



KEYWORDS: *Cupule – Rock art – Megalith – Cross-dating – Central Plain of China*

NEW DISCOVERY OF ROCK ART AND MEGALITHIC SITES IN THE CENTRAL PLAIN OF CHINA

Tang Huisheng

Abstract. Since the turn of this century, an immense amount of rock art has been discovered in Henan Province (located in the Central Plains region of China), centred at Mt Juci. Over 90 percent of the rock art consists of cupules and the remainder comprises linear groove patterns, chessboard-like designs and other motifs. The rock art features mainly ground motifs and patterns chiselled by metal tools. There are a variety of cupules, varying in size, depth and arrangement, e.g. occurring in rows, concentric patterns and so on. Rock art was executed on over 10000 boulders, some of which could be classified as megalithic sites, such as menhirs, dolmen, 'stone altars' and the like. The cupules and the megaliths from the Central Plains region appear to show a structural context, which will help us to understand and identify their cultural nature, contents and ages. Based on cross-dating, their production could be considered as spanning the Neolithic and the Bronze Age.

Since the turn of this century, a large quantity of rock art has been discovered at Mt Juci, in Henan Province (located in the Central Plains region of China), which has captured public attention and stimulated extensive interest in rock art studies. Probably two reasons could be given for this:

- (1) According to our previous understanding, rock art was distributed only in the frontier regions of China, such as the coastal area of the south-east, the steppe area of the north and the areas of ethnic minorities of the south-west. This new discovery requires a revision in this traditional understanding of the geographical distribution of rock art in China.
- (2) Mt Juci, located in the Central Plain of China, is legendarily associated with the origins of the Han people and the early history of China.

After a plethora of designs of cupules, linear grooves and chessboard-like arrangements had been discovered at Mt Juci, a large number of similar designs were also found in nearby vicinities, such as Fangcheng County, Ye County, Biyang County, Qi County, Zhenying County, Xichuan County and Nan-zhao County (Fig. 1). With their extensive distribution, large number and variety of types, the new discoveries came as

a considerable surprise — not only to rock art studies, but also to archaeological studies and studies of early Chinese history. Herein, we introduce the rock art of the Central Plain based on information mainly from Mt Juci and Fangcheng County.



Figure 1. Distribution of cupules in Henan Province, China.

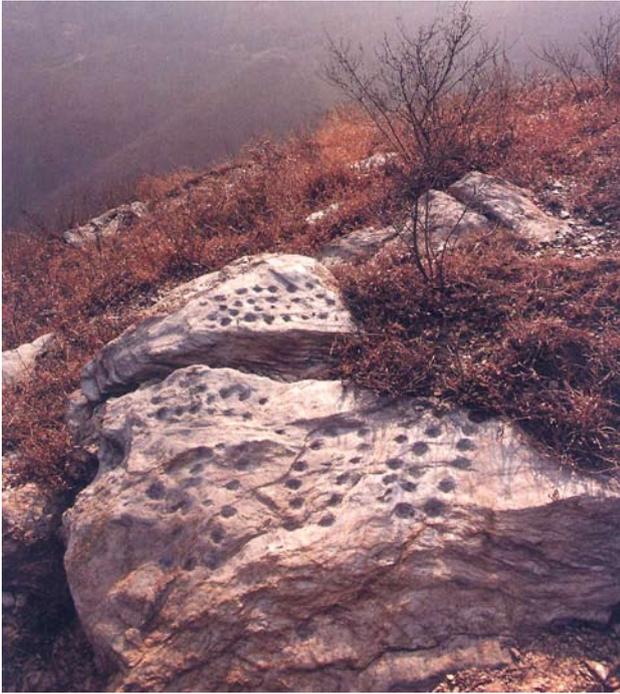


Figure 2. The cupule designs produced in double rows, from Mt Juci.



Figure 4. Cupules associated with circles, from Fangcheng County.

I. Cupules assembled in the shape of a circle

Cupules comprise a prominent proportion of the rock art known from the Central Plain. Cupules are not something newly found in China, they were discovered as early as the 1980s along the south-eastern coastal area of China. Many rock art researchers have propounded their views to interpret this design (Li 1997: 154–156; Tang 2004a, 2004b). The cupule design is an artistic theme, not only the earliest in origin, but also the most extensively distributed (Bednarik 2008a). A list of the different explanations suggested for cupule designs from all over the world shows an almost infinite variety (Bednarik 2008b).

At the rock art site of Mt Juci, most of the cupule designs were produced in double rows with six cupules

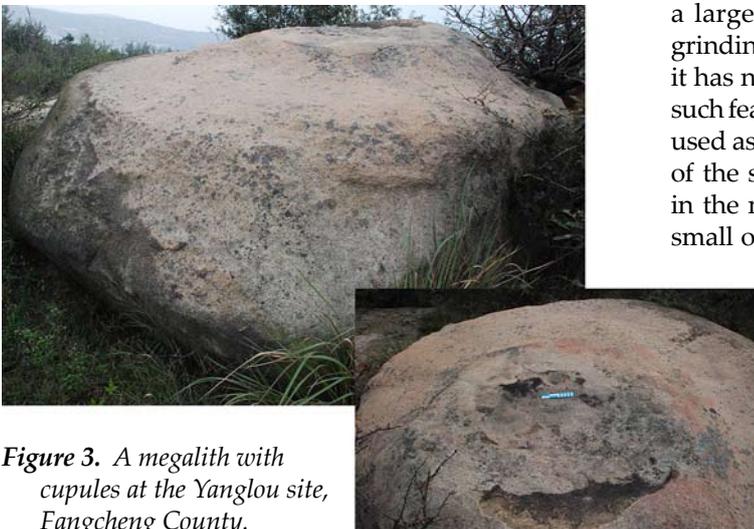


Figure 3. A megalith with cupules at the Yanglou site, Fangcheng County.

for each row (Fig. 2), while the rest were randomly executed on stone surfaces whose purpose, function, cultural meanings and so forth are difficult to surmise. At a series of rock art sites found in Fangcheng County since April 2010, many cupule designs were executed in a consistent manner. A large round stone, higher in the middle and lower at the sides, was usually selected for the cupules layout, with many smaller cupules surrounding a large one in the middle. Some irregular stones needed to be dressed to make them appear to be round, while some stones with a flat surface needed to be abraded or ground at the sides to render them higher in the middle and lower at the margins (Fig. 3). Sometimes, a groove circle at the outside was drawn to enclose all of the cupules. In the Chinese traditional view, this kind of round stone or groove circle with a large cupule in middle looks like a millstone for grinding grains and kernels. However, we know that it has no connection with any mundane utilities since such features are set on the ground and are too low to be used as millstones (Fig. 4). Some arrangements consist of the shape of a plum blossom, with a large cupule in the middle, concentrically surrounded with many small ones (Fig. 5; compare with Bednarik 2008a: Fig. 31). Some cupule-like depressions were shaped as squares and linked, by a linear groove, with a cupule (Fig. 6).

