



HAL
open science

A Technological Analysis of the Eastern Han Rock-Cut Burials in Citangpo, Anyue County, Sichuan Province

Lia Wei

► **To cite this version:**

Lia Wei. A Technological Analysis of the Eastern Han Rock-Cut Burials in Citangpo, Anyue County, Sichuan Province. [XXXXXXXXXXXX](#) (Proceedings of the Annual International Conference on Dazhu Studies), Chongqing chubanshe [XXXXX](#), 2016, 9787229115852. <hal-05455740>

HAL Id: hal-05455740

<https://hal.science/hal-05455740v1>

Submitted on 17 Mar 2026

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire HAL, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons CC BY-NC-ND 4.0 - Attribution - Non-commercial use - No Derivative Works - International License

MA RELIGIOUS ARTS OF ASIA

**A TECHNOLOGICAL ANALYSIS of the EASTERN HAN ROCK-CUT BURIALS in CITANGPO
(Anyue County, Sichuan Province).**

Lia Wei

September 14, 2013.

INTRODUCTION	3
A. A CASE STUDY	4
<i>Area</i>	<i>4</i>
<i>The Citangpo 'Cemetery'</i>	<i>6</i>
<i>Typology and Relative dating</i>	<i>7</i>
<i>Technology vs/ Iconography</i>	<i>8</i>
B. ROCK-CUT CARVING AND QUARRIED COFFINS	9
<i>Material and Tools</i>	<i>9</i>
<i>Craft Specialization</i>	<i>12</i>
<i>Carving process</i>	<i>15</i>
<i>Unfinished works and Surface Dressing</i>	<i>17</i>
C. 'PICTORIAL STONES'	20
<i>Terminology and Classification</i>	<i>20</i>
<i>Sculpture</i>	<i>22</i>
<i>'Progressive' Reliefs in Citangpo</i>	<i>23</i>
<i>Dressing Lines</i>	<i>24</i>
<i>From Flat to Bulging Relief</i>	<i>24</i>
<i>High Relief and Architectural Framing</i>	<i>26</i>
CONCLUSION	29
BIBLIOGRAPHY	30
<i>Chinese Archaeology</i>	<i>30</i>
<i>Publications in Western Language</i>	<i>32</i>

INTRODUCTION

This study individuates simple rules that governed the making of rock-cut burials in Eastern Han times, departing from the Citangpo site in Central Sichuan. Carving processes reconstructed here are also based on observations from several field trips in the Sichuan and Chongqing provinces.¹

Technical choices proper to rock-cut carving, a stoneworking tradition then found almost exclusively in Sichuan, will be confronted to quarried stone coffins.

It is hoped that the exposed carving sequence will help us understand the peculiar qualities of Sichuanese sandstone sculpture, which have raised many an art historian's perplexed eyebrow, and rethink the proposed classifications for Han dynasty 'Pictorial Stones'.

¹ All photographs and rubbings for which no source is precised were taken by the author of this study.

A. A CASE STUDY²

Area

Anyue county (安岳县) is located in Central Sichuan, halfway between the metropolises of Chengdu and Chongqing. It is today under the administration of Neijiang city (内江市), Han times' Han'an county (汉安县). Together with the Niupi and Zizhong counties (牛鞞县,资中县) along the navigable Tuo River (沱江), formerly called Xindu (新都江), Neijiang belonged to the Jianwei commandery (犍为郡).³ Jianwei was related with the further North Guanghan commandery (广汉郡), today's Santai county (三台县), centered on the Qi river (郫江), a smaller effluent of the Fu river (涪江), which also represents the closest important ensemble of Eastern Han burials, carved into spectacular rock-cut architectures. The area bounded by the three river streams, the Tuo, the Fu and its effluent, the Qi, is referred to as the 'Tuo River district'.⁴ Downstream from the Chengdu plain, where burials were mostly made of assembled brick and quarried stones, Jianwei was also open to influences from the Upper Min River rock-cut sites. By contrast, the majority of Sichuanese pictorial stone coffins were found further south, along the Upper Yangzi River course. The Citangpo cemetery in inland Anyue county (安岳县驯龙镇铁佛村祠堂坡), among the hills of Central Sichuan (川中地区),⁵ is thus located at the crossroads of distinct geographical areas, each with a dominant burial type.

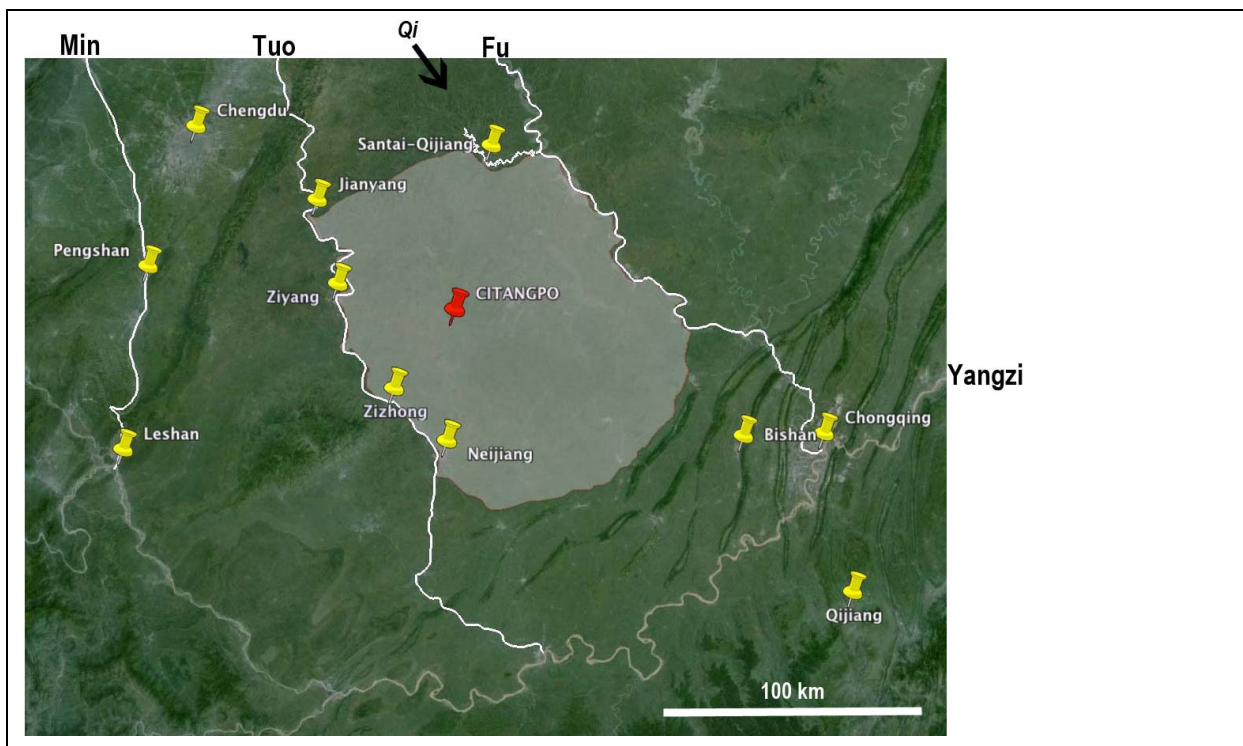


Fig.1.Tuo River district. Source: Google Earth (accessed on 9/09/2013).

² The scale and length of this study do not allow us to draw definitive conclusions for the chronological and geographical classifications of rock-cut burials : these are evoked here mainly as research background.

³ Wan Lixin et al. 1997:10.

⁴ Luo Erhu 2001:84.

⁵ Luo Erhu 2001:82.

Most rock-cut burials in the Neijiang area are found in groups of 3 to several dozens, distributed in rows, often on superposed levels.⁶ The spaces are preceded by an alley, in most cases reduced to an entrance recess, leading to a narrow door (90-120cm w. x 100-160cm h.). In its alignment follows a short tomb corridor, and finally, the burial chamber (墓道 - 墓门 - 短甬道 - 墓室). The chamber is usually rectangular, between 3 and 4.8 meters deep.⁷ Ceilings are simply convex, rarely enough to be called vaults. Grounds are slightly sloping towards the outside, for water drainage purposes. Most burials have two, or only one chamber, with only 2-3% of them containing up to three chambers, thus generally smaller than in major rock-cut ensembles on the Qi and Min Rivers.

No more than a dozen decorated rock-cut burials were found in the Neijiang area,⁸ while most pictorial carvings are found on 'stone cases' (*shihan/ju/xiang* 石函/柜/箱),⁹ which have been identified as coffins (*shiguan* 石棺). These include rare cases of assembled stone slabs coffins, such as the house-shaped examples found in Hongying and Lulandong, Neijiang city (红樱乡, 潞澜洞),¹⁰ but also simply hollowed out quarried blocks, or rock-cut coffins (*yaguan* 崖棺).¹¹ Ceramic coffins, and rare examples of assembled brick coffins, are sometimes present in the same caves.¹² Burials without coffins constitute the majority, but since it is hard to imagine a family spending the effort of excavating a rock-cut space without providing a container for the corpse, most burials may have stored wooden coffins, marked by the presence of iron nails.¹³ No coffins were found in Citangpo, but the chambers are systematically hollowed out with simple alcoves (ca. 150cm l.), which in the close by Dingjiaba M2 (丁家坝),¹⁴ as well as in several sites in Nejiang city, combine with spectacular house-shaped rock-cut coffins (Fig 2.A-A'). This type of niche is alternatively designated by the terms 'niche-shaped rock-cut coffin' (*kanxing yaguan* 龕形崖棺), 'coffin platform' (*guantai* 棺台) or 'corpse platform' (*shitai* 尸台) (Fig.2.B).¹⁵ Citangpo M8's alcoves bear pairs of deep rectangular holes facing each other, possibly meant to fix a wooden railing to contain the corpse (Fig.2.C-C').

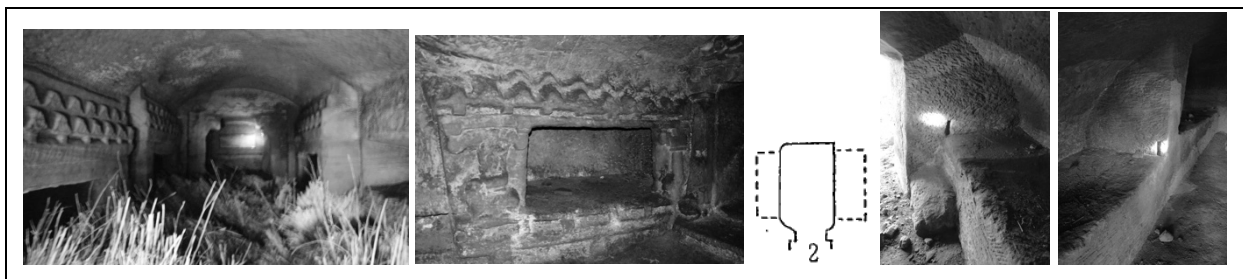


Fig.2.(A-A').House-shaped rock-cut coffins in Guanyin dong, Xunhe district (旬河镇观音洞), and Yanbian shan, (岩边山) Neijiang City.-- (B).Typology of Rock-cut burials: single chamber with 'niche-shaped rock-cut coffins'.max 5m deep. Source : Type I.2.from Fig.145 in Luo Erhu 2001:188.-- (C-C').Rectangular holes in Citangpo M8 alcoves. 100 cmhx 200cm lx92cm deep.

⁶ Wan Lixin et al. 1997:11.

⁷ Fu Chengjin 1996:42.

⁸ See Appendix 7 in Zhu Qinsheng 2004:187-192.

⁹ Rudolph 1950:31. and Gao Wen and Wang Jinsheng. 2004 (B):19.

¹⁰ Gao Wen 2011:242-3.

¹¹ Luo Erhu 2002:69-83.

¹² Gao Wen and Wang Jinsheng 2004 (A) :11-12.

¹³ Wan Lixin et al. 1997:12 and Luo Erhu 2002:229-230.

¹⁴ Fu Chengjin 1996:43.

¹⁵ Luo Erhu 2001:73-4.

The Citangpo 'Cemetery'

The caves in Citangpo are among the best preserved examples of the area, although half of the outcrop was quarried away.¹⁶ Only four comparably decorated rock-cut burials were found in Neijiang city.¹⁷ The burials are cut into the solid rock of a sandstone hillock (Fig.3), a hundred meters from a small waterway. While most burials are accessible from the ground level today, which makes it unlikely that they were situated much higher then, at least two burials, M6 and M11, are placed at a more than 2 meters height, their making and access requiring scaffolding or a sloping ramp. All burials are cut into the same curved cliff, oriented towards North-West, excepted for M15 on the opposite side of the hillock, facing East.

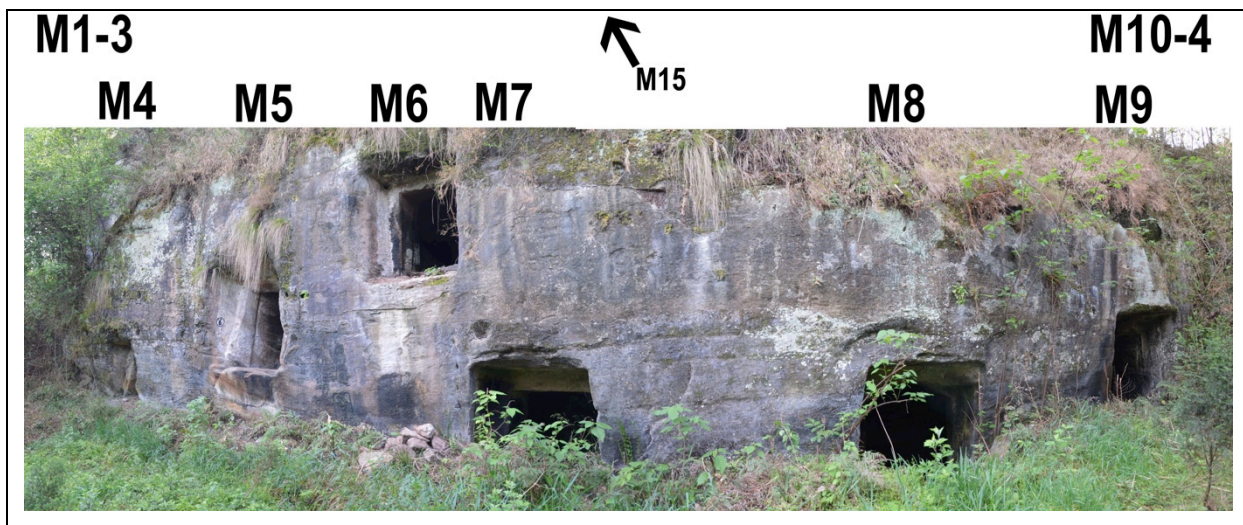


Fig.3. The sandstone hillock at Citangpo.

