yue bronze drum musical instrument combination.

Secondly, the combination of bronze drums and music and dance forms a musical expression that integrates singing, dancing and instrument performance. For example, the Huashan rock murals in Chongzuo, Guangxi Province show large-scale music and dance scenes. After scientific testing, the Huashan rock paintings in Guangxi have been basically confirmed to be music and dance images from the pre-Qin and Han dynasties in China. Among the dancers there are tall and burly dancers who wear ring-shaped knives and have dog-shaped animals on their feet. They are the leaders of the dancers and the religious ceremonies. The bronze drums and Yangjiaoniu bell in the murals serve as accompaniments to religious rituals of singing and dancing. They not only communicate with the deity of heaven and earth, but also serve as accompaniments for music and dance. The position of the bronze drum in the mural is on the top of the dancer's head, crotch or next to the hand (the bronze drum is replaced by a circle, or a pictographic mark similar to a sun pattern painted in the circle, with three, four, five, six, eight or even twelve awns), the playing method of bronze drums is also shown in the murals, some seem to be suspended under the crossbar (the crossbar is represented by a horizontal line, and the bronze drum is under the triangular hanging rope), and some have no crossbar, but are painted with triangles suspended rope markers. The number of bronze drums in each

set of images varies from one to multiple. In addition, the picture content decorated on the drum tympanum of Hi-SZS Bronze Drum No. M12:2 (reservoir) is called a double-layered music and dance picture of worship. There are three drum fragments, and the outer one is a scene of singing and dancing. There are 15 free-hand dancers. They are all Dian women with silver spindle buns, big earrings, circle bracelets, and striped gowns with a robe breasted and wide sleeves. There were flowers used for the festival and goblets filled with fine wine. The inner halo shows the scene of feasting and beating bronze drums for sacrifice. Among them was a group of four men with feathers on their heads, earrings and large bracelets. One of them played a drum instrument, one of them squatted on his knees and stretched out his arms to sing loudly. One of them hit the bronze drum with drumsticks in one hand, and spread his arms with the other to do in an intoxicating dance shape, one person sat with legs crossed, the four fingers of both hands were raised together, and the thumbs were spread out in a dance shape. The whole scene is a state of intoxication and ecstasy, reflecting the ancient custom of *beating bronze drums and singing and dancing* unique to the southern ethnic minorities. From the above cases, we can infer that the bronze drum music in the prosperous period was a form of expression that integrated singing, dance, and bronze drum rhythm, and was a kind of sacrificial witchcraft music.

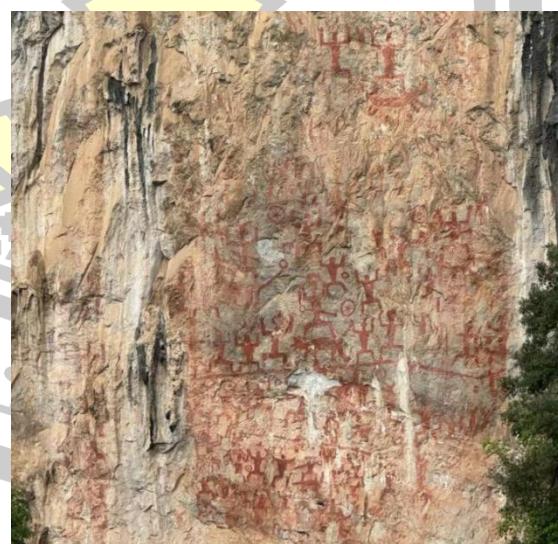


Figure 108. Huashan rock murals in Chongzuo, Guangxi Province.

Source: Jinxi Liu, 2021.

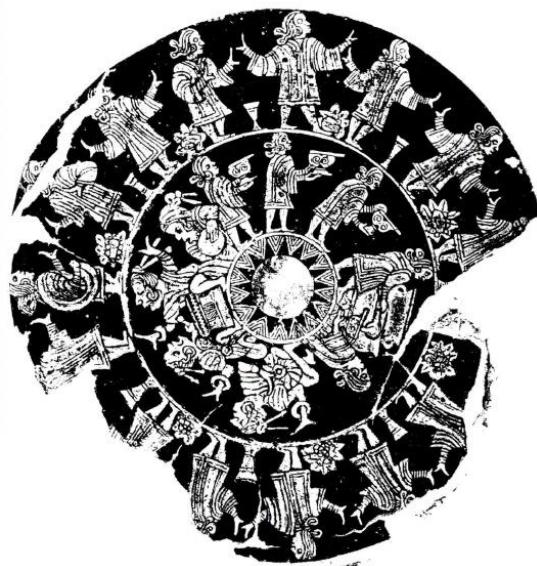


Figure 109. Tympanum of Shizhaishan M12:2.

Source: Decoration Arts of Ancient Bronze Drums. p.146.

From the Warring States Period to the Eastern Han Dynasty, the people who used bronze drums were mainly the Pu, Dian and Luoyue people. Ban Gu's *Hanshu. Geography* annotation quoted Zan Chen as saying: *From Jiaozhi to Kuaiji, Baiyue are scattered, each with its own characteristics...* From the Warring States to the Qin and Han Dynasties, the Baiyue described in the literature was from today's Yangtze River's downstream reaches south of Lingnan, including the vast area of Vietnam. *Jiu Tang Shu Geography* also records that certain areas in the southwest (including parts of Guangxi and Guangdong) were places where ancient Xi'ou and Luoyue lived together. According to Mr. Tingyu Jiang's research, the ancient Luoyue people's activity range ranged from the Hongshui River Basin in Guangxi in the north, to Hainan Island and the Red River Basin in Vietnam in the south, from the southeast of the Yunnan-Guizhou Plateau in the west to the southwest of Guangdong Province in the east. The central area where the H1 type drums are distributed is exactly within the activity range of the ancient Luoyue people.

(2) In Thailand

Before the third century AD, Thailand was established as two countries in the Chao Phraya River Basin by the Mon people, an ancient ethnic group in Southeast Asia. They were called Jinlin and Linyang in the ancient Chinese book *Shui Jing Zhu Funan Zhuan*. However, we have not yet found evidence whether the Mon people are the original people who used bronze drums. The Thai people are an important ethnic group in Thailand. The Thai ethnic group in Thailand developed from a branch of the ancient Shan Tai (掸泰) language group. As early as around the second century BC, Dian Yue, a branch of the Yue nationality, lived in southern Yunnan and the northern part of Indochina Peninsula, China. Many scholars believe that the ancient sound of Dian is the same as Dai(傣), Dai(岱) and Tai(泰). In the 1st century AD, the Shan Kingdom, an alliance of Shan tribes, emerged in the northern part of the Indochina Peninsula. According to the research of historians, the Shan people are the ancient general name for the Tai(泰), Dai(傣) or Dai(岱) people, and it is inferred that the Shan(掸) activities at that time were in the vast areas of Guangxi and the southern border of Yunnan and the connected Myanmar, Thailand, Laos, and northern Vietnam (Wyatt.D.K, Guo Jiguang. 2009. *History of Thailand*. p.19.). According to this speculation, the Shan (掸) people should also be the Baiyue people recorded in Chinese classics. With the conquest of the Baiyue ethnic groups during the Warring States Period, Qin and Han Dynasties, and subsequent melee between the north and the south, some branches of the Shan ethnic group moved south along the tributaries of the river system to the central, eastern, and southern parts of the Indochina Peninsula to develop and thrive. Among them, the Mekong River was an important ancient waterway at that time. It originates from Tibet, China, passes through Yunnan, Myanmar, Laos, Thailand, Cambodia, and reaches the sea in Vietnam. Therefore, there is a certain possibility that the H₁ type bronze drum entered the Indochina Peninsula along the Mekong River with the ancestors of Yunnan and Vietnam. However, judging from the appearance characteristics of the H₁ type drums in Thailand so far, except for some bronze drums that have some similarities with the Yunnan bronze drums, most of them are more similar to the same type of bronze drums unearthed in Henan, Hoa Binh, Thanh Hoa, and Nghe An in Vietnam. The main ethnic group using Dongshan Bronze Drum in Vietnam is the ancient Luoyue

ethnic group. The water system between Vietnam and Thailand is connected. From Nghe An, it can flow directly down the Mekong River to Nakhon Phanom, Mudahan, Ubon Ratchatani and other provinces in northeastern Thailand, and then along the Mae Nam Mun River to central and eastern Thailand. In addition, it is worth mentioning that in Xilin, Guangxi, China, a set of bronze drums were unearthed as a burial vessel to contain the bones of the tomb owner and burial objects. A bronze drum with two sets of sets on each other was also unearthed in Kanchanaburi Province, Thailand (Pan Ping Jiao Su Liya, 1974), is similar to the burial method of Xilin bronze drums. The set of bronze drums contain human bones and some ornaments. To this day, the Zhuang people in Guangxi still use this method of secondary body burial to bury their ancestors. The Luoyue people are the ancestors of the Zhuang people in Guangxi. This has also become evidence that during the unification war of Qin and Han, the Luo Yue people migrated from southern Guangxi to Vietnam and Thailand along the river branch. To sum up, it can be speculated that there are three main routes for bronze drums to be introduced into Thailand. One is directly introduced from Yunnan along the Mekong River, the second is introduced from Vietnam along the Mekong River to northeastern Thailand, eastern Thailand, central Thailand and even northern Thailand, and the third is along the coastal route introduced to southern Thailand. The main ethnic groups using the H₁ type drum in Thailand may be ancient ethnic groups such as Yunnan, Shan-Tai (掸泰), and Luo Yue (骆越) who were forced to move south due to war, with the Luo Yue ethnic group being the main group. As the Shan-Tai branch thrives in Thailand and establishes a unified national government, the Shan-Tai people gradually become the main ethnic group that uses bronze drums.

As for the expression of bronze drum music in Thailand during the prosperity period, we can look for clues from the characteristics of bronze drum in Thailand companions and bronze drum patterns, as well as related musical archaeological images.

First of all, judging from the accompaniments, H₁-TA bronze drums in Thailand may also be performed in ensembles with other musical instruments. Apart from Vietnam and China, Thailand is the country with the largest number of

unearthed bronze drums of early H_I type bronze drums without standing frogs, with a total of 35. Among them, 4 bronze drums have accompanying objects (one from Uttaradit, 3 from Trat Province), but none of them are accompanied by musical instruments. Bronze drums are mostly accompanied by bronze knives, bronze pots, bronze bracelets or beaded ornaments, iron farm tools, pottery, etc.. It can be seen that the bronze drums in Thailand's prosperous period should also be used by people with a certain social status, but the bronze drums may be used alone.

Secondly, judging from the decoration on the drum tympanum, H_I-TA bronze drums musical performance in Thailand should also be a form of singing and dancing. Because the drum tympanum of this type of bronze drum also has the image of a dancing person holding a feather shield, which is similar to the decorative image of similar bronze drums in China.

In summary, the main ethnic groups that use H_I-SZS type drums in southwest China and H_I-TA type drums in Thailand have certain historical origins, and they should both belong to the Baiyue ethnic group in China's pre-Qin and Han Dynasties. The expression forms of bronze drum music are also similar, but the regions, living groups and tribes are different, the degree of Chu-Han Chineseization received is different, and the accompaniment instruments are also different.

1.2.3 Music function and its performance characteristics of the bronze drum in the prosperous period.

Regarding the function of bronze drum music, we mainly infer based on the records in historical books and documents and what archaeological data show. Since there are few Thai classics and related archaeological artifacts, this section mainly focuses on discussing the functions of Chinese bronze drum music.

(1) In southwest China

① Ritual and music function. During this period, the Yue activity areas (including today's Yunnan, Guangxi and northern Vietnam) had been conquered and included in the management scope of the Chu State, Qin Dynasty, Western Han Dynasty, and Eastern Han Dynasty. Judging from the musical instruments (wooden drums, Zhu, twelve-stringed qins, bamboo flutes, straight chimes, gongs, etc.) accompanying the bronze drums from the Han tombs in Luobowan, Guangxi, and their placement, it can be seen that the rulers at that time

had followed the court music of the Chu and Han. It was made to make ritual music (silk and bamboo instruments such as twelve-stringed harps and bamboo flutes were mostly used as banquet music in the Chu and Han Dynasties). From the shape and type of the instruments and the inscriptions with the word *bu* (布) engraved on them, it can be inferred that the music played at that time was the fusion of Chu-Han and Yue music.

② Sacrificial function. On the platform in front of the cover of the storage device *Bronze Storage Device of the Cursed League Scene* unearthed in Shizhai Mountain, Yunnan, there is a *ganlan* style building. There are six bronze drums on the left and right sides of the platform in the building, and four bronze drums on the back. There are large bronze drums on each side. A pillar and stele were erected between the two drums, and human sacrifices were tied to the stele. On the left side of the platform, there are four groups of musical instruments, but three of them have fallen off. Only the bronze drum and the Chunyu remain in one group. Its shape is: two piles stand on the ground and a crossbar is set up. The lugs of the bronze drum and the Chunyu pass through the crossbar and are suspended above the ground. A man with a bun and a long back, holds a hammer in each hand, hitting the Chunyu with the left hand and the bronze drum with the right hand. The Chunyu is a ritual instrument of the Chu and Han Dynasties. The bronze drum and the Chunyu ensemble are used for sacrifices and covenant activities. The bronze drums in the Ganlan building served as a demonstration and a deterrent, and were a symbol of the ruler's power and status. The bronze drum music and dance in the Huashan murals should have the same function, but the content of the sacrificial activities is different.

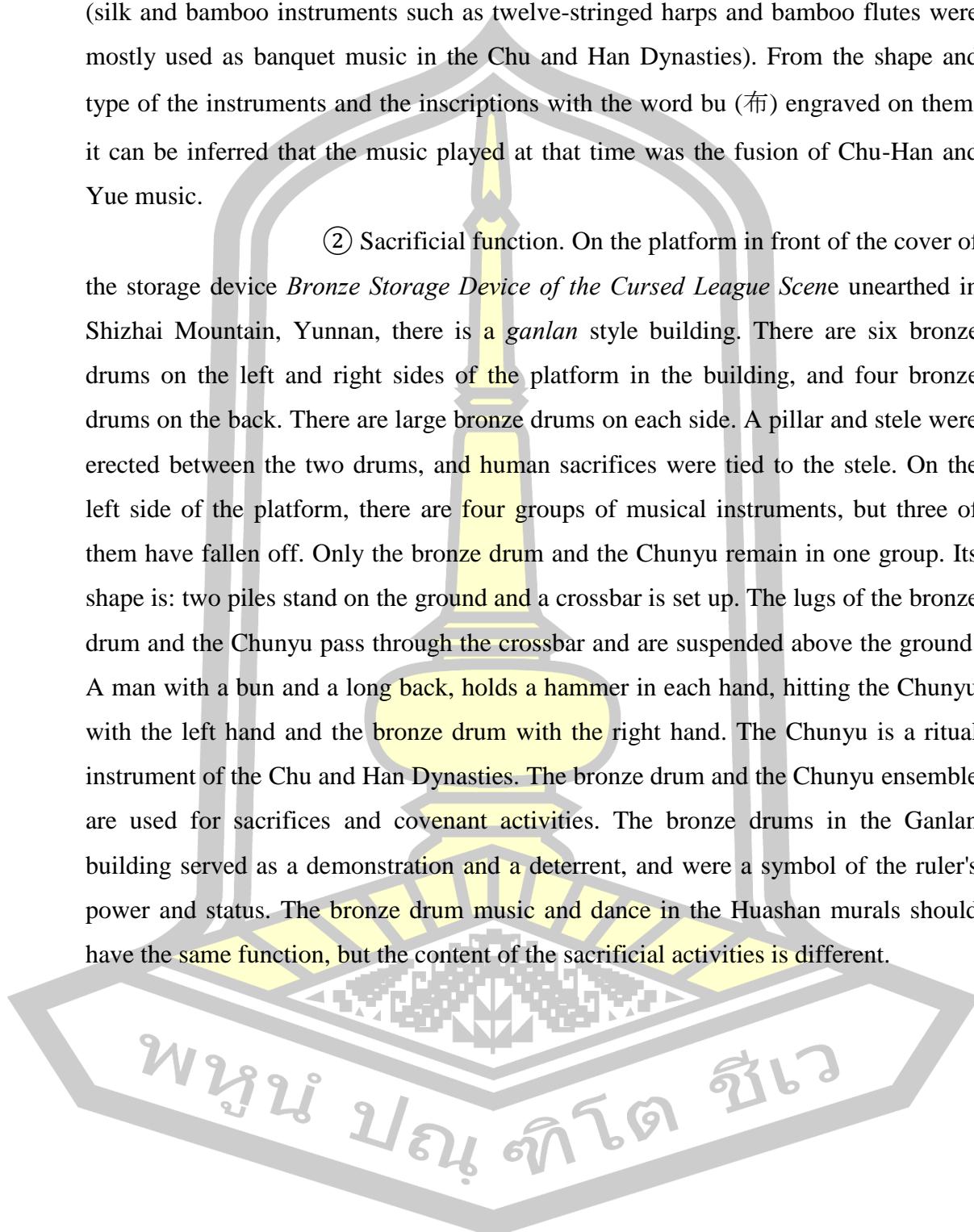




Figure 110. Bronze Storage Device of the Cursed League Scene.

Source: Jinxi Liu, 2021, Yunnan Province Museum.

③ Military function. The historical classic of the Eastern Han Dynasty in China, *The Book of the Later Han·Biography of Ma Yuan* records: *Yuan is good at riding, and he is also known as distinguish a good horse. He obtained the Luo Yue bronze drum in Jiaozhi, cast it into a horse style, When he returned, handed it to the emperor.* This is the earliest literary and historical record about bronze drums. It records the bronze drums of the Luoyue clan captured by Ma Yuan in the war to conquer Luoyue. It can be seen that the bronze drum at this time was still the incarnation of power, status and belief among the Luoyue ethnic group, and it played a role of demonstration and deterrence in military wars. Ma Yuan melted it down and recast it as a sign of his surrender.

(2) In Thailand

① Used for sacrifice. The drum tympanum of a few bronze drums in Thailand are decorated with altars and dancers. In addition, a mural found in Ta Duang Cave, Murang Kanchanburi District, Kanchanburi province, Thailand, has images of people dancing (as shown below figure 111), with a circle under one of the crossbars. Archaeologists interpret the circle as a bronze drum and the Hui (like Chinese character 囍) pattern as a coffin, and think it is a funeral painting. In the picture, there are sideways figures wearing feathers on their heads. Similar images of people wearing feathers on their heads and bending their knees and stamping their feet also appear in the Huashan rock mural paintings in Guangxi. The person wearing feathers on the head is usually a tribal leader or a priest, and the crowd next to him

kneels and dances to the beat of the bronze drum as the priest chants his prayers, which is regarded as evidence of the use of bronze drum music in sacrificial ceremonies. Although the rock paintings shows a round object that resembles a suspended drum from a frame, it is not certain whether this is a wooden drum or a bronze drum, or some other object. More archaeological evidence is needed to prove the period in which the rock paintings were painted and the widespread use of bronze drums by local ethnic groups at that time.

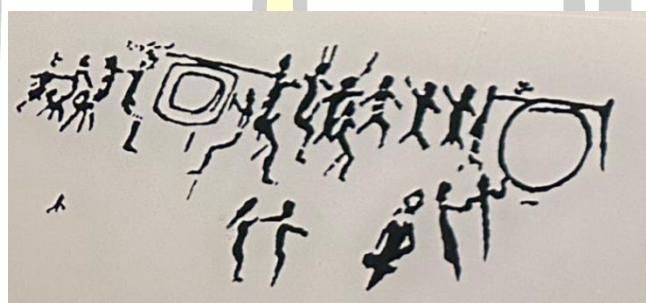


Figure 111. Line drawing of rock art at Ta Duang Cave, Murang Kanchanburi District, Kanchanburi Province.