We should also pay attention to the chessboard-like designs, which were often chiselled on the same panels with the former cupules. Most of the cupules were produced using pounding or direct percussion technique with stone hammers, while a

few were made with metal chisels, i.e. by indirect percussion (Fig. 7). This suggests that cupule production has experienced a long history, quite likely dating from the Neolithic to the Bronze Age. Whole chessboard-like designs were produced using metal chiselling techniques. Some of these overlap the designs of the cupules, indicating that their date is later than that of the cupules.

The words *pounding* and *direct percussion* are used here to express a result of observation and to distinguish by relative dating from the later chiselling or indirect percussion method. Bednarik (2001, 2008a, 2010) and Kumar (2010) have established by experimental archaeology that it is impossible to produce cupules on very hard rock by way of abrading. This is supported by the observation of the continuing practice by Tibetan people who still nowadays produce cupules by direct impact (see below). These cupules are being repeatedly renewed by direct impact for many years.

II. Megaliths with cupules

1. Boulders with cupules

Although all rock art was produced on natural rock surfaces, we still regard the boulders with cupules in Fangcheng County as megalithic sites. Generally speaking, boulders without rock art would not be considered as artefacts and archaeological sites. However, the boulders found in Fangcheng County were removed by humans to the place where they have been found standing, with supporting smaller stones at the bottom to keep their balance (Fig. 8). We thus identify these boulders as megalithic sites (stone arrangements). The megalithic sites themselves, most of them bearing cupule designs and local legends, constitute a significant meaning of landscape archaeology. Some of the boulders were retouched using chiselling and percussion techniques to create the figures, which are higher in the middle and lower at the sides.

Furthermore, many types of naturally shaped boulders with cupules have been discovered in Fangcheng County. The most outstanding is the megalithic site at the Mt Zifang in Fangcheng County. The Mt Zifang megalith is composed of granite, which is characterised by a spherical weathering granite landform. At the top of the mountain, there are three granite tors with cupules and some other designs. The largest measures 800 × 500 × 300 cm and bears two cupules, 20 cm in diameter, on the top. The boulder



Figure 5. Cupules arranged in the shape of a plum blossom, from Mt Juci.



Figure 6. Linear groove between two kinds of 'cupule', one round and one square, were often made to indicate a meaning of connection.



Figure 7. Cupules produced using metal chisels, i.e. by indirect percussion, from Biyang County.

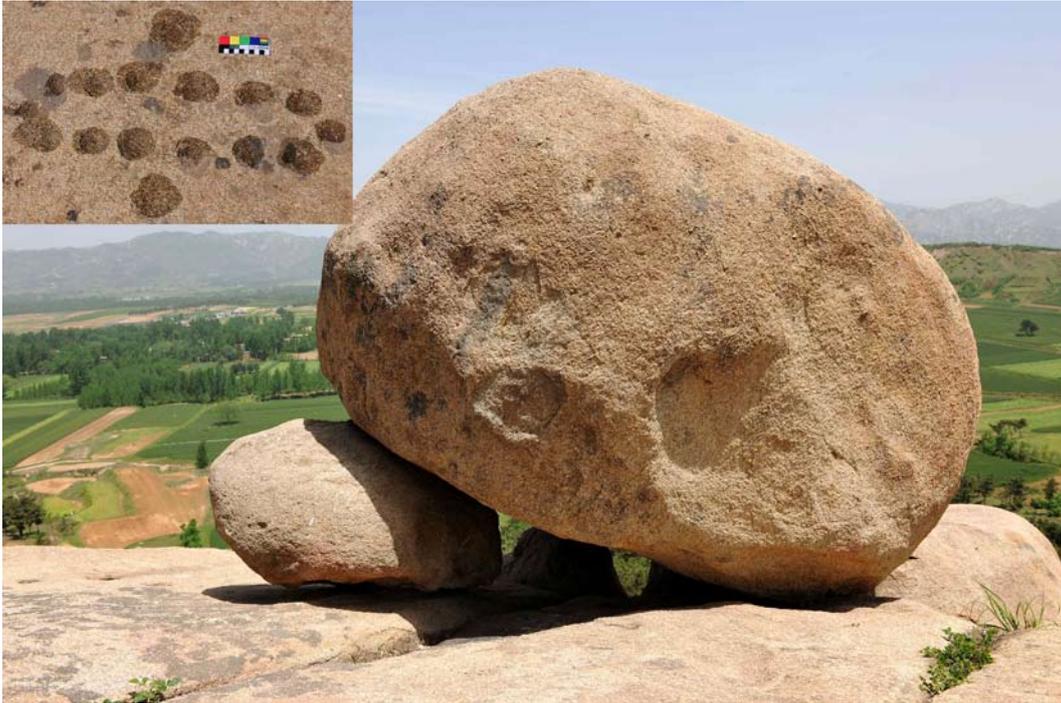


Figure 8. The boulder, found in Biyang County, with supporting smaller stones at the bottom to keep its balance.