Apart from obvious differences in access, orientation and distribution, further disparities in size, layout, and carved content, distinguish the caves from one another. In Vignato's definition, a coherent group of rock-cut sandstone caves should be 'carved close to one another, usually set at the same level, contained within well defined boundaries which do not overlap with the boundaries of other groups, sometimes connected by architectural elements (...), and usually comprised of caves of different types and having different functions'.¹⁸ In terms of functions, Vignato is dealing with spaces designed for a living community of Buddhist believers, while we are looking at a collection of independent spaces modelled on an household scale which, in all likelihood, were not designed to be accessed on a daily basis. However, this calls into question the idea of a Citangpo 'cemetery', which might as well be only an abstract construct.

M8 and M9 are the biggest and best preserved rock-cut spaces in Citangpo. They both reach a depth of 5-6 meters, thus more than any of the other units, which are only between 2-3 meters deep. Both chambers contain 3 to 4 niches, while the other caves only contain 2 to none niches. More importantly, these are the only two units that contain pictorial reliefs carved inside the chamber. Only the back wall of M3 was left, with pictorial carvings in a poor state of conservation. Tool traces from M7 will be used in this study. M11's profile has been exposed, cut in half by a quarry. Probably

¹⁶ Fu Chengjin 1996:42.

¹⁷ See Lei Jianjin and Fu Chengjin 1987.

¹⁸ Vignato 2006:364.

because it stands on a gently sloping ground, instead of the vertical outcrop, M15 is also the only unit to possess a longer alley and tomb corridor. Unlike the rectangular layout seen in other units, its chamber widens towards the back wall, acquiring a trapezoid shape also referred to as a ‘T-shaped’ groundplan.¹⁹ Moreover, the ‘facade’ and tomb corridor of M15 are decorated with carvings, while its chamber is left totally plain.

		(M3)	M4	M5	M6	M7	M8	M9	M10	(M11)	M15
Only dressing			X	X	X	X					
Structural elements	Stepped door	(X)	X	X	X	X	X	X	X	X	X
	Rock-cut stove			X		X	X	X	X	(X)	
	Rock-cut animal						X	X			X
Relief Carvings	Line carving, Flat and Bulging relief scenes.	X					X				
	High relief architectural models with line carved and flat relief details.							X			
	Facade with high relief architectural elements and figures.										X

Fig.4. The Citangpo cemetery carvings.

Typology and Relative dating

50 rock-cut burials are unambiguously dated by epigraphy between 58 CE and 202 CE, distributed in the Sichuan, Chongqing, Guizhou and Yunnan provinces.²⁰ Typologies based on these units look mainly at groundplans,²¹ also taking into account burial goods and iconography.²² Since the phenomenon of rock-cut burials continues well into the Shu Han (221-263 CE), Two Jin (264-419 CE) and Southern Dynasties (420-500 CE), funerary goods such as ceramics and coins are essential to determine whether the burial belongs to the Eastern Han period. The burial objects left behind by looting in Citangpo M2, a ceramic *bo* vessel (钵),²³ together with ceramic *mingqi* figurines of a dog and a rooster,²⁴ and five *wuzhu* coins (五铢) of the type in circulation under the Han, have motivated the general attribution of the cemetery to the Eastern Han period.²⁵ In terms of groundplan typology,²⁶ only Citangpo M15 resembles the Upper Min River burials, attributed to a phase of development for the rock-cut burial tradition (89-121 CE), when the custom extends to Central Sichuan. All other burials seem closer to the late part of this phase (122-146 CE), when elements such as rock-cut stoves and shelves, rock-cut coffins and stepped doorframes appear.²⁷

Apart from comparing our units with those for which absolute dating is available, relative dating methods proper to rock-cut sites, such as parietal stratigraphy, a dating method based on the relative position of the caves, can be resorted to. Experience shows that deviations or change of plans are

¹⁹ Luo Erhu 2001:90.

²⁰ See Fan Xiaoping 2006 :27. and Luo Erhu 2001:248-9.

²¹ See Ma Xiaoliang 2012 :86.

²² See Luo Erhu 2001:85.

²³ See the ceramic *bo* 钵 from Ziyang. Zhou Yongdong et al. 2011:15.

²⁴ See 11 ceramic figurines and 5 coins from another Anyue rock-cut burial. Can Shunyong 2000:66-7.

²⁵ Fu Chengjin 1996:42. see burial objects from the Hongying rock-cut burial, Neijiang city. See Lei Jianjin et al. 1989:40-2.

²⁶ Luo Erhu 2001:90-2.

²⁷ Luo Erhu 2001:90.

often due to the danger of cutting a cave into a pre-existing one.²⁸ Such an anomaly is visible within our small group of caves : two holes on the bottom of M9 left wall communicate with an alcove in M8 right wall (Fig.5.A). The first reaction would be to attribute these to later plunderers who, by merging adjacent caves, avoid removing the mud and stones that seal the burials. However, a closer look at the caves' layout tells another story. The entrance of M8 being placed lower than M9 (Fig. 5.B), and the two caves being carved on a curved cliff, the caves collide in two points, both situated in M8 right corner niche. M8's groundplan is symmetric, with two pairs of opposing alcoves, while M9 obviously diverts its progression (Fig.5.C). To avoid running into M8, M9 was carved with only three niches instead of four. This irregular layout due to a technical obstacle has nothing to do with groundplan typologies.²⁹

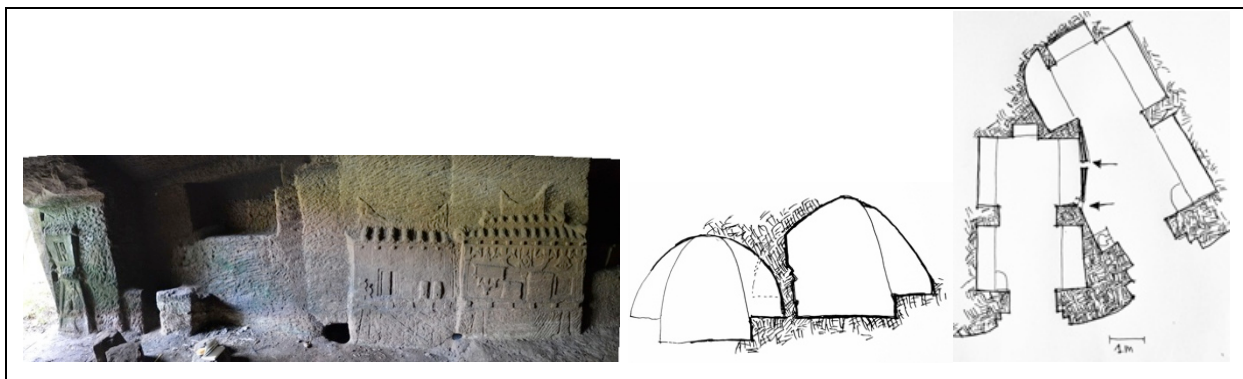


Fig.5.(A).Citangpo M9 Left wall. – (B-C).Groundplan and profile views of the overlap between M8 and M9. Citangpo.

We cannot conclude much of this 'micro-periodisation' which concerns only two units in Citangpo, and leaves us still uncertain about the time period elapsed between the two projects. We learn here that the caves were excavated without too much thought given to their relative position, as the result of independent projects. This also tells something about technical challenges encountered by the carvers : rock-cut spaces can only be seen from the inside out, making it difficult to control the increasing shape and size of the room.³⁰

Technology vs/ Iconography

The lack of planning repeatedly noticed in Sichuanese rock-cut carvings, was interpreted as one of its specific features, as compared to Eastern Han carved ensembles from other regions. Rudolph first suggested that vestibules of rock-cut burials 'were made larger than necessary with an eye to future use',³¹ and he believed this 'work in progress' attitude extended to the pictorial carvings. Anomalies in the excavation process of rock-cut spaces obviously impacts on the visual qualities of their pictorial content. Style results from choices depending on cultural factors that transcend technological constraints.³² But to track mental processes embedded in a broader symbolic system,

²⁸ Nagaraju 1981:68.

²⁹ See a case of erroneous dating based solely on typology exposed by He Zhiguo 1993:760.

³⁰ Rockwell 1993:189.

³¹ Rudolph 1950:32.

³² Lemonnier 1993:2.

one has to find cases where the divorce from technical considerations can be mapped.³³ Looking at manufacturing processes has the advantage proper to field sciences not to reduce the object to a web of meanings and social relations.³⁴

Most attempts at explaining the Sichuanese carvings identify their composition and iconographical content with elements of Eastern Han political ideology and social affiliation. The scattering of 'auspicious' motifs, the visibility of monumental rock-cut façades and vestibules, are formal characteristics attributed by Mengoni to the rejection of Confucian ideology by local clans in search for legitimization. She adds that the representational conventions of an imperial structured cosmos are best shown in stone coffins, supposedly belonging to the metropolitan elite.³⁵ The attribution of specific spatial arrangements to the quest for an ideal order, was attempted earlier by Powers for the Shandong pictorial stones, ascribing symmetry, stylization, stiffness, and even the use of a 'striated background' to a shift in cosmological beliefs.³⁶ However, such interpretations are largely based on Han written sources absent in Sichuan. Moreover, the Neijiang area shows a intricate coexistence of decorated rock-cut burials, rock-cut coffins and quarried coffins, which can hardly be attributed to specific functions or ideologies. As written sources from other areas are used to describe Eastern Han Sichuan, so are interpretative frameworks initially built up for pictorial stones from other areas. Even when thinking in terms of transmission,³⁷ a technique which escapes the tradition and system of thought it was born in naturally goes through an empirical process of experimentation.³⁸ The spontaneity of Sichuanese sculpture, the lack of planning of its sparse figures on open backgrounds, and even its relief, much higher than the Eastern Han carvings found outside Sichuan,³⁹ are all formal characteristics which at least partly owe it to the technical possibilities of rock-cut sandstone.

B. ROCK-CUT CARVING and QUARRIED COFFINS

Material and Tools

The qualities of the raw medium, sandstone, should be kept in mind when making comparisons with carvings from areas outside Sichuan, predominantly using limestone, a harder and fine-grained material, or granite, an exceptionally hard stone. Sandstone is a sedimentary rock structured into easy to split horizontal beds, and working against the bedding direction can lead to unvoluntary cracks. Ideally, exposed bits on waterside cliffs are tested and chosen for their homogeneity.⁴⁰ Unlike hard sandstones, that must be hammered at a 90° angle, soft sandstones like those used in Sichuan are worked at a 45° angle, 'as if drawing'. Sandstone owes to its even

³³ Lemonnier 1993:12.

³⁴ Gavin 2010:229.

³⁵ Mengoni 2003:146-9.

³⁶ Powers 1981:29 and 32-3.

³⁷ Haudricourt 1940. Cited in Bert 2010:125.

³⁸ Haudricourt 1936. Cited in Bert 2010:14.

³⁹ Rudolph 1950:32.

⁴⁰ Rababeh 2005:33.

consistency, which can be worked in any direction, to be called 'freestone'. Its surface cannot be polished, because of its granular structure, it thus keeps a good amount of tool traces, which make it the best record of carving movements.⁴¹ While most marks left on final products usually belong to finishing tools, Sichuanese reliefs often bear traces of preliminary carving stages.

The transition between bronze tools, to steel and iron tools happened around the middle Western Han period.⁴² Although the soft nature of sandstone allows bronze tools,⁴³ as well as wooden or stone complements, the iron tools made in Eastern Han Sichuan⁴⁴ must have been a decisive factor of change in the working methods of the stonemason.⁴⁵

Soft stone generally requires less indirect percussion, and a lot is done directly with an axe or a quarry pick,⁴⁶ unless the working position doesn't allow it: in the constrained rock-cut spaces, carvers are pushed to work over their heads, in nearly acrobatic positions.⁴⁷ Direct percussion depends on the relation between the tool's weight and the lever arm's length,⁴⁸ resulting in less controlled strokes which easily slip beyond the planned outlines (Fig. 24.D). The adze is an axe employed for sandstone carving, with a flat cutting edge at 90° to the shaft.⁴⁹ The adze/axe produces vertical, short strokes with broken edges (Fig.6.A). The quarry pick is held similarly to the axe, but it produces more irregular and deep marks. (Fig.6.A').

As indirect percussion tools, necessitating the intermediary of a mallet (Fig.6.B), we have the point chisel or punch (*jianzao* 尖凿), which traces are similar to the quarry pick's when used for the roughing-out stage,⁵⁰ and the flat chisel (*pingzao* 平凿). The latter is typical of areas and periods where ironworking is widespread, its cutting-edge then lasting a reasonable long time. It works ten times more rapidly than the punch and was able to satisfy periods of increasing popular demand for sculpture.⁵¹ The depth obtained with a flat chisel rarely exceeds 1 cm: it is most successful for low relief work aiming at a 'flat' effect, or to model thin convex areas.⁵² Its traces are also recognizable by the 'broken' aspect of curved lines. A wide range of tools was excavated in Han burials, especially royal tombs.⁵³ No hammer was excavated yet, but a rare preserved wooden mallet was found in the Western Han Shuangbaoshan tombs.⁵⁴ Apart from easily identifiable chisels, which might as well have been used as quarrying wedges (Fig.6.C-C' and traces on Fig.13.A), Sichuanese rock-cut burials conceal unidentified tools such as this iron blade with a ring-shaped head (Fig.6.D). It is often held in hand, or hanging from *mingqi* figurines' belt, and archaeological reports alternatively present it as a

⁴¹ Hunt 2008:35.

⁴² Liu Qi 2011:93.

⁴³ See 4 Western Han Bronze chisels from Chengdu. Mengoni 2004:66.

⁴⁴ Sage 1992:177.

⁴⁵ Hodges 1970:168.

⁴⁶ Bessac 1986:172.

⁴⁷ Rockwell 1993 : 190-1.

⁴⁸ Haudricourt 1987:175.

⁴⁹ Wootton et al. 2013 (C):6.

⁵⁰ Wootton et al. 2013 (B):8.

⁵¹ Casson 1933:80-5.

⁵² Adam 1966:28.

⁵³ 锤 (hammer), 鑿 (quarry pick), 斧 (axe), 楔 (cutting blocks), 鏊 (line carving), 凿 (chisel), 锯 (saw), 铲 (spade), 钢刀 (steel knife), 锥 (drill). In Liu Qi 2011 :92 and Xu Yongbin 2008:23.