Source: Jinxi Liu, Bangkok National Museum, 2023.

② Used for military. A bronze drum found in Wang Kra Chae Sub-district, Mueang District, Trat province, Thailand has a pleasure boat pattern on its chest (H₁-TA, A6). The dancers in the boat hold a feather shield in one hand and a feather sword in the other, with uniform movements, seems to be a war-like music and dance activity, so the bronze drums in Thailand's prosperous period may have been used for sacrifices before military expeditions or for conveying messages during wars.

In summary, comparing the functions of bronze drum music in China and Thailand, we believe that in southwest China at this time, ethnic minorities had their own right to rule. They learned from the bell and tripod (Zhong and Ding, Chinese character is 钟鼎) etiquette system of the Central Plains and used bronze drums as important national and ritual vessels for their rule, to intimidate the leaders of other ethnic groups who come to worship, and use it as the core of ritual and music instruments to make rituals and music to demonstrate their dominance. Bronze drums

played an absolutely central role in the political etiquette at this time. The same type of bronze drums in Thailand came later than in southwest China. At this time, some ethnic groups were far away from their former homes due to war. On the one hand, they had to continue to deal with the invasion of powerful powers, and on the other hand, they had to settle down in new areas and develop production and life. Therefore, the bronze drums are accompanied by objects, some are agricultural tools. At this time, the bronze drums represented more of the ethnic identity and the cohesion and appeal of tribal leaders. This was already the transition form of bronze drum music to the development stage.

1.3 Development period

1.3.1 Time range

Throughout history, we can see that the ups and downs of bronze drum status are inseparable from political rule. In China, from the time when the Qin Dynasty unified Lingnan and established prefectures and counties, to the Western Han Dynasty when Emperor Wu of the Han Dynasty (111 BC) pacified South Vietnam, expanded the three counties of Qin to nine counties, and placed the governor of Jiaozhi under unified management (Jiaozhi County is in today's northern Vietnam, Red River Basin area). In the Eastern Han Dynasty, Ma Yuan went south to conquer Jiaozhi to quell the rebellion in Lingnan. He cast the Luo Yue bronze drums captured by the conquest into horse style and presented them to the emperor. After that, China entered the turbulent period of the Three Kingdoms, Two Jins, Southern and Northern Dynasties. The wars brought not only political changes, but also a great integration of national cultures. The unique bronze drum, which represents the supreme power of the ruler, also experienced ups and downs with the war. After the Luo Yue ethnic group was conquered, it gradually lost its dazzling light and entered a stage where it was transformed from a powerful weapon and a ritual instrument to an ordinary one. A stage of development in which nobles showed off their wealth, power, and enjoyment of entertainment, as well as musical instruments and artifacts that entrusted people's faith in life.

In Thailand, before the 8th century AD, the territory was basically in a state of separatism. For example, there are Duyuan, Jinlin, Dunson, and Dvaravati kingdoms in central Thailand (Volume 13 of *The Western Regions of the Tang*

Dynasty is called the Tuoluo Bodi Kingdom (堕罗钵底国). There is a reference to Tuoluo Bodi in Du You's *Tongdian* of the Tang Dynasty in China. ([Thai]Li Daogang. 2000. *Thailand Ancient History and Geography Series*, Beijing: Zhonghua Book Company. p.55). In Prachinburi in the east of Thailand, there is the Tuopuan Kingdom ([Thai]Li Dao Gang. 2000. *Thailand Ancient History and Geography Series*. Beijing: Zhonghua Book Company. p.12.), in the Lamphun area in northern Thailand, there is the Haripunchai Kingdom (it is called the Kingdom of Women in the Chinese ancient book *Manshu*), there is the Lanna Kingdom in Chiang Mai, and there are Panpan and Red Earth Kingdom in southern Thailand (Tian He, Zhou Fangyi. 2005. *Thai Kingdom Chronicles*. p.80.), etc.. There are many small countries, and the regional situation is turbulent. Many of them are commercial city-states, which rely on being attached to some powerful countries (such as Funan Kingdom, Chenla Kingdom, etc.) to survive. This phenomenon of regime change is very similar to that in China. Therefore, in this environment, the process of ethnic integration is accelerated. The ethnic groups that do not use bronze drums maybe conquered the ethnic groups that used bronze drums, and the bronze drums gradually disappeared. This is probably the reason why Thailand's H_I-TB type drums are rare in number and gradually disappeared without H_I follow-up, unlike China, which created two types of bronze drums of the same system, the H_{IV}-ZY (H_{IV} Zun Yi type) and the H_{IV}-MJ (H_{IV} Majiang type).

The development period of bronze drum music mainly refers to the period when the late H_I type bronze drums (H_I-LSC, H_I-TB) and H_{II} bronze drums (H_{II}-BL, H_{II}-LS) were actively used. Bronze drums from this period were huge in size, and they were basically single drums unearthed upside down, with very few accompanying objects unearthed. Based on Mr.Tingyu Jiang's research on the age range of these types of bronze drums, it is inferred that the development period of bronze drum music roughly spanned the Eastern Han Dynasty to the Tang Dynasty, that is, around the 1st century to the 8th century AD. During this period, the bronze drums gradually moved down from the hands of the chiefs who were in charge of royal power to the homes of wealthy dignitaries or small settlement groups, and their usage rights were transferred downwards. They were no longer important treasure of the state and symbols of the supreme power of the ruler. For example, *Jiu Tang Shu*

(945) records: *Bronze drums are made of cast copper. One side is empty, and then it is covered and struck on top. ... Rich families in Lingnan have them, and the larger ones are more than ten feet wide. Another example is the Chen Shu written by Yao Silian in the early Tang Dynasty. It is recorded that Ouyang Kai followed Lan Qin to conquer the Yi officials in the south, ...captured Chen Wenche, and gained an incomparable sum. He presented a large bronze drum, which has never been seen in generations... His second brother Sui became the governor of Hengzhou and the family were distinguished nobles. The dignitaries were well-known in southern China. They often gave bronze drums and livestock as offerings.* (Tingyu Jiang. *Bronze Drum in Lingnan*. 2018). Bronze drums have become a symbol of the reputation, status and wealth of wealthy and distinguished families.

1.3.2 Bronze drum musical performance form and the user ethnic groups.

At this time, the bronze drums were mainly decorated with deformation patterns and geometric patterns. We can only judge its musical performance from the tuning marks on the back of the drum tympanum and the analysis of the alloy ratio. A large part of the H_{II}-BL and H_{II}-LS types of bronze drums have tuning shovel marks, while the alloy proportions of the H_I-LSC type and H_I-TB type bronze drums are more in line with the requirements for cast bell-type instruments described in *Kao Gong Ji*. It can be seen that these types of bronze drums pay more attention to musical performance and have higher sound quality requirements.

(1) In southwest China

① Bronze drums accompany singing and dancing. For example, Wan Zhen's *Nanzhou Foreign Objects Chronicles* records that: *the people in the border area of Jiaoguang are called Wuhu... Go out to find people, when they return home, gather with neighbors, hang them (the people) among the dead, sit on all sides, beat bronze drums, sing, dance and drink. Just cut them off...* The boundary of Jiaoguang refers to Jiaozhou and Guangzhou in the Jin Dynasty. It was in the area from today's Leizhou Peninsula in Guangdong to Yujiang in Guangxi. The Wuhu people there often ambush on the roadside to attack passers-by and capture them. After returning, hang it up and invite the neighbors to sit around, beat drums, sing, dance and drink, and then cut and eat.

②Bronze drums and other musical instruments are played together, accompanied by singing and dancing. For example, it is recorded in the *Old Book of Tang Dynasty* that *the Dongxie Man... beat bronze drums, blew big horns, and sang and danced for fun during banquets*. (According to historical data, during the Tang and Song Dynasties, among the ethnic groups in the southwest that used bronze drums, man (蛮) was the most prominent, such as Huangdong Man, Dongxie Man, etc. Man is the collective name for the ethnic minorities in the south.)

③The bronze drum is used alone. It is mainly used in occasions such as beating drums to convey messages and gather crowds. According to historical records, the main ethnic groups living in the areas where these types of bronze drums were distributed at this time were the Luoyue people (Bangu of the Eastern Han Dynasty, *Book of the Later Han*), the Wuhu people (Wan Zhen, *Nanzhou Yi Wu Zhi*), and the Liliao people (Jin dynasty, Guo Yigong's *Guangzhi*, Tang Dynasty, Yao Silian's *Chen Shu*, and *Nanzhou Yi Wu Zhi* are all recorded), barbarians (such as *Xin Tang Book*, *Barbarian Biography*, etc.). Therefore, bronze drum researchers generally believe that the people who use these types of bronze drums are Luoyue people, Liliao people, and barbarians.

(2)In Thailand

At present, we have not found any documentation about the H_I-TB bronze drum in Thailand, but we have found other musical instruments among the bronze drum companions. Among the 10 H_I-TB bronze drums in Thailand, 3 bronze drums have accompanying artifacts, namely 2 from Nan Province and 1 from Uttaradit Province. Among them, KP.1 drum (B2) from Uttaradit Province has accompanying artifacts. The musical instrument small gong appears. This is different from the bronze drum accompanying objects in China, and has certain regional characteristics. During the recent fieldwork conducted by the researcher, the researcher also found many cases of bronze drums and gongs being displayed together in temples. This should be related to the integration of local belief and culture. Drums and gongs may be a fixed combination of musical instruments in Thailand from ancient times to the present. Regarding the ethnic groups that used bronze drums during this period, most of them should be consistent with the H_I-TA drums, even if the main ethnic groups who used them were still descendants of Dian Yue and Luo

Yue. This can be judged from the fact that the patterns on the drum tympanums and drum bodies of the two types of drums are generally consistent.

In summary, we can see that during the development period of bronze drum music, Thailand was similar to southwest China in that they both suffered the impact of war. However, because the ethnic groups living in southwest China were still dominated by Dian Yue, Luo Yue or their descendants, they used the custom of bronze drums has not disappeared due to the impact of politics and economy. Instead, it has been further innovated, integrated with elements of Han culture, and spread and used more widely. In Thailand, it is just the opposite. As the main ethnic groups gradually integrate into the local cultural life, the H₁ type bronze drum gradually loses its survival soil and eventually disappears suddenly.

1.3.3 Music function of bronze drum in the development period

(1) In southwest China

① Sacrifice to deities. For example, the poem *Twenty Rhymes of Seeing Off Guests on a Spring Tour to Lingnan* by Bai Juyi, a poet of the Tang Dynasty, contains the sentence *Bronze drums competition worshiping the river deity*, which illustrates the tradition of ethnic minorities in Lingnan area using bronze drums to worship deities.

② Command the military formation. For example, Li He, a poet of the Tang Dynasty, wrote the poem *The black flags waved three times and the bronze drum beat loudly* in Huangjiadong. Huangjiadong, also known as Huangjia or Huangdong in Yongning, Guangxi today, was the most powerful place in the Zuojiang River Basin at that time. Branch of the *Xiyuan Man* (Tingyu Jiang, *Lingnan Bronze Drum*, p.447). It shows that the ethnic minorities in Huangjiadong use bronze drums to direct military formations.

③ Feast and gathering. For example, *New Book of Tang Dynasty·Nanman Biography* records that *south of Xicuan, there are Dongxie Man... gathering, beating bronze drums and blowing horns*, indicating that bronze drums were used in gathering ceremonies.

④ Beat drums to gather the crowd. For example, *Biographies of the Manyi (Barbarians)* contains records of the use of bronze drums by the barbarians of Fushui Prefecture in the south of Yizhou: *Fushui zhou is in the south of*

Yizhou... Their tribe cast copper into large bronze drums. When they were first completed, they hung them in the courtyard and placed wine to attract similar people, race for gold and silver as a big hairpin. Beat the drum, and leave the hairpin to its owner. Attack each other, beat the drum to gather the crowd, and the one with the drum trumpet is called Du Lao, and the crowd praises him.

(2) In Thailand

① Used for sacrifice. There is a bronze drum with images of deformed dancers and altars on the drum tympanum, which should also be a record of the use of bronze drums in sacrificial activities.

② For other activities. There is only one case of bronze drums and gongs being unearthed in Thailand. They were used for praying and offering sacrifices in temples, or for performing rituals. Their application cannot be determined.

1.4 Popularization period

1.4.1 Time range

The popularity period of ancient bronze drum music mainly refers to the period when H_{III} and H_{IV} bronze drums were actively used. The bronze drums of this period were relatively small in size and were commonly used by the people and the court. In southwest China, during the period of popularization, the status of bronze drums further moved down to smaller ethnic settlement units. Almost every natural village or family has a bronze drum. In Thailand, the only bronze drums in the popular period were the H_{III} type, which was shared by the palace and the people. The time range is roughly from the Tang and Song Dynasties (about 8th century AD) to the end of the 19th century. The reason why the starting date is set in the 8th century is due to the record in *Lingbiao Luyi* by Liu Xun of the Tang Dynasty in China: *In Zhenyuan (785-805), there were Yuluo Bronze Drums denoted by Pyu state.* The Yuluo bronze drum donated by the Pyu state of the Tang Dynasty in today's Myanmar is likely to be the H_{III} (Ximeng type, also called Karen type) bronze drum still in use today. Myanmar is adjacent to Thailand, and after the H_I type bronze drums disappeared, the H_{III} type bronze drums with northern Thailand as the main distribution area directly entered the period of popular use. It is speculated that it was

due to the change of the user groups and the war or politics or cultural exchange of neighboring countries.

1.4.2 Bronze drum musical performance form and the using ethnic groups

(1) In southwest China

Bronze drums are performed solo or together with other musical instruments and singing and dancing. For example, in the *New Book of Tang* written in the Song Dynasty, it is recorded that Pyu state presented national music to the emperor of Tang, such as *Yan music*. ... *Tianzhu instruments include bronze drum, Jie drum, Dutan drum, Maoyuan drum, zhen, and horizontal flute, phoenix-headed harp, pipa, five strings, and shells are all one, two bronze cymbals, two dancers*. Bronze drums, other musical instruments, songs and dances perform the *Yanle Tianzhu Ji* together. For another example, the *Luocheng County Chronicle* of the Daoguang period of the Qing Dynasty records that the people of Sanfangdong went to the government office to celebrate the New Year's birthday of Yingsong Yu, the chief administrator of Sanfang. *The reeds and bronze drums are ringing in unison. It cannot be said that this place is a border defense*. It describes the scene of the ensemble of bronze drums and reeds, etc..

In the Tang and Song Dynasties, the ethnic minorities living in the southwest were collectively called barbarians. In the Song Dynasty, the barbarians in northwest Guangxi were called Chuang (Zhuang 僮). They used H_{IV}-MJ (Majiang-type) bronze drums. By the Ming and Qing Dynasties, the names of ethnic minorities were more detailed, the ethnic groups that use bronze drums found in historical documents include Zhuang, Dong, Miao, Yao, Li, Dai, Dong, Li and other ethnic groups.

(2) In Thailand

After the 6th and 7th centuries AD, due to the emergence of Nanzhao and Chenla Kingdoms in the north and south of Thailand at the same time, the Tai people at this time were still unable to form a unified political entity and became a subordinate tribe of Nanzhao or Chenla. Until the 11th and 12th centuries, the state of separation within Thailand continued. At this time, in the north of Thailand there were the Yong Naga Kingdom and the Payao Kingdom with the Tai

ethnic group as the main body, and the Halipunchai Kingdom with the Luo Hun group as the main body. There was the Sri Dharmaraja kingdom, and most of these countries belonged to the Angkor dynasty. In the second half of the twelfth century AD, the Jinglong Jindian Kingdom of the Shan (掸) ethnic group appeared. Lanna was one of the main members of the Thai-Shan (泰掸) alliance and was the Jingxian branch of the ancient Shan Tai people (known as the Jingxian Kingdom, Chinese historical records call it the Eight Hundred Daughters-in-law Country). After a long period of differentiation and integration, struggle and unification, the ancient Shan Tai ethnic branch formed the Thai ethnic group in today's Thailand (History of Thailand, p.25.). In the 13th century, northern Thailand got rid of the control of the Angkor Empire, and three Thai-dominated countries emerged, namely the Kingdom of Chiang Mai (the Kingdom of Eight Hundred Daughters-in-law), the Kingdom of Payao, and the Kingdom of Sukhothai (called the Siam Kingdom in Chinese history books). Among them, the Kingdom of Sukhothai became an emerging power in Indochina. According to Chinese historical records such as *Daoyi Zhilue*, *Chenla Customs* and *The Inscription of King Rammo Kamhaeng of Sukhothai City*, its power reaches as far north as Luang Prabang and as far south as the southern tip of the Malay Peninsula, heading west to the seaside, and heading east as far as Wenzhan (Vientiane) and Wenkan (Wankan) (History of Thailand, p.30.). It can be seen that the main ethnic group using 鼓 bronze drums at this time was the Tai people. In addition, the Karen and Khmu people living on the border between Thailand, Myanmar and Thailand and Laos also use such bronze drums.

The form of bronze drum music during the popularization period in Thailand is as follows: bronze drums are played together with conchs, bells or gongs. The earliest record of bronze drums in Thai literature appears in the *Three Realms Sutra* written by King Lithai (reigned 1347-1370 AD) in the 14th century: *The gongs and drums are noisy, the conch trumpets are ringing, the golden bells are jingling, and the bronze drums are Dong Dong*. In the early days of the Ayutthaya Dynasty, Boromma Trailokkanat (reigned 1448-1488) also mentioned bronze drums in the *Court Law* formulated by him. This law said in the relevant ceremony: *Kunxi Shangkuan plays the conch shell, Pai Nuanjie plays the gong, and Dakunli plays the*

bronze drum. (Dong Xiaojing. 2021. *Research on Bronze Drum Cultural Exchanges between Ancient Yunnan and Southeast Asia*. Beijing: China Social Science Press).

1.4.3 Music functions of bronze drum in the popularization period

(1) In southwest China

① Ritual and music function. *New Book of Tang* records that *in the seventeenth year of Zhenyuan* (貞元), King Yongqiang of Piao sent his younger brother Xiliyi and the city lord Shunanda to present his national music.... There is a jade conch and bronze drum in the national music team. It shows that the bronze drum is an important instrument of ritual music in the country, and thereafter Piao's national music was included in the court music of the Tang Dynasty.

② Military ceremony. For example, the *Biography of Han Yong* of the Ming Dynasty records: *There are dozens of bronze drums at the military gate, and the rituals are detailed....*

③ Used for *the sound the night watches*. For example, Zhou Qufei's *Lingwai Daida* in the Song Dynasty recorded: *The larger ones are seven feet wide, and the smaller ones are three feet wide. They are found in all the shrines and Buddhist temples where they are located, and are used by states and counties for the sound the night watches.*

④ Used for festivals and folk activities such as racing deities, praying for good luck, and celebrating the New Year. For example, *Taiping Huanyu Ji* of the Northern Song Dynasty records the custom of Hezhou, Guangxi, *Bronze drums are set up during festivals, the big ones are one foot wide, and the small ones are three or four feet wide*. Jie Jin's *Poetry of Longzhou* of the Ming Dynasty states: *The city is dark with jackfruit trees, and the deities are racing at night with the sound of bronze drums*. In the fifty-seventh year of Emperor Kangxi's reign in the Qing Dynasty (1718), Wang Weihuai of Jiangsu Province went to Xilin, Guangxi Province to serve as the governor, and *Bingshen* was included in the Xilin County Chronicle he compiled. *New Year's Eve* says: *...Bronze drums drive away the canla* (pronounced cán là, 残腊, means the end of the lunar year), *and barbarians sing in late spring*.

