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THE INTERPRETATION OF CUPULES

Robert G. Bednarik

Abstract. Cupules have been subjected to interpretation attempts for as long as they have been investigated, and thousands of such attempts have been recorded over the past two centuries. Most of them were presented without any credible supporting evidence and are essentially ethnocentric constructs arrived at by unsophisticated contemplation. They are devoid of any cultural or taphonomic considerations, knowledge of antiquity or technological appreciation, and they are not susceptible to refutation attempts; hence they are not scientifically relevant. Only a minute number of sound ethnographic interpretations are available, and they are always site-specific or culture-specific; therefore no form of generic explanation for cupules can be offered. Such form of interpretation can only be attempted after a massive improvement in the currently very inadequate database we posses of cupules, much of which is distorted by futile interpretation endeavours.

Keywords: Cupule, Meaning, Interpretation, Ethnography, Symbolism, Utilitarian purpose, Belief system

Introduction

In the well over 200 years of research of cupules (Abel 1730), the greatest emphasis has perhaps been placed on the question of their meaning or purpose. By comparison, their scientific properties have been almost completely neglected. Needless to say, before we can address the question of their interpretation we need to secure comprehensive data of their metrical, statistical, distributional and morphological characteristics (see chapter on technology, this volume), and relate these to their lithology and taphonomy before we can say anything relevant about the circumstances of their production, which may in turn permit sound deductions of their purpose. This is the fundamental sequence of research priorities we need to follow.

As we see from the chapter on the ethnography of cupules in this volume, there is almost no sound ethnographic information available globally on the emic significance of cupules. Indeed, that minute data that we do have tell us unambiguously that the correct interpretation could have never been guessed without such information (cf. especially Macintosh 1977). That observation already indicates the futility of trying to invent simplistic explanations.

A list of potential interpretations of cupules

The most commonly mentioned interpretations of cupules found in the literature could be grouped into a number of classes, based on their purported uses.

1. Unspecified or specified cultic or magic rituals

1.1: Components of sacrificial altars (e.g. Anati 1968: 17).
1.2: Human or animal blood sacrifices (e.g. Magni 1901: 91; Tschurtschenthaler 1934a: 63; Schwegler 1992: 14).
1.3: Meeting places of witch covens (e.g. Tschurtschenthaler 1934a: 62; Ricchiardi and Seglie 1987: 54).
1.4: Magical charms protecting dwellings against witchcraft (e.g. Schgör 1970: 332, 1977: 7; Haller 1947: 272).
1.5: Fertility rituals related to rockslides, which are thought to occur widely in Europe, Africa and South America (e.g. Egger 1948: 59).
1.6: Ritual boring relating to the preparation of stone axes (e.g. Egger 1948: 57).
1.7: Snake symbolism (e.g. Pozzi 2000: 30).

2. Utilitarian preparation of substances

2.1: Preparation of paints (Lombry 2008).
2.2: Production of medicines of mineral or organic origins.
2.3: Pounding of pigments of mineral or plant substances.
2.4: Preparation of spices (Pohle 2000: 199) or foods (Lombry 2008).

3. Mnemonic or record-keeping devices

3.1: Measurement of time or as calendars (Innerebner 1937:

46; Parkman 1988).
3.2: Commemoration of major events, such as earthquakes (Magni 1901: 90).
3.3: Genealogical markers (Rizzi 2007: 93).
3.4: Recording of pregnancy months (Haller 1978: 168).
3.5: Records of stock animals (Magni 1901: 89; Šebesta and Stenico 1967: 127).
3.6: Records of administrators or warriors (Magni 1901: 89; Šebesta and Stenico 1967: 126).
3.7: Records of oaths, e.g. concerning land ownership (Gruber 1991: 23).

4. Elements of belief systems

4.1: Impressions of hands, feet or knees of saints (Fink 1957: 129; Casagranda and Pasquali 2003: 35, and Note 3).
4.2: Use of cupules as receptacles of holy water (Magni 1901: 88; Tschurtschenthaler 1934a: 63).
4.3: Use of the resulting mineral powder in amulets or talismans (Rizzi 2007: 110).
4.4: Use of cupules in funerary contexts (Magni 1901: 83, 85; Rizzi 2007: 111–114).
4.5: Release of a life essence in the form of the resulting mineral powder (Mountford 1976).
4.6: Use of the resulting mineral powder to induce pregnancy (Stevenson 1887: 539–540, 1904: 295; Fewkes 1891: 9–10; Barrett 1908: 164–165, 1952: 385–387; Loeb 1926: 247; Gifford and Kroeber 1937: 186; Heizer 1953; Grant 1967: 106; Hedges 1983a, 1983b; Lombry 2008).
4.7: To influence wind and weather (Spier 1930: 21; Heizer 1953).
4.8: To attract or replace thunder (Parkman 1992: 367).
4.9: Use in reported supplication rituals in recent years (Querejazu Lewis 2007).