⁵⁴ Chapter 3 in Mianyang 2006.

knife (40 cm),⁵⁵ a chisel (12 cm)⁵⁶, or a quarrying tool,⁵⁷ according to its length. Tools may have been personalized by their owners, their use should thus not be over-generalized.⁵⁸



Fig.6.(A-A')Traces of oblique cutting by an axe/hammer and traces of a quarry pick. Source : Fig.13-1. In Bessac 1986:47. And Fig.4-2 in Bessac 1986:19.– (B).Figures holding a chisel and mallet in the 'Thunder God procession' scene. Back chamber , Wuliang shrine, Shandong Province. Source: Zhu Xilu 1986:37 and 39.–(C-C').Iron chisel⁵⁹ or wedge. Bailinpo M5, Santai county.(柏林坡).10cm l. Source : Fig.269. in Santai 2007.-- (D).Iron 'chisel' with a ring-shaped head. Bailinpo M1, Santai county. 12cm l. Source: Fig.23-12. in Santai 2005:26.

The drill is a mechanical tool that reaches zones where movements are too restricted for the chisel, such as deep corners in stepped doors (Fig.7.A-B). It is used for delineating spaces and volumes, but also to detach low and high relief from its background (Fig.7.C-D and Fig. 23.D).⁶⁰

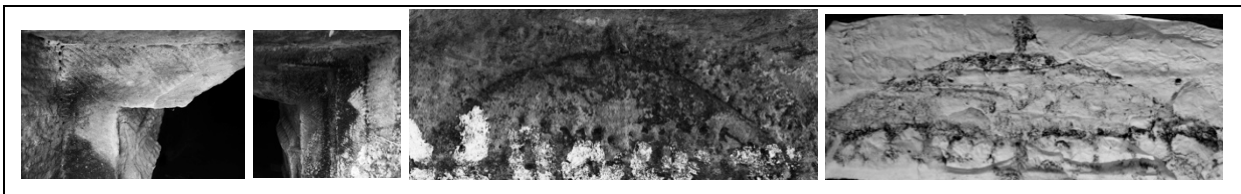


Fig.7.(A-B).Drilled corners of Citangpo M9 stepped door.-- (C-D).Drilled umbrella shape. Citangpo M3 back wall. (Photograph and Ink Rubbing). 110cm w.

Luo Erhu suggested the use of another mechanical tool : the longest tunnels were excavated by 'ramming' the stone with a wooden beam in rocking motion (*chongjishi dunzuanfa* 冲击式顿钻法).⁶¹ This ramhead, reinforced with a metal point, was suspended to an horizontal beam secured to the rock mass, through pairs of 10 cm deep, round drill holes placed in front of each other, at regular intervals along rock-cut corridors and side rooms (Fig.8.A-B). The holes are grooved towards the corridor's entrance (Fig.8.C): the dispositive was progressively displaced deeper into the tunnel, producing long, centripetal traces along main corridors, different from traces seen on inner walls. It could serve as a calibrating tool for the spaces' dimensions, but also for structural elements such as stepped cornices (Fig.8.D-E). It is hard to tell if the technique was employed in Citangpo, where the side walls have been almost integrally hollowed out to create alcoves. The only wall left in its first stage of excavation is the Citangpo M9 left wall, where no niche could be excavated. Two round holes are visible exactly on top of the seams between diverted sections of wall (Fig.8.F) : the fixation beam may have been displaced when hindered by the adjacent M8.

⁵⁵ Fig. 263-7. In Santai 2007:263.

⁵⁶ Santai 2005:26.

⁵⁷ Xu Yongbin 2008:21.

⁵⁸ Li Jinghua et al. 1995:63-4.

⁵⁹ See also item n°28 in Taliangzi M3. Fig.153in Taliangzi 2008.

⁶⁰ In some cases, the rounded edges of the traces may also be a result of natural wear.

⁶¹ Luo Erhu 1987:35-8.



Fig.8.(A-B).Symmetric pair of holes. Xiaoba, Chezi district, Leshan city.(车子镇肖坝). -- (C).Grooved hole. Xiaoba, Chezi district, Leshan city. -- (D-E).Paired series of three holes by a stepped door. Xiaoba, Chezi district, Leshan city.-- (F).Two round holes.Citangpo M9 Left wall.

From the point of view of 'volume studies',⁶² the 'ramming technique' gets rid of 5 to 10 m³ per day. In such a restricted space, the quarry pick would only excavate 0,5 to 1 m³ per day, and the 250 cm of a raised direct percussion tool would hardly fit into a 180 cm low tunnel. If excavated by hand, one Citangpo cave, varying from 10 to 33 m³,⁶³ would necessitate around a month to be completed, excluding the time dedicated to ornamentation. The rock-cut cemeteries being diachronic processes, excavating a single burial at a time wouldn't require more than the few men fitting in that narrow space at a time.⁶⁴ Sandstone rock-cut spaces easily reach a monumental scale, supposedly suiting the purposes of 'a technically unsophisticated or economically limited society to create a larger monument than it could by any other process'.⁶⁵ Indeed, these 'sandcastles' require no quarrying, no transport, no placement or assemblage techniques, and know no limitation in available material. The making of a rock-cut space thus only requires small groups of multitasking workers, characteristic of a domestic or community-based production.⁶⁶

Craft Specialization

Circa 250 examples of inscribed Eastern Han pictorial stones have been recorded,⁶⁷ of which only a small proportion were found in Sichuan. The inscriptions are of two types: the *bangti* (榜题), a legend describing the content of the carvings,⁶⁸ and the *tiji* (题记), which contains informations about the making. The Sichuanese *tiji* only give the patron's name and the date of construction, usually designating the burial by the term 'hole' (*xue* 穴), 'stone chamber' (*shishi* 石室), or 'stone tomb'

⁶² Kane and Carrier 1992:122.

⁶³ Rock-cut volumes vary from 750m³ (Leshan city Xiaoba Laiziwan tomb), to 330m³ for middle-sized examples, to 2-3m³ for the simplest. Luo Erhu 2001:35.

⁶⁴ Stocks 2003:169.

⁶⁵ Rockwell 1993:191.

⁶⁶ Takaoglu 2005:45.

⁶⁷ Ouyang Moyi 2007:61.

⁶⁸ See the inscribed Jianyang stone coffins N°2 and 3. see Lei Jianjin 1988, Jianyang 1991 Wang Jianguo et al.1992.

(*shizhun/mu* 石冢/墓),⁶⁹ apart from two occurrences, where the workers called by name, and qualified by the terms 'stone carver' (*shigong* 石工),⁷⁰ and 'master' (*shi* 师, here written as 師).⁷¹ The most cited *tiji*, because longer and more detailed,⁷² is the 154 CE Xiangtajun inscription (东阿县芈他君祠堂题字) in Shandong province :⁷³

Although of small dimensions, the shrine took us a long time to achieve. The work was finished only two years after the stone was quarried (取石) from the southern mountain. Master (师) Rongbao, from Xiaqiu county in the *jun* of Shanyang, was called to design (操蒙)⁷⁴ the shrine, but also Daisheng, a draftsman/painter (画师) from Gaoping county, Shao Qiangsheng, and ten other men. I gave them twenty-five thousand, took good care of the workers, avoiding to make them unhappy, and showed them infinite gratitude.

Despite the formulaic praising mode of the inscription,⁷⁵ speculations on Han craftsmanship followed. The shrine's construction gathered a dozen workers from neighbouring cities, among whom at least three were remembered by name : according to a master's design, common workers quarried, sized and dressed the stones, a draftsman sketched the project, then entrusted to a specialized stone carver, and finished with painted details again.⁷⁶ In fact, we are unable to prove that stone carvers were distinguished from common workers, as different terms could designate the same worker, or that each tomb and shrine needed its own draftsman, when the use of models may have been widespread.⁷⁷ Luo Erhu sees in the Qigedong cemetery a co-occurrence of professional relief carving and popular bidimensional line-carving, proving specialization among stone carvers. But the carvings are very close in terms of execution, and more importantly, the obvious overlap between carvings (Fig.9.A) indicates that the interventions were made at different moments. Some suggest that the Sichuan pictorial stones too needed a preparatory draft by a painter,⁷⁸ citing the unfinished carved bird in the Huangfenbao⁷⁹ and Shaping⁸⁰ tombs, Hechuan city (合川皇坟堡石室墓, 合川沙坪画象石墓), still bearing traces of a cinnabar preparatory drawing. We are unable to confirm these informations, but like the above-mentioned Xiangtajun shrine, both belong to carvings in assembled stone tombs, not rock-cut burials. In the rock-cut Taliangzi M3 and Bailinpo M1, Santai county, where wall painting was preserved, colour is used independently to paint on coarsely dressed surfaces, or applied on relief figures and architectural elements. It is possible that the painting was realized by another kind of

⁶⁹ Xieling 2000:19-20.

⁷⁰ '建平五年六郡五官范功平史石工 叅 徒要本长廿五丈贾二万五千'. 2 BCE 'Silkworm Cliff Stele', Dujiangyan city (都江堰蚕崖碑). Xieling 2000:21.

⁷¹ '陽嘉二年王師作直 (值) 四萬'. 133 CE cliff inscription on the Leipishi rock-cut burial, Nanchuan county (南川县雷劈石). Can Yongshu 1989:25.

⁷² See also the lengthy 157 CE inscription of the Anguo shrine in Shandong province (山东嘉祥宋山安国祠堂题记). Ouyang Moyi 2008:65.

⁷³ Cited in Chen Zhi 1979:65.

⁷⁴ Chen Zhi's interpretes 蒙 as 技艺. Chen Zhi 1979:66. See diverging translation where 蒙 is part of a craftsman's name in Zheng Yan 2008:97.

⁷⁵ Declared amounts of 'money', and the time spent on the work are similarly exaggerated in the Anguo shrine inscription. Zheng Yan 2006:45.

⁷⁶ Xin Lixiang 2000:24-6.

⁷⁷ Deng Lijun 2010:38. And Erickson 2006:444.

⁷⁸ Luo Erhu 2001:66.

⁷⁹ Luo Erhu 2001:66.

⁸⁰ from Wang Jianzhong 2001:476. Cited in Deng Lijun 2010:89.

craftman, if we look at the calligraphic qualities and textual content of the *bangti*,⁸¹ and the portrait's level of detail (Fig.9.B). However, these coloured zones complete the carvings, rather than preceding them as a draft would.⁸² many of the carved figures would result unreadable without the painted details, suggesting a close collaboration between carvers and painters, or even a single hand at work, like in Bailinpo M1 (Fig.9.C). No such collaboration between carvers and painters is visible in Taliangzi M3, where several flat relief figures were overpainted with scenes of a totally different scale, style and content (Fig.9.D-E-F). The overlapping carved and painted figures probably belong to distinct makers, but also to two different moments, maybe far enough from each other to be considered as a case of re-use. The excavation of the cave being usually tightly connected with its carved decoration, the owner of Taliangzi M3 possibly turned to a specialized painter from another type of craft organization to transform a 'normal' burial into this one-off project. At any rate, this shows that stages in the making of the caves are also loaded with intentions, sometimes contrasting.



Fig.9.(A).Qigedong M5 door frame. Changning county.(长宁七个洞).-- (B).Animal relief and painted background with cinnabar inscription. Side chamber of Bailinpo M1, Santai county.-- (C).Painted relief figure. back chamber of Bailinpo M1, Santai county. Source: Pl.168 in Santai 2007.(D-D').Banquet scene painted over a bird relief. 80cm wx60cm h.-- (E-E').Banquet scene painted over a rodent relief. 80cm wx60cm h.. -- (F-F').Banquet scene painted over a standing figure relief. 80cm w.x 60cm h.— Taliangzi M3, Santai County. (塔梁子).Source : Plates 50, 52, 55 and Figs. 59,61,64 in Taliangzi 2008:59, 60, 61.

⁸¹ See Wang Zijin et al. 2004.

⁸² Architectural elements were painted pretty much like the wooden elements would have looked like, another connection between the carvings and wooden architecture. Compare *Yingzao fashi* 2006:400-415. and Pl.290-3 in Santai 2007.

Carving process

As a subtractive process, stoneworking gives the opportunity to look backwards from the final product to reconstruct a carving sequence. Excavating follows a linear progression, where room A must be carved before room B: the two cannot be constructed simultaneously. In fact, lithic technologies first led to the formulation of the *chaîne opératoire*, this stock of 'reference routines stored in the brain' which constitute the basis for any craft tradition.⁸³ Another characteristic of stoneworking is irreversibility. The material cannot be reforged, melted down or added to: this aspect requires careful planning, and decision-making at each step.⁸⁴ Rock-cut spaces are said to represent a sculptural, rather than an architectural problem. The only difference is that the spaces are hollowed out from the inside, while sculpture is worked from the outside: this conceptually challenging reversal could explain 'mistakes' by unexperienced carvers.⁸⁵ It seems that for Sichuanese rock-cut stoneworking, from Eastern Han burials to Tang Buddhist shrines, the 'trick' had to be relearned for each new cave. In the 'step-by-step' progression used to avoid overcutting, the very first step, probably after having tested the quality of the rock with a quarry pick or an axe (Figs.10.A-A' and B-B'), is to draw a sketch of the door and chisel it directly on the cliff (Fig.10.C). This principle is valid for rock-cut pictorial reliefs too (see Fig.23.A).⁸⁶



Fig.10.(A-A').Vertical series of holes, potentially by quarrying wedges, and pick trace above Citangpo M7 door.– (B-B').Pick trace and preparatory outline for a rock-cut door. Wofoyuan, Anyue county.(卧佛院).– (C).Preparatory outline for a rock-cut door. Qigedong, Changning county.

Basically, all caves are obtained by excavating a tunnel, from where material has to be continuously extracted, like in a mining process. Cutting proceeds from the center out, and from the ceiling down (Fig.11.A), requiring the establishment of a central line.⁸⁷ The excavation can also begin with the wall's bottom part, followed by its sides: when hitting the remaining top-central part, the rock easily falls off in big chunks. (Fig.11.B). We should be careful when making parallels with medieval rock-cut sandstone technology in the area: the function and meaning of the rock-cut space also interfere in its excavation sequence. Unlike indoor carvings, outdoor doorframes can be carved anytime during the excavation process, independently from the cave itself, as seen in Citangpo M11 exposed profile (Fig.11.C). In Yongjia, a finished stepped door marks the location of a rock-cut burial, which was excavated from an adjacent cave (Fig.11.D):⁸⁸ the door does not communicate with the chamber it stands for. The door may also have had a specific meaning, autonomous from its function.

⁸³ Dobres 2000:19.

⁸⁴ Rockwell 1993:12.

⁸⁵ Rockwell 1993:190.

⁸⁶ Williams 1970:99.

⁸⁷ Dodson 1991:56.