⑤ Banquet guests. For example, in Song Dynasty's *Taiping Huanyu Ji* there is *the name of the Yi people is Yueyi... Relatives' banquets are usually played with bamboo flutes and drums*.

⑥Used for weddings and funerals. For example, when Su Shi was demoted to Danzhou in the Song Dynasty, he saw bronze drums used to make music during sacrifices in Xianfuren's temple, and he wrote a poem *He Tao Imitates Ancient Times*. The poem included *Bronze drums, pots and reeds, this song is a farewell poem*. One sentence describes it. It shows the scene of using bronze drums to play music during sacrifices. Another example is Li Wenyan's *Qingyuan Mansion Chronicles* recorded in the 20th year of Qianlong's reign in the Qing Dynasty (1755): *Nandan is only used for funerals, and it still needs auspicious days. If it can be hit, it will be hit, and if it cannot be hit, it will be stopped.*

⑦Used in temples to worship supernatural being. For example, it is recorded in *Hundred Odes of Nanhai* written by Fang Xinru of the Southern Song Dynasty: *Bronze drums are found in both the East and West temples of Nanhai... The drums in today's temples have been in existence since the Tang Dynasty. The Panyu County Chronicle has recorded its system. During the Spring and Autumn Period, people enjoy sacrifices. It must be mixed with music and played to music to the deities.* Another example, Qu Dajun in the Qing Dynasty's *Guangdong Xinyu* has a record that *on the 13th day of the second month of the second month, when Rong's birthday is celebrated, the Cantonese people play to music to the deities.* It is worth mentioning that from the Song Dynasty to the Ming and Qing Dynasties, especially during the Ming and Qing Dynasties, there were many records in classics, county annals, and prefecture annals about bronze drums being unearthed and enshrined in temples, Supernatural Being Temples, Guandi Temples, Confucian Temples and other places.

(2) In Thailand

①Ritual and music function. In the legal documents of the royal of the Ayutthaya Dynasty (also known as the Ayutthaya Dynasty) in the 14th century, there are records of beating bronze drums and officials specializing in drumming during royal ceremonies. It is recorded in Volume 7 of Li Diaoyuan of the Qing Dynasty in *Notes on Nanyue* that in the fourth year of Hongwu in the Ming Dynasty (1371), King Shenlepiya sent envoys such as Naisili and others to pay tribute to China. Among the offerings were bronze drums. This shows that the bronze drum had once again become an important instrument of the country. It was used in

important royal ceremonies and was also used as a national importance instrument to pay tribute and has the function of ritual and music.

②Used in sacrificial prayer ceremonies. When the researcher was inspecting Nakhon Phanom in northeastern Thailand, he found bronze drums and gongs displayed side by side in the Wat Phrathat Phanom Woramahawihan Museum. It is speculated that they may have been used in previous temple prayer ceremonies. In addition, in the areas where the Karen and Kemu people live in northern Thailand, there is also a tradition of using bronze drums. Bronze drums are used every New Year, weddings, baby naming or funerals, etc.. (Yanli Liang, 2017). However, most people in Thailand cannot describe the specific situation in detail, and more investigation is needed to prove it.

To sum up, the bronze drum music in southwest China and Thailand during its popularization period have both commonalities and different characteristics. In the popularization stage, Chinese bronze drum music has been integrated into the lives of the public, embodying the beliefs and concepts of the user groups, and has become a musical instrument and artifact shared from top to bottom, with regional and ethnic characteristics becoming more prominent. Due to the rule of the Thai people, the bronze drum in Thailand has once again become an important and ritual instrument of the country, showing a retro style. Although it cannot be compared with the luxurious lineup of China's Yunnan and Vietnam period, it has become a symbol of the royal family's majesty, retaining the ancient bronze drum's role in the country. The customs used in important ceremonies have become living fossils that survive to this day.

1.5 Decline period

1.5.1 Time range

Due to the continuous wars in modern times, the change of new regimes and the development of social economy and culture, many ancient cultural customs have gradually been submerged by modern civilization, and the phenomenon of traditional national culture being lost is common. Bronze drums, as the carrier of folk culture, are gradually disappearing. The decline period of bronze drum music roughly started and ended from the end of the 19th century to the present. Bronze drums unearthed from the Ming and Qing Dynasties were mostly placed as ancient relics in

temples, temples or cultural temples. In modern times, many people no longer know what bronze drums are. Even in ethnic minority areas, the ritual performances of bronze drums have gradually been lost, there are even fewer people who can cast and use bronze drums. In China, in order to protect this traditional culture, the government has listed it on the list of intangible cultural heritage, regularly organizes bronze drum festivals every year, and resurrects traditional sacrificial rituals. Folklorists have also gone deep into the folk to excavate the remaining bronze drum drum scores, so that the bronze drum culture can regain its former glory. But no matter what measures are taken, the bronze drum has lost its luster for more than two thousand years and remains in the world only as a carrier of memory. In the current era of high-tech entertainment, it has become a cultural relic for the world to remember and view.

1.5.2 Bronze drum musical performance form and ethnic groups using it

(1) In southwest China

The performance form of Chinese bronze drum music in the decline period is similar to that in the Ming and Qing Dynasties. Different regions, different festivals and folk activities, and different occasions have different functions of bronze drums and different performance forms. Bronze drums can be struck individually, male and female, in pairs, or combined with other musical instruments (such as horns, reeds, etc.), combined with singing and dancing, etc., in various forms. The main ethnic groups used are: Zhuang, Yao, Miao, Shui, Dai, Dong, Buyi, etc.. There are only two types of bronze drums: Ximeng type and Majiang type. For example, *Donglan County Chronicle* records: *Bronze drum is a precious musical instrument of the Zhuang and Yao people in Donglan County. Zhuang bronze drums are popular in Datong Township and Sihe Township, and are mostly performed on Chinese New Year and wedding days. It originated from labor, sacrifice, entertainment or etiquette. There are different opinions. From the perspective of dance performance form, it is closely related to entertainment. Most of the bronze drums that spread to the early days of the founding of the People's Republic of China were performed by 7 people, of which 4 people played 4 bronze drums, one person beats the cowhide drum for accompaniment, another person dances with a rain hat or dustpan, and another person beats the bamboo tube, the sound of the bronze drum*

continues, and the dance is full of joy. The bronze drummer and dancer will change when they are tired, and it often lasts for an hour or two.

(2) In Thailand

The situation in Thailand and China is similar. In the palace, bronze drums were played with other musical instruments for royal ceremonies. For example, during the Spring Plowing Festival, two bronze drums were played with large gongs. In the Royal Phoenix Boat Parade (also known as the Royal Barge Parade), bronze drums are played together with musical instruments such as conches, large gongs, victory drums, and trumpets (Fubin Wan, ect.. 2022 *Protection and Inheritance of Bronze Drum Culture in China and Southeast Asia*, p.193.). The only type of bronze drum used is the Ximeng type, and the main ethnic groups used are still the Tai, Khmu and Karen.

1.5.3 Music Function of the bronze drum in the decline period

(1) In southwest China

① Used for festivals and sacrifices. For example, the Zhuang people in Tian'a Nadong, Guangxi every year have a song to worship Maguai during the Maguai Festival in the first lunar month. The song goes like this: ...*The sail pole stands at the head of the village to summon souls and drive away evil spirits to protect the deities. They come to worship every three days, and every seven days there are noisy early in the morning. Some sang in the pavilions, some danced under the fence. Some played the flute, sheng and Xiao, and some played games and played tricks. Praying for good weather in the coming year and peace in the four seasons. The commotion continued until February 2, when the ants were buried. The festival has arrived. Men, women and children, old and young, have come to join in the fun. Painting flags, making sedan chairs and setting up torches are too busy for everyone. After a busy day and night comes, torches are lit and the horns are blown. When the horns are blown, the bronze drums sound and the suona sounds. The song shook the sky...*". *Guangxi Travel Notes* also records that the Wa Po custom in Donglan, Guangxi is similar to the Maguai Festival. In his book *Lovely Xilin*, Wang Wengao collected the text recording the Donglan New Year in Shanghai's *Taibai* in 1935: *The drums are grouped into groups. The drummer is a boy, and his left hand uses a small wooden stick to beat the edge of the drum surface. Use the mallet tied with a rag in*

your right hand to hit the center of the drum. (Bronze Drum in Hechi. 2009.) This way of playing can also be seen in today's Donglan Bronze Drum performances.

②Used for private entertainment, marching rallies, wedding celebrations and other activities. In 1933, Xifan Liu recorded in *Ling Biao Ji Barbarians* (Chapter 19): *Today barbarians gather to discuss all military and police public welfare matters, and they also use banging bronze drums as their only method of calling. The customs have continued, but they have not changed much. But this thing is not They used it for marching rallies, private entertainment, and also tried to control it.* In addition, he also recorded the Miao seedlings in Rongxian (now Rongshui, Rong'an), Sanjiang, Luocheng, Guizhou, and Xiajiang (now Congjiang) in Guizhou, the scene of Dong people using bronze drums in weddings: *Lighting torches, blowing firecrackers, blowing reeds, beating bronze drums, the valley is in response.* In the *Welcoming Song* of the Zhuang people, there is also *Big bronze drums on four sides, big bronze gongs on eight sides, everywhere.* The lyrics of *Knocking loudly, my heart is full of songs.*

It is worth mentioning that in the creation songs and myths and legends sung by many ethnic minorities, the bronze drum is transformed into a guardian spirit with spiritual power. It has the magical function of eliminating disasters, resolving problems, safeguarding justice, and protecting the people, and embodies the spirit of ethnic minorities' belief. Therefore, we can see that the sacred object function of the bronze drum is still being continuously enhanced.

(2)In Thailand

Used in court ceremonies. Currently, bronze drums are still used in Thai royal ceremonies, such as the foundation laying ceremony of the Grand Palace, the coronation ceremony of the king, the Changing Ceremony of the Emerald Buddha, the private celebration ceremony of Songkran Festival held in the palace, the Spring Plowing Festival ceremony, the Royal Phoenix Boat Parade Ceremony, etc.. (Fubin Wan, etc.. *Research on the Protection and Inheritance of Bronze Drum Culture in China and Southeast Asia*, p.192.)

Regarding the use of bronze drums by the Karen and Kemu people in Thailand, only a few documents have been mentioned, but no more detailed records have been found on how to use them. Only from some media resources, the researcher

found pictures of bronze drums, but there is no details about the use of bronze drums. When bronze drums were unearthed from private land, some households took them to Buddhist temples or erected temples where they were unearthed. During the investigation, the researcher found that many Thai people do not know what a bronze drum is.

Summary of this section:

In the course of more than a thousand years of history, the bronze drum has carried the faith of the ethnic group and has become a sacred instrument of the cultural identity of the ethnic group. With the change of political power and the pace of migrating ethnic groups, the bronze drum has ups and downs in the long river, branches and shunts, and where it falls, where it shines brightly, becoming a space-time dimensional belt, outlining the evolution of the ethnic group for more than two thousand years. The ancient bronze drum in southwest China has gone through a long development process from musical instrument to national heavy instrument to ritual instrument to sacred instrument. Its owners have ranged from the supreme kings, princes, ethnic leaders, to powerful men, nobles, and tribal kings, to ordinary people. The altar for worship gradually moved down to the public stage for entertaining supernatural being and people. Today, the bronze drum has fallen from the altar and has become a cultural heritage symbol of an ethnic group. Thailand's ancient bronze drums migrated and settled with their owners. After a long period of struggle, they finally followed the Thai people and continued to be used in the royal court for thousands of years as a national important and ritual vessel. Although it is no longer as glorious as it once was, it has become the only beautiful and beautiful flower standing quietly in the world today, continuing its vitality.

The development of modern science and technology has dispelled the folk beliefs of the ignorant era, and it is impossible for the bronze drum to return to the altar. People can only stop in front of thousands of bronze drums with different shapes, exquisite decorations and exquisite casters, watching them silently describe the splendor of more than two thousand years, becoming a trace of memory.

2. Contemporary Bronze Drum Music of southwest China and Thailand

2.1 Contemporary Bronze Drum Music in southwest China

In contemporary China, some ethnic groups in the three southwestern provinces of Guangxi, Guizhou and Yunnan still use bronze drums. For example, the Buyi, Miao and Shui ethnic groups in Guizhou, the Zhuang and Baiku Yao ethnic groups in Guangxi, the Zhuang, Yi and Wa ethnic groups in Yunnan, etc.. Among them, the twelve laws of bronze drums of the Buyi people in Zhenfeng, Guizhou, the bronze drums of the Donglan Zhuang people in Guangxi, the Baikuyao bronze drums of Nandan, and the bronze drums of the Zhuang and Yi people in Wenshan, Yunnan are the most famous. The researcher visited Donglan County, Guangxi in 2022 and 2023 to inspect bronze drums. When the researcher inspected bronze drums in Banwen Village, in 2023, it happened that a hundred-person bronze drum formation held a grand performance at the first bay of the Hongshui River here. So the researcher asked a friend to introduce me to the local resident Anyi Tan. He is a teacher at Donglan National Primary School and has been developing modern music drums, and he is also one of the leaders of this bronze drum's performance, with the help of teacher Tan the researcher collected and recorded the performance of bronze drums in Dong Lan's on site.



Figure 112. Anyi Tan's musical bronze drum display and live bronze drum competition performers.

Source: Jinxi Liu, 2023.



Figure 113. The 100 Bronze Drum Assembly at the first bay of Hongshui River in Banwen Village, Donglan.

Source: Jinxi Liu, 2023.

2.1.1 Introduction to the use of bronze drums in Guangxi Hechi festivals

Donglan County is affiliated to Hechi City, Guangxi. Hechi City is located in the north of Guangxi, adjacent to Guizhou, and is the land of Baiyue people in pre-Qin dynasty. The Hongshui River originating from Qijiang in Yunnan flows through the territory and is an important ancient waterway connecting Yunnan, Guizhou and Guangxi. Hechi City is the area with the largest number of surviving bronze drums. It is also the area where bronze drums are still used and the culture of bronze drums is best preserved. In July 2023, it was approved by the Ministry of Culture and Tourism of China to establish a national-level cultural and ecological protection zone to carry out regional overall protection of bronze drum customs and other intangible cultural heritage that are concentrated, distinctive, complete in form and connotation. Among them, Donglan County, Nandan County and Tian'e County are the core areas of the ecological zone. There are eight living ethnic groups in Hechi City: Zhuang, Han, Yao, Miao, Mulao, Maonan, Dong and Shui. The ethnic groups that still use bronze drums among the people include Zhuang, Yao and Miao. Donglan County is dominated by Zhuang. It is understood that there are more than 600 bronze drums handed down from ancient times in Donglan County, which is known as the Hometown of Bronze Drums in the World. The types of bronze drums are basically H_{IV} type, that is, H_{IV}-MJ (Majiang) type drum.

2.1.2 Occasions for the use of bronze drums

Bronze drums are mostly used in festivals, weddings, funerals and other occasions. Among the Zhuang people's festivals, the Maguai (蚂拐) Festival is the most famous. Maguai (local dialect of Guangxi) means frog. Maguai Festival, in Zhuang language, is au ja kve, which is translated as asking for the frog woman in Chinese. It is mainly popular in Zhuang villages along the Hongshui River. It usually runs from the first day of the Lunar New Year to the second day of February every year. Maguai, in Zhuang legends, is considered to be the deitydess in charge of wind and rain. By offering sacrifices to Maguai, people pray for good weather, abundant grains, and prosperity for people and animals. The ceremony of Maguai Festival mainly includes several steps, such as inviting Maguai, offering sacrifices to Maguai, filial piety to Maguai, and burying Maguai. The specific ritual practices are different in different villages where people live. (*Bronze drum in Hechi*. 2009.) Bronze drum playing is mainly used in the last three main links. Now, in order to protect the bronze drum culture, Hechi City has dedicated the bronze drum playing part of the festival to exchanges and performances. In various bronze drum celebrations held every year, bronze drum artists from all over Hechi City will perform collective bronze drum performances according to records. Local schools have also incorporated it into the school's extracurricular activities and passed down the teaching among primary and secondary school students.

2.1.3 The male drum and female drum

The bronze drums used in Zhuang festivals are male and female drums. Documentary records about the male and female bronze drums first appeared in the book *Chi Ya* written by Kuang Lu in the Ming Dynasty: *The two drums in the East and Guangdong are twice as high and wide, and the male and female echo each other. The Yi people beat them all the time to do a competition to worship the celestial being, and entertain guests.* There is currently no reliable evidence as to when the Male and female bronze drums first originated. Some scholars define the four bronze drums of different sizes unearthed from the M23 scene in Wanjiaba, Chuxiong, Yunnan, as male and female bronze drums. However, the researcher believes that this single case cannot be used as definite evidence be accepted. At present, male and female bronze drums are mainly judged by the light body, shape and timbre of the drum body. The ones with the rays of light body awns protrude like claws, small body

size, thin waist, soft and low sound are female drums, while the ones with relatively the long and slender light body awns, large body size, high pitched and sonorous sound are male drums (Anyi Tan, 2023). But during our on-the-spot investigation, we found that there are also performance teams that also play male as female drums, the villagers said that the main thing is judged by the bronze drum's sound. From the introduction of bronze drum types in Chapter 4, we know that the sound quality of bronze drums depends on casting and tuning technology. Among all bronze drum types in China, the ones that pay more attention to these two aspects of technology are H_{II}-BL, H_{II}-LS and H_{IV}-MJ three types. Judging from the unearthed reports and literature on various cultural relics seen so far, H_{II}-BL and H_{II}-LS are tall and have not been found in both male and female bronze drums. Therefore, the appearance of male and female bronze drums should have occurred when the H_{IV}-MJ type bronze drums entered the period of popularization of bronze drum music, that is, after the Tang and Song Dynasties.

2.1.4 Musical skills and posture of the bronze drum performance

The Donlan Zhuang bronze drum performances an ensemble with four bronze drums as a group. The four bronze drums have similar timbres, with two of male drums and two of female drums. Use a rope to pass through one drum lug and hang it on a long horizontal frame, or every bronze drum hangs from the drum rack. The drum tympanum faces the right side of the player. The player stands on the side of the drum body and holds the drumstick in his right hand to hit the center of the drum tympanum, and hold bamboo pieces or hard objects such as stones and coins in his left hand to hit the drum waist. One drum one tone, only hit the heart of the bronze drum, and other three drums to synthesize four different pitches, forming a high and low rhythm style.



Figure 114. The view of performer playing the bronze drum.

Source: Jinxi Liu, 2023.

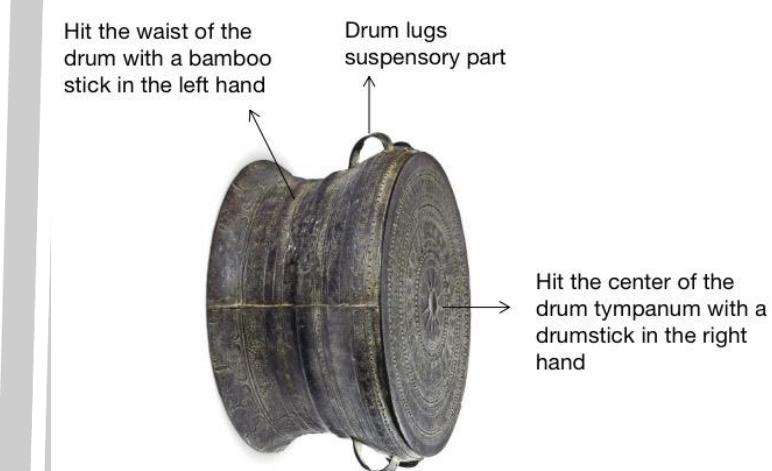


Figure 115. Schematic diagram of the beating parts of the Zhuang bronze drum.