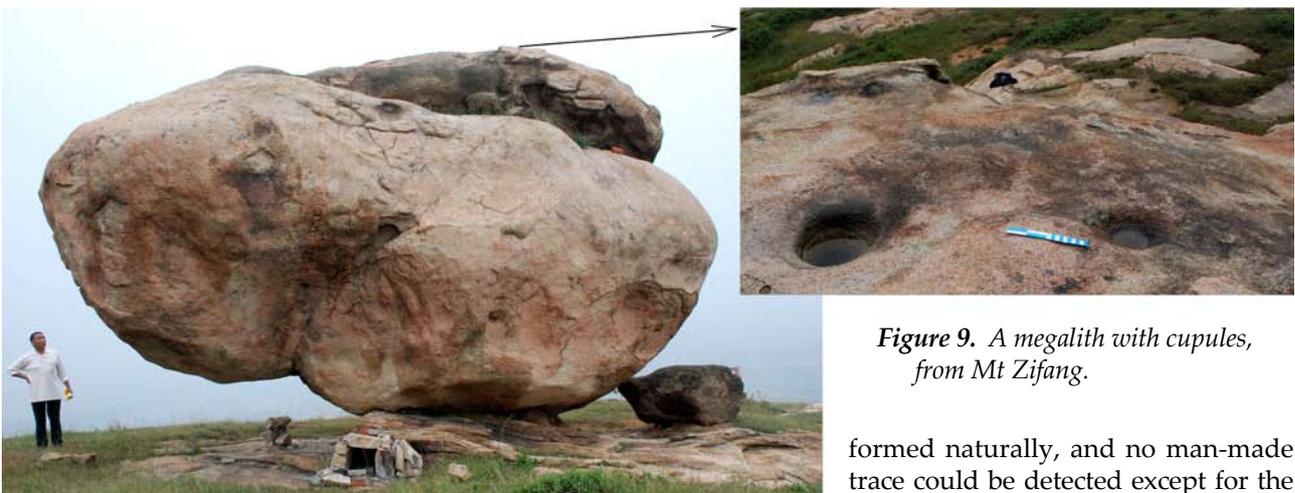


Figure 9. A megalith with cupules, from Mt Zifang.

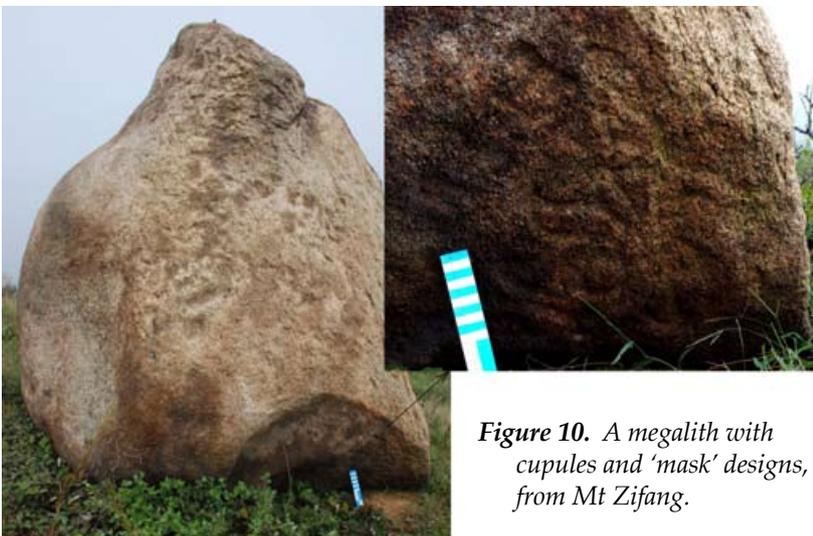


Figure 10. A megalith with cupules and 'mask' designs, from Mt Zifang.

formed naturally, and no man-made trace could be detected except for the cupules (Fig. 9). Due to their unique shape and special location, the three boulders are still worshipped by the modern local people. Not far from this megalith there is another great boulder, 210 × 190 × 130 cm, with cupules and 'mask' designs, which were found towards the bottom of the boulder. The cupules have been heavily weathered, and the presumed mask designs are also indecipherable. The latter are now situated in a very inconvenient position to produce the petroglyphs; we therefore assume that the boulder was originally in an inverse position (Fig. 10).

There is another remarkable megalithic site at the top of Mt Laoyashi. It is a naturally weathered, phallus-like



Figure 11. Megalith with cupules and a ladder-like design, from Biyang County.

upright megalith, 300 cm in height and 200 cm in diameter, with a couple of cupules on its top and ladder-like motifs on its side (Fig. 11, upper left). The megalith is still worshipped in fertility rites by the modern local people. On top of the mountain, many spherically weathered, tall and upright granites, with cupules, were artificially erected at the places where they are currently found. Some of them have small panels of cupules, which were made at the bottom of the phallus-like megaliths (Fig. 12).

On the flat agricultural land there are also some megaliths whose obvious man-made features can be observed. The boulder 'old donkey', so called by the locals, is as big as 600 × 200 × 200 cm, with several cupules on its top and with some supporting small stones at the bottom (Fig. 13). Only glacial movement could remove such a huge boulder. However, by checking relevant information, no glacier formation was found to have occurred in the recent geological past. Puzzling, too, was how such a huge boulder could have been moved using only human power.

In the Valley Mati of the Village Liuhe, Fangcheng

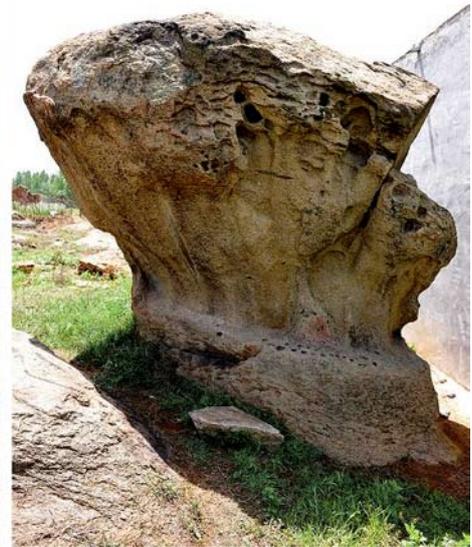
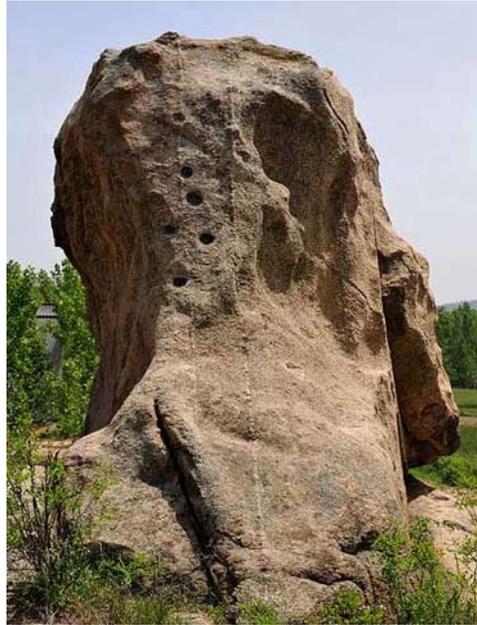


Figure 12. The phallus-like megalith with two panels of cupules, from Mt Laoyashi.