⁸⁸ This also shows that not all *a posteriori* communications between adjacent caves are unrelated to their original purpose.



Fig.11.(A).Unfinished cave. Qianfuyan site, Anyue county. Tang dynasty. (千佛岩).– (B).Unfinished cave. Wofoyuan site, Anyue county. Tang dynasty. – (C).Profile of Citangpo M11 stepped door.– (D).Unfinished cave in Yongjia cemetery, Tongliang county.

Potential ramifications of the inner volume are then delineated : structural predispositions are necessary to place tridimensional elements. Unlike central pillars, the half life-size rock-cut stove and animal can be realized after the first tunnel has been hollowed out, when widening the tunnel backwards, in the corners immediately behind the door (Fig.12.A and B-B'). Apart from the M8 rock-cut animal, which is facing the corner next to the door (Fig.12.C), the M9 ram had lost its head. On what should be the back of the animal (according its legs' direction), a break trace coincides perfectly with the surprisingly small and well-finished ram head found on the chamber's floor (Fig.12.D). In Taliangzi M3, a comparable animal combines a roughly cut body with a fine polished head sculpted in the round, showing again radically different levels of finish and depth in relief coexisting on the same relief (Fig.12.E).

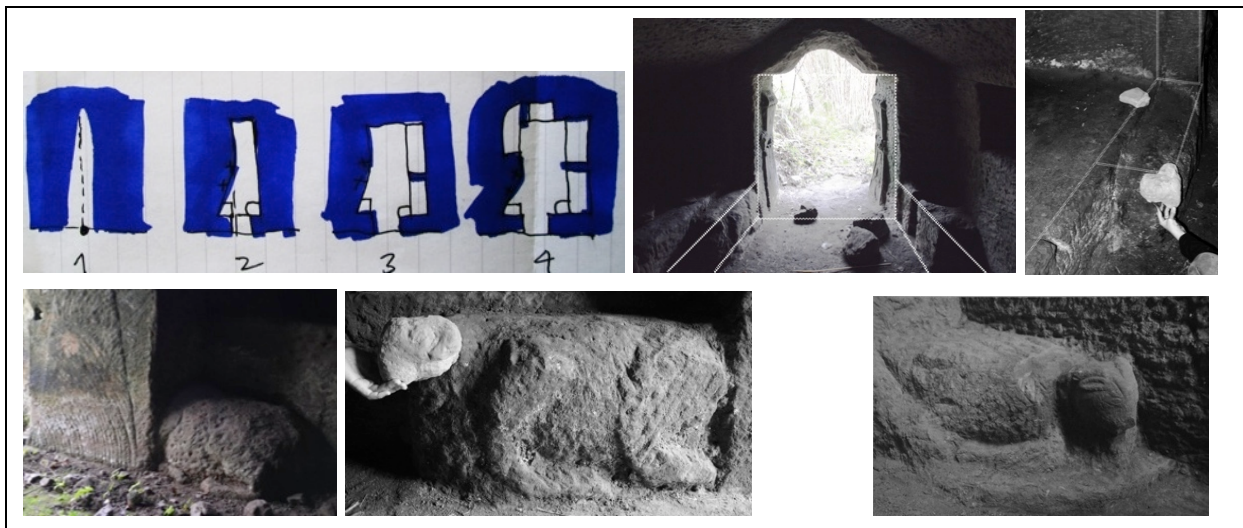


Fig.12.(A).Citangpo M9 excavation sequence.– (B-B').Initial tunnel outline. Citangpo M9.– (C).Headless Rock-cut animal. Corner left of Citangpo M8 door. 32cm hx55cm wx33cm deep.–(D).Recomposed rock-cut animal. 38cm hx72cm wx23cm deep.Corner right of Citangpo M9 door.– (E).Rock-cut animal . Corner left of Taliangzi M3 door, Santai county. Source : Pl.85 in Taliangzi 2008.

Central pillars require an initial division of the tunnel into two branches, which will join again to form the back wall, leaving a free-standing chunk of rock in the middle like in Bailinpo M4 (Fig.13.A). Interestingly, only the side of the pillar facing the entrance corridor is finished (Fig.13.B) : its back is only roughly shaped (Fig.13.C-D). The back bracket-arm on the Bailinpo M1 central pillar too, was left unfinished and unpainted (Fig.13. E-F-G). These two structural elements were apparently meant to be viewed only from the entrance of the rock-cut burial and, compared to the rest of the cave, their visible side may have been realized at a distinct stage, by a specific maker.



Fig.13.(A).Groundplan and profile of Bailinpo M4. Qijiang county. Source : Fig.1-4. in Ma Xiaoliang 2012:83.– (B-C-D).Front, back and profile views of the Bailinpo M4 central pillar. Qijiang county.– (E-F-G).Entrance, front and profile views of the Bailinpo M1 central pillar. Qijiang county.

For parts to be carved in higher relief, enough raw matter should be left on the rock-cut wall before it attains its final shape. Instead, lower relief only takes place as the wall is completely freed from the rock matrix. The unfinished states of the above-mentioned Yongjia door, the Citangpo and Taliangzi animals, as well as pillars in Bailinpo M1 and M4, show distinct making stages. At this point, we can only speculate about the nature of this distinction, and the intentions behind unfinished works.

Unfinished works and Surface Dressing

Luo Erhu attributes unfinished stone coffins to the short time at a carver's disposal between the coffin owner's death and its interment.⁸⁹ While its shape may have already been finished, the coffin's decoration would be left undone until the owner's death.⁹⁰ This fabrication process in two steps is visible on the unfinished head and feet sides of Zhuwapu coffin N°3 (Fig.14 A-A'). The square surface is first divided in four by its diagonals : the resulting triangles are then chiselled in alternate directions. Secondly, the figure is incised, and the residual matter between its limbs, chiselled away. Surface dressing is the intermediary stage between the quarrying, and decoration of a stone coffin. Ornamental dressing (Fig.14.B) acts here as a structuring geometric grid, which confers balance and dynamism to the figure, and deepens its background. Interestingly, this 'combination of taut curves and tense diagonals'⁹¹ is also a major constituent of Sichuanese sculpture, according to Edwards. Zheng Yan reached the same conclusion when analyzing Western Han assembled limestone slabs coffins (*shiguo* 石槨) from Shandong : he attributes this heavy reliance on surface dressing to an early stage of stoneworking traditions (Fig.14.C).⁹² To join the stone slabs, early stonemasons simply

⁸⁹ Luo Erhu 2001:67-8.

⁹⁰ Based on written sources describing the *shouguan* (寿棺) custom, literally 'longevity coffins'. In Luo Erhu 2001:68. And Neijiang 1996:22.

⁹¹ Edwards 1954:26.

⁹² Zheng Yan 2013:76 and 79.

continued previous techniques of wooden assembly,⁹³ surface dressing being the first step in truly experimenting the new material. However, Sichuanese stone coffins are mostly made of hollowed out quarried blocks, which, together with rock-cut coffins, give a sculptural orientation to the making of stone coffins.

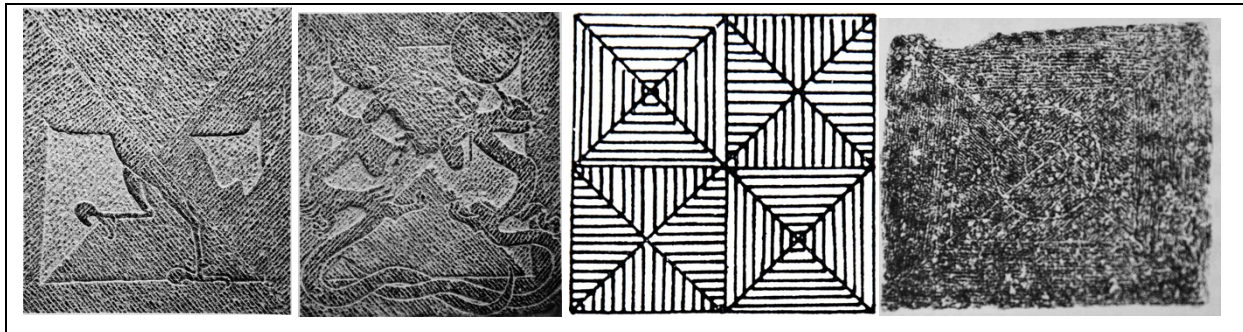


Fig.14.(A-A').Head and feet panels of the Zhuwapu unfinished stone coffin. Pixian county. (郫县竹瓦铺) 90cm hx82cm w. Source: Gao Wen 2011:134.– (B).Decorative dressing 'in triangles' by the mallet and chisel. Source : Fig.31-9 in Bessac 1986:131.– (C).Head side of a limestone slabs coffin. Linyi county, Shandong Province.(临沂).Source: Fig.3 in Zheng Yan 2013:80.

The position of unfinished stone coffins within the grave, usually placed very close to one another, could hide one or more of their sides to the potential viewer.⁹⁴ Even though the caves are progressively filled up with coffins,⁹⁵ it seems that only the hidden side is left undecorated (Fig.15.A-B), almost if treated like a rock-cut coffin attached to the wall. This would confirm that decoration is realized only after the coffins have reached the cave, or at least after their position within the cave is known by the carver. This would prove to some extent that in terms of decoration, quarried stone coffins complete the rock-cut space they are stored in, like rock-cut coffins do.

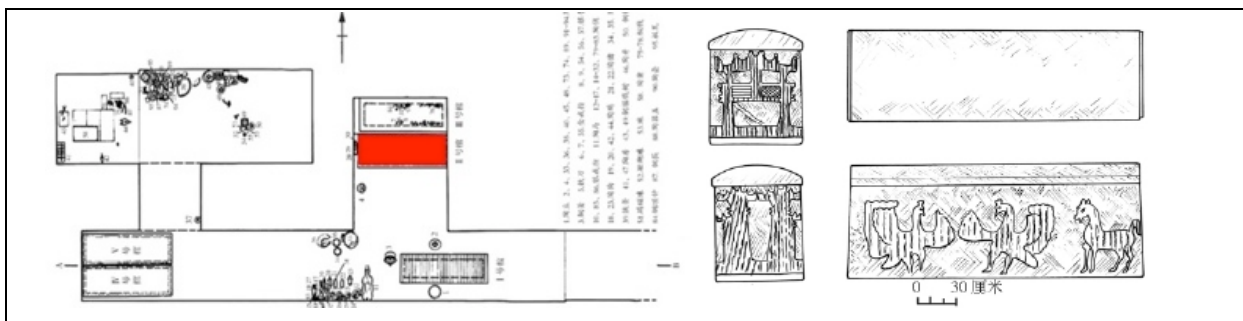


Fig.15.(A).Shizishan M2 coffin N°2 located in red, (B).its incomplete side facing North. Ziyang City, Yanjiang district.(资阳市狮子山).--- Source: Zhou Yongdong et al. 2011:11-2.

While free-standing stone coffins require distinct tasks such as quarrying, dressing and polishing, the excavation and sculptural program of rock-cut spaces are realized together. Even the above-described 'ramming' technique' may have been used to sketch the rock-cut reliefs.⁹⁶ Surface dressing is no more a distinct task here, but repeatedly intervenes within a continuous process realized by only one type of workers : carvers. The following two examples show contrasting options for the level of finish reached in rock-cut spaces. In Xiaoba, three stages of surface dressing are visible in a corner, but the pursued final result is a smoothed surface structured by architectural

⁹³ Wooden assembled coffins (*guo* 椁) and hollowed out 'boat-coffins' (*chuanguan* 船棺) coexist in Pre-Qin Sichuan. See Chapter 2 in Mianyang 2006, and Mengoni 2004:62 .

⁹⁴ Seen for several unfinished *peperino* quarried coffins placed in Etruscan rock-cut burials.Tuscania Archaeological Museum.

⁹⁵ See also Jianyang 1991:20.

⁹⁶ Luo Erhu 2001:67.

pseudo-wooden frames (Fig.16.A). Instead, different stages of dressing are visible in the final shape of Citangpo M9 stepped door (Fig.16.B): the outward-facing surface is finely dressed, while the inward-looking surface is kept in a coarser state. This way, stepped doors catch starker contrasts between light and shadow, visible from a greater distance (Fig.16.C).



Fig.16.(A).Transition zone between dressing stages. Xiaobao, Chezi district, Leshan city.– (B).Alterned quarried and dressed surfaces. Citangpo M9 stepped door. – (C).Stepped doors. Qigedong, Changning County.

Ornamental dressing is sometimes designed to fit the whole rock-cut cave. In Citangpo M7, the ceiling and walls are systematically dressed by alternating orthogonal frames and oblique fillings (Fig.17.A). In Bishan county, both the Guangpu district rock-cut burials, where finely decorated quarried stone coffins were once stored (Fig.17.B),⁹⁷ and the Chaqishan M1 rock-cut coffins (Fig.17.C), show a similar type of framework covering the whole chamber. This type of dressing imitates the wooden frames and adobe fillings of a hut, like the one represented in Citangpo M9 model A (Fig.32.D). This modest architectural framing occasionally encloses relief figures (Fig.17.D), echoing the pseudo-wooden framework of the richly decorated Santai county rock-cut burials.⁹⁸

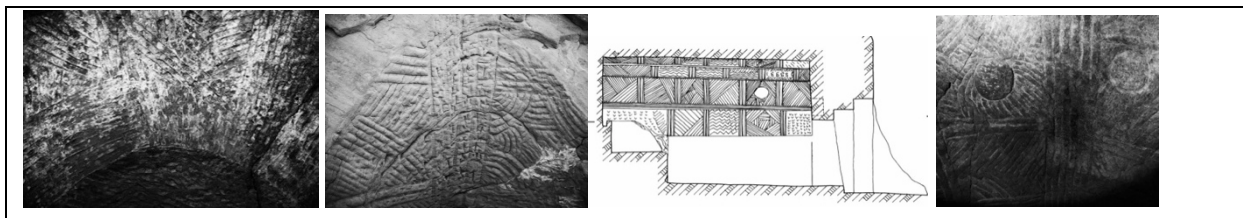


Fig.17.(A).Citangpo M7 ceiling dressing.– (B).Ceiling dressing. Guangpu district, Bishan county (璧山区广谱镇).– (C).Wall Dressing in Chaqishan M1 (插旗山), Bishan County. Source: Fan Peng et al. 2012:30.– (D).Ceiling dressing enclosing a 'sun and moon' pattern. Guangpu district, Bishan county.