Source: the drum's picture is from The essence of bronze drums in Guangxi, Zu 0019, p.128.



Figure 116. Drum hammer beating bronze drum

Source: Bronze Drum in Hechi, 2009; Lei Wen, 2023.

According to artists, drumsticks in the past were mostly made of old cloth soles rolled into a tube shape with a wooden or bamboo handle in the middle. Some also had the hammer head sewn into a square bag filled with cotton or rags. Many players now also buy wooden drum sticks directly. The hammer heads are wrapped in layers of red cloth or pieces of cloth to form a round head. Generally, heavy and hard drumsticks are not used when playing bronze drums to avoid damaging the drum surface.

2.1.5 Bronze drum's pitch and timbre

The Donglan Zhuang people use four bronze drums, two male drums and two female drums, with different pitches and timbres, and pairs with similar timbres. Donglan people have a customary name for the timbre of these four bronze drums: Ning (宁), Nang(囊), Neng(哝) and Nong (nōng浓). Among them, Ning (male drum) and Nang (female drum) are one group, and Neng (male drum) and Nong (female drum) are one group. Among them, the Ning sound drum should be sharp, high, crisp and bright. The Nang sound drum should be low, wide, open and bright. The Neng sound drum should be high-pitched and round. And the Nong drum should be vigorous and low-pitched. No matter which type Drums all have a common standard, which is that the sound quality is pure and not scattered. Generally speaking, the Ning Nang group has bright and divergent timbre, while the Neng Nong group has a concentrated and thick timbre. (*Bronze Drum Hechi*, p. 223).

Ning, Nang, Neng, Nong, its pitch sequence is: Ning-Neng-Nang-Nong, which sounds like GEDC or GEDA. It is understood that all bronze drums basically follow this pitch sequence principle. As for how to determine which bronze drum has which sound, Zhaochun Hua, an 83-year-old man from Jielangtun, Jingu Township, Donglan, said: *In the past, bronze drums were buried, and when they were dug out, the person in charge (that is, the custodian of the bronze drum) would The bronze drum is kept by a person with prestige.) He said to the bronze drum, When people call you Ning, you are Ning, and the Nang is the Nang. After saying this, the sound of the bronze drum will be the same as before.* (*Bronze Drum in Hechi*, p.137) This gives the bronze drum a mysterious color, and also shows that the Zhuang people's aesthetic requirements for sound sequence, sound, and sound quality have a certain

historical and cultural heritage. Because of this aesthetic commonality, what we see now in large-scale bronze drum performances, from four, to eight, to dozens or even a hundred or hundreds of bronze drums, all can be played in unison at the same time, and the resulting drum array has basically the same timbre. For example, in December 2011, 500 bronze drums in Donglan played in unison, and the 100-person bronze drum performance held at the first bay of Hongshui River in Donglan County on April 24, 2023. It was played in accordance with the GEDC (or A) scale sequence. The rhythm was uniform, the scene was warm, and the momentum was grand.

2.1.6 The beating of the bronze drum

Donglan bronze drum each township and village generally has its own drumming techniques, with different beating methods and different arrangements. The general order of ranking is:

Zhuang language pronunciation:	Ning	Nang	Neng	Nong
Male and female classification:	Male1	Female1	Male2	Female2
Front and rlug positions:	1	2	3	4
Approximate pitches:	G↓	D↑	E↓	C↓

When beating bronze drums, at the beginning, they take turns in the order of 1-2-3-4. After the basic rhythm is formed, the rhythm of the beating changes. *The key is the drum leader, who changes the tapping signals, the next three naturally follow, basically G (male drum) C (female drum) E (male drum) D (female drum), or C (female drum) D (female drum) E (male drum) G (male drum), changing patterns, and other more difficult patterns (Anyi Tan, 2023).* The rhythm of beating tricks is played by two drums at the same time. The rhythm of each set of bronze drums is the same, but the variations of beating tricks are performed at different times. The beating order of each group of bronze drums is: 4-2-3-1 (C-D-E-G) or 1-4-3-2 (G-C-E-D). Bronze drum performance generally adopts the continuous playing method, and the time can be extended indefinitely.



Figure 117. The position of four bronze drums.

Source: Jinxi Liu, 2023.

2.1.7 Bronze drum's notation and music analysis

Zhuang bronze drums have rich rhythms, but most of them are taught by heart orally and do not have their own notation method. After the 1950s, when various places began to create bronze drum dances, they began to use Chinese characters and simplified Chinese rhythm scores to record drum beats, and some drum scores were formed. Most of them use Chinese characters for gongs and drums, such as: Chang (昌), Dong (冬), or Du (都), Dong (冬), Dang (当), Da (达), Tong (同), etc.. Chang (昌) is usually in the downbeat and stressed position, and Dong(冬)is generally in the weak position and undressed beats. Du (都), Dong (冬), Dang (当), Da (达)simulate the sound of four bronze drums, Du is the male drum 1, Dang is the female drum 1, Dong is the male drum 2, Da is the female drum 2, and Tong was in unison. The four bronze drums are different in size and timbre, forming a set of melody scales with a pitch similar to "CGED".

the researcher selected two Donglan County participating groups, used the Chinese simple notation method to record rhythm patterns, and recorded their drum rhythms. One group practiced the performance of two male drums to match the rhythm of knocking tricks (there are also considered to be one male and one female. The one with a higher pitch is the male drum and the one with a lower pitch is the female drum). The other two female drums cooperate with the male drum to beat the basic rhythm. In order to have a clearer understanding of the rhythmic characteristics

of beating tricks, we only recorded the playing of two male drums in example 1. The other group is basically a loop of one section, so we only excerpted one section in example 2. Specific rhythm score examples are as follows:

① Donglan bronze drum rhythm score example 1:

Code:
 X=beat on the drum.
 0=rest.

01
 Chinese Characters for Gong and Drum: Du Dong |
 Male Drum 1: X 0 | X 0 | X 0 | X 0 | X 0 |
 Male Drum 2: 0 X | 0 X | 0 X | 0 X | 0 X |

06
 Chinese Characters for Gong and Drum: Du Dong | Du Dong Du | Du Du Dong | Du Du Dong | Du Dong |
 Male Drum 1: X 0 | X 0 X | X X 0 | X X 0 | X 0 | X 0 |
 Male Drum 2: 0 X | 0 X | 0 X | 0 X | 0 X |

11
 Chinese Characters for Gong and Drum: Du Du Dong Du | Dong Du 0 Du Du | Du Dong Du Dong | Du Dong Du | Dong Du Dong |
 Male Drum 1: X X 0 X | 0 X 0 | X 0 X 0 | X 0 X | 0 X | 0 X 0 |
 Male Drum 2: 0 X | X 0 0 X X | 0 X 0 X | 0 X | 0 X | X 0 X |

16
 Chinese Characters for Gong and Drum: Du Dong | Du Dong Dong | Du Du Dong Du | Dong Du Dong | Du Dong Du Dong |
 Male Drum 1: X 0 | X 0 | X X 0 X | 0 X 0 | 0 X 0 | X 0 X |
 Male Drum 2: 0 X | 0 X | 0 X X | 0 X | 0 X | 0 X 0 |

Chinese Characters for Gong and Drum		21						
Du	Dong Du	Dong Du	Dong	Du Du	Dong Du	Dong Du Dong Du	Dong	Dong Du
Male Drum 1	X 0 X	0 X 0	0	X X	0 X	0 X 0 X	0	0 0 X
Male Drum 2	0 X 0	X 0 X	0	X 0	X 0	X 0 X 0	X	X 0

Remark: The note duration is the same as the staff notation. The following example is the same.

Notation by: Jinxi Liu, 2023.

In this example, male drum 1 is the leader, and the changing percussion signal is the $\underline{\text{x}} \ \underline{\text{x}} \ \underline{\text{0}} \ \underline{\text{x}}$ rhythm pattern. Among them, bars 1-6 are the first part, which is the basic drum rhythm. Bars 7-9 are the first rhythmic variation section. Bar 10 is a transitional section. Bars 11-15 are the second rhythmic variation section. Bars 16-17 are transitional section. Bars 18-22 are the third rhythmic variation section, and bars 23-25 are the fourth rhythmic variation section. There is a cue rhythm pattern $\underline{\text{x}} \ \underline{\text{x}} \ \underline{\text{0}} \ \underline{\text{x}}$ before each rhythmic variation section played by the leader drummer. After this rhythm pattern, there will be a pattern of male drum 1 and male drum 2 changing to hit downbeats or stressed positions. For example: in bars 11 to 15, after the leading male 1 drum has struck the cue rhythm pattern $\underline{\text{x}} \ \underline{\text{x}} \ \underline{\text{0}} \ \underline{\text{x}}$, the male drum 1 hits the downbeat and stressed position in bar 13 and the downbeat of bar 14, like

$\underline{\text{x}} \ \underline{\text{0}} \ \underline{\text{x}} \ \underline{\text{0}} \ \underline{\text{x}}$ | x
this $\underline{\text{0}} \ \underline{\text{x}} \ \underline{\text{0}} \ \underline{\text{x}}$ | 0 , then what followed is the male drum 2 hit the stressed position

and downbeat of bar 14 to bar 15, $\underline{\text{0}} \ \underline{\text{x}} \ \underline{\text{0}} \ \underline{\text{x}}$ | x $\underline{\text{x}} \ \underline{\text{0}} \ \underline{\text{x}}$ | x , this playing style is called the ‘turtledove contending style’ (斑鳩爭鳴式), like two turtledoves tweeting in turn. This style is always used during auspicious and happy events. In the previous drum rhythm music example, this type is repeated twice, and the next two times are in bars 20-22, while bars 23-25 are a closing variation of this rhythm pattern. When recording this piece of music, the drummer did not finish it all, but according to reports, it is basically a repetitive loop of the basic drum beats.

From the above notation, we can get the following rhythm patterns:

Table 16. The rhythm pattern used for the male and female drums in Example 1.

Serial No.	Rhythm pattern of Male drum 1	Serial No.	Rhythm pattern of Male drum 2
1	x 0	8	0 x
2	x 0 x x x 0	9	x 0 0 x x
3	x x 0	10	0 x 0 x
4	x x 0 x	11	0 x x
5	0 x 0	12	x 0 x
6	x 0 x 0	13	0 x 0
7	0 x 0 x	14	x 0 x 0
		15	x x 0

Notation by: Jinxi Liu, 2023.

As can be seen from the table 16 above, during the beating process of male drum 1, there is an effect similar to syncopated rhythm (or it is the improvisation of the drummer), and male drum 2 even has a rare sixteenth note rhythm. The rhythm pattern of this drum score is relatively rich. The male drums on both sides cooperate tacitly, and the rhythm is well-proportioned, warm and lively.

②Donglan bronze drum rhythm score example 2.

Code:

X=beat on the drum.

0=rest.

ខ្លួន បាន ពិនិត្យ ខ្លួន

Chinese Characters for Gong and Drum		Du Dong		Du Dong		Du Dang		Dong Da		Du Dang		Dong Da	
Male Drum 1	X 0	X 0	X	0	X	0	X	0	X	0	X	0	
Male Drum 2	0 X	0 X	0	X	0	X	0	X	0	X	0	X	
Female Drum 1	0 0	0 0	0	X	0	0	X	0	0	X	0	X	0
Female Drum 2	0 0	0 0	0		0	X	0		0	X	0	X	
Drum Waist	0 X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	

Chinese Characters for Gong and Drum		Du Dang		Dong Da		Du Dang		Tong Tong		Du Du		Tong Tong		Dang Du Tong Tong	Du Dang Tong Tong
Male Drum 1	X 0	X	X	X X	X X	0	X	0		X	X	0	X	X	X
Male Drum 2	0 X	0	X	0	X	0	X	0		0	X	0	X	0	X
Female Drum 1	0 X	0	X	0 X	0 X	0	X	0		X	X X	0 X	0 X	0 X	
Female Drum 2	0	0 X	0	0 X	0 X	0	0 X	0		0	0 X	0	0 X	0	
Drum Waist	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	

Chinese Characters for Gong and Drum		Du Du Tong Tong		Dang Du Tong Tong		Du Dang Tong Tong		Du Dang		Dong Da		Du Dang		Dong Da
Male Drum 1	X X 0 X	0 X 0	X 0 X 0	X 0 X 0	X 0 X 0	X 0 X 0	X 0 X 0	X 0 X 0	X 0 X 0	X 0 X 0	X 0 X 0	X 0 X 0	X 0 X 0	
Male Drum 2	0 X	0 X	0 X	0 X	0 X	0 X	0 X	0 X	0 X	0 X	0 X	0 X	0 X	
Female Drum 1	0 X	X	X X	0 X	0 X	0 X	0 X	0 X	0 X	0 X	0 X	0 X	0 X	
Female Drum 2	0	0 X	0	0 X	0 X	0	0 X	0	0 X	0	0 X	0	0 X	
Drum Waist	X X X X	X X X X	X X X X	X X X X	X X X X	X X X X	X X X X	X X X X	X X X X	X X X X	X X X X	X X X X	X X X X	

ພអូនំ បណ្តិត ខេវ

Chinese Characters for Gong and Drum		Du Dang DongDa		Du Dang DongDa		TongTong DaDa		TongTong Dong Da		TongTong Da Dong	
Male Drum 1	X	0	X	0	X	0	X	0	X	0	
Male Drum 2	0	X	0	X	0	X	0	X	X	X	0 X
Female Drum 1	0 X	0	0 X	0	0 X	0	0 X	0	0 X	0	
Female Drum 2	0	0 X	0	0 X	X	X X	0 X	0 X	0	X	
Drum Waist	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X

(16)

Chinese Characters for Gong and Drum		TongTong Da Dong		TongTong Dong Da		TongTong Da Dong		TongTong DaDa		TongTong Da Dong	
Male Drum 1	X	0	X	0	X	0	X	0	X	0	
Male Drum 2	X X	0 X	X	X	X X	0 X	0 X	0	X X	0 X	
Female Drum 1	0 X	0	0 X	0	0 X	0	0 X	0	0 X	0	
Female Drum 2	0	X 0	0 X	0 X	0	X	X X	0	X 0	X 0	
Drum Waist	0	0	X X	X X	X X	X X	X X	X X	X X	X X	X X

(21)

Chinese Characters for Gong and Drum		Du Dong Dang Da									
Male Drum 1	X	0	X	0	X	0	X	0	X	0	
Male Drum 2	0 X	0	0 X	0	0 X	0	0 X	0	0 X	0	
Female Drum 1	0	X	0	X	0	X	0	X	0	X	
Female Drum 2	0	0 X	0	0 X	0	0 X	0	0 X	0	0 X	
Drum Waist	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X

(26)

Chinese Characters for Gong and Drum		Du Dang Dong Da									
Male Drum 1	X	0	X	0	X	0	X	0	X	0	
Male Drum 2	0	X	0	X	0	X	0	X	0	X	
Female Drum 1	0 X	0	0 X	0	0 X	0	0 X	0	0 X	0	
Female Drum 2	0	0 X	0	0 X	0	0 X	0	0 X	0	0 X	
Drum Waist	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X

(31)

(36)

Chinese Characters for Gong and Drum	Du Dang		Dong Da		Du Dang		Dong Da		Hai	Hai	
Male Drum 1	X	0	X	0	0		0	0			
Male Drum 2	0	X	0	X	0		0	0			
Female Drum 1	0	X	0	0	X	0	0	0	0	0	
Female Drum 2	0	0	X	0	0	X	0	0	0	0	
Drum Waist	X	X	X	X	X	X	X	X	0	0	

Notated by: Jinxi Liu, 2023.

In Example 2 of Donglan Bronze Drum rhythm score, bars 1-2 are the starting rhythm, played by two male drums. This is the same starting rhythm as in Example 1.

Bars 3-6 is the basic drum beat rhythm. During the beating of the male drums on both sides, the female drum beats the second half beat of the respective male drum. The basic drum beats are as follows:

Right hand	Male Drum 1	X	0
	Male Drum 2	0	X
	Female Drum 1	0	X
	Female Drum 2	0	0
Left hand	Drum Waist	X	X

The right hand of the four bronze drum is struck in the order of male-female-male-female, that is, 1-3-2-4, and the left hand is beating the waist of the drum in a consistent rhythm from beginning to end.

Bars 7-12 are the first rhythmic variation performance. The main drums are male drum 1 and female drum 1. Male drum 1 is the leader. The signal rhythm of rhythmic variation is | x x |, and the rhythm of the main drum in bars 7-9 are basically the same as bars 10-12, and the other two drums play in basic rhythm.

Bars 13-18 are transitional sections in the middle, with basic drum beats similar to bars 3-6.

Bars 19-25 are the second beating tricks performance. The main drum is transferred to male drum 2 and female drum 2. Male drum 2 is the leader. The signal rhythm of rhythmic variation is still | x x |. Bars 19-21 and the main rhythm in

bars 22-24 is basically the same. Bar 25 is a repetition of bar 24 and is also the transition section of the next part.

In bars 26-30, the second basic drumbeat appears:

Right hand	Male Drum 1	x 0
	Male Drum 2	0 x 0
	Female Drum 1	0 x
	Female Drum 2	0 0 x
Left hand	Drum Waist	x x x x

. In this basic drum beat, the right hand of the bronze drum is played in the order of male-male-female-female, that is, 1-2-3-4. The left hand still beats the waist of the drum with the rhythm $x x \underline{x x}$.

In bars 31-37, it switches to the first basic drum beat.

In bar 38, generally add vocals: Woo! Hai! As an end.

The two groups of male drums used in the score example take turns to play rhythmic variation. The rhythmic variation pattern in bars 19-25 are basically a repetition of the rhythmic variation pattern in bars 7-12.

The rhythm patterns used in example 2 are summarized as follows:

Table 17. In Example 2, the rhythm patterns used by male and female drums.

Serial No.	Rhythm pattern of Male drum 1	Seria No.	Rhythm pattern of Male drum 2	Seria No.	Rhythm pattern of Female drum 1	Seria No.	Rhythm pattern of Female drum 2
1	x 0	7	0 x	11	0 x 0	15	0 <u>0</u> x
2	x x	8	0 x 0	12	0 x 0 x	16	x x x
3	x x x x	9	x x x	13	0 x 0	17	0 x 0 x
4	0 x 0	10	x x 0 x	14	x x x	18	0 x
5	x x 0 x			0	x	19	0 x 0
6	x 0 x 0						

Notation by: Jinxi Liu, 2023.

From the table above, we can see that the rhythm patterns of the four drums are relatively simple, and most of them are male and female drums played

alternately. In addition, the different pitches of the four drums also make the bronze drum performance patchy and interesting.

2.1.8 Structural pattern of drum score

From the above examples, we can see that Donglan Bronze Drums all have a three-stage structure. We call it the beginning section, the middle section, and the end section. Its rhythmic characteristics are as follows:

The beginning section: they all start with the beating of the male drum. The male drum basically falls on the stressed position of the downbeat, and the female drum basically falls on the upbeat and weak position. The division of phrases is relatively clear. For example, in the example 1 and example 2, 1-6 bars are the beginning section.

The middle section: the rhythm changes greatly, and techniques such as rest, legato, and sixteenth rhythm are used. The rhythm becomes intense. The rhythm of the drum beat changes greatly. It belongs to the cadenza section. For example, in the example 1, 7-25 bars, are the middle section, in the example 2, 7-30 bars are the middle section.

The ending section: the ending section of Example 1 is not recorded in the example because the drummer stopped. However, it is similar to Example 2. It basically returns to the basic drum beat of the first section and is basically consistent with the rhythm of the first section. It shows the structural characteristics of traditional Chinese tail-joining style. For example, in the example 2, 31-38 bars are the ending section.