5. Depiction of heavenly bodies

5.1: Depiction of star constellations (Magni 1901; Leonardi 1954; Šebesta and Stenico 1967: 128; Dalmeri 1980: 95–97, 1985; Facchini 1993, 1998; Casagranda and Pasquali 2003: 40; Cairns and Branagan 1991; cf. Cairns and Yidumduma Harney 2003).
5.2: Depiction of the Moon or moon phases (Fink 1971: 254; Haller 1978: 172; Pace 1982: 39).
5.3: Depiction of the Sun (Pace 1982: 39).
5.4: Depiction of observations of supernovae.

6. Depiction of topographic elements

6.1: Elements of pre-Historic maps (Anati 1994: 151).
6.2: Referents to nearby topographic features, including springs, peaks, rivers and mines (Rizzi 2007: 79).
6.3: Aids in orientation (Egger 1948: 57; Malfer 1976).
6.4: Markers of land property boundaries (Tschurtschenthaler 1934b; Haller 1972: 242–247; Ricchiardi and Seglie 1987: 64; Gruber 1991: 23).
6.5: Purported markers of deposited or hidden goods or treasures (Bednarik 2000).

7. Board games

7.1: Use in mancala games (Fu 1989: 179; Bandini-König 1999; Pohle 2000: 199–202).
7.2: Use in boa games (Odak 1992).
7.3: Games involving the use of marbles or coins (Rizzi 2007: 107).
7.4: Use in the board game *huwais* in Arabia (Rice 1994).
7.5: Use in the pursuit game *mangura* in the Congo (Lombry 2008).

8. Symbolisms that are no longer recoverable

8.1: Indeterminable cabalistic meaning (Magni 1901: 90).
8.2: Writing symbols or messages (Šebesta and Stenico 1967: 127; Haller 1972).

9. Receptacles for offerings

9.1: For offerings to deities or priests (Rizzi 2007: 97).
9.2: For offerings to goblins or lost souls (Magni 1901: 89).
9.3: For elves or spirits of nature (Šebesta and Stenico 1967: 127; Dondio 1970: 33–34; Santacroce 1987: 74).
9.4: For offerings by the sick (Tschurtschenthaler 1934a: 62).
9.5: To deposit supplication coins (Tscholl 1933: 440).
9.6: For offerings to flocks of birds to entreat them to spare the fields (Rizzi 2007: 98).
9.7: To place food tokens on the thresholds of churches (Wallnöfer 1946: 309; Egger 1948: 64).
9.8: For depositing coins or jewellery in cupules on stone crosses (Tschurtschenthaler 1934a: 61–63).

10. Specific symbolisms

10.1: Depiction of vulvae, occurring with or without anthropomorphs (Priuli 1983: 48).
10.2: To commemorate visit of a location (Mandl 1995: 65).
10.3: Production of cupules with coins to convert these into luck charms (Magni 1901: 102).

11. Other purely utilitarian purposes

11.1: Use as mortars (Huber 1995: 25).
11.2: Use as recess to keep door hinges in place (Huber 1995: 25).
11.3: Cooking of food (Magni 1901: 89).

11.4: Use as recess for salt for animals, such as cattle or deer (Fuchs and Huber 1995: 10).
11.5: Receptacles for bird food or to allow butter to melt (Rizzi 1994: 299).
11.6: Illumination or marking of paths with the aid of oil and a wick placed in cupules (e.g. Magni 1901; Bernardini 1975; Schwegler 1992; Pozzi 2000).
11.7: Receptacles of the first berries of the season (Fink 1983: 15; Rizzi 1994: 299).
11.8: Receptacles for smoke or fire signals (Haller 1972: 244).
11.9: Use as lamps (Egger 1948: 63–64; Tschurtschenthaler 1934a: 63; Rizzi 2007: 102–103).
11.10: Production of rock powder for ingestion (geophagy) by humans or animals for medicinal purposes (Trost 1993: 57; cf. Malotki and Weaver 2000: 72; Callahan 2004).
11.11: Receptacles for food and water for chickens (Egger 1948: 68).
11.12: Receptacles for pointed vertical posts in the construction of buildings (Rizzi 1995: Fig. 8, 2001, 2007).
11.13: Supports for the legs of beehives to prevent entry of specific insects (Egger 1948: 68; Rizzi 2007: 104).
11.14: Preparation for splitting of rocks (Dal Ri and Rizzi 1991: 626; Rizzi 2007: 104–105).
11.15: Use to measure quantity of grain (Trost 1993: 57).
11.16: Use as lithophones (Robinson 1958; Conant 1960; Singer 1961; Cooke 1964; Jackson et al. 1965; Montage 1965; Trost 1993: 94; Ouzman 1998: 38; Huwiler 1998: 148; Kumar et al. 2003: Fig. 2; Bednarik et al. 2005: Fig. 42; Bednarik 2008: 74–76).
11.17: Use to indicate local hydrology, as recounted by David Camacho in this volume.