Dressing patterns also form autonomous panels placed next to the caves' side niches or back walls (Fig.18.A) : the rest of the cave is left plain, or just regularly dressed. A rectangular panel with geometric subdivisions can be seen next to the Citangpo M7 rock-cut stove (Fig.18.B). The rich repertoire of dressing techniques, fluidly executed 'as if drawing' on the soft sandstone,⁹⁹ provided essential compositional guidelines for the carver who had to fit pictorial motifs within the rock-cut burial. In Yongjia, Incised fishes, birds or circular figures are added to these compositions (Fig.18.C-D).¹⁰⁰ Instead, when only a few lines are added to the regular wall dressing, these look more like a technical accident than like intentional design. The varied levels of planning and complexity of these motifs defy classifications : unlike clearcut distinctions between dressing and figure outlining stages

⁹⁷ See Fan Peng et al. 2012.

⁹⁸ Erickson 2006:407.

⁹⁹ Rababeh 2005:93-8.

¹⁰⁰ Similar to printed patterns on moulded bricks found in the area in terms of composition. Gao Wen and Wang Jinsheng. 2002:411-2 and 505.

seen in quarried stone coffins, rock-cut carvings respond to a 'progressive' logic where dressing and pictures belong to one single carving process, at different stages of finish.

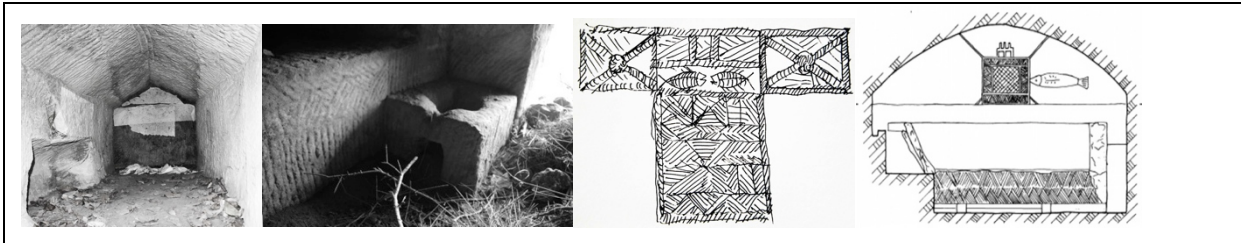


Fig.18.(A).Back wall and side niche panels. Baishulin, Zhongfeng district, Qijiang county (綦江县中锋镇柏树林). 100cm hx90cm wx250 cm deep. Dated 165 CE.-- (B).Dressing pattern and rock-cut stove. Citangpo M7, right wall. 20cm hx70cm w.-- (C).Line drawing of a back wall panel dressing. Yongjia district, Tongliang County. (铜梁县永嘉镇) 160cm hx170cm w.-- (D).Dressing patterns on back wall and rock-cut coffin. Chaqishan M1 (插旗山), Bishan County. Source: Fan Peng et al. 2012:30.

C. 'PICTORIAL STONES'

Terminology and Classification

The term 'Pictorial Stone' (*huaxiang* 畫像, literally 'figure drawing') was first used by Song scholar Zhao Mincheng (赵明诚) to describe the Wuliang shrine limestone carvings.¹⁰¹ Its use was then extended to 'all the stones that can be rubbed',¹⁰² thus designating all kinds of relief pictures, be it on stele, column, *que* gate, shrine, burial chamber, cliff, ect, from the two Han dynasties to the Wei-Jin (4th century), in sometimes desperate attempts to make the reliefs fit into the category (Fig.19 A-A' and B). Latest attempts at cataloguing pictorial stones are still busy refining duplication techniques of the final carved product.¹⁰³

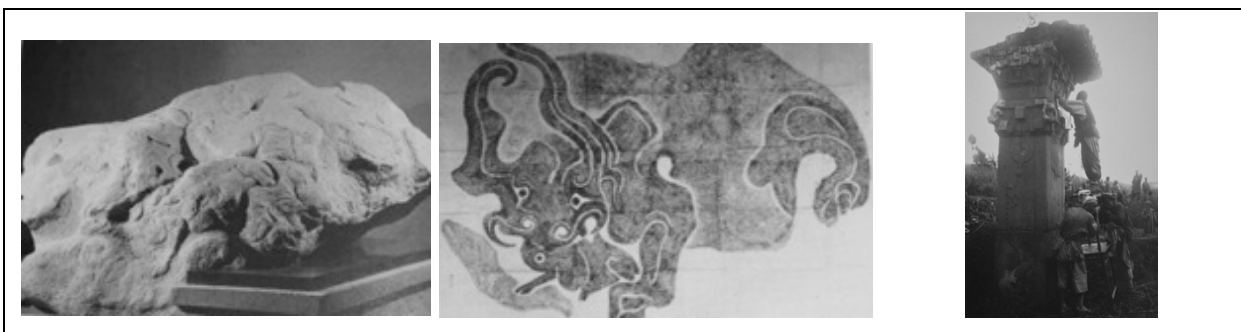


Fig.19.(A) 'Monster devouring a goat'. Tomb of Huo Qubing. 2nd century. Granite. Source : Pl.44 in Wang Jingxian 1989. reproduced in Wang 2011:160.-- (A') 'Monster devouring a goat'. Rubbing. Source : Fig 66 in Paludan 2006:112.-- (B). Attempts at rubbing a *que* pillar in Qu county (渠县). 1914. Photograph by Segalen. 13 x 18 cm. Source: Photographic archive of Musée Guimet. Reproduced In Ghesquière et al. 2005:124.

Modern classifications for pictorial stones, first made for the Shandong and Nanyang stone slabs, depart from the pictorial/sculptural distinction when based on visual effects, intaglio/relief being its counterpart in terms of carving technique.¹⁰⁴ In Li Falin's early attempt (Fig.20), the historical

¹⁰¹ *Jinshi lu* (1129 CE : *Juan* 19) . 2005 :331.

¹⁰² Even pictorial bricks are included therein, although these are not carved in stone, but printed from a carved mould. Yang Boda 1987:3.

¹⁰³ See Zhu Qinsheng 2011:403-9.

¹⁰⁴ Yang Boda 1987:4.

evolution of carving techniques goes from flat to high relief, overtly suggesting that line carving has an 'indigenous' priority. Twenty years later, the same author recognizes that rather than obeying to a chronological order, these categories are successive additions on two basic processes, line carving and relief, which may always have coexisted at different stages of the carving process.¹⁰⁵ Pushing further Li Falin's conclusions, we could propose surface dressing as the very first category among stoneworking techniques.

1	Line carving/ Intaglio	<ul style="list-style-type: none"> • <u>Dressing or left undressed</u> • Outline
2	flat low relief	<ul style="list-style-type: none"> • Idem + • hollowing out the background
3	bulging low relief	<ul style="list-style-type: none"> • Idem + • deeper background • Rounding the figures' edges • Line carved details on the bulging shape
4	sunken low relief on a flat surface	<ul style="list-style-type: none"> • dressing • outline • Hollowing out the figures' inside • Line carved details on the sunken shape
5	sunken relief	<ul style="list-style-type: none"> • Same as above, but deeper
6	high relief	<ul style="list-style-type: none"> • Rough dressing • Rough outline • Chiseling out the background and sides of the figure
7	see-through relief	<ul style="list-style-type: none"> • Same as above, • But drilling holes > transparency
8	'bulging lines' carving. (incl. printed patterns on bricks)	<ul style="list-style-type: none"> • Dressing • Double outline • Excavating everything but the line.

Fig.20. Li Falin's classification of pictorial stones. Source: Li Falin 1965:199-200 and 203.

Equally concerned by terminology and evolution, Yang Boda prefers the terms *yinqi* (隐起) and *tuqi* (起突), literally 'hidden bulge' and 'sudden rise', to the terms high and low relief, which he considers a 'Western import' (Fig.21).¹⁰⁶ Yang goes back to 'indigenous' terminologies in use in 6th century Li Daoyuan's *Shuijing zhu* (酈道元-水经注), 1100 CE Lijie's *Yingzao fashi* (李诫-营造法式), and 1129 CE Zhao Mincheng's *Jinshi lu* (赵明诚-金石录), 1166 CE Hongshi's *Lishi* (洪适-隶释). Despite his concern for terminology, the two main stoneworking categories he sees are still pictorial carving (*kehua* 刻画) and bulging relief (*yinqi* 隐起), which he places in an evolutionary sequence.¹⁰⁷ Unsurprisingly, line carving dominates in the early stage, high relief appearing only in the last stage.




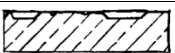
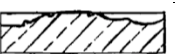
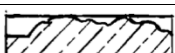
1	阴线刻	Intaglio/line carving		Early stage	100 BCE-0 CE
2	凹象刻	Sunken relief		Middle stage	from 0 CE
3	阳线刻	Relief line carving			
4	平凸刻	Flat relief			
5	隐起刻	'Hidden Bulge' (Low relief)		Late stage	150-200 CE
6	起突刻	'Sudden rise' (High relief)			

Fig.21. Yang Boda's classification of pictorial stones. Source: Yang Boda 1987:5.

¹⁰⁵ Li Falin 1989:90-2.

¹⁰⁶ Yang Boda 1987:5.

¹⁰⁷ '雕镂制度有四等，一日剔地起突，二日压地隐起华，三日减地平钗，四日素平' in *Yingzao fashi* 营造法式 (Li Jie李诫 1100 CE), 2006:21.

Sculpture

Two categories were added by Luo Erhu to describe Sichuanese pictorial stones : 'half-sculpture' and sculpture in the round (Fig.22). In his classification, the categories of high relief and 'half-sculpture' are only differentiated by a few centimeters deep, a quantitative difference which relevancy is questionable. More importantly, sculpture in the round also includes sitting animal figures cut out from corners or as bases for central pillars, thus not necessarily free-standing, but sometimes requiring the use of a drill as seen on the Jiangkou M951-2 rock-cut dog figure (Fig.23.D). The carvings' context does not appear as a determining factor in this classification which mixes assembled *que* gate with rock-cut carvings, two distinct technical processes.

1	'bidimensional' line-carving	
2	concave figures	
3	flat relief	0,5--1cm
4	relief	0,5—4cm
5	high relief	3—10cm
6	'half-sculpture'	10-20cm
7	Sculpture in the round	+ use of the drill

Fig.22. Luo Erhu's classification of pictorial stones. Source: Luo Erhu 2001:65-6.

The Chinese scholars' concerns for tridimensional representation resonate with the way Western Art History sees Chinese sculpture : as a constant struggle between 2D and 3D.¹⁰⁸ In the linear 'conquest of space', progressive steps lead from relief to sculpture in the round, with moments of decadence or archaism, like in the Late Roman Empire, where sculpted figures fall back into rigid, unbalanced compositions isolated by harsh outlines. Early softstone carving is clearly disregarded : early Greek *poros* sculpture, where the material changes, while the craftwork is said to remain unchanged, is still reputed too close to woodcarving techniques.¹⁰⁹ Instead, art historical works display a fascination for hard stone and slow, holistic abrasion process, denying the use of the flat chisel, associated with early line carving and mass-produced low relief.¹¹⁰

Ashton defines Chinese sculpture as generally more concerned with outlines : modelling is conveyed by subtle curves rather than anatomical knowledge. Interestingly, because of its mastery in rendering volumes, Sichuanese sculpture 'does not represent an entirely Chinese form of the art' to him.¹¹¹ When it gets to monumental sculpture, Ashton notices an overall neglect for details, as if the works were only meant for a distant observer.¹¹² A comparable 'lack of care' was noticed for Indian rock-cut sculpture.¹¹³ As it appears from unfinished figures rock-cut Indian temples (Fig.23.A), the carvers aiming at cutting a sculpture out of the living rock begin the work from a chiselled outline, as they would do to excavate a rock-cut space. This approach is different from the Classic Greek sculptor's holistic approach, which attacked the chunk of rock with a punch simultaneously from all four sides.¹¹⁴ However, according to Williams, this is where the Indian sculpted figure gains its strong

¹⁰⁸ Riegl and Winkes. (1901) 1984 :234.

¹⁰⁹ Casson 1933:83.

¹¹⁰ Casson 1933:92.

¹¹¹ Ashton 1934:133.

¹¹² Ashton 1934 : 132.

¹¹³ Williams 1986:99.

¹¹⁴ Bluemel (1927) 1955:43.

outlines and dynamism,¹¹⁵ a quality also attributed to Sichuanese sculpture, again suggesting some kind of continuity between rock-cut carving traditions and the visual qualities of sculpture. It is precisely this kind of intermediary forms between 2D and 3D, that are most frequently encountered in rock-cut caves. Within the same burial, high relief figures sometimes coexists with free-standing stone sculpture (*shiyong* 石俑) of similar scale, style and content (Fig.23.B-C). More commonly found modelled or casted ceramic figures of smaller dimensions could represent another source of inspiration for tridimensional sculpture,¹¹⁶ which sometimes seems to correspond to nearly identical clay models (Fig.23.D-E).



Fig.23.(A).Unfinished Vishnu image. Marle, Siddheshvara temple (Hoysala). 12th century CE. Source: Williams 1986:99.-- (B).Rock-cut standing figure. Mahao M1 vestibule. Leshan city.-- (C).Half life-size stone figures in Mahao M1 tunnel N°1. Leshan city.-- (D).Drilled leg of a rock-cut dog. Jiangkou M951-2, Pengshan county. (彭山县江口).-- (E).Moulded ceramic dog. Leshan city, Mahao museum.

‘Progressive’ Reliefs in Citangpo

Among the progressive stages of finish found in Sichuanese rock-cut burials, this study recognizes three main categories. The first two include the above-studied structural elements, inseparable from the rock-cut space’s excavation process (stepped door frame, stove and rock-cut sculpture), and surface dressing (rough dressing, line dressing, grinding). This section verifies the idea of ‘progressive relief’ in Citangpo M8 and M9, for one third category : from line carving to relief. The M8 reliefs are concentrated on both sides of the tomb corridor, and on the low walls and pillars constituting the sides of the ‘coffin platforms’ (Fig.24.A). In M9, all figures are enclosed into rock-cut architectural models on both sides of the tomb corridor, and next to a rock-cut shelf on the chamber left wall. (Fig.24.B).