Through on-site comparison, it was found that although the performance teams participating in the bronze drum array came from different places in Hechi City, they had similarities in drumming methods and rhythm patterns, as well as the tail-jointed structural characteristics. In some large-scale bronze drum performances, in order to enhance the expressiveness and shocking effect, the government unified the drum scores and used basic drum beats for collective ensemble playing. This also made the bronze drum performances more and more common.

2.2 Contemporary bronze drum music in Thailand

It is understood that bronze drums are no longer used in most areas of Thailand. Only in the mountainous areas on the border between northern Thailand and

Myanmar, the custom of using bronze drums may be left. Specifically, the researcher asked museum staff in various places during the investigation, but most of them were unclear . But the tradition of using bronze drums in Thai royal ceremonies continues. The bronze drum used in the royal palace is the private property of the king and a symbol of royal power. It's the *HIII* type drum. the researcher watched the use of bronze drums in The Roral Ploughing Ceremony at Sanam Luang Ceremonial Ground in May 2023.

2.2.1 Introduction to The Roral Ploughing Ceremony

The Roral Ploughing Ceremony is an ancient royal ceremony held in many Asian countries such as Thailand and Myanmar. During the ceremony, the royal family simulates the process of plowing and sowing in order to pray for good weather and abundant harvests. In Thailand, The Roral Ploughing Ceremony, commonly known as Peak Na Khwan, means *Auspicious Beginning of the Rice Growing Season* and the Royal Ceremony is called *Phra Ratcha Phithi Charot Phra Nangkhan Raek Na Khwan*, which literally means Royal Ceremony to Celebrate Rice Auspicious rituals during the growing season. It can be traced back to the Sukhothai Dynasty and was learned from the Khmer people. The ceremony is a merger of Buddhist and Brahminical rituals into one royal ceremony, with the Buddhist part held at the Grand Palace and the Brahmanical part at Sanam Luang Ceremonial Ground. The farming ceremony attracted a large number of Thai people and foreign tourists to watch. After the plowing is completed, the chief plow official takes the sacred cow to the royal Brahmin divination table and chooses seven kinds of food to eat: grass, rice, corn, mung beans, sesame, wine and water. Which kinds of food the sacred cow chooses to eat will predict this year what kinds of foods will produce a good harvest. After the ceremony, onlookers will flock to the square to pick up the fine grain seeds sown during the ceremony and mix them with their own seeds, hoping to bring good luck and a good harvest. (source: https://en.m.wikipedia.org/wiki/Royal_Ploughing_Ceremony) Bronze drums are used in rituals as a symbol of royal power and as a tool to communicate with the deities.

2.2.2 Drum sacrifice ceremony before use

In Thailand, the bronze drum is considered to be one of the deities controlled by the Celestial Ruler Supreme deity. Only through pious worship and

worship can the drum deity come to ensure the smooth progress of the ceremony. Before each use of the bronze drum, the royal Brahmin priest, as the chief priest, will lead the royal band musicians to worship the bronze drum. The drum sacrifice ceremony is held the day before the bronze drum is used. People place the bronze drum to be used the next day together with the drum stand on the altar. On the altar in front of the bronze drum, there are seven-layer flower towers, coconuts, bananas, pineapples and other fruit sacrifices. The Brahmin priest recited mantras and worshiped, sprinkled holy water and lit holy leaves on the drum tympanum. After the ceremony, the musicians presented jasmine garlands to the drums in turn and prayed devoutly. (Yanli Liang. 2020. *Research on bronze drum in Thailand Culture*. p.55.)

2.2.3 Bronze drum performance form in the ceremony

The body of the bronze drum used in the ceremony has a layer of gold plating, and the chest and waist of the drum have two circles of black lacquer and gold-plated patterns. It looks like black and gold alternate, gorgeous and majestic. During the ceremony, the bronze drums were placed on both sides behind the gong, and were placed at the end of the venue, far opposite the rostrum of the king and queen. Bronze drums and gongs played together. After the presiding officer finished ordering powder for the cows, the music officer in charge of the gongs struck it, the two bronze drums simultaneously began to beat the drum hearts at the same rhythm and a constant speed. The plowing ceremony officially began, and the bronze drums continued to beat until The Royal Ploughing Ceremony is over.



Figure 118. The bronze drum in The Royal Ploughing Ceremony

Source: Facebook-NNT-National News Bureau of Thailand, 2019.

2.2.4 Musical skills and posture of the bronze drum performance

The technique of playing the bronze drum during the ceremony is relatively simple. The performer looks majestic, stands with both feet side by side, looks forward, holds the drumsticks in both hands, and does not move his arms. He only uses his wrists to drive his hands up and down to beat the heart of the drum at a uniform speed at the same time.



Figure 119. The back view of the two performers beating bronze drums .

Source: Facebook-NNT-National News Bureau of Thailand, 2019.



Figure 120. The side view of the performer beating the drum.

Source: Facebook-NNT-National News Bureau of Thailand, 2019.

2.2.5 Bronze drum's notation and music analysis

We watched the live broadcast of the Royal Plowing Ceremony at Sanam Luang Ceremonial Ground on May 3, 2019 from the NNT-National News

Bureau of Thailand public homepage on Facebook, and recorded the bronze drum performance presented in the video. The total length of the video is 1 hour 33 minutes and 7 seconds. Among them, the plowing ceremony starts at 19'29" and ends at about 47'00", at 47'36", the music officer in charge of the gongs and drums bowed to the rostrum and exited the venue. The total duration of gong and bronze drum performance is 28'31", with a total of 9 plowing circles. When each circle reaches the statue of the deity, the gong musician will strike the gong once, and all team walked past the statue and struck the gong 3 times in total. We recorded 9 rhythmic examples of the drum and gong playing together. The details are as follows:

①The Royal Ploughing Ceremony bronze drum rhythm score example 1, from 19'29" to 20'09", the time for striking the gong three times is at 19'29", 19'51" and 20'08":

Code:

X=beat on the drum.

0=rest.

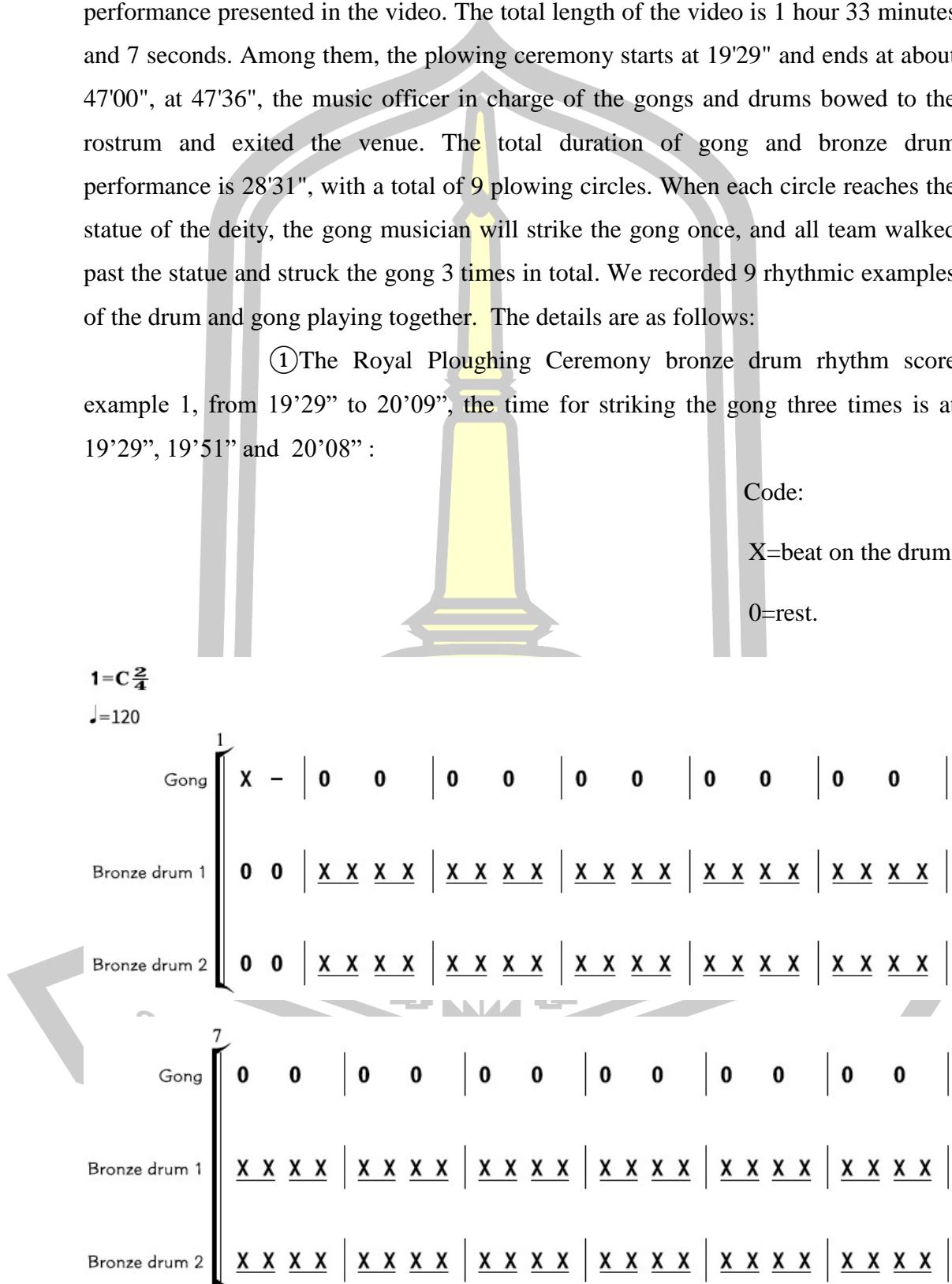
$$1 = C \frac{2}{4}$$

• $\angle = 120^\circ$

111

Bronze drum

Bronze drum 2



13

Gong 0 0 | 0 0 | 0 0 | 0 0 | 0 0 | 0 0 |

Bronze drum 1 X X X X | X X X X | X X X X | X X X X | X X X X | X X X X |

Bronze drum 2 X X X X | X X X X | X X X X | X X X X | X X X X | X X X X |

19

Gong 0 0 | 0 0 | 0 0 | 0 0 | X - | 0 0 |

Bronze drum 1 X X X X | X X X X | X X X X | X X X X | X X X X | X X X X |

Bronze drum 2 X X X X | X X X X | X X X X | X X X X | X X X X | X X X X |

25

Gong 0 0 | 0 0 | 0 0 | 0 0 | 0 0 | 0 0 |

Bronze drum 1 X X X X | X X X X | X X X X | X X X X | X X X X | X X X X |

Bronze drum 2 X X X X | X X X X | X X X X | X X X X | X X X X | X X X X |

30

Gong 0 0 | 0 0 | 0 0 | 0 0 | 0 0 | 0 0 |

Bronze drum 1 X X X X | X X X X | X X X X | X X X X | X X X X | X X X X |

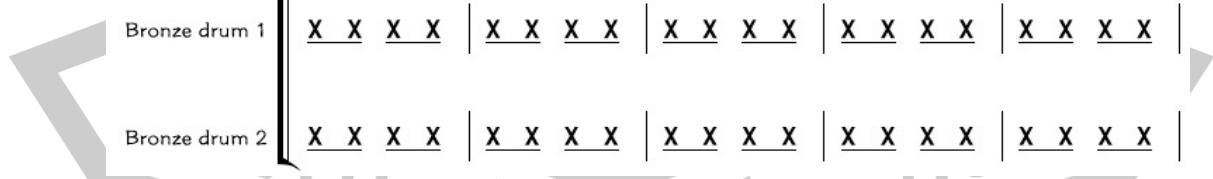
Bronze drum 2 X X X X | X X X X | X X X X | X X X X | X X X X | X X X X |

35

Gong 0 0 | 0 0 | 0 0 | 0 0 | X - | 0 0 |

Bronze drum 1 X X X X | X X X X | X X X X | X X X X | X X X X | X X X X |

Bronze drum 2 X X X X | X X X X | X X X X | X X X X | X X X X | X X X X |



Notation by: Jinxi Liu, 2023.

②The Royal Ploughing Ceremony bronze drum rhythm score example 2, from 25'22" to 25'59", the time for striking the gong three times is 25'23", 25'37" and 25'58" :

19

Gong 0 0 | 0 0 | 0 0 | 0 0 | 0 0 | 0 0 |

Bronze drum 1 X X X X | X X X X | X X X X | X X X X | X X X X | X X X X |

Bronze drum 2 X X X X | X X X X | X X X X | X X X X | X X X X | X X X X |

25

Gong 0 0 | 0 0 | 0 0 | 0 0 | 0 0 | 0 0 |

Bronze drum 1 X X X X | X X X X | X X X X | X X X X | X X X X | X X X X |

Bronze drum 2 X X X X | X X X X | X X X X | X X X X | X X X X | X X X X |

30

Gong 0 0 | 0 0 | 0 0 | 0 0 | 0 0 | 0 0 |

Bronze drum 1 X X X X | X X X X | X X X X | X X X X | X X X X | X X X X |

Bronze drum 2 X X X X | X X X X | X X X X | X X X X | X X X X | X X X X |

35

Gong 0 0 | 0 0 | X - | 0 0 |

Bronze drum 1 X X X X | X X X X | X X X X | X X X X |

Bronze drum 2 X X X X | X X X X | X X X X | X X X X |

Notation by: Jinxi Liu, 2023.

③ The Royal Ploughing Ceremony bronze drum rhythm score example 3, started from 29'10" to 29'39", the time for striking the gong three times is 29'11", 29'27" and 29'37" :

Code:

X=beat on the drum.

0=rest.

1=C $\frac{2}{4}$

♩=120

1

Gong 0 0 | X - | 0 0 | 0 0 | 0 0 | 0 0 |

Bronze drum 1 X X X X | X X X X | X X X X | X X X X | X X X X | X X X X |

Bronze drum 2 X X X X | X X X X | X X X X | X X X X | X X X X | X X X X |

7

Gong 0 0 | 0 0 | 0 0 | 0 0 | 0 0 | 0 0 |

Bronze drum 1 X X X X | X X X X | X X X X | X X X X | X X X X | X X X X |

Bronze drum 2 X X X X | X X X X | X X X X | X X X X | X X X X | X X X X |

13

Gong 0 0 | 0 0 | 0 0 | 0 0 | 0 0 | X - |

Bronze drum 1 X X X X | X X X X | X X X X | X X X X | X X X X | X X X X |

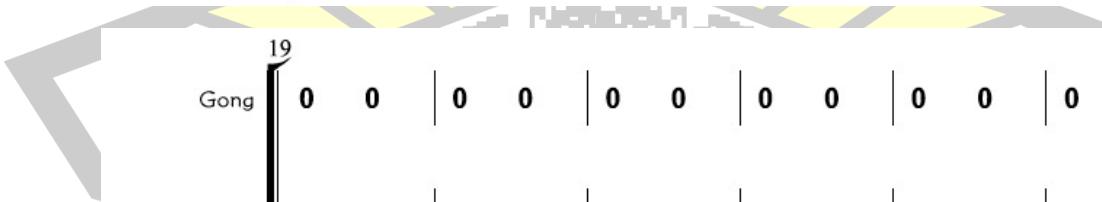
Bronze drum 2 X X X X | X X X X | X X X X | X X X X | X X X X | X X X X |

19

Gong 0 0 | 0 0 | 0 0 | 0 0 | 0 0 | 0 0 |

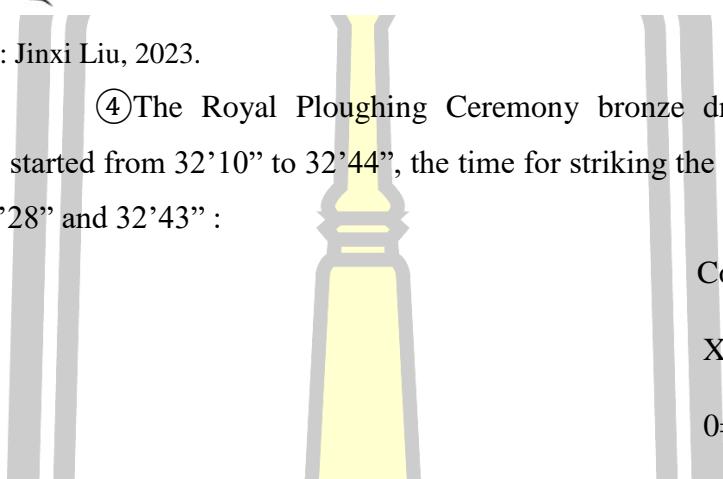
Bronze drum 1 X X X X | X X X X | X X X X | X X X X | X X X X | X X X X |

Bronze drum 2 X X X X | X X X X | X X X X | X X X X | X X X X | X X X X |



Notation by: Jinxi Liu, 2023.

④The Royal Ploughing Ceremony bronze drum rhythm score example 4, started from 32'10" to 32'44", the time for striking the gong three times is 32'11", 32'28" and 32'43" :



Code:

X=beat on the drum.

0=rest.

13

Gong 0 0 | 0 0 | 0 0 | 0 0 | 0 0 | 0 0 |

Bronze drum 1 X X X X | X X X X | X X X X | X X X X | X X X X | X X X X |

Bronze drum 2 X X X X | X X X X | X X X X | X X X X | X X X X | X X X X |

19

Gong 0 0 | X - | 0 0 | 0 0 | 0 0 | 0 0 |

Bronze drum 1 X X X X | X X X X | X X X X | X X X X | X X X X | X X X X |

Bronze drum 2 X X X X | X X X X | X X X X | X X X X | X X X X | X X X X |

25

Gong 0 0 | 0 0 | 0 0 | 0 0 | 0 0 | 0 0 |

Bronze drum 1 X X X X | X X X X | X X X X | X X X X | X X X X | X X X X |

Bronze drum 2 X X X X | X X X X | X X X X | X X X X | X X X X | X X X X |

30

Gong 0 0 | 0 0 | 0 0 | 0 0 | X - |

Bronze drum 1 X X X X | X X X X | X X X X | X X X X | X X X X |

Bronze drum 2 X X X X | X X X X | X X X X | X X X X | X X X X |

35

Gong 0 0 | |

Bronze drum 1 X X X X | |

Bronze drum 2 X X X X | |

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Notation by: Jinxi Liu, 2023.

⑤The Royal Ploughing Ceremony bronze drum rhythm score example 5, started from 34'54" to 35'21", the time for striking the gong three times is 34'55", 35'09" and 35'20":

example 5, started from 34'54" to 35'21", the time for striking the gong three times is 34'55", 35'09" and 35'20":

Code:
 X=beat on the drum.
 0=rest.

1=C $\frac{2}{4}$
 $\text{♩} = 120$

Gong

1	0 0	X - 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0

Bronze drum 1

	X X X X X X X X X X X X X X X X X X X X X X X X

Bronze drum 2

	X X X X X X X X X X X X X X X X X X X X X X X X

Gong

7	0 0 0 0 0 0 0 0 0 0 0 0 0 0

Bronze drum 1

	X X X X X X X X X X X X X X X X X X X X X X X X

Bronze drum 2

	X X X X X X X X X X X X X X X X X X X X X X X X

Gong

13	0 0 0 0 0 0 X - 0 0 0 0 0 0

Bronze drum 1

	X X X X X X X X X X X X X X X X X X X X X X X X

Bronze drum 2

	X X X X X X X X X X X X X X X X X X X X X X X X

Gong	0 0 0 0 0 0 0 0 0 0 0 0
Bronze drum 1	<u>X X X X</u>
Bronze drum 2	<u>X X X X</u>
	  
Gong	25 0 0 0 0 X - 0 0
Bronze drum 1	<u>X X X X</u> <u>X X X X</u> <u>X X X X</u> <u>X X X X</u>
Bronze drum 2	<u>X X X X</u> <u>X X X X</u> <u>X X X X</u> <u>X X X X</u>

Notation by: Jinxi Liu, 2023.