County, there is a megalith in the shape of a triangle with a large hole, around 20 cm in diameter, in the middle (Fig. 14, right). The megalith is about 140 cm in height, 110 cm wide and 30 cm thick. The smooth surface of the stone is very slippery and seems to have been retouched by abrading. It reminds us of the Tolvan (or Tolven) Holed Stone in Cornwall, United Kingdom (Fig. 14, left). Thus we presume that the triangular stone, like the Tolvan Holed Stone, originally should have been standing upright on the ground.

2. Dolmen with cupules

Some dolmen sites have also been discovered in the Central Plain. The Village Dahongzhai in Yuzhou County, Henan Province, is a small village in the Mt Juci area, where a great number of cupules have been discovered recently, and where, in accordance with the legends and myths recorded in the historic book of *Shiji (Records of the Historian)*, the legendary source



Figure 13. The boulder 'old donkey' with cupules on its top, from Fangcheng County.



Figure 14. On the right, the megalith in the shape of a triangle with a large hole in the middle, from the valley Mati of the village Liuhe, Fangcheng County. For comparison the Tolvan Holed Stone in Cornwall is shown on the left (image by Tim Clark).

of the Huaxia ethnic group of China, i.e. the Han people, is located. Here, a well-preserved dolmen was found on the side slope of a deep valley. The dolmen is composed of a large capstone slab with three smaller stones underneath (Fig. 15). The capstone is a shale slab while the chock-stones below are of quartz. The capstone is about 258 cm in diameter and 70 cm thick with around twenty cupules, 3–9 cm in diameter, on its upward surface.

A dolmen whose construction is more complicated has been found at the foot of Mt Tuwu, Guzhuangdian Village, Fangcheng County. This dolmen was constructed with three levels. The capstone slab was 230 cm long, 60 cm wide and 40 cm thick, and was peripherally retouched to form a regular oval. The capstone bears several cupules, while some prop-

stones were also carved with cupules and some other patterns, which have badly weathered and are hard to decipher. The entire dolmen has collapsed and some other cupules and patterns, now behind and below the stones, are difficult to observe as a result (Fig. 16).

Pillar-like stone piles are another new discovery resulting from the recent rock art survey in the Central Plain. The flagstones were usually piled up one by one, with propping stone flakes between larger flagstones to keep them in balance. At the Mt Juci site, for instance, flagstones have collapsed and now lie dispersed in a heap over the ground (Fig. 17).

Compared with the pre-Historic megalithic piles, the modern locals build mini-piles instead to symbolise a plethora of offspring. This ancient tradition still prevails not only in the regions of the Central Plain,

but also in Tibet, where stone piles or spires represent 'the centre of the universe', wherein the god of war resides (Fig. 18a, b, c). Furthermore, up to today, Tibetan people are still making cupules on megaliths in the way of percussion with small stones (Fig. 18d).



Figure 15. The dolmen with cupules on its top from the village Dahongzhai in Yuzhou County.

3. Chinese historic resources about the megaliths

In common with the study of rock art and from the perspective of

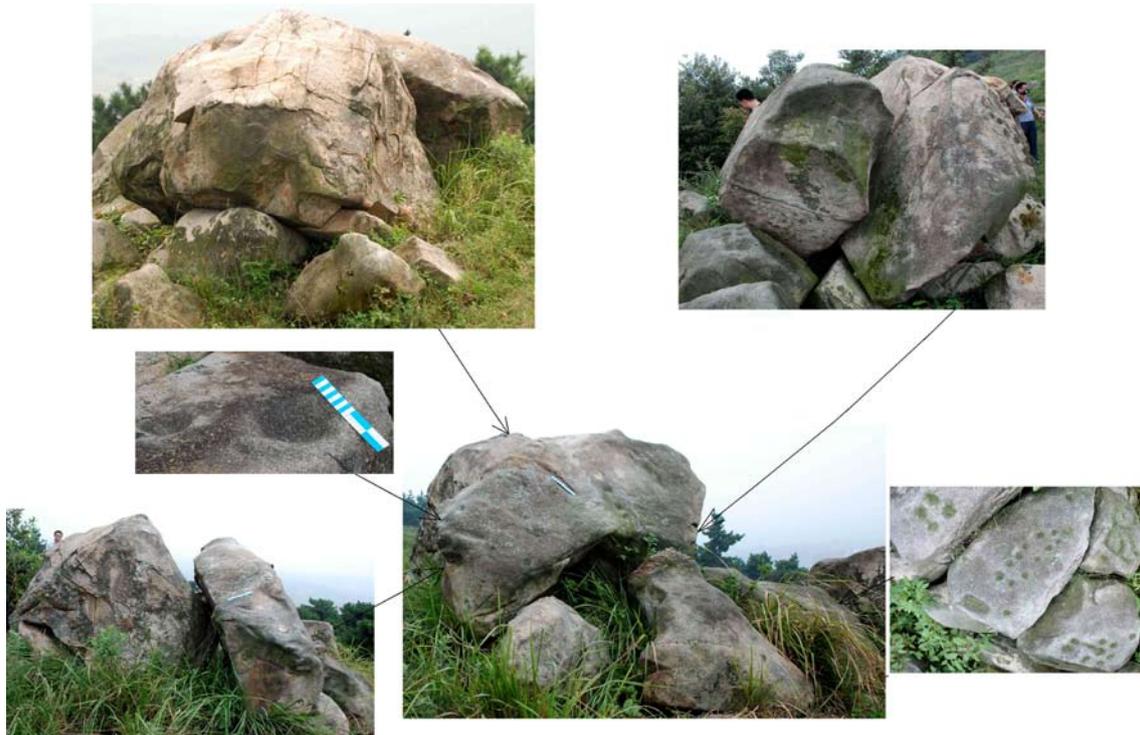


Figure 16. A dolmen at the foot of Mt Tuwu, Guzhuangdian Village, Fangcheng County.