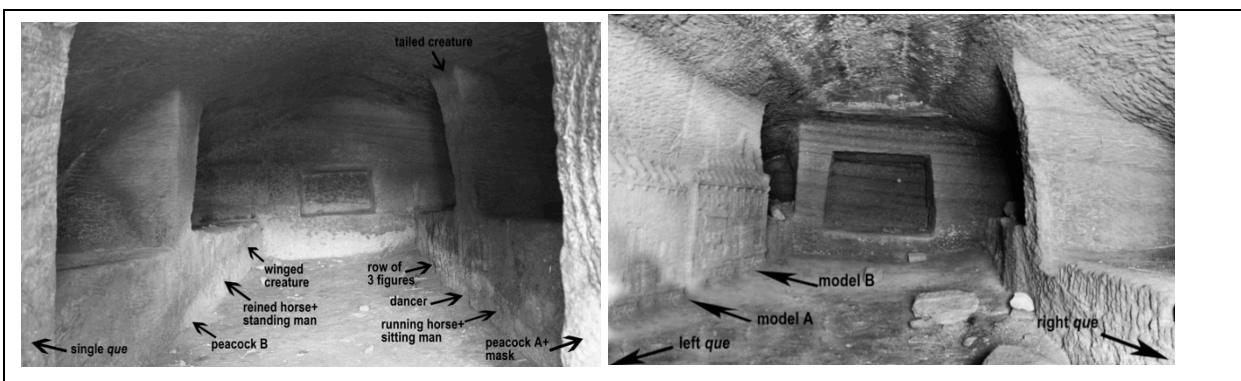


Fig.24.(A).Distribution of the Citangpo M8 reliefs.-- (B).Distribution of the Citangpo M9 reliefs.

¹¹⁵ Williams 1986:100.

¹¹⁶ Bluemel 1927:43.

Dressing Lines

The coarse, wide-curved tool traces on M8 single *que* tower are characteristic of ‘fan-like’ dressings realized with a pick, by circular arm movements (Fig.25.A). Once executed by the quarryman, these should be smoothed by the stonecutter, who removes protruding parts to make the surface as flat as possible. Instead, the dressing completes the M8 *que* figure (Fig.25.B), and as it was the case in the above-mentioned Pixian coffin n°3, may have played a structuring role in tracing its outline, pretty much like a measuring compass would (Fig.25.C). On the *que* roof’s right edge, the carver seems to have ‘slipped’ beyond the point it should have stopped on (Fig. 24.D).

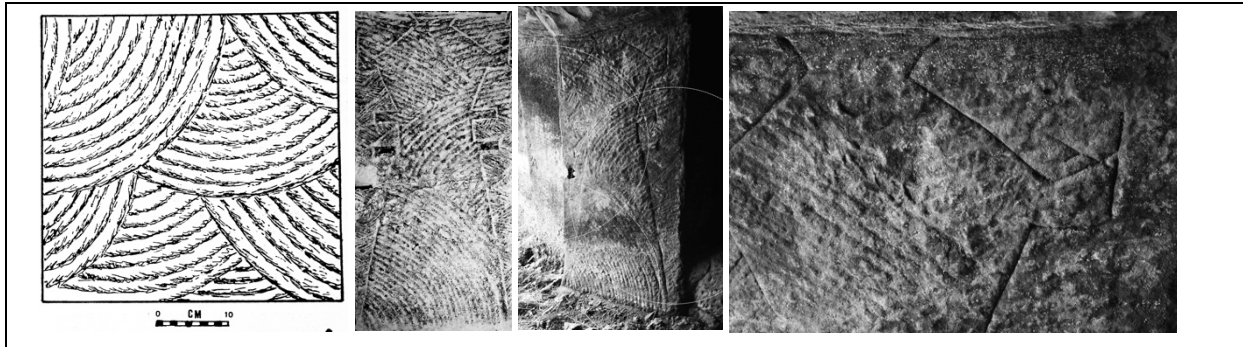


Fig.25.(A) ‘fan-like’ dressing by a quarry pick (or peck). Source:Fig.4-4. In Bessac 1986:47.– (B-C).Rubbing and proportions of M8 Single que. Left side of Citangpo M8 corridor. 125cm hx68 cm w.– (D).Detail of Citangpo M8 single que.

The wall dressing behind M8 peacock A is not as structured as for M8 single *que* (Fig.26.A). The figure’s background was removed without a dominant order in tool traces’ directions (Fig.26.B). However, the dressing still plays a role in the overall visual effect produced by the peacock’s tail. The background between the long tail’s feathers (96 cm) was excavated by short, straight and regularly repeated movements, probably by the point and mallet (Fig.26.C). A similar lack of structure is found in M8 peacock B, wich was also first outlined, then roughly detached from its background (Fig.26.D). Interestingly, the carver regretted his movement on the peacock’s left wing (Fig.26.E). This could be an argument suggesting that no preparatory drawing preceded the carving. The peacock would then be the result of direct carving, as opposed to indirect carving realized from a draft, or a copied model.¹¹⁷

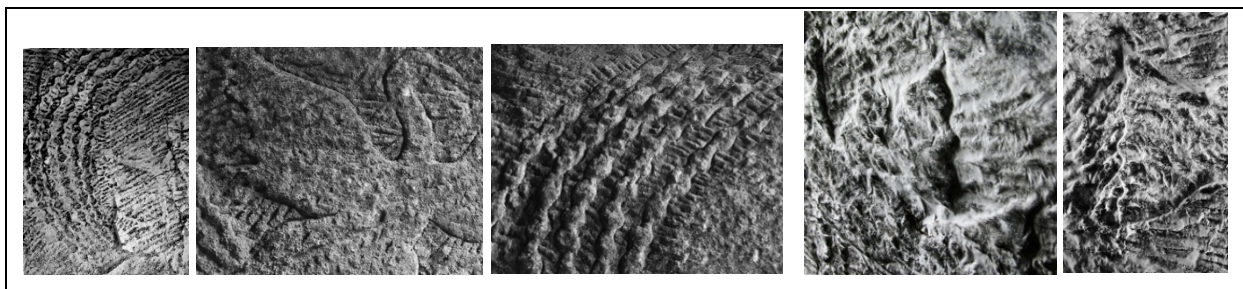


Fig.26.(A-B-C).Rubbing, body and tail of Peacock A. Right side of Citangpo M8 corridor. 82cm hx62cm w.– (D-E).Body and tail detail of Peacock B. Left wall, Citangpo M8. 55cm hx78cm w.

From Flat to Bulging Relief

On M8 chamber’s left wall, a succession of figures are carved in an increasing order of depth : the peacock B, a standing man driving a reined horse, and a winged figure (Fig.27.A). The figures’ legs are only line-carved, and surrounded by shorther, chaotic dressing lines, while the relief

¹¹⁷ Wootton et al. 2013:3.

progressively rises towards the figures' top. This rule applies to most high relief figures in Citangpo : because outlines are detached from their background following a top to bottom movement, and because carving movements are obstructed when the wall meets the ground, the top of the figure is systematically in higher relief than its bottom (Fig.27.B). This linear composition is very close to the scenes found on the longer sides of the Neijiang coffins.¹¹⁸ Despite the inconveniences due to an immovable support, the nearly unlimited amount of raw material that can be excavated from the rock-cut wall leads to particularly unexpected combinations, such as in the animal mask on M8 right door frame (Fig.27.C-C' and D).

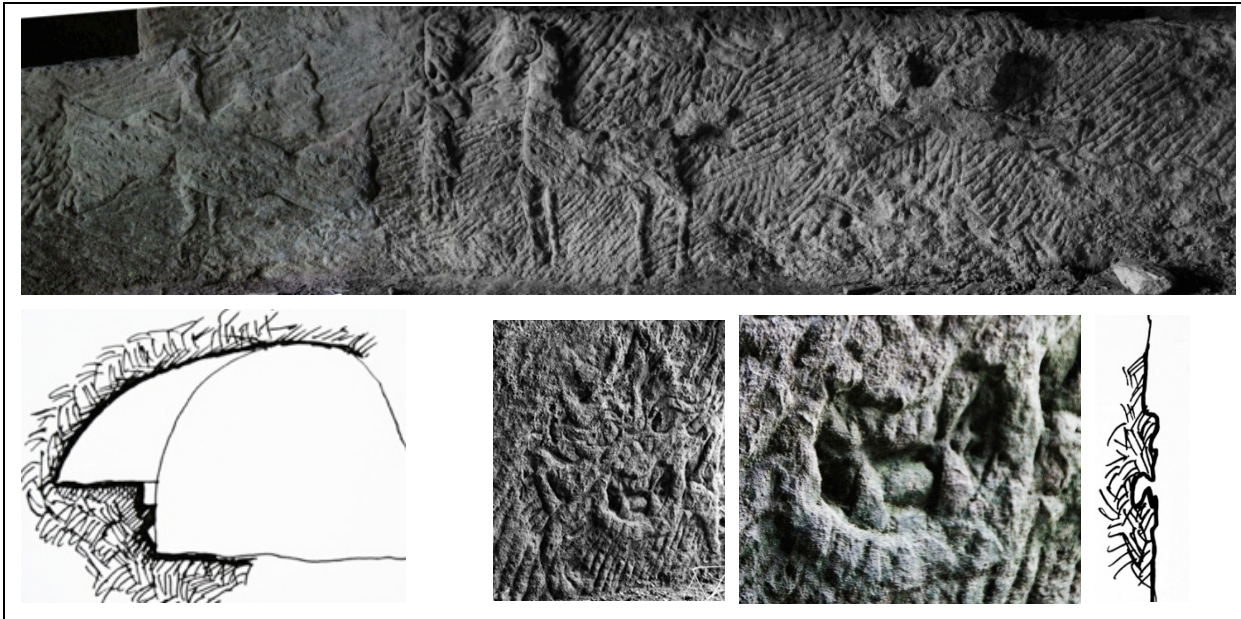


Fig.27.(A).Left wall panel. Citangpo M8. 80cm hx150cm w.– (B).Profile of the left wall panel.– (C-C').Animal mask. Right side of Citangpo M8 corridor. 20cm hx20cm w.– (D).Profile of the animal mask relief.

On M8 chamber's right wall, parts of the carving sequence involving a row of three figures, a dancer and a tailed creature holding a disk over its head, can be reconstructed (Fig.28.A). The row of three is smaller in height (55 cm) than the female dancer (75 cm), probably because the latter made the most of its location on the pillar, where the tailed creature is located. The figures' outlines are not visible because their depth exceed 3 cm, just enough to be called 'high relief', and line carved details were added to the relief shapes. The tail and arms of the tailed creature on the pillar however, are only line-carved. This can be explained by the pillar's curved surface, which follows the ceiling vault (Fig.28.B). The incised tail, executed this close to the much higher dancer relief, must have followed it in the carving sequence (Fig.28.C). The same remark is valid for the low relief running horse, which was probably realized after the sitting figure (Fig.28.D). The compositions shown among the 5 decorated rock-cut burials from Neijiang city, are similar in content (Fig.28.E-F), but only hastily line-carved, and placed in the most unlikely locations within the complex, and carefully proportioned rock-cut architecture, as if it was a later addition. This iconographic consistency with a radically different execution, suggests a shared model, possibly in another material.

¹¹⁸ Gaowen 1997:40-2.

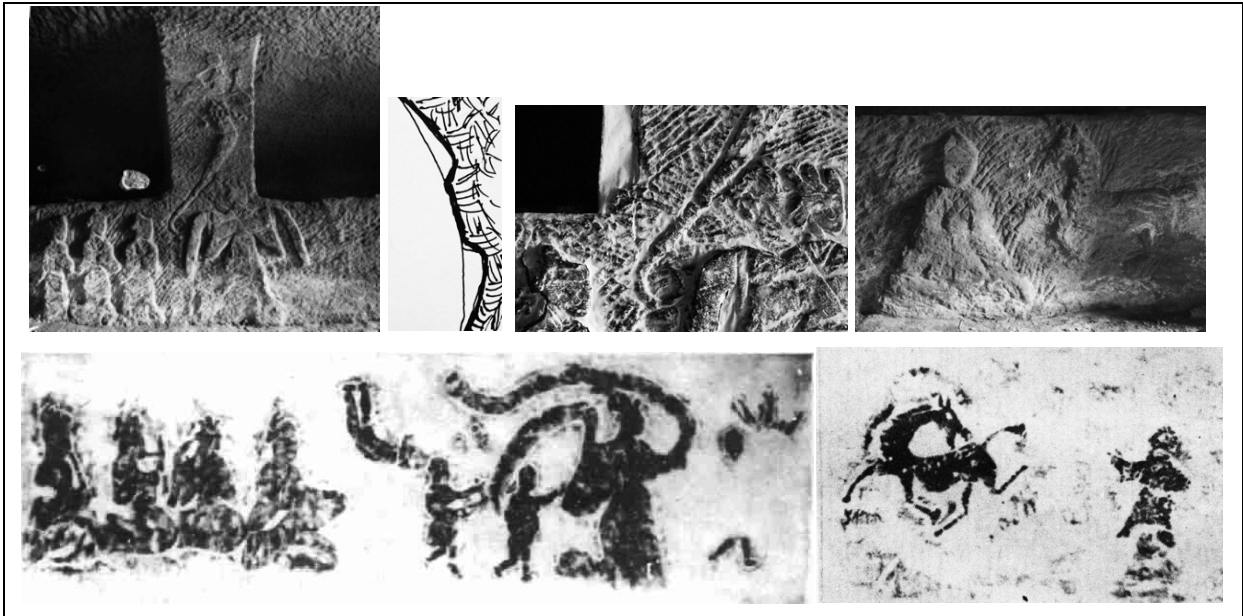


Fig.28.(A).Right wall scene. Citangpo M8. 80cm hx120cm wx3-5cm deep.-- (B).Profile of the tailed creature. Citangpo M8 right pillar.-- (C).Creature's tail and dancer (Detail from a rubbing).-- (D).Sitting figure and running horse. Right wall, Citangpo M8. 57cm hx99 cm w.-- (E).Dancer scene. Back wall of Yanbianshan M1 (岩边山). 36cm hx135cm w. Source: Fig.1 in Lei Jianjin et al.1987:65.-- (F).Standing figure taming a horse. Daliangshan M3 (大梁山), Neijiang City. 25cm hx37cm w. Source: Fig.4 in Lei Jianjin et al.1987:66.

High Relief and Architectural Framing.

On both sides of M9 tomb corridor, a pair of *que* towers have been detached from their background by removing a layer of stone from cave's wall (Fig.29.A-A'). Here too, the roof and the upper floor figures appear in higher relief, while the lower part is only line carved. The two rock-cut burials in Yanbianshan M1 show identical pairs of *que* towers in style and execution (Fig.29.A-B, A'-B'). This coherence over such a stretch of country is remarkable, and given the rarity of decorated tombs in the Nejiang area, suggests the same hands at work on both sites, at least for architectural elements. Although the alcoves in Citangpo are much simpler than the Neijiang house-shaped rock-cut coffins, both are flanked by miniature models of buildings on piles like those on the Citangpo left wall (Fig.29.C). As mentioned above, the carver had not enough material to rise the relief equally on the bottom of the models, as he did for the roof, and the Citangpo models appear shallower (Fig.29.D-D').