⑥The Royal Ploughing Ceremony bronze drum rhythm score example 6, started from 37'38" to 38'10", the time for striking the gong three times is at 37'39", 37'53" and 38'09" :



Code:

X=beat on the drum.

0=rest.

$$1 = C \frac{2}{4}$$

J=120

7

Gong 0 0 | 0 0 | 0 0 | 0 0 | 0 0 | 0 0 |

Bronze drum 1 X X X X | X X X X | X X X X | X X X X | X X X X | X X X X |

Bronze drum 2 X X X X | X X X X | X X X X | X X X X | X X X X | X X X X |

13

Gong 0 0 | 0 0 | 0 0 | X - | 0 0 | 0 0 |

Bronze drum 1 X X X X | X X X X | X X X X | X X X X | X X X X | X X X X |

Bronze drum 2 X X X X | X X X X | X X X X | X X X X | X X X X | X X X X |

19

Gong 0 0 | 0 0 | 0 0 | 0 0 | 0 0 | 0 0 |

Bronze drum 1 X X X X | X X X X | X X X X | X X X X | X X X X | X X X X |

Bronze drum 2 X X X X | X X X X | X X X X | X X X X | X X X X | X X X X |

25

Gong 0 0 | 0 0 | 0 0 | 0 0 | 0 0 | 0 0 |

Bronze drum 1 X X X X | X X X X | X X X X | X X X X | X X X X | X X X X |

Bronze drum 2 X X X X | X X X X | X X X X | X X X X | X X X X | X X X X |

30

Gong 0 0 | 0 0 | 0 0 | 0 0 | X - | 0 0 |

Bronze drum 1 X X X X | X X X X | X X X X | X X X X | X X X X | X X X X |

Bronze drum 2 X X X X | X X X X | X X X X | X X X X | X X X X | X X X X |



Notation by: Jinxi Liu, 2023.

⑦ The Royal Ploughing Ceremony bronze drum rhythm score example 7, started from 40'24" to 40'57", the time for striking the gong three times is at 40'25", 40'41", 40'55":

Code:
X=beat on the drum.
0=rest.

1=C $\frac{2}{4}$
♩=120

Gong

0	0		X	-		0	0		0	0		0	0	
---	---	--	---	---	--	---	---	--	---	---	--	---	---	--

Bronze drum 1

X	X	X	X		X	X	X	X		X	X	X	X		X	X	X	X		X	X	X	X	
---	---	---	---	--	---	---	---	---	--	---	---	---	---	--	---	---	---	---	--	---	---	---	---	--

Bronze drum 2

X	X	X	X		X	X	X	X		X	X	X	X		X	X	X	X		X	X	X	X	
---	---	---	---	--	---	---	---	---	--	---	---	---	---	--	---	---	---	---	--	---	---	---	---	--

Gong

0	0		0	0		0	0		0	0		0	0		0	0	
---	---	--	---	---	--	---	---	--	---	---	--	---	---	--	---	---	--

Bronze drum 1

X	X	X	X		X	X	X	X		X	X	X	X		X	X	X	X		X	X	X	X	
---	---	---	---	--	---	---	---	---	--	---	---	---	---	--	---	---	---	---	--	---	---	---	---	--

Bronze drum 2

X	X	X	X		X	X	X	X		X	X	X	X		X	X	X	X		X	X	X	X	
---	---	---	---	--	---	---	---	---	--	---	---	---	---	--	---	---	---	---	--	---	---	---	---	--

Gong

0	0		0	0		0	0		0	0		0	0		0	-	
---	---	--	---	---	--	---	---	--	---	---	--	---	---	--	---	---	--

Bronze drum 1

X	X	X	X		X	X	X	X		X	X	X	X		X	X	X	X		X	X	X	X	
---	---	---	---	--	---	---	---	---	--	---	---	---	---	--	---	---	---	---	--	---	---	---	---	--

Bronze drum 2

X	X	X	X		X	X	X	X		X	X	X	X		X	X	X	X		X	X	X	X	
---	---	---	---	--	---	---	---	---	--	---	---	---	---	--	---	---	---	---	--	---	---	---	---	--

Gong	0 0 0 0 0 0 0 0 0 0 0 0
Bronze drum 1	X X X X X X X X X X X X X X X X X X X X X X X X
Bronze drum 2	X X X X X X X X X X X X X X X X X X X X X X X X
Gong	0 0 0 0 0 0 0 0 0 0 0 0
Bronze drum 1	X X X X X X X X X X X X X X X X X X X X
Bronze drum 2	X X X X X X X X X X X X X X X X X X X X
Gong	0 0 0 0 X - 0 0 0 0
Bronze drum 1	X X X X X X X X X X X X X X X X X X X X
Bronze drum 2	X X X X X X X X X X X X X X X X X X X X

Notation by: Jinxi Liu, 2023.

⑧ The Royal Ploughing Ceremony bronze drum rhythm score example 8, started from 43'27" to 43'59", the time for striking the gong three times is at 43'28", 43'40" and 43'58":

Code:

ធម្មនំ បណ្តុះពិន្ទុ

X=beat on the drum.

0=rest.

1=C $\frac{2}{4}$

♩=120

1

Gong 0 0 | X - | 0 0 | 0 0 | 0 0 | 0 0 |

Bronze drum 1 X X X X | X X X X | X X X X | X X X X | X X X X | X X X X |

Bronze drum 2 X X X X | X X X X | X X X X | X X X X | X X X X | X X X X |

7

Gong 0 0 | 0 0 | 0 0 | 0 0 | 0 0 | 0 0 |

Bronze drum 1 X X X X | X X X X | X X X X | X X X X | X X X X | X X X X |

Bronze drum 2 X X X X | X X X X | X X X X | X X X X | X X X X | X X X X |

13

Gong 0 0 | 0 0 | 0 0 | 0 0 | 0 0 | 0 0 | X - |

Bronze drum 1 X X X X | X X X X | X X X X | X X X X | X X X X | X X X X |

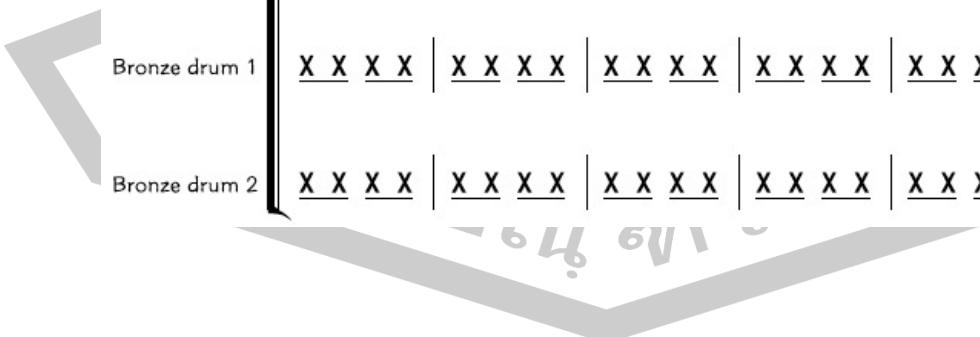
Bronze drum 2 X X X X | X X X X | X X X X | X X X X | X X X X | X X X X |

19

Gong 0 0 | 0 0 | 0 0 | 0 0 | 0 0 | 0 0 | 0 0 |

Bronze drum 1 X X X X | X X X X | X X X X | X X X X | X X X X | X X X X |

Bronze drum 2 X X X X | X X X X | X X X X | X X X X | X X X X | X X X X |



Gong	0 0 0 0 0 0 0 0 0 0
Bronze drum 1	X X X X X X X X X X X X X X X X X X X X
Bronze drum 2	X X X X X X X X X X X X X X X X X X X X
Gong	0 0 0 0 X - 0 0
Bronze drum 1	X X X X X X X X X X X X X X X X
Bronze drum 2	X X X X X X X X X X X X X X X X

Notation by: Jinxi Liu, 2023.

⑨The Royal Ploughing Ceremony bronze drum rhythm score example 9, started from 46'36" to 47'00", the time for striking the gong three times is at 46'37", 46'47" and 46'59":

Code:

X=beat on the drum.

0=rest.

1=C $\frac{2}{4}$	
$\text{♩}=120$	
Gong	0 0 X - 0 0 0 0 0 0 0 0
Bronze drum 1	X X X X X X X X X X X X X X X X X X X X X X X X
Bronze drum 2	X X X X X X X X X X X X X X X X X X X X X X X X

7

Gong 0 0 | 0 0 | 0 0 | 0 0 | 0 0 | 0 0 |

Bronze drum 1 X X X X | X X X X | X X X X | X X X X | X X X X | X X X X |

Bronze drum 2 X X X X | X X X X | X X X X | X X X X | X X X X | X X X X |

13

Gong 0 0 | 0 0 | 0 0 | 0 0 | 0 0 | X - |

Bronze drum 1 X X X X | X X X X | X X X X | X X X X | X X X X | X X X X |

Bronze drum 2 X X X X | X X X X | X X X X | X X X X | X X X X | X X X X |

19

Gong 0 0 | 0 0 | 0 0 | 0 0 | 0 0 | 0 0 |

Bronze drum 1 X X X X | X X X X | X X X X | X X X X | X X X X | X X X X |

Bronze drum 2 X X X X | X X X X | X X X X | X X X X | X X X X | X X X X |

19

Gong 0 0 | 0 0 | 0 0 | 0 0 | 0 0 | 0 0 |

Bronze drum 1 X X X X | X X X X | X X X X | X X X X | X X X X | X X X X |

Bronze drum 2 X X X X | X X X X | X X X X | X X X X | X X X X | X X X X |

25

Gong 0 0 | 0 0 | 0 0 | 0 0 | 0 0 | 0 0 |

Bronze drum 1 X X X X | X X X X | X X X X | X X X X | X X X X |

Bronze drum 2 X X X X | X X X X | X X X X | X X X X | X X X X |



Gong	30		0	0	0	0	x	-	0	0	
Bronze drum 1	x	x	x	x	x	x	x	x	x	x	
Bronze drum 2	x	x	x	x	x	x	x	x	x	x	

Notation by: Jinxi Liu, 2023.

When recording the music score, we used the strokes of the gong as clues. The gong plays the role of signal prompt in the ensemble with the bronze drum. The plowing team consists of three parts, the priests, the cattle team, and the team carrying the sacrifices. When each team goes to location near the bronze drum and the gong, the gong will be struck once.

The above examples to show that overall, the drum patterns are similar all throughout the plowing ceremony. The timing of the gong strike is determined according to the time of the ploughing procession. Bronze drum 1 and bronze drum 2 are played with both left and right hands at a constant speed, like this:

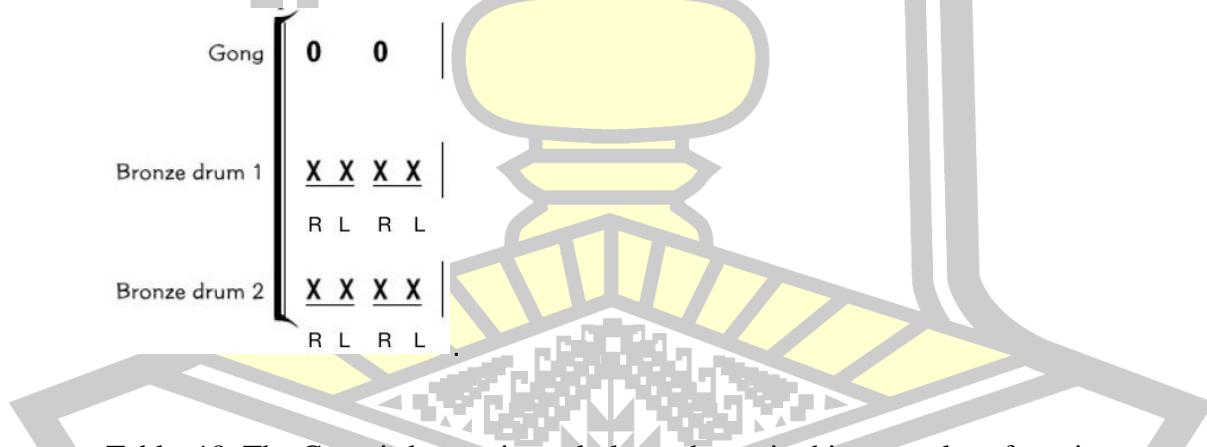


Table 18. The Gong is beaten irregularly as shown in this examples of music.

Music Example	Notation time (minute, video clip start and end time)	Gong beat on measure number
1	19'29" ~ 20'09"	1, 23, 39.
2	25'22" ~ 25'59"	2, 16, 37.
3	29'10" ~ 29'39"	2, 18, 28.

4	32°10" ~ 32°44"	2, 20, 34.
5	34°54" ~ 35°21"	2, 16, 27.
6	37°38" ~ 38°10"	2, 16, 34.
7	40°24" ~ 40°57"	2, 18, 33.
8	43°27" ~ 43°59"	2, 18, 32.
9	46°36" ~ 47°00"	2, 18, 32.

Tabulator: Jinxi Liu.

2.3 comparison of contemporary bronze drum music of southwest China and Thailand.

Through the above analysis, we can summarize the similarities and differences between contemporary bronze drum music in these two countries.

(1) The similarity

Both contemporary bronze drum music of southwest China and Thailand have the function of entertaining deities.

(2) The differences

Due to the different countries and national cultures used, the contemporary bronze drum music of southwest China and Thailand is also very different. Details are as follows table:

Table 19. The differences of the contemporary bronze drum music between the Donglan festival and the Royal Ploughing Ceremony.

Comparative Item	Donglan Festival in southwest China	The Royal Ploughing Ceremony in Thailand
Bronze drum's type	H _{IV} type	H _{III} type
Instrument combination	Generally, two male and two female drums are played together.	Two bronze drums are played at the same time, regardless of the male and female drums.
Bronze drum's musical performance (pitch and timbre)	Better, soft and low sound are female drums, high pitched and sonorous	Poor, the sound of both bronze drums is dull.

	sound are male drums. A customary name for the timbre of these four bronze drums: Ning (sounds like G), Nang (sounds like D), Neng (sounds like E) and Nong (ນົອງ, sounds like A or C).	
Application occasions	Folk festival ceremony	The Royal festival ceremony
Bronze drum's placement	Side hanging, four bronze drums arranged vertically.	Vertical hanging, two bronze drums arranged horizontally.
Mode of performance	The right hand uses a drumstick to hit the drum heart of the tympanum, and the left hand uses a bamboo stick or other hard object to hit the drum waist. The tapping movement is free.	Hold the drumsticks with both hands and strike the drum heart of tympanum at equal distances up and down. The striking movements and postures are strictly regulated.
Rhythm characteristics	The four drums have different rhythms, have a rhythmic variation section in the middle, and have a three-stage structure.	The rhythm pattern of the two bronze drums is the same from beginning to end.
Beating pattern	The beating order of four bronze drums is: 4-2-3-1 (C-D-E-G) or 1-4-3-2 (G-C-E-D).	Beating at a constant speed simultaneously.

Tabulator: Jinxi Liu, 2023.

To sum up, Chinese contemporary bronze drum music and Thai contemporary bronze drum music have different musical expressions due to different usage occasions and objects. The contemporary bronze drum in Thailand is an important national and ritual instrument. It pays more attention to the symbolic meaning of the bronze drum and does not have too many requirements for the musicality of the

bronze drum. The bronze drum used is the H_{III} with exquisite shape and decoration but poor musical performance. The contemporary bronze drums in southwest China are mostly used for performances in folk festivals. People pay more attention to the musical performance of bronze drums when choosing them to play, so, the H_{IV} drum with the best musical performance is used. Now, as the object of protection of intangible cultural heritage, they are also used as entertainment performance instruments. The musical expression of bronze drums in southwest China is more richer.

Summary of this section:

In the process of historical development, different types of bronze drums were popular in different time periods, with different distribution areas, different user groups, different musical performances, and different historical functions. Through the analysis of five periods, the different cultural functional characteristics of bronze drum music in these two countries in different periods. At the embryonic period, the bronze drum was an ceremonial instrument in southwest China. At the prosperity period, the bronze drum had the ritual and musical function, sacrificial function, and military function, it's the national heavy treasures and the ritual instrument. At the development period, the bronze drum had the sacrifice, military, feast and gather the crowd functions, etc.. At the popularization period, the function of bronze drum music in this period began to have different characteristics in these two countries. In southwest of China, the bronze drum had the ritual and music function, military ceremony, for the sound of the night watches, for the festivals and folk activities, for the banquet guests, for the weddings and funerals, and also used in temples to deities. However, in Thailand, the bronze drum was used for ritual and music function, and used in sacrificial prayer ceremonies. The main group of people using bronze drums in southwest China are folk, the bronze drums had become a folk instrument. While bronze drums in Thailand were used in important ceremonies as national heavy treasures and ritual instrument. At the decline period, the bronze drum was used for festivals and sacrifices and for private entertainment in southwest China, but in Thailand, the bronze drum was used in royal ceremonies, still a national heavy treasure.

Comparing the bronze drum music examples of contemporary southwest China and Thai royal ceremony, whether in terms of musical instrument performance or the pitch and timbre, or the mode of performance, or the rhythm characteristics, or the beating patterns, the musical expression characteristics of bronze drums in southwest is more richer than Thailand royal ceremony.



CHAPTER VII

Conclusion Discussion and Suggestion

1. Conclusion

According to the first research objective, on the basis of practical investigation, the researcher combined archaeological excavation and academic research data to analyze the distribution, the shape, decoration, casting technology and musical performance of bronze drums in Thailand and the same type of bronze drums in southwest China. Confirmed that, currently, there are two types of bronze drums visible in Thai collections, namely H_I and H_{III} . The distribution areas of the two types are relatively regular, that is, H_I is mainly concentrated in the northeast, east and south of Thailand. H_{III} is mainly concentrated in northern and central Thailand. Comparing the classification situation of bronze drums in Thailand, we selected 3 of the 8 types of bronze drums in China to introduce, namely the H_I - Szs, H_I - Lsc, H_{III} - Xm bronze drum. Among them, H_I - Szs is mainly concentrated in Yunnan and Guangxi, H_I - Lsc is mainly concentrated in Guangxi, and H_{III} - Xm mainly concentrated in Yunnan. The appearance characteristics contain the historical information of the bronze drums. In order to compare the bronze drums more clearly in those two country, we conducted a deconstructive analysis of each comparative element to gain a clearer understanding of the similarities and differences between bronze drums in Thailand and southwest China.

According to the second research objective, the geographical relationship between the distribution of H_I and H_{III} type bronze drums in southwest China and Thailand was compared, and get the speculate on three main transmission paths of bronze drums: the first one maybe that the H_{III} bronze drums in China, Myanmar and Laos spread to northern Thailand via the Mekong River, the second one maybe that the H_I bronze drum spreads to Vietnam to northeastern and east Thailand via the Mekong River and other rivers, the third maybe that the H_I type bronze drums directly spread to southern Thailand via sea route from Vietnam. All these, provide evidence for research on the spread of bronze drums in Thailand.