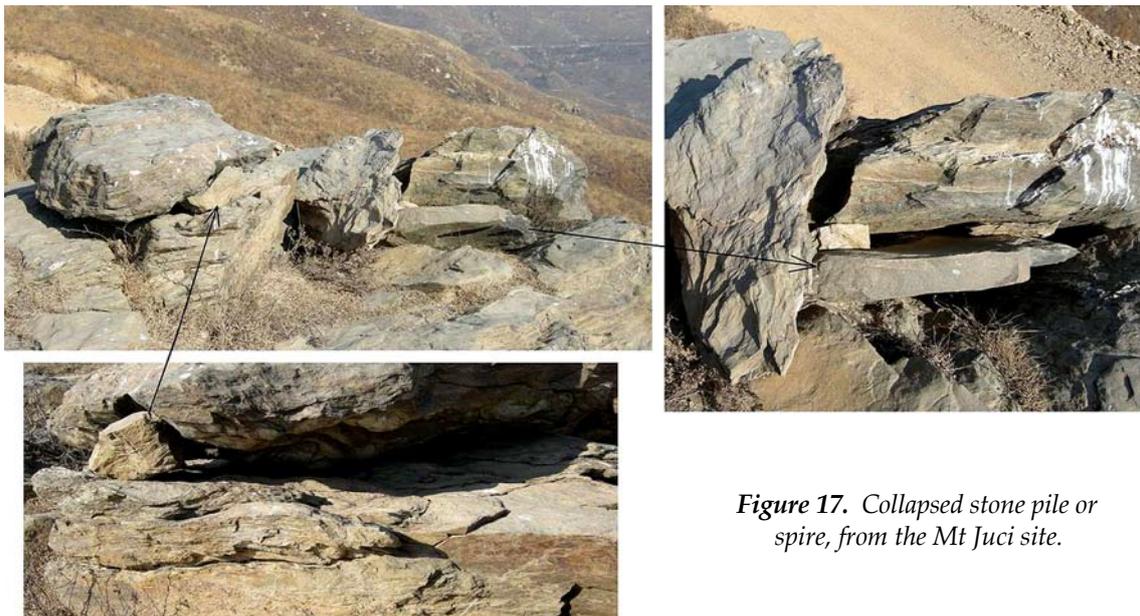


Figure 17. Collapsed stone pile or spire, from the Mt Juci site.

modern science, it is rather late to begin studying dolmen and other megalithic sites in Chinese history. However, dolmen and other megalithic sites were mentioned in early Chinese written historical records. *Hanshu*, the Han book written by Gu Ban (32–92 CE), mentions megalith-like dolmen at the foot of Mt Tai in Shandong Province:

A huge stone, with three small stones as its feet, with its bottom entering into the earth as deep as eight *chi* [one *chi* of the Han dynasty equals 23.1 cm], with a diameter as big as ten people's arms length, stood individually, and hundreds of birds gathered nearby (Ban 1999: 1141).

Also:

The stone mansion on Mt Tai had been considered by necromancers as the place where immortals dwelled. Thus, Emperor Wudi of the Han dynasty went there and offered personal sacrifices (Ban 1999: 1033).

As for erected boulders, they were called *shizhu* (lithic pillar) in *Zhouli* (Zheng et al. 2000: 581). From the oracle inscriptions of the Shang dynasty on tortoiseshells or animal bones, there are some characters such as:

𠄎 (*di*, god), 𠄎 (*qie*, sacrifice), 𠄎 (*tu*, earth), 𠄎 (*shi*, omen)

These ancient characters were deciphered as the pictographs of megaliths and dolmen by Chen Mengjia (Chen 1936), Ling Chunsheng (Ling 1967: 5) and Xiao

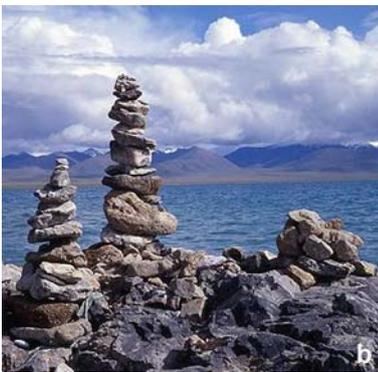
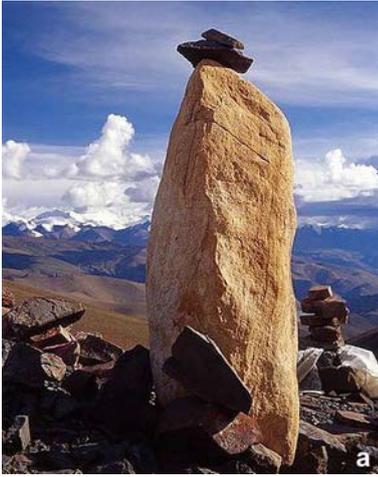


Figure 18a, b, c, d. Modern stone spires from Tibet (a–c); and modern cupules on a megalith (d) produced by Tibetans in Qinghai Province, using direct percussion with hammerstones.

Bing (Xiao 1980).

III. Chronological observations

1. A chronological study

As we mentioned above, most cupules were produced using the technique of direct percussion with stone while the chessboard-like designs were more often than not executed by chiselling with metal. Different regions have different characteristics of rock art. Most cupules, especially cupules arranged in the shape of a circle, are concentrated in Fangcheng County, while the chessboard-like designs occur at the Mt Juci site. Obviously, rock art sites and their main theme in the Central Plains can be chronologically ranked. A rock art panel from the Mt Juci site shows different patterns, e.g. round cupules, square 'cupules' and the chessboard-like designs (Fig. 19). We could date them relatively by distinguishing their overlapping relationship, production



Figure 19. A panel with round cupules, square 'cupules' and the chessboard-like designs, from Mt Juci.

techniques and degree of erosion. The cupules in two rows at the centre of the panel are the earliest, since they are badly eroded, and overlapped by the chessboard-like designs. The cupules in two rows at the upper part of the panel, including the chessboard-like designs nearby, are from a later period since they were chiselled with metal. Their method of chiselling shows deep grooves with upright sides and less weathered patterns. The deep, square cupules must have been done with a chisel since it is impossible to produce them with the direct percussion technique. As a rule, the central panel is in most cases occupied by cupules. So we may come to the conclusion that



Figure 20. Cupules made using direct percussion, from Fangcheng County.

the cupules, made using the direct percussion method, are from the earlier stage (Fig. 20). Other cupules, including the round and the deep square patterns, and the chessboard-like designs, were all done with metal chiselling, and are productions from the later stage (Fig. 21). In other words, the rock art from the Central Plain could be assigned to two stages: the earlier and the later. The earlier cupules and linear grooves were produced using direct percussion techniques, while the later ones were made using the metal chiselling technique. The square cupules and chessboard-like designs appeared during the later stage.