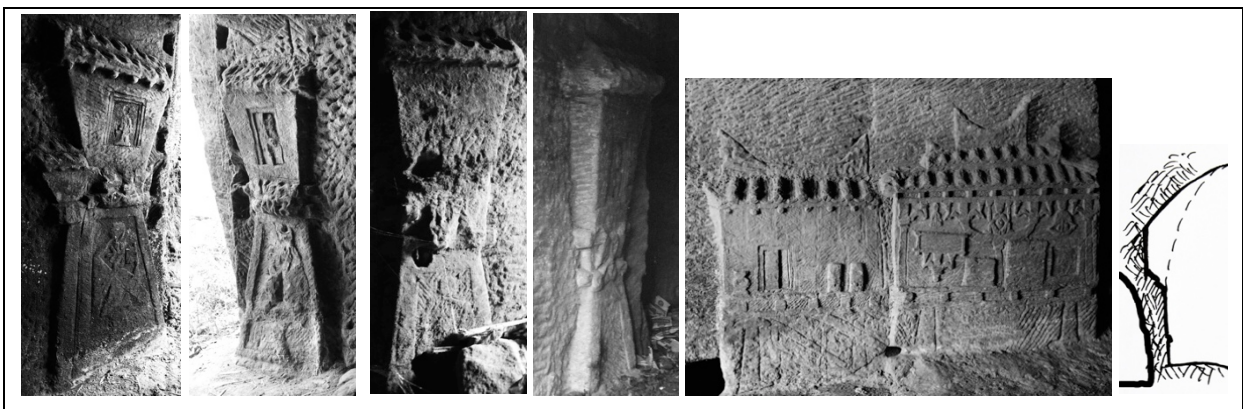


Fig.29.(A-A').Citangpo M9 tomb corridor pair of que. 124cm hx45cm w.-- (B-B').Neijiang Yanbianshan tomb corridor pair of que. 135cm hx40cm w.-- (C).Citangpo M9 Model A. 90cm hx66cm w, and Model B. 76cm hx95cm w. Left wall, Citangpo M9.-- (D-D').Profile of Model A.

Today, the tomb corridor carvings are visible from the outside, but traces that precede them on the edge of the stepped door frame, show that they were invisible once the burial was sealed

(Fig.30.A). Apart from its peculiar orientation, M15 is the only unit to display a 'façade', preceded by a long alley (Fig.30.B). Figures in M15 include association of flutist and crossbowman in a bracket-set framework, above the door cornice (Fig.30. C-C'), and two standing figures in the tomb corridor (Fig.30.D): all of them are carved in higher relief than any other carving on Citangpo. Due to the rapid decay of these exposed reliefs, M15 was re-buried in 2011. Although the Citangpo modest outcrop looks nothing like the monumental, exposed waterside façades along the Min River,¹¹⁹ this kind of outdoor reliefs is typical from those regions.¹²⁰



Fig.30.(A).Citangpo M9 tomb corridor reliefs. --(B).Citangpo M15 Façade.—(C-C').Flute player and Crossbowman. Citangpo M15 façade. --(D).Standing figure. Citangpo M15 tomb corridor. 50cm h.

Although on a smaller scale and lower relief, the flutist and crossbowman duo is still visible on the M9 right *que* (Fig.31.A), but also among the bracket-sets of M9 Model B too, on both sides of a caryatid figure (Fig.31.B). The latter's overlapping limbs recall the M9 left *que* interlocked squatting naked figures (Fig.31.C). *Que* pillar's corners and timber frames are often the occasion to display such organic, round modelling, in strong contrast with the architectural lines. In his early typology, Ashton suggested that rather than corresponding to a chronological evolution, relief types were distributed according to a predetermined visual strategy : the higher reliefs being located on central pillars and corners, while line carved and flat relief parts stretch on side walls.¹²¹ This kind of planning, if harder to reconstruct on the disassembled quarried stones of Shandong,¹²² is easier to experience in the Sichuanese rock-cut spaces.



Fig.31.(A).Crossbowman. Citangpo M9 right *que*. 14cm h.-- (B).Flute player, Caryatid, and Crossbowman. Citangpo M9 Model B. 11cm h.--(C).Squatting naked figures. Citangpo M9 left *que*. 14cm h.

Most figures carved on the M9 architectural models are in flat relief, following the carving process seen in the Min and Qi River caves (Fig.32.A) : the walls 'have been smoothed and divided into rectangles for future reliefs' which, as noticed by Rudolf, sometimes 'did not materialize'.¹²³ A similar situation, although at a miniature scale, may explain the two plain square surfaces on M9

¹¹⁹ LuoErhu 2001:79.

¹²⁰ Tang Changshou 2006:460-1.

¹²¹ Ashton 1924:23-4.

¹²² For the exception that confirms this rule, See Anqiu 1992.

¹²³ Rudolph 1950:32.

model B : this could be raw material prepared for a flat relief figure to come (Fig.32.B), left in higher relief than any other figure on the model. They may have been outlined first, then keeping their original shape till the final stage. However, their surface was flattened in short strokes by the flat chisel, instead of the long oblique punch traces present on all other parts of the model. Rare occurrences of walls with preserved pigments show that many of the frames that appear empty in other caves were actually painted, completing the plain flat reliefs (Fig.32.C).¹²⁴ Although there is no visible trace of painting in Citangpo, a figure maybe stood in M9 model B's empty frame next to the two protruding squares, like in the Bailinpo M1 half-opened door.

Well-represented in Citangpo M9, false doors constitute an interesting case of flat relief, where a simple sloped incision in the surface creates depth. The door is left ajar (Fig.32.D), with sometimes a figure in flat relief standing on its treshold (Fig.32.E). When the door is completely open, its frame is stepped to recreate the depth sensation (Fig.32.F), like in life-size tomb door cornices. A last possible explanation for M9 model B, is to look at rock-cut models of buildings on piles found in other rock-cut burials : their 'door' is deeply hollowed out to form a niche (Fig.32.G). Our Citangpo carver may have had the same project in mind, but he abandoned it since the wall was not deep enough to hollow model B' door. Neighbouring crafts present in the rock-cut burials, such as modeled or assembled ceramic mingqi, are often associated with the rock-cut models, but they result from totally different making processes. Other clay processing techniques, such as moulded pictorial bricks from carved wooden moulds, could be further investigated in comparison to stone reliefs.



Fig.32.(A).Flat reliefs in pseudo-wooden framework. Bailinpo M1, Santai county.--(B).Empty frame. Citangpo M9 Model B. --(C).Painted figure on a half-opened door relief. Bailinpo M1, Santai county. 15cm hx25cm w. --(D).Half-opened door. Citangpo M9 Model A. --(E).Half-opened door. Citangpo M9 Left que. 20cm hx15cm w.--(F).Opened door. Citangpo M9 right que.--(G).Set of ceramic mingqi excavated *in situ* next to a rock-cut model. Bailinpo M2, Santai county. Source: Fig.219 in Santai: 2007.

¹²⁴ Erickson 2006:458-460.

CONCLUSION

In an area renowned for its pictorial stone coffins, Citangpo belongs to a minority of decorated rock-cut caves. Both the site's geographic location, and its diachronic realization, may explain the lack of consistency between the decorated units, which allowed to compare different carving programmes within one single site. I have individuated three types of carving programmes in Citangpo : structural elements (including stepped door frame, rock-cut stove and animal, but also architectural elements), dressing patterns, and line carved to relief scenes. Among these, only the last one is usually taken into account by the term 'Pictorial Stones'.

Instead, it is principally the categories of structural rock-cut elements and surface dressing that guided our reading of the carvings. This study took the different carving techniques as added stages in one single carving sequence, relating pictorial reliefs to their rock-cut context. Such a reading also involved looking back at more complex and better studied ensembles of the Qi, Min and Yangzi Rivers, with a different eye. Indeed, the less rigid making process of the Citangpo rock-cut caves, rather than a recognizable 'tradition', shows several instances where experimentation leads to innovative shapes.

The Citangpo M8 and M9 pictorial reliefs showed that transmission and diffusion for stoneworking traditions may have proceeded via iconographic models, travelling carvers, or clay objects. The copy of farther landmarks could be envisaged for M15, the only decorated cornice visible from the outside, which looks like a miniature version of the monumental façades along the Min River.

With the rock-cut coffins as intermediary form, well-represented in the Neijiang area, we were able to relate the rock-cut spaces' carving sequence to free-standing quarried coffins, and free-standing sculpture in the round in general, somehow compensating the poor record of sculpture in the round available for that period of Chinese Art History. This could well provide a missing link to relate Sichuanese stoneworking to Han funerary stone carving from outside Sichuan and rethink the category of 'Pictorial Stones'.

BIBLIOGRAPHY

Chinese Archaeology

- Anqiu. 1992. Anqiu County Cultural Relics Office and Anqiu County Museum 安丘县文化局, 安丘县博物馆. *The Dongjiazhuang Pictorial Stone Tomb in Anqiu County*. 安丘董家庄汉画像石墓. *Jinan chubanshe* 济南出版社.
- Can Yongshu 缪永舒. 1989. On the Han cliff tombs carvings in Nanchuan county 南川县汉崖墓石刻研究. *Sichuan wenwu* 四川文物 3: 25-28.
- Can Shunyong and Chen Bi 廖顺勇, 陈必. 2000. Excavation report for the Eastern Han Rock-cut Burials in Anyue County, Linfeng District, Songlin Village. 安岳县林凤镇松林村东汉崖墓清理简报. *Sichuan Wenwu*. 四川文物 5: 66-67.
- Chen Zhi 陈直. 1979. A Study on the Inscription in the Han Dynasty Xiangtajun Stone Shrine. 汉芎他君石祠堂题字通考. *Xibeidaxue xuebao (Zhhexueshehuikexue ban)* 西北大学学报 (哲学社会科学版) 4: 65-7.
- Deng Lijun 郑立君. 2010. *Design and Carving : the Making of Han Pictorial Stones*. 剔图刻像: 汉代画像石的雕刻工艺与成像方式. *Chongqing daxue chubanshe* 重庆大学出版社.
- Fan Xiaoping. 范小平. 2006. *Rock-cut Burials in Sichuan* 四川崖墓艺术. *Bashu shushe* 巴蜀书社.
- Fan Peng et al. 范鹏, 邹后曦, 李大地. 2012. On the Han Dynasty Stone Coffins excavated in Bishan County, Chongqing Province 重庆市璧山县汉代石棺的发现与研究. *Sichuan Wenwu* 四川文物 6:28-35.
- Fu Chengjin 傅成金. 1996. A General Description of the Rock-cut Burials in Anyue 安岳崖墓石刻画像概述. *Sichuan Wenwu* 四川文物 3:42-4.
- Gao Wen 高文. 1997. *Han Dynasty Pictorial Stone Coffins from Sichuan* 四川汉代石棺画像集. *Renmin chubanshe* 人民美术出版社.
- _____.2011. *A Catalogue of Han Dynasty Pictorial Stone Coffins in China* 中国画像石棺全集. *Renmin chubanshe* 人民美术出版社.
- Gao Wen and Wang Jinsheng 高文, 王锦生. 2002. *A Catalogue of Han Dynasty Pictorial Bricks from the Bashu Area* 中国巴蜀汉代画像砖大全. *Guoji Gangou chubanshe* 国际港澳出版社.
- _____.2004 (A). The First Integral Brick Coffin Unearthed in Sichuan.. 四川出土的第一具完整砖棺. In Zhu Qinsheng (ed.) 朱青生. 2004. (Journal of the Association for Research on Han Dynasty Art and the Han Art Institute Peking University 中国汉画学会, 北京大学汉画研究所). *Art of the Han Dynasty* 中国汉画研究. Vol. 1. *Guangxi shifangdaxue chubanshe* 广西师范大学出版社 :9-12.
- _____.2004 (B). New Discoveries on the Han Pictorial Stone Coffins from Xinjin County, Sichuan Province. 四川新津县汉代画像石棺上之新发现. In Zhu Qinsheng (ed.) 朱青生. 2004. (Journal of the Association for Research on Han Dynasty Art and the Han Art Institute Peking University 中国汉画学会, 北京大学汉画研究所). *Art of the Han Dynasty* 中国汉画研究. Vol. 1. *Guangxi shifangdaxue chubanshe* 广西师范大学出版社 :13-9.
- Gu Sen 顾森. 1997. *Illustrated Dictionnary of Han Pictorial Stones* 中国汉画图典. *Zhejiang sheying chubanshe* 浙江摄影出版社.
- He Zhiguo. 何志国. 1993. Discussing the Chronology of Mahao Tomb n°1, Leshan city, Sichuan Province. 四川乐山麻浩一号崖墓年代商榷. *Kaogu* 考古 8: 760-763.
- Jianyang 1991. Neijiang City Cultural Relics office and Jianyang County Culture Museum. 内江市文管所, 简阳县文化馆. Eastern Han Rock-cut Burials in Guitoushan, Jianyang County, Sichuan Province 四川简阳鬼头山东汉崖墓. *Wenwu* 文物 3:20-5.
- Jinshi lu* 金石录. (Zhao Mingcheng 赵明成 1129 CE). 2005. Jin Wenming. 金文明 *Guangxi Shifang daxue chubanshe* 广西师范大学出版社齐鲁书社.
- Lei Jianjin and Fu Chengjin 雷建金, 付成金. 1987. Eastern Han Rock-cut Tombs Discovered in Neijiang City 内江市发现东汉岩墓画像. *Sichuan wenwu* 四川文物 4:65-67.
- Lei Jianjin 雷建金. 1988. The Discovery of Inscribed Bangti on the Guitou shan Pictorial Stone Coffins, Jianyang County 简阳县鬼头山发现榜题画像石棺. *Sichuan Wenwu* 四川文物 6: 65.
- Lei Jianjin and Zeng Jian 雷建金, 曾健. 1989. The Hongying Eastern Han Rock-cut Burials in Neijiang City Center. 内江市中区红缨东汉崖墓. *Sichuan Wenwu* 四川文物 4:40-42.
- Li Falin 李发林. 1965. About the Carving Technique and Dating of Han Pictorial Stones 略论汉画像石的雕刻技法及其分期. *Kaogu* 考古 4:199-204.