Besides these, the similarities and differences in appearance and decoration features, casting technology and musical performance of the same type of bronze drums in Thailand and southwest China were compared and analyzed. And the conclusions were drawn that the bronze drum shell storage vessels and some H_I-Szs bronze drum types discovered in Lijiashan and Xilin areas of China have many similarities with the H_I-TA discovered in Thailand in terms of shape and decoration, and should have a certain origin. While there are also some H_I-Szs type bronze drums obviously follow the shape characteristics of the Pre-H_I-WJB type. Although they have their own characteristics in shape and decoration as H_I-TA drums in Thailand, the main halo decorative elements of the bronze drum are basically the same, such as the shape of the light body, the decorative patterns between the light bodies, the main halo pattern on the drum tympanum that decorated with flying heron or feathered-figure pattern, the main halo pattern on the drum body that decorated with the feathered-figure rowing pattern, and the main halo pattern on the drum chest that decorated with the feathered-figure pattern, etc.. By comparison, it is undeniable that, the H_I-TA type drum in Thailand looks later than most of the H_I-Szs type in southwest China, and the H_I-TB type drum looks earlier than the H_I-LSC type or two different paths of development. There are many similarities between the H_{III}-TC type drum in Thailand and the H_{III}-XM type in southwest China in terms of appearance, drum tympanum, decorative pattern and vertical decoration of the drum body, casting process and musical performance. From the changes in the types and decorative features of bronze drums, we can more clearly judge the cultural exchanges, transmission paths, functional changes, and ethnic changes of bronze drums.

According to the third research object, based on practical investigation and combined with classical literature, the development history of ancient bronze drums in southwest China and Thailand and the performance of contemporary bronze drums were discussed respectively. The musical functional characteristics of ancient bronze drums and the musical performance characteristics of contemporary bronze drum in these two countries were summarized and compared. According to the ancient bronze drum's popularity time and type, the researcher divided into five stages, namely: the embryonic period, the prosperity period, the development period, the popularization period, and the decline period. Since the types of bronze drums in Thailand Museum

are only H_1 and H_{III} , the researcher put it into four stages for discussion: prosperity period, development period, popularization period and decline period. The time range of each stage was set, and the expression forms, ethnic origins, and musical function characteristics of bronze drum in these two countries were comprehensively compared. At the same time, the researcher selected the musical performance clips of the Donglan Zhuang bronze drum in Hechi, Guangxi, China, and the bronze drum from The Roral Ploughing Ceremony in Thailand, and made a comparative introduction and analysis of usage occasions, performance methods, bronze drum's notation and music analysis etc., based on the specific conditions of bronze drum performance in the two countries. These lead to the conclusion that the ancient bronze drum in southwest China has gone through a long development process from musical instrument to national importance instrument to ritual instrument to sacred instrument. Its users have evolved from the initial overlords, princes and ministers, to ordinary people, from the supreme being worshiped by thousands of people to entertaining deities and people. The civilian stage for entertaining people has gradually declined in the long history. It is only now, with the intervention of the national government, that it can continue to shine in the form of performances among the people. The ancient bronze drums in Thailand migrated and settled with their owners. After a period of glory and silence, it finally followed the Tai people and continued to be a national importance instrument, ritual instrument, and musical instrument in the imperial court for thousands of years, and it has remained unchanged to today. But in folk Thailand, the bronze drum also disappeared and became an sacred object only placed in temples or private fields for worship, was almost no longer used. In terms of musical performance, bronze drums in Thailand pay more attention to their symbolic meaning of worshiping and connecting deities, and do not have too many requirements for the musicality of the bronze drums. Contemporary bronze drums in southwest China are mostly used in folk festivals and ceremonies, and they tend to use pleasant bronze drum music and rich performance forms to entertain people.

2. Discussion

This dissertation investigates the H_1 and H_{III} type bronze drums in these two countries, uses iconography and typology method systematically study the

appearance, decorative characteristics, casting techniques and music performance of the bronze drums, use documents and investigation method to systematically comb and compare the development history of ancient bronze drum and the music examples of contemporary bronze drum in these two countries. Compared with other study about bronze drums in these two countries, this study based on the integration of multiple discipline, sorted out the various characteristics, similarities and differences of bronze drums in a more detailed and rigorous way. Based on archaeological data, the researcher speculated on the chronological order of the existence of the same type of bronze drums and the transmission route about the different type bronze drums in these two countries, and combined the historical materials of these two countries to sort out the music history of bronze drum and compare contemporary music examples, all these have certain innovative and enrich the research field and research results.

After comprehensive combing and comparative analysis, the types of bronze drums currently collected in Thailand are Heger I and Heger III types, which is consistent with the bronze drum information introduced in the book *The Bronze Kettle Drum in Thailand* by Miss Matinee Jirawattana of the Fine Arts Department. However, the researcher has doubts about the inference of the age of bronze drums in this book and did not apply it to the history of bronze drums. In addition, scholars such as Keiji Imamura, Eiji Nitta, Kunsheng Li, and others mentioned in their research results the pre-Heger I bronze drums in Thailand, since the author has not seen the actual ones in Thailand, in this dissertation, no comparative study was done.

Regarding the research on bronze drums decoration, distribution and their transmission routes. Combining archaeological data and survey statistics, we have concluded that the main distribution areas of H_I and H_{III} type bronze drums are basically consistent with current research results of Chinese and foreign scholars. The research on bronze drums decoration in southwest China is basically consistent with the research results of Chinese scholars such as Tingyu Jiang, Weiqing Li and Chongji Wu, etc.. However, because part of the bronze drum's decoration in Thailand has a unique regional style, the researcher briefly described and analyzed them. It still need to be combined with the research on Vietnamese bronze drum decoration for more in-depth discussion.

In terms of research on transmission paths, Fubin Wan, Danfang Wei, Kunsheng Li and other scholars generally agree that the early bronze drums (Pre-H_I) were developed separately from the bronze cauldron, with the center located in the west-central region of Yunnan, China. They communicated with each other through rivers, and gradually moved eastward to the Dianchi Lake area in central Yunnan (H_I-SZS), and then spread in three directions: east, south, and north in a fan shape, southward to the Red River Delta and to the Dong Son area of Vietnam. One branch further moved to the East, South, and North directions from north Vietnam. It had developed in the south, reaching Thailand, Laos, Cambodia, Malaysia and even Indonesia. Thai scholars believed that H_I type bronze drums in Thailand were spread from Vietnam. Through comparative analysis, the researcher found that from the perspective of the development pattern of the shape and decoration of bronze drums, H_I-SZS type drum in southwest China is earlier than H_I-TA type in Thailand, and the shape and decoration of the shell storage device of Lijiashan bronze drum in Yunnan and No. 283 in the Xilin bronze drum tomb are very similar to some bronze drums in Thailand. This also proves to a certain extent the connection of the H_I-TA bronze drum in Thailand and the H_I-SZS bronze drum in southwest China. Therefore, the transmission route speculated by the researcher is certain consistent with the research of Chinese scholars and Thai scholars. As for whether it is a tributary of the H_I-SZS or Dong Son bronze drum, it remains to be seen further research. After comprehensively sorting out the characteristics of H_I-TA and H_I-TB drums in Thailand, and comparing the introduction of Dong Son bronze drums by Vietnamese scholar Ruan Wenzuan and others, it is indeed more similar to the bronze drums in Henan, Thanh Hoa, Nghe An and other provinces in Vietnam. Vietnamese scholars' view that northern Vietnam is the central birthplace and starting point of the spread of bronze drums, and foreign scholars such as Bernet Kempers believed that *North Vietnam and adjacent regions formed the cradle of the wide-spread Heger I drums, both the Yunnan and the Pejeng type drums are alternative types with cultural backgrounds and outside relations of their own*, based on a comprehensive analysis of archaeological data the researcher does not entirely agree with these views.

Regarding the study of history of bronze drums, on the basis of quoting Chinese and Thai classics and documents on bronze drums, the researcher drew on

Professor Fubin Wan's six-phase classification of bronze drums. However, Professor Fubin Wan focused on the analysis of the casting, shape, and decorative characteristics of each period of bronze drums, and did not clarify the common characteristics of each period. The researcher focuses more on sorting out the history of bronze drum application based on historical records and combining the political and cultural development of China and Thailand in different historical periods, dividing it into five historical stages, and more systematically and clearly summarizing the different stages of bronze drum in these two countries. The different functional characteristics make it easier for readers to understand the development context of the history of bronze drum, and gain a glimpse of the commonality and individuality of the development of bronze drum musical culture in the two countries.

Regarding the research on contemporary bronze drum music in southwest China and Thailand, the researcher selected two musical performance examples of Donglan Zhuang bronze drum. Donglan bronze drum rhythm score example 2 is similar with Donglan Zhuang bronze drum music score of Chinese National Folk Dance (Guangxi Volume) included in *Bronze Drum in Hechi*, but the researcher did not find a leather drum ensemble during the investigation, so it is simpler than the examples included in *Bronze Drum in Hechi*. However, in the comparative analysis of bronze drum music examples in southwest China and Thailand, the author has not yet found any identical or similar research materials.

3. Suggestion

During the inspection of the bronze drum, we encountered many obstacles and inconveniences. In Thailand, there are very few historical records about the bronze drum, and for many reasons, it is impossible to obtain more detailed unearthed information on the bronze drum. Due to language barriers, the inheritance and protection of bronze drum in Thailand is difficult to gain a deeper understanding. However, based on the current research and investigation, the researcher also give the following suggestions for the study of bronze drums in southwest China and Thailand:

3.1 Construct a Bonze Drum Digital Resource Library. The construction of the bronze drum digital resource library can provide an important platform for bronze drum research and cultural exchanges, as well as school teaching. In China, a nationwide

inspection of the bronze drum collections in museums was conducted in the late 1970s. All the bronze drum inspection data were included in the *Compilation of Actual Measurements and Records of Ancient Bronze Drums in China* and was officially published in 2015. There is a relatively systematic bronze drum research team in Guangxi, China, which has published a series of high-definition and high-quality catalogs of bronze drums in Guangxi. And on December 30, 2023, the special digital venue Instigating the Ba Gui to Shock Jiu Zhou-Digital Exhibition of Guangxi Ancient Bronze Drum Culture was officially built and opened to the public, opening the door to the construction of Guangxi Bronze Drum digital resource library. However, in Guizhou and Yunnan, although the Yunnan Museum printed an internal bronze drum catalog in the 1950s, there has been no high-definition and high-quality color catalog since then, and no systematic bronze drum catalog database has yet been built. Therefore, the construction of Chinese bronze drum data resource database needs further improvement. In Thailand, only the book *Bronze Kettle Drum in Thailand* published by the Fine Arts Department in 2003 was found, which contains data, pictures, and line drawings of 48 bronze drums. There is no high-definition color bronze drum catalog published, and there is no such book on the homepages of various museums. Detailed introduction of bronze drum information requires in-depth and systematic research on Thai traditional historical music culture, and the construction of a bronze drum digital resource library is also necessary.

3.2 Increase support for bronze drum inspections in southwest China and Thailand. In China, with the support of the government, the bronze drum has become a representative of national history and culture. While people pursue bronze drum performances, they tend to ignore the original significance of the bronze drum in folk customs. With the development of society, the original folk customs activities are gradually disappearing, and we can hardly get a glimpse of the use of bronze drums in undisturbed folk activities. The real folk culture of bronze drums is gradually disappearing. We need more investment in manpower and material resources to discover and record the folk customs and performances of bronze drums used by different ethnic groups in different regions, so that they will not fade into people's memory.

In Thailand, there are very few introduction materials on the use of bronze drums in the palace and among the people, and more in-depth records or investigations by the government or school organizations are needed.

3.3 Conduct a comprehensive comparative study on the bronze drums in China, Thailand and Vietnam. In the process of comparative analysis of the same type of bronze drums in southwest China and Thailand, although the HI type bronze drums in Thailand and in southwest China are similar in decorative elements, they are still quite different in the shape and decorative style of the bronze drums. It can be speculated that there should be an intermediate transition zone between the spread of bronze drums in the two countries, and this zone should be in Vietnam. Including the early form of the HIII drum, it should also be an evolution with Vietnam as a communication intermediary. Therefore, if we want to conduct an in-depth study of the spread of bronze drums between China and Thailand, Vietnam is an indispensable part. To draw more accurate and reliable conclusions, more detailed research must be conducted in conjunction with Vietnam's bronze drum archaeological data.

3.4 Add bronze drum cultural content to the study and research of musical history in regional universities. At present, most of the content of Chinese history focuses on the Central Plains region, while rarely covering the southwest region. As a typical representative of southwest music culture, bronze drums developed in parallel with the music of bells and tripods in Chu and Han Dynasties in the Central Plains during the Spring and Autumn Period, Warring States Period, Qin and Han Dynasties. It's a symbol of the power and status of the southwest elite. Therefore, the content of music history cannot be missing from Southwest China. In Thailand, bronze drums have been used as palace instruments in major ceremonies since the Sukhothai Dynasty in the 13th century. As a type of ancient Thai musical instruments, they should also receive widespread attention and research. Today, some primary and secondary schools in Nandan, Hechi and other places in Guangxi, China, have introduced beating bronze drum into the classrooms of students' interest activities, and hired intangible cultural inheritors to teach students how to play bronze drums, making an important contribution to the inheritance of bronze drums. In colleges and universities in southwest China, many teachers and students do not understand the bronze drum and do not have systematic and accurate knowledge of the history of the bronze drum. Therefore, the research and application of bronze drum historical materials in teaching is a matter that both countries must strengthen.

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APPENDIX

Appendix table 1. List of main dimensions and structural features of Hi-SZS

Serial number	Original Number	Main Dimensions					Decoration of Tympanum					Decoration of Body				Gasket marks : Have 1 or no 0
		T-D	H	C-D	F-D	H&T.R	awns	strings	No. of halo circle	Main Halos:	Chest Halos	Grids/halos:	lugs	casting line		
1	Jin Shi M1 : 32A	30.2	23.5	34.6	35.4	0.78	D	1-2	—	1	—	8/3	4	2	1	
2	Jin Shi M1:58	36	30	41.5	44	0.83	9	1-2	8	1	1	2/1.2.4	4	2	1	
3	Jin Shi M3:3	40.6	32	46.8	51	0.79	10	1	8	1	1	/2	4	2	0	
4	Shi Jia M6:2	30.3	20.5	35.5	37	0.68	D	2	4	5	1	D.7/1.2	4	2	0	
5	Shi Jia M6:120	31.5	23	36.5	37	0.73	—	2	5	5	1	8/1.2	4	2	0	
6	Shi shier 205A	41.5	31	47	49	0.75	16	1	3	2,3(Feast)	3.4	5.Spring plowing and Planting Ceremony	4	2	1	
7	Jin Shi M13:2	36.4	28.5	43.6	45.4	0.78	D	—	—	—	1	9/3	4	2	1	
8	Jin Shi M14:1	40.7	31	—	48.1	0.76	10	1-2	—	1	1	8/1	4	2	0	
9	Jin Shi M14:15	40.7	31.2	46.4	48.1	0.77	10	2	7	1	1	8/1	4	2	0	
10	Jin Shi M15:7	32.8	28	38.8	40.2	0.85	—	1	7	1	1	16/2.3	4	2	0	
11	Jin Shi M16:1	23.8	20	34	37.2	0.84	10	2	5	1	2	8/3	4	2	0	
12	Jin Shi M16:3	29	23.8	34	37.2	0.82	D	2	5	1	2	8/3	4	2	0	
13	Jiang Li M17:10	30.8	24.5	35	36.7	0.8	D	2	4	1	2	8/3	4	2	0	
14	Jiang Li M17:30	26.4	21.5	31	33.8	0.81	D	1	7	4	1	8/3	4	2	0	
15	Jiang Li M23:30	25	20.9	29	33	0.84	8	2	4	1	2	8/3	4	2	1	
16	Jiang Li M23:10	25.7	21.5	32	35.9	0.84	8	2	4	1	2	8/3	4	2	0	
17	Jiang Li M24:36	39	31	44.5	47.5	0.79	10	2	6	1	2	6/1	4	2	0	
18	Jiang Li M24:42 A	37.5	33	44.6	47	0.88	12	2	7	1	1	8/2.3.5(p laying on the swing)	4	2	0	
19	Jiang Li M24:42 B	39.8	30.1	47.8	50	0.76	12	2	6	4	1	8/1.2.3	4	2	0	
20	Jiang Li M24:60	37.9	31.5	44.9	47.5	0.83	D	2	5	1	2	8/1.3	4	2	0	
21	Mananc hengzi shan No.1	36.2	28.3	41.8	43	0.78	D	1	7	1	1	10/2	4	2	1	
22	Guangnan	68.5	46	80.5	84	0.67	21	1	14	3,thunder pattern	1	12/1.5(killing the cow)	4	2	0	
23	Gumu	29.5	24	—	39	0.81	14	2	7	4	1	8/5(standing)	4	2	0	

												herons)			
24	Kaihua	65	53.5	—	71	0.82	12	1	16	1.2.3(stilt style architecture)	1	6/1	4	2	0
25	Mengmei No.I	41.2	25.2	46.5	—	0.61	8	1	13	1.3cattle	1	6/2	4	2	0
26	Yun 14	40.3	30.5	46.4	48.4	0.76	12	1	9	1	1	10/2	4	2	1
27	Yuan jiang	47.8	35.9	—	57.5	0.75	12	—	7	1	1	10/2	4	2	0
28	Haozhang No.6712	45.5	24.5	47.3	48.8	0.54	9	2	8	1	1	8/2	4	2	0
29	Haozhang M153:1	42	25	—	46	0.6	8	2-3	9	1	1	8/2	4	2	1
30	Huili 3	41	30.4	—	50	0.74	8	2	9	4	1	8/2.5.birds	4	2	0
31	Xilin 280	77.5	52	85.6	90	0.67	16	1-2	13	1	1	12/1.5.Deer	4	2	1
32	Xilin 281	72	49	82.4	83.3	0.68	14	—	—	—	1	1	4	2	1
33	Xilin 282	52	41	—	56	0.79	10	2	8	-	—	—	4	—	—
34	Xilin 283	57	—	60.5	—	—	8	2	8	1	—	—	—	—	—
35	Gui Luo M1:10	56.4	36.8	63.6	67.8	0.65	12	1-2	12	1	1	10/1.5 heron with fish	4	2	1
36	Gui Luo M1:11	29.2	24.5	35.3	37	0.84	10	1-3	7	4	1	8/3	4(in all directions)	2	1
37	Tu 1011	42.3	43.3	43.3	51	1.02	10	2	7	1	D	—	4	—	0
38	Bai 01	41	28.5	47.1	49.7	0.7	8	1	6	1	—	8/2	4	2	1
39	He County Longzhang	36.5	27.5	—	—	0.75	uncl ear	2	—	1	1	8/2	4	2	0
40	Gonghe	44.5	28.5	—	—	0.64	8	2	8	1	—	8/2	4	2	0
41	Jingxi Can 0003	69.7	D2.2.3	—	—	—	16	2	11	1.2	1	D	D	2	0
42	Jin shi M11:2	36	—	42	D	-	13	2	7	1	1	D	4	2	0
43	Jiang li M69:171	27.6	23.4	—	—	0.85	9	2	5	1	5	1/6	4	2	0

Remark: T-D = Tympanum Diameter, H= Height, C-D = Chest Diameter, F-D = Foot Diameter, H&T.R = Height to Tympanum Diameter Ratio, F-H= Flying herons, F-F= Feathered-figure, O= Others, P = Plain, N=No, R = Rowing (feathered-figure rowing boat pattern), D = Damaged.

Tabulator: Jinxi Liu, 2023.

Source: The dimensions and data come from *Ancient Bronze Drums in China and Southeast Asia* written by Kunsheng Li and Derong Huang and compiled by the Ancient Chinese Bronze Drum Research Association and Guangxi Nationalities Museum. *Compilation of Measured and Recorded Data on Ancient Bronze Drums in China*, and various archaeological reports and research materials, the ratio of tympanum and drum body decoration, drum height to tympanum diameter is calculated by the researcher.