We are also cognisant of some endemic, if not temporal, differences among the rock art found in the Central Plain. All cupules assembled in the shape of a circle are distributed in Fangcheng County and most cupules made with the direct percussion technique are also concentrated there. Together with the megalithic rock art sites, which have also mainly been discovered in Fangcheng County, it seems probable that Fangcheng County could be the 'fountainhead' for cupules in the Central Plain.

2. Cross-dating

Cross-dating is a method of chronological study initially used by Flinders Petrie, a well known British archaeologist, to study ancient Egyptian burials (Petrie 1899). In China, 'cross-dating' is also known as 'dating of cross association' (Zhang 1983), that is to say, dating something whose date is unknown by analogy with something whose date is known. Cross-dating has played a prominent role in contemporary archaeological studies of China.

Due to the lack of effective means for dating (Tang 1993), the scientific nature of rock art research, as an independent discipline, has more often than not been impugned. Also, the rock art from the Central Plain has not drawn archaeological attention due to its indeterminate age. Still, we can attempt chronological research of it by using the cross-dating method. A few



Figure 21. The cupules overlapped by chessboard-like designs made with metal chiselling, from Biyang County.

cupule sites with valid dates would provide us with archaeological evidence for our cross-dating.

- (1) The dolmen in Ximu City, Haicheng County, Liaodong Peninsula. This dolmen, composed of one top-slab and four supporting slabs that had been neatly trimmed, was used as a burial with grave goods (Fig. 22). Thirty-three cupules, ranging from about 4–10 cm in diameter, 2–5 cm deep, were engraved on the southern end of a supporting slab. This dolmen has been dated back to 3300 years BP as determined by ¹⁴C measurement (Chen 1953). Some archaeologists suggested 'Shuangfang Culture' as a name for such dolmen (Wang 2004). Shuangfang Culture is a product of the middle of the Bronze

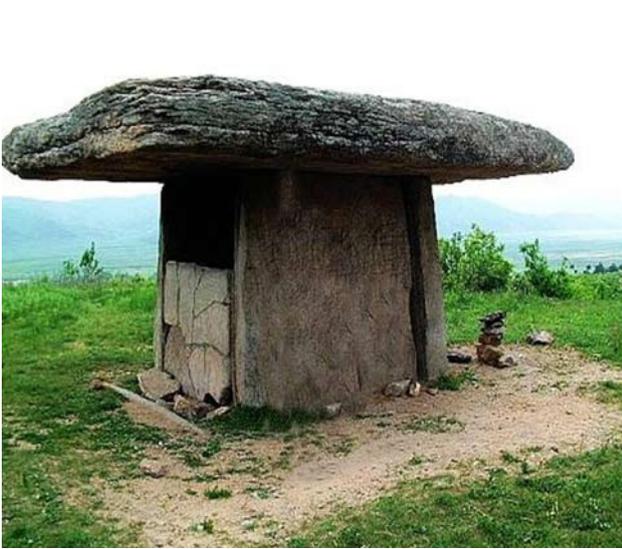


Figure 22. The dolmen dated back to 3300 BP in Ximu City, Haicheng County, Liaodong Peninsula.

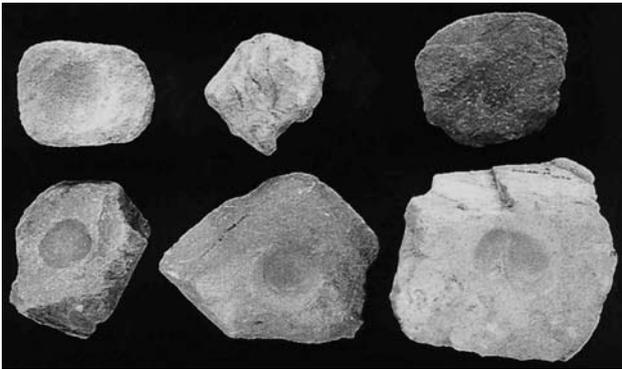


Figure 24. 'Socket stones', small stones with large cupules in the middle, from Xiajiadian Culture (lower strata) at Chengzishan site, Chifeng City, Inner Mongolia.

Age, so the cupules, neatly produced and co-located, could have been done with metal tools.

- (2) In 2000, an altar of the Xiajiadian Culture (lower strata), with ^{14}C dating to 4000 BP, was excavated at the Chengzishan site, Chifeng City, Inner Mongolia (National Cultural Relics Bureau 2001). The archaeologists working there discovered many features, such as altar, walls and houses, all composed of stone structures. The altar is quite huge, penned in with a stone block wall, with a huge stone, 350 cm long and 200 cm wide, in the middle. On the surface of this huge stone, some cupules were assembled in the shape of a circle (Fig. 23). Additionally, many so-called socket stones, small stones with a large cupule in the middle, have also been found (Fig. 24). These 'socket stones' were retouched into various shapes and sizes.
- (3) In 2005–2006, another well-preserved site of the Xiajiadian Culture (lower strata) was revealed at Sanzuodian, Chifeng City (Guo and Hu 2007). Also, many construction remains have been excavated.

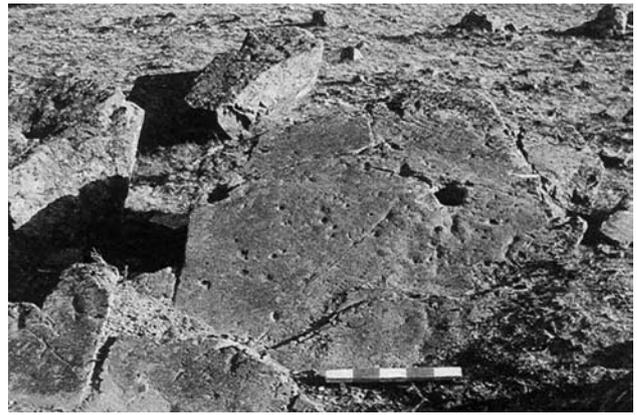


Figure 23. Cupules assembled in the shape of a circle, from Xiajiadian Culture (lower strata) at Chengzishan site, Chifeng City, Inner Mongolia.