- _____. 1989. Complementary Thoughts on the Carving Techniques in Han Pictorial Stones 汉画像石的雕刻技法问题补谈. *Zhongyuan wenwu* 中原文物 1: 88-92 and 81.
- Li Jinghua and Chen Changshan. 李京华, 陈长山. 1995. *Iron Production in Han Times Nanyang* 南阳汉代冶铁. Zhongzhou guji chubanshe 中州古籍出版社.
- Liu Qi 刘齐. 2011. Techniques of Iron Production in Han times and the Making of Pictorial Stones. 汉代的冶铁技术与画像石. *Xianyang Shifaxueyuan xuebao* 咸阳师范学院学报 26 (2): 89-96.
- Luo Erhu 罗二虎. 1987. Investigating the Excavation Techniques of the Cliff Tombs in Sichuan Province 四川崖墓开凿技术探索. *Sichuan wenwu* 四川文物 2: 35-38.
- _____. 2001. On the Southwestern Han Pictorial Stones and Pictorial Stone Burials. 西南汉代画像与画像墓研究. Phd Sichuan University. 四川大学博士学位论文.
- _____. 2002. *Han Dynasty Carved Stone Sarcophagi* 汉代画像石棺. *Sichuan chuban jituan, Bashu shushe* 四川出版集团 巴蜀书社.
- Ma Xiaoliang 马晓亮. 2012. Early Rock-cut Burials in Sichuan and Some Related Problems 四川早期崖墓及相关问题探讨. *Kaogu* 考古 1: 82-90.
- Mianyang 2006. Sichuan Provincial Institute of cultural relics and Archaeology, Mianyang City Museum 四川省文物考古研究院, 绵阳博物馆. Han tombs in Shuangbaoshan, Mianyang. 绵阳双包山汉墓. *Wenwu chubanshe* 文物出版社.
- Ouyang Moyi 欧阳摩一. 2008. About the *Bangti* and *Tiji* Inscriptions on Han Pictorial Stones 论汉画像石文字榜题和题记. *Dongnan wenhua* 东南文化 1: 61-65.
- Santai 2007. Sichuan Provincial Institute of cultural relics and Archaeology, Mianyang City Museum and Cultural Relics Office of Santai County. 四川省文物考古研究院, 绵阳市博物馆, 三台县文物管理所. *Rock-cut Burials in Qijiang, Santai County* 三台碛江崖墓. *Wenwu chubanshe* 文物出版社.
- Taliangzi 2008. 中江塔梁子崖墓. Sichuan Provincial Institute of cultural relics and Archaeology, Deyang City Institute of cultural relics and Archaeology and Zhongjiang County Office for the Protection of Cultural Relics. 四川省文物考古研究院, 德阳市文物考古研究院, 中江县文物保护管理所. *Rock-cut Burials in Taliangzi, Zhongjiang County*. *Wenwu chubanshe* 文物出版社.
- Tang Changshou 唐长寿. 1999. Excavation Report for the Mahao Cemetery Rock-cut Burial M1 in Leshan City, Sichuan Province. 四川乐山麻浩一号崖墓. *Kaogu* 考古 2: 111-123.
- _____. 2006. Door and Cornice Carved Programme in the Pengshan Youfanggou Rock-cut Burials. 彭山油房沟画像崖墓兼论彭山崖墓门区画像. In Zheng Xianxing 郑先兴 (ed.). *Han Pictorial Stones : The Tenth Seminar of the Association for Research on Han Dynasty Art*. 汉画研究: 中国汉画学会第十届年会论文集. Hubei renmin chubanshe 湖北人民出版社 :455-461.
- Wan Lixin and Yang Hua. 万立新, 杨华. 1997. Eastern Han Rock-cut Burials in Neijiang 内江东汉崖墓调查于探讨. *Sichuan wenwu* 四川文物 2:10-16.
- Wang Zijin and Gao Dalun 王子今, 高大伦. 2004. About the Bangti Inscription in Taliangzi, Zhongjiang County 中江塔梁子崖墓壁画榜题考论. *Wenwu* 文物 (09):64-9 and 73.
- Wang Jianguo and Tang Chaojun 万建国, 唐朝君. 1992. Eastern Han Rock-cut Burials in Yeyue dong, Jianyang county 四川简阳县夜月洞发现东汉崖墓. *Kaogu* 考古 4: 323 and 383-4.
- Wang Jianzhong 王建中. 2001. *On Han Dynasty Pictorial Stones* 汉代画像石通论. *Zijincheng chubanshe* 紫禁城出版社.
- Wang Jingxian 王静宪. 1989. *A Catalogue of Chinese Sculpture*. 雕塑集. 中国美术全集. Vol. 2. *Renmin meishu chubanshe* 人民美术出版社.
- Xie Ling 谢凌. 2000. Epigraphy in the Sichuan Area : Preserved Examples and Styles 四川地区现存主要铭文石刻及其艺术特色. *Sichuan Wenwu* 四川文物 4:18-25.
- Xin Lixiang 信立祥. 2000. *A General Study of Han Dynasty Pictorial Stones* 汉代画像石综合研究. *Wenwu chubanshe* 文物出版社.
- Xu Yongbin 徐永斌. 2008. The Development of Iron Production in Han times Nanyang and the Carving of Pictorial Stones 汉代南阳冶铁工艺的发展与画像石的雕刻. *Nandu xuetan(Renwenshehuikexue xuebao)* 南都学坛 (人文社会科学学报) 28(6):21-3.
- Yang Boda 杨伯达 1987. About Carving Techniques in the Shandong Pictorial Stones 试论山东画像石的刻法. *Gugong bowuyuan yuankan* 故宫博物院院刊 4:3-25.
- Yingzao fashi 营造法式 (Li Jie 李诫 1100 CE). 2006. Zou Qichang 邹其昌 (ed.) *Renmin chubanshe* 人民出版社.

- Zheng Yan 郑岩 2006. On the Viewers of Han Funerary Art. 关于汉代表葬画像观者问题的思考. In Zhu Qinsheng (ed.) 2006. (Journal of the Association for Research on Han Dynasty Art and the Han Art Institute Peking University 中国汉画学会, 北京大学汉画研究所). *Art of the Han Dynasty* 中国汉画研究. Vol. 2. *Guangxi shifangdaxue chubanshe* 广西师范大学出版社 :39-55.
- _____. 2013. Masking Death : Funerary Art of Medieval China. 逝者的面具: 汉唐墓葬艺术研究. *Beijing daxue chubanshe* 北京大学出版社.
- Zhu Qinsheng 朱青生 (ed.). 2004. (A Journal of the Association for Research on Han Dynasty Art and the Han Art Institute Peking University 中国汉画学会, 北京大学汉画研究所). *Art of the Han Dynasty* 中国汉画研究. Vol. 1. *Guangxi shifangdaxue chubanshe* 广西师范大学出版社.
- _____. 2006. (Journal of the Association for Research on Han Dynasty Art and the Han Art Institute Peking University 中国汉画学会, 北京大学汉画研究所). *Art of the Han Dynasty* 中国汉画研究. Vol. 2. *Guangxi shifangdaxue chubanshe* 广西师范大学出版社.
- _____. 2010. (Journal of the Association for Research on Han Dynasty Art and the Han Art Institute Peking University 中国汉画学会, 北京大学汉画研究所). *Art of the Han Dynasty* 中国汉画研究. Vol. 3. *Guangxi shifangdaxue chubanshe* 广西师范大学出版社.
- _____. 2011. Technical problems Related to the Line Drawing of Han Pictorial Stones. 线描问题: 以汉画线描技术为中心. (Journal of the Association for Research on Han Dynasty Art and the Han Art Institute Peking University 中国汉画学会, 北京大学汉画研究所). *Art of the Han Dynasty* 中国汉画研究. Vol. 4. *Guangxi shifangdaxue chubanshe* 广西师范大学出版社 : 403-9.
- Zhu Xilu 朱锡禄. 1986. *The Wu Family Shrine Pictorial Stones* 武氏祠汉画像石. *Shandong meishu chubanshe* 山东美术出版社.
- Zhou Yongdong et al. 周永东, 王屹, 杨彬, 丁红继, 邓礼同, 甘学仙, 李成彬, 张稳平, 程大宏, 代兵. 2011. Excavation report for the Shizishan cemetery Rock-cut Burial M2 in Yanjiang district, Ziyang city 资阳市雁江区狮子山崖墓 M2 清理简报. *Sichuan wenwu* 四川文物 4:10-25.

Publications in Western Language

- Adam, Sheila. 1966. *The Technique of Greek Sculpture in the Archaic and Classical Period*. British School of Archaeology. Thames and Hudson.
- Ashton, Leigh. 1924. *An Introduction to the Study of Chinese sculpture*. E. Benn limited.
- Bert, Jean-Francois. 2010. *Des Gestes aux Techniques: Essai sur les Techniques dans les Sociétés Pré-Machinistes*. Editions Quae.
- Bessac, Jean-Claude. 1986. *L'Outillage Traditionnel du Tailleur de Pierres de l'Antiquité à Nos Jours*. Editions du Centre National de la Recherche Scientifique.
- Bluemel, Carl. (1927) 1955. *Greek Sculptors at Work*. Translated by Lydia Holland. Phaidon.
- Casson, Stanley. 1933. *The Technique of Early Greek Sculpture*. Hacker Art Books.
- Dobres, Marcia-Anne. 2000. *Technology and Social Agency: Outlining a Practice Framework for Archaeology*. Blackwell Publishers Oxford.
- Dodson, Aidan. 1991. *Egyptian rock-cut tombs*. Shire.
- Edwards, Richard. 1954. The cave reliefs at Ma Hao. *Artibus Asiae* 17 (1): 5–28.
- Erickson, Susan N. 2006. Eastern Han Dynasty Cliff Tombs of Santai Xian, Sichuan Province. *Journal of East Asian Archaeology* 51 (4): 401–469.
- Gavin, Lucas. 2010. Fieldwork and Collecting. In D. Hicks and M.C. Beaudry (eds). *The Oxford Handbook of Material Culture Studies*: 229–245.
- Ghesquière, Jérôme, et al. *Missions Archéologiques Françaises en Chine : Photographies et Itinéraires 1907-1923*. 2005. Les Indes Savantes. Editions du Musée Guimet.
- Haudricourt, André-Georges. 1987. *La Technologie, Science Humaine: Recherches d'Histoire et d'Ethnologie des Techniques*. Maison des Sciences de l'Homme.
- Hodges, Henry. 1992. *Technology in the Ancient World*. Barnes & Noble Publishing.
- Hunt, Barry J. 2008. Sandstone. *Geology Today* 24 (1): 33–38.
- Kane, S., and S. C. Carrier. 1992. Relationships between Style and Size of Statuary and the Availability of Marble in the Eastern Roman Empire. Norman Herz and Luc Moens (eds.). *Ancient Stones: Quarrying, Trade and Provenance: Interdisciplinary Studies on Stones and Stone Technology in Europe and Near East from the Prehistoric to the Early Christian Period*. Vol 4. Leuven University Press: 121-135.

- Lemonnier, Pierre. 1993. *Technological Choices: Transformation in Material Cultures since the Neolithic*. Psychology Press.
- Mengoni, Luisa Elena. 2003. Defining Identities within the Funerary Space: Social and Cultural Diversification in the Brick and Cliff Burials of Sichuan (25-220 AD). *Annali dell'Università degli Studi di Napoli 'L'Orientale'*. 63:139-156.
- _____. 2004. *Changing Cultural and Social Identities in a Border Area: The Case of Pre-Imperial and Early Imperial Sichuan (4th century BC)*. Phd University College of London.
- Nagaraju, Seshabhatta, and Madhusudan Narhar Deshpande. 1981. *Buddhist Architecture of Western India, c. 250 BC-c. AD 300*. Agam Kala Prakashan.
- Paludan, Ann. 2006. *Chinese Sculpture: a Great Tradition*. Serindia.
- Powers, Martin J. 1981. An Archaic Bas-relief and the Chinese Moral Cosmos in the First century AD. *Ars Orientalis* 12: 25–40.
- Rababeh, Shaher Moh'd Ahmad. 2005. *How Petra was Built: An Analysis of the Construction Techniques of the Nabataean Freestanding Buildings and Rock-Cut Monuments in Petra, Jordan*. Vol. 1460. British Archaeological Reports Ltd.
- Riegl, Alois, and Rolf Winkes. 1984 (1901). *Late Roman Art Industry*. Translated from the original Viennese edition with foreword and annotations by Rolf Winkes. Giorgio Bretschneider Editore.
- Rockwell, Peter. 1993. *The Art of Stoneworking: a Reference Guide*. Cambridge University Press.
- Rudolph, R.C.1950. Han Tomb Reliefs from Szechwan. *Archives of the Chinese Art Society of America*: 29–38.
- Sage, Steven F. 1992. *Ancient Sichuan and the Unification of China*. State University of New York Press.
- Stocks, Denys A. 2003. *Experiments in Egyptian Archaeology: Stoneworking Technology in Ancient Egypt*. Routledge.
- Takaoglu, Turan. 2005. *A Chalcolithic Marble Workshop at Kulaksızlar in Western Anatolia: An Analysis of Production and Craft Specialization*. Vol. 1358. British Archaeological Reports.
- Vignato, Giuseppe. 2006. Archaeological Survey of Kizil: Its Groups of Caves, Districts, Chronology and Buddhist Schools. *East and West* 56 (4): 359–416.
- Wang Eugene 2011. Collecting the World: Sculptural Ensemble of Bestiary on General Huo Qubing's (140–117 BCE) Tumulus. In Rujivacharakul, Vimalin (ed.). *Collecting China: the World, China, and a Short History of Collecting*. Rowman & Littlefield : 155-164.
- Williams, Joanna. 1970. An Unfinished Chaitya Hall: Junnar, Manmodi 39. *Ars Orientalis*: 185–190.
- _____. 1986. Unfinished Images. *India International Centre Quarterly* 13 (1): 90–105.
- Wootton, Will, B. Russell, and Peter Rockwell. 2013 (A). Making the Art of Making in Antiquity. *The Art of Making in Antiquity: Stoneworking in the Roman World*. <http://www.artofmaking.ac.uk/content/essays/1-making-the-art-of-making-in-antiquity-w-wootton-j-bradley-b-russell/> (Accessed on <6/07/2013>).
- _____. 2013 (B). Stoneworking Techniques and Processes. *The Art of Making in Antiquity: Stoneworking in the Roman World*. <http://www.artofmaking.ac.uk/content/essays/3-stoneworking-techniques-and-processes-w-wootton-b-russell-p-rockwell/> (Accessed on <6/07/2013>).
- _____. 2013 (C). Stoneworking Tools and Toolmarks. *The Art of Making in Antiquity: Stoneworking in the Roman World*. <http://www.artofmaking.ac.uk/content/essays/2-stoneworking-tools-and-toolmarks-w-wootton-b-russell-p-rockwell/> (Accessed on <6/07/2013>).
- Zheng Yan. 2008. Concerning the Viewers of Han Mortuary Art. in Cary Y. Liu (Ed.) *Rethinking recarving: ideals, practices, and problems of the 'Wu Family Shrines' and Han China*. Yale University Press :92-109.