Appendix table 2. List of Main Dimensions and Structural Features of Hi-LSC type Bronze Drums in Southwest China

Serial number	Original Number	Main Dimensions						Decoration of Tympanum				Drum Body	
		T-D	H	C-D	W-D	F-D	H&T.R	Awns	Strings	No. of halo circle	High-relief motifs:	Lugs	Half circle lug
1	Zu 0100	83.7	60.2	85.6	68.7	83.2	0.72	10	1	17	1(4),3(2)	4	2
2	Zu 0102	87.7	66.2	94.2	75.1	90.5	0.75	12	1-2	16	1(4),3(1),2(1)	4	2
3	Zu 0111	80.5	55	80.9	65.3	71.5	0.68	12	1	15	1(4),2(3 groups, 1-2/every group)	4	-
4	121	84.7	61	86.3	72.3	83.5	0.72	12	1	20	1(4),other 2 lost	4	2
5	Teng conty 04	69	48	70	57.3	70	0.7	12	2	12	1(4),other thing (2)	4	-
6	Teng conty 05	63.5	D 38.5	62.4	49.7	D	-	10	1-2	10	1(4),3(1),hors e2,another thing(1)	4	-
7	Zu 0103	82.4	59	88.5	68.8	83	0.72	12	1-2	14	1(4),beef pulling tools(2)	4	2
8	Guiping 451	37	-	-	-	-	-	12	1-2	9	1(4) lost	-	-
9	Zu 0110	62	42	61.7	49.3	D	0.68	12	1	17	1(4),3(2)	4	-
10	Zu 0117	72.4	50.9	75.1	61.7	73.7	0.7	12	1-2	17	1(4),3(1),little horse(1),another thing lost.	4	2
11	Zu 0123	76	52.8	77.3	63.2	75.7	0.69	12	1	20	1(4),stack squat frog(1),another thing lost.	4	2
12	Zu 0166	72.6	51.5	74.5	60.6	72.5	0.71	12	2	13	1(4)	4	-
13	Wuming 01	68.5	47.8	53.4	42.3	67.5	0.7	12	1-2	12	1(4)	4	-
14	Fenglin	78.68	55	-	-	-	0.7	12	1-2	13	1(4),two birds on one frog's back	4	-
15	0205	80.8	61.6	-	-	-	0.76	12	1-2	13	1(4),animal(1)	4	-
16	0207	78.5	58.2	-	-	-	0.74	12	1-2	17	1(4),lost(1)	4	-
17	0208	75.6	50	-	-	-	0.66	12	1-2	17	1(4),4(1)	4	-
18	Xiakang	70.5	43	-	-	-	0.61	12	1-3	12	1(4)	4	-
19	Wuxuan 01	89.2	65.7	93.9	77.7	92.6	0.74	12	1	19	1(4),four frog on the table(1),table and two people(1),another thing lost.	4	-
20	Gaodui village	70.8	47	-	-	-	0.66	10	1-2	13	1(4),3(2)	4	2

21	580	79.7	D48	-	-	-	-	12	1-2	16	1(4),unknow object(1)	4	-
22	058	76	54.5	78	65	76	0.72	14	1	18	1(4)(carrying turtle),4(1)	4	2
23	Tu 01	87	61	88.5	72.5	86	0.7	12	1	26	1(4)	4	-
24	Tu 02	69.3	48	70	56.6	70	0.69	12	1	11	1(4),2(5 birds one group),cow (5 one group),riding cow(1)	4	2
25	Tu 05	75	55	76.4	62.7	74	0.73	12	1	17	1(4),3(2)	4	2
26	Pingnan 1304	63.5	43	-	-	-	0.68	12	1	20	1(4),barn(1),cow(1)	4	-
27	2406	69.4	48	-	-	-	0.69	12	1	18	1(4),shell(7, 2groups)	4	-
28	Gufang	81.7	54.2	-	-	-	0.66	12	1	17	1(4)	4	-
29	J0727	89	53.5	-	-	-	0.6	12	1	19	1(4),3(1), other animal(2)	4	-
30	0751	82	57.5	-	-	-	0.7	12	1	22	1(4),fish(2)	4	2
31	000050	70	47	-	-	-	0.67	12	1-2	13	1(4)	4	-
32	Zu 0324	70.5	46.7	68.1	54.4	D	0.66	12	1-2	12	1(4),reptile(1), another 1 lost	4	-
33	Guixian 080	72.5	45.3	69.7	55.7	D	0.62	12	1	19	1(4)	4	-
34	Yizhou Han heron pattern bronze drum	D 33.8	24.6	-	-	-	0.73	10	2	8	lost	4	-
35	Zu 158	64.6		-	-	D	-	12	1	18	1(4)	4	-
36	Zu 054	75	D	-	-	-	-	10	1-2	14	1(4)	4	-
37	Total 000613	74	48.8	-	-	-	0.66	12	1	17	1(4),man pulling cattle(1),2(1), men hug animal(1)	4	-

Remark: T-D = Tympanum Diameter, H= Height, C-D = Chest diameter, W-D = Waist diameter, F-D = Foot diameter, H&T.R = Height to Tympanum Diameter Ratio, D = Damaged.

Tabulator: Jinxi Liu, 2023.

Source: The dimensions and data in the table come from the *Compilation of Measured and Recorded Data on Ancient Bronze Drums in China* (compiled by the Ancient Chinese Bronze Drum Research Association, Guangxi Nationalities Museum, *Guangxi Bronze Drum Atlas*). *Bronze Drums in Guangxi* and various documents. The ratio of drum height to drum tympanum diameter is calculated by the researcher.

Appendix table 3. List of Main Dimensions and Structural Features of HIII-XM type Bronze Drums in Southwest China

Se ria 1 nu m be r	Origi nal Num ber	Main Dimensions				Decoration of Tympanum					Body			region s
		T-D	H	F-D	H&T. R	stri ngs	No. of hal o circ le	awn s	Main patterns : 1.T-F- F. 2.bird. 3.fish. 4.flow er.	Frog H- R: ①singl. ②two stack squatting. ③three stack squatting/ 1.antiloc kwise	H-R	Lug s (No .) /1.fl at. 2.cr oss	Casting: 1.mold casting. 2.mixed casting /1.castin g line(No .). 2. relief line (No.)	
1	031	49.9	33.4	44.6	0.6 7	1	10	7	1.2	4①/1	-	4/1	1/1(2)	Longz hou, GX
2	Xime ng 1	49.8	37.3	37	0.7 5	2	16		1.2° 3.4	4①/1	-	4/2	2/2(2)	Ximen g, YN(Y Nsame below)
3	Meng lian 1	65.5	48.7	51.2	0.7 4	3	20	12	2.4	4①/1	-	4/2	2/2(2)	Mengl ian
4	Bing 1	56.6	43	47.3	0.7 6	2-3	17	12	234	4①/1	-	4/2	2/2(2)	Kunmi ng
5	Bing 3A	43.2	29.2	34	0.6 8	1-2	15	8	234	4①/1	-	4/2	2/2(2)	Kunmi ng
6	Shop 3	44.5	32.8	34.4	0.7 4	1-2	14	8	123	4①/1	-	4/2	2/2(2)	Kunmi ng
7	Shop 5	45.5	33.5	35.5	0.7 4	2	12	8	1234	4①/1	-	4/2	2/2(2)	Kunmi ng
8	Shop 8	52.7	38.7	40	0.7 3	1-2	16	8	234	4①/1	-	4/2	2/2(2)	Kunmi ng
9	Shop 10	58.9	41.7	46.8	0.7 1	2	18	10	234	4①/1	-	4/2	2/2(2)	Kunmi ng
10	Shop 11	54.5	39.8	45	0.7 3	2	17	10	123	4①/1	-	4/2	2/2(2)	Kunmi ng
11	Shop 12	57.2	39.8	44.3	0.7	2-3	16	12	12	4②/1	Tree,ele phant(2),s hell (5)	4/2	2/2(2)	Kunmi ng
12	Shop 13	61.1	48	50	0.7 9	2-3	17	12	23		Elephant +shell+fi sh	4/2	2/2(2)	Kunmi ng
13	Shop 14	64.3	D7.5	D	-	3	17	12	24	4③/1				Kunmi ng
14	Shop 15	67.3	50.2	51.8	0.7 5	2-3	17	12	24	4①/1	Tree+she e(3)	4/2	2/2(2)	Kunmi ng
15	New (新) 1	39.5	32.1	D	0.8 1	2	10	8	1234	4①/1	-	4/2	2/2(2)	Kunmi ng
16	Zan (暂)2	50.8	38.5	41.3	0.7 6	2-3	16	12	24	4①/1	-	4/2	2/2(2)	Kunmi ng
17	Zan (暂)5	35.2	27.4	29.2	0.7 8	1-2	12	6	1234	4①/1	-	4/2	2/2(2)	Kunmi ng
18	I*8	67	30.5	54	0.4 6	3	19	12	2	4③/1	Tree+ele phant(3)+ shell(3)	4/2	2/2(2)	Kunmi ng
19	Hg00 038	43.5	28	-	0.6 4	1	9	7	12	4①/1	-	4/1	1/1(2)	Liuzh ou,GX
20	0332	53.4	41	-	0.7 7	1-2	19	7	234	4①/1	-	4/2	2/2(2)	GX(fr om YN)

Remark: T-D = Tympanum Diameter, H= Height, F-D = Foot Diameter, H&T.R = Height to Tympanum Diameter Ratio, H-R = High - relief motifs, D = Damaged. S = Stack squatting, GX = Guangxi, YN = Yunnan, T-F-F = transformed feathered figure.

Tabulator: Jinxi Liu, 2023.

Source: *Bronze Drums in Guangxi, 2018. Compilation of Measured and Recorded Data on Ancient Bronze Drums in China. 2015.*

Appendix table 4. List of main dimensions and structural features of existing Heger type Ibronze drums in Thailand.

Se ria l nu m be r	Orig inal Nu mbe r	Main Dimensions			Decoration of Tympanum					Decoration of body				regio n
		T- D	H	H & T. R	stri ngs	No . of hal o cir cle	aw ns	Main patterns 1.multi- angular. 2.T-F-F 3.F-H. 4.fish. 5.transfor med bird.	H- R:1 .fro g; 2.s hell / No.	Dru m che st : 1.tra nsfor ned boat. 2.co mbli ne- circl e. 3co mbli ne- tange nt- circl e.	Drum waist: 1.T-F. 2.trans - forned boat. 3.verti cal grid,pl ain. 4.com b line- conce ntric circle.	Lugs patte rn: 1.fea ther. 1. br aid. 2. sp ike patte rn. 3. str aight line. 4.rop e patte rn	Foot patte rn: 1. 1 leaf patte rn. 2.pla in. 3.co mb line- conc entr ic circl e	
A-1	KP. 2	69. 5	53. 5	0.7 7	2-3	9	12	2.3	-	2	3	1	2	Bang kok
A-2	KP. 4	63	42	0.6 7	1- 2-3	8	12	3	-	2	3	1	2	Bang kok
A-3	KP. 5	48	40	0.8 3	-	-	10	-	-	-	3	1	2	Prach inbur i
A-4	-	58. 5	D	-	1-2	11	16	4	-	3	3	-	-	Trat
A-5	-	40. 7(D)	D	-	1- 2-3	7	14	B	-	-	-	-	-	Trat
A-6	-	72	53	0.7 4	2	9	10	2.3(2.flyi ng and standing)	-	1	3(up:st anding herons .down: T-F-F)	1		Trat
A-7	-	67. 5	D	-	2- 3(r ope and fea the r pat tern)	9	12	2.3(Ding sheng)	-	3	3	3	-	Kanc hana buri
A-8	576/ 251	44	D	-	2-3	7	10	B	-	D	3	1	2	Ratch aburi

	9(21 5/25 33)														
A-9	-	65	25(D)	-	2-3	9	12	1.3	-	D	D	1	-	Ratch aburi	
A-10	-	50(D)	-	-	-	-	16	-	-	-	-	-	-	Chu mpho n	
A-11	-	78	69	0.8 9	2	B	32	B	1	1	2	1	Circl e.ups ide dow n trans form ed boat patte rn	Muk daha n	
A-12	32.2 5/25 40(KP. 3)	64	51	0.7 8	2-3	B	14	B	-	3	3	2	2	Ubon Ratch athan i	
A-13	-	54. 5	39(D)	-	2	11	12	3	-	3	3	3	2	Ubon Ratch athan i	
A-14	KP. 6(38 /32/ 20(3 19)	66	33(D)	-	2	10	12	B	-	D	3	2	D	Kalas in	
A-15	223/ 252 5(35 /013 9/25 40)	68. 5	56	0.7 8	2	11	12	3	-	3	3	2	2	Chu mpho n	
A-16	224/ 252 5	18. 5	15. 5	0.8 4	2	4	8	3	-		3	-	-	Chu mpho n	
A-17	35/0 015/ 255 4	69	50. 5	0.7 3	2	14	14	3.5	-	3	1	2	2	Chu mpho n	
A-18	478	69. 5	53. 5	0.7 7	2	11	10	2.3	-	1	1	2	2	Chai ya	
A-19	-	51	38	0.7 5	1- 2-3	8	12	3.rope pattern in Gasket mark	-	3	2	2		Chai ya	
A-20	1/25 12	51	44	0.8 6	1- 2-3	5	12	3	-	-	3	3	2	Nakh on Sri Tham	

														marat
A-21	-	-	-	-	1-2	B	12	3	-	-	-	-	-	Nakh on Sri Tham marat
A-22	82/2 526	21(D)	-	-	2	D	D	D	-	-	-	-	-	Song khla
A-23	TSK .79/ 41	40(D)	-	-	2	D	D	D	-	-	-	-	-	Song khla
A-24	TSK .78/ 41- 361 110 51	44. 5(D)	-	-	2	7	12	3	-	-	-	-	-	Song khla
A-25	TSK .1/4 1- 361 110 51(2 533. 221)	18. 4(D)	-	-	2	-	-	-	-	-	3	-	-	Song khla
A-26	TSK .2/4 1	D	-	-	-	-	-	-	-	-	3	-	-	Song khla
A-27	KP. 7	44	4(D)	-	2	9	12	3	-	-	-	-	-	Prach inbur i
A-28	G.9 A.2 8.80	74. 5	49	0.6 6	2	B	B	B	-	3	2	2	2	Bangkok
A-29	37- 254 0	73	41(D)	-	2	10	12	1.2.3	-	1	2	-	2	Nakh on Ratch asima
A-30	219/ 36(5 4)	-	27(D)	-	-	-	-	-	-	-	3	-	-	Pathum Thani
A-31	17	Lo st	49	-	-	-	-	-	-	1,co w	2	-	-	Pathum Thani
A-32	-	72	D	-	2	7	12	2.3	-	-	-	-	-	Pathum Thani
A-33	-	D	-	-	-	-	-	-	-	1	1	1	-	Pathum Thani
A-34	-	40	D	-	-	-	12	3	1	-	-	-	-	Uttar adit
A-35	-	54. 4	41(D)	-	2-3	9	12	3	-	3	3	2	D	Ubon Ratch athan i
A-36														
B-1	(N.1 /39) 1/25 39	64	46	0.7 2	1- 2-3	12	12	1.2.3(Din gsheng)	1/4	2	3	1	1	Nan Province

B-2	KP.1	65	53	0.82	2-3	10	10	2.3	2/4	2	3	2	2	Bangkok
B-3	M.6/2536	75	54	0.72	2-3(F eat her pat ter n)	7	14	2.3	1/4 (2 lost)	3	3	1	2	Sukh othai
B-4	M.2 8/2532	65	D5	-	2	11	14	1.2.3	1/4 (3 lost)	-	-	-	-	Sukh othai(decor ation likes B-3)
B-5	-	86	65	0.76	2	B	14	B	1/4 (los t1)	1	1	1	2	Muk dahan
B-6	38/3 2/21 (320)	64	D	-	2	10	10	123(T-F-F, sacrificia l altar)	2/4 (los t1)	D	-	-	-	Phuk et (didn't find it)
B-7	-	51.6	6(D)	-	1	15	12	Only discerned feather pattern ,o ther main halo had some feathers. 2.3	1/4	D	D	D	D	Nakh on Phan om
B-8	1/25 11(1 70/2 511)	81.5	38(D)	-	2-3	11	12	3	1/4	2	D	2	2	Nakh on Sri Tham marat
B-9	-	75	D	-	-	-	16	3	1/4 (On ly left 1)	B	B	5	2	Sukh othai
B-10	-	75.5	53	0.7	B	B	12	2.3	1/4	-	-	5	2	Nong Bua Lam Phu

Remark: T-D = Tympanum Diameter, H= Height, H&T.R = Height to Tympanum Diameter Ratio, H-R = High - relief motifs, B=Blur, D = Damaged. T-F-F = transformed feathered figure. T-B= transformed bird. T-H = transformed herons. F-H=flying herons.

Tabulator: Jinxi Liu, 2023.

Source: Some of the dimensions and quantities in the table are from *The Bronze Kettle Drums in Thailand*, and some are from ความสัมพันธ์ทางวัฒนธรรม สมัยก่อตั้งประวัติศาสตร์ กรณีศึกษา กลองมิหาราชทีก (กlongmiborayakdi kromsikupakr กรณีที่กlongmiborayakdi) . Another part comes from the researcher's field measurements. tympanum and drum body decoration, drum height and tympanum diameter are statistics and calculations by the researcher.

Appendix table 5. List of main dimensions and structural features of existing Hm bronze drums in Thailand

Serial number	Original Number	Main Dimensions			Decoration of Tympanum				Decoration of body				Display region
		T-D	H	H&T.R	strings	No. of halo circle	awns	Frog H-R	elephant	shell	tree	1.ca rp, 2ins ect	
C-1	20.1/39 (2/39)	60	44	0.73	1-3	16	10	1	-	-	-	-	2?
C-2	152/25 61	50.4	34.5	0.68	2	11	vague	1	-	-	-	-	2
C-3	-	52	37	0.71	1	12	8	1	-	-	-	-	2
C-4	-	66	47	0.71	3	17	12	3	3	3	-	-	2
C-5	-	61	44	0.72	2	28	12	3	3	3	1	1(2)	2
C-6	-	61	43	0.71	2	28	12	3	3	3	1	1(2)	2
C-7	1124	68	49	0.72	2-3	17	12	2	3	3	1	-	2
C-8	-	73	50	0.69	3	19	16	3	3	3	1	-	4
C-9	631/25 17	69.3	49	0.71	2-3	18	12	3	3	3	-	2	? Khon Kaen?
C-10	39/253 2	33.4	21.8	0.65	2	vague	Lost	1(llost2)	-	-	-	-	2
C-11	1125, R S.8	67.8	48	0.71	3	18	12	3	3	2	1	-	4 Lopburi
C-12	771/25 10, RS.9	65.8	48	0.73	3	19	12	3	3	2	1	-	4 Lopburi
C-13	38/253 1	38	22(D)	-	1-2	10	6	1	-	-	-	-	4? Chiang Rai
C-14	39/253 1	56	23(D)	-	3	17	12	3	-	-	-	-	2 Chiang Rai
C-15	5/2516	48	39	0.81	1	17	7	1	1	2	-	-	2 Chiang Mai
C-16	-	55	48	0.87	-	-	12	1	3	3	-	-	4 Tak(to be verified)

Remark: T-D = Tympanum Diameter, H= Height, H&T.R = Height to Tympanum Diameter Ratio, H-R = High - relief motifs, D = Damaged. B = Blur.

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Source: Some of the dimensions and quantities in the table are from *The Bronze Kettle Drums in Thailand*, and some are from ความสัมพันธ์ทางวัฒนธรรม สมัยก่อนประวัติศาสตร์ กรณีศึกษา กองโบราณโยธาทีก (กองโบราณคดี กรมศิลปากร กระทรวงวัฒนธรรม) . Another part comes from the researcher's field measurements. tympanum and drum body decoration, drum height and tympanum diameter are statistics and calculations by the researcher.

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