Figure 25. The stones with 'mask' designs and cupules from the Xiajiadian Culture (lower strata) at Sanzuodian, Chifeng City.

On a vertical surface of one of the stones, used in building a wall, mask designs and cupules assembled in two rows were executed (Fig. 25). The excavator suggested that it was impossible for the Xiajiadian people to carve rock art on the base of the wall. So it must be that the Xiajiadian people used the stone with pre-existing rock art to build this wall. That is to say, the stone with rock art is from a period earlier than the Xiajiadian Culture (lower

strata).

(4) There are also cupules in the Jiangjunya rock art site, Lianyungang City, Jiangsu Province. The site, located at the top of Jingping Hill, features cupules, 'masks' and some geometrical designs, which were discovered and studied initially in the 1980s. Three kinds of context and provenances of cupules from this site can be observed: cupules with 'mask' designs, cupules on the dolmen (Fig. 26), and cupules on the bedrock of the hill (Fig. 27). This rock art site was dated with the technique of microerosion analysis in 2005. The calibration data, which was used to conduct the microerosion analysis, comes from Buddhist inscriptions at Kongwang Hill, which is eight kilometres away (Ji 2006). We know from the inscriptions found on the cliff at Kongwang Hill that they were produced in April of 61 CE. Both Kongwang Hill and Jingping Hill are composed of granite and must have shared the same climatic conditions. By comparing the Jingping data with that from Buddhist inscriptions at Kongwang Hill, three kinds of datings have been obtained (Fig. 28), corresponding to different contextual epochs for the Jiangjunya rock art site: c. 4500 to 4300 BP for cupules with 'masks', c. 6000 BP for cupules on the dolmen, and c. 11 000 BP for cupules on bedrock (Tang and Mei 2008).



Figure 26. Collapsed dolmen with cupules at the top, Jingping Hill, Lianyungang City, Jiangsu Province.

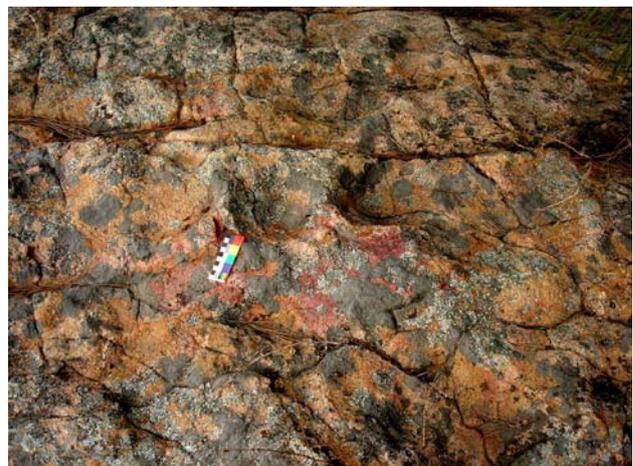


Figure 27. Cupules on the bedrock of Jingping Hill, Lianyungang City, Jiangsu Province.

We may now apply an inductive analysis to the data above, and draw an analogy between the rock art found in the Central Plain and the rock art sites whose ages have been determined approximately. The cupules from the dolmen of the Shuangfang Culture in Ximu City, Liaodong Peninsula, are the most recent, and the dolmen built with neatly trimmed, regular flagstones indicates a much more recent history than the dolmen from Dahongzhai Village in Yuzhou County. Since the stones previously engraved with cupules and 'masks' were used to build walls, we can suppose that the cupules and 'masks' are earlier than the Xiajiadian Culture (lower strata) in age, that is to say before 4000 BP, which is taken as the terminus ante quem for the cupules made using direct percussion from the Central Plain. The cupules on the dolmen from Dahongzhai Village in Yuzhou County typologically bear great resemblance to the cupules on the

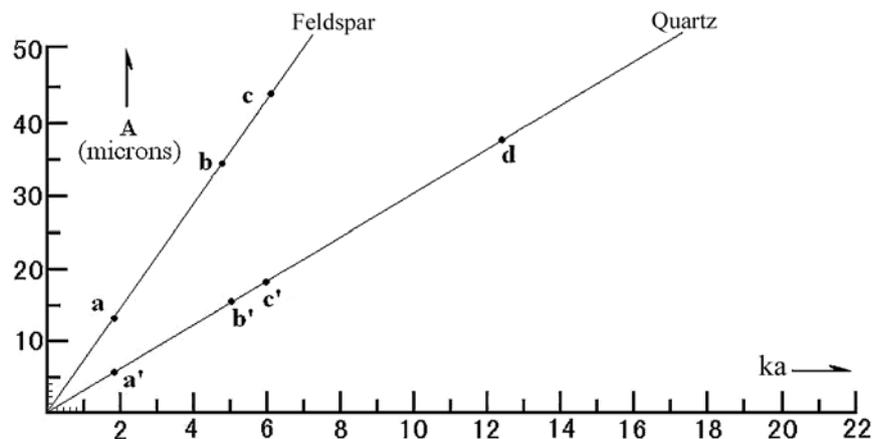


Figure 28. Microerosion dating curves from the Jiangjunya rock art site; a and a': Buddhist carving from Kongwang Hill, of known age; b and b': cupule with 'masks'; c and c': cupule on the dolmen; d: cupule on bedrock.