Discussion

The seventy-one potential interpretations of cupules listed above are derived from the literature, some having been suggested frequently, others rarely. Very few can be soundly demonstrated as being valid, based on ethnographic observation, and where this does apply it only refers to specific cases, at specific sites or to specific societies. These cases are listed under the above numbers 4.5, 4.6, 4.7 and 11.16, and number 11.12 appears to be soundly demonstrated archaeologically in a few cases in northern Italy (Figure 1). The five explanations in group 7, that some cupules were used in games, also enjoy various levels of credibility, although not accepted by Rice (1994) for 7.4. However, most of the rest of these many possible interpretations derive from pure speculation. This applies especially to those that seem to be the most popular, such as 5.1 (star constellations), 6.1 (maps) and the various proposed uses in supplication rituals. Moreover, most of these advocated possibilities offer little if any prospects of falsification; they are presented in a scientific vacuum, they cannot be tested.

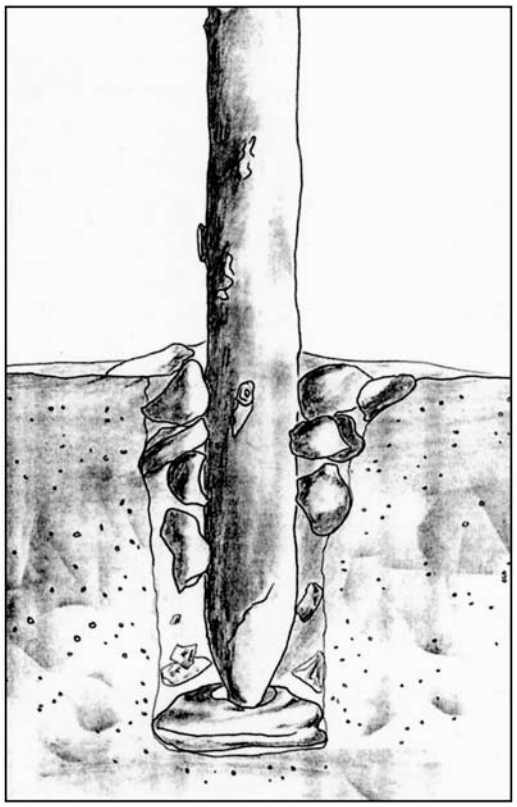

Figure 1. *Use of a cupule as receptacle for the pointed end of a vertical wooden post used in the construction of a dwelling, holding the post in position.*

Therefore the prospects of discovering a generic explanation for cupules (after we have properly identified them, which is yet another problem area), or even just for a significant portion of them, are most discouraging. To begin with, the few solid examples we do have only serve to emphasise this encumbrance: they are applicable only in specific circumstances, and cannot be extrapolated to other cases (Hedges 1983b). Therefore they are of no help in explaining the phenomenon as a whole. Secondly, it is obvious that a great many of the above potential explanations cannot realistically apply to vertical cupules. This applies specifically to those involving the cupules being filled with some material, be it liquid or solid, or most of those invoking some utilitarian purpose. Thirdly, the most popular notions are profoundly ethnocentric, they are the result of perceiving long-gone societies from modern perspectives, or as some kind of 'intermediate' stage in the development towards some cultural 'ideal state' to be reached. This pernicious ethnocentric approach to the past is unambiguously invalid, but it is reflected in many of the interpretation attempts we have seen. To illustrate, consider the popular cases of maps or star charts: the modern investigator, massively burdened by his/her cultural, cognitive and academic baggage, looks over a site and sees its rock art with a perception that is so much conditioned by his/her construct of reality that s/he probably perceives the site quite different from the way the ancient visitor did; ancient artist and modern 'interpreter'

would probably be incapable of communicating at a meaningful level — apart from the language barrier.

On top of this incredible encumbrance, there are the 'technical' limitations. In particular, the modern visitor, having determined to 'make sense' of the rock art, tends to ignore that what he sees is in any case — ignoring the profound differences of perception — not the same as what the ancient rock artist saw. Any traditional rock art site is today manifested only as the current outcome of countless taphonomic effects. Most surviving rock art provides little information