Sites whose ages known				Sites from Central Plain whose ages unknown					
Sites	Subject matters and characteristics	Archaeological periods	Dates	Dolmen	Linear grooves	Cupules by direct impact	Cupules by metal chiseling	Chessboard like	Stages
Shuangfang Culture	Cupules on dolmen made with metal	Bronze Age	3300 BP				↑	↑	IV
Jiangjunya site Xiajiadian culture	Cupules with 'masks'	End of the Neolithic or early Bronze Age	Before 4000 BP	↑	↑	↑			III
Jiangjunya site	Cupules on dolmen	Neolithic	6500-6000 BP						II
Jiangjunya site	Cupules on bedrock	Upper Palaeolithic	11000 BP	?	?	?			I

Table 1. An analogy between the sites whose approximate ages are known and the sites from the Central Plain whose ages are unknown.

dolmen from the Jingping Hill, Jiangjunya rock art site, e.g. at both the cupules were executed on dolmen, and at both the stones used to build the dolmen were roughly dressed, no 'masks' or other designs co-occur with cupules on the same panel etc. Given these analogies, we should date the cupules on the dolmen from Village Dahongzhai Village back to 6500–6000 BP. The earliest cupules are from the bedrock of the Jiangjunya rock art site. Therefore, 11000 BP could be considered as the terminus post quem for the known cupules from the Central Plain.

Conclusion

Traditionally, Chinese rock art has been divided into three regions of distribution (Fig. 29):

- (1) Rock paintings, painted using mineral pigments in south-western China.
- (2) 'Mask' petroglyphs and geometric designs, such as concentric circles, along the south-eastern coast of China.
- (3) Animal petroglyphs of the northern steppe of China.

Since the beginning of this century, many rock art

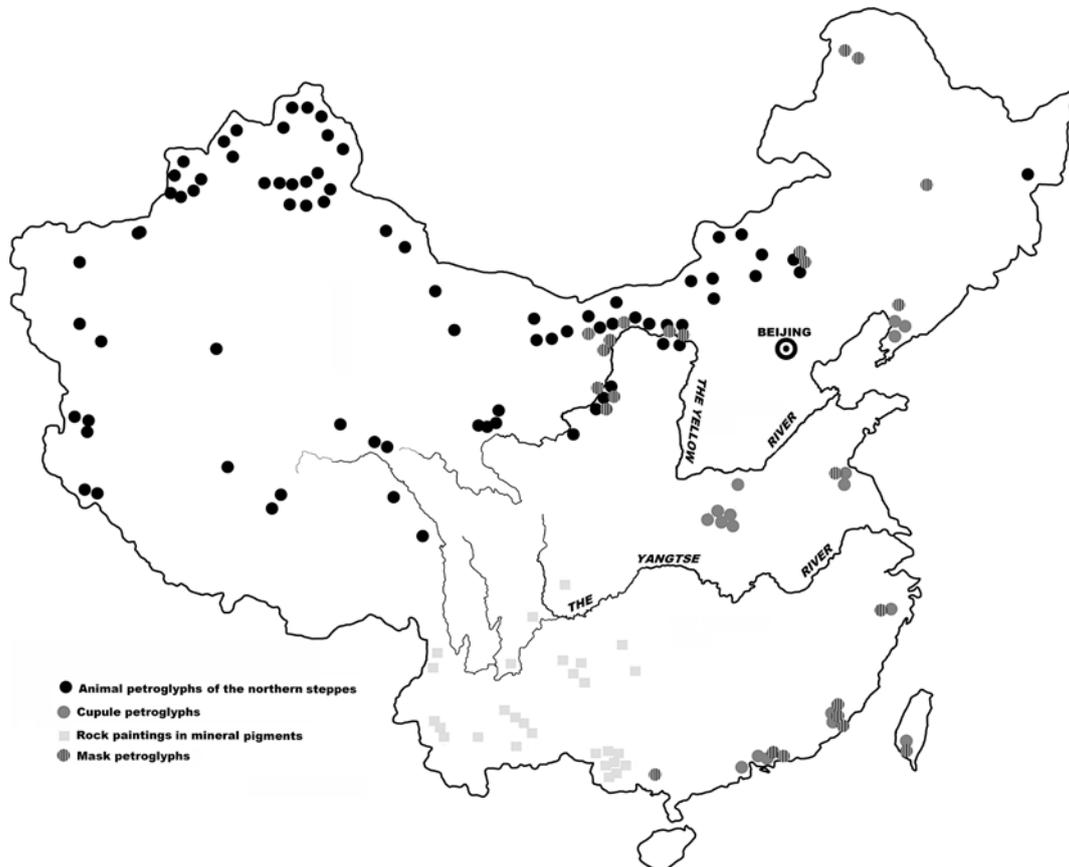


Figure 29. Distribution of Chinese rock art.

sites have been successively discovered in the region of the Central Plain, initially at the Mt Juci site in Xinzheng County, and then from Fangcheng County, Biyang County, Yexian County, Xichuan County and so on. More and more discoveries of rock art sites from the Central Plain are shedding an important new light on the distribution of Chinese rock art sites. Corresponding to the other three rock art regions, we may call the new discovery 'the cupule petroglyphs in the Central Plain'. From the current information available and according to the above discussion, the cupule petroglyphs in the Central Plain are presumably the earliest type of rock art currently known in China. The cupules made by direct percussion can be dated to 11 000 years BP as their terminus post quem and 6000 BP as their terminus ante quem. The cupules and chessboard-like patterns made using the chiselling technique can be considered as rock art produced after 4500 BP.

The cupules and the megaliths from the Central Plains region show a structural context, which will help us to understand and identify their cultural nature, contents and dates. According to the current mythological analysis, cultural content embodied in the cupules is closely related to the ideas of communicating with the heaven, which played an important role in the ideology of ancient China.

In the early Chinese legends and myths, the Central Plain was traditionally considered as the cradle-land of Chinese civilisation. Currently, an abundant amount of archaeological information, including age correlates, also demonstrates the validity of the legends and myths, and has been explained in a consistent way which clearly delineates the correspondence to each other. With such a highly consistent archaeological explanation, there is no valid reason to doubt the significance of the cupule petroglyphs. However, Chinese archaeologists treat the cupule petroglyphs with a high degree of scepticism, arguing that their age cannot be ascertained and their cultural meanings or functions cannot be interpreted. Furthermore, some scholars would rather ignore the new discoveries. That is why the studies of the cupule petroglyphs from the Central Plain have garnered much more attention from the public than from the academic establishment, i.e. the field of archaeology. Much research remains to be done and further important discoveries await our archaeological investigation.

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Professor Tang Huisheng
Society Development School of Nanjing Normal University
122 Ninghai Road
Nanjing
Jiangsu Province
P. R. of China
tanghuisheng@163.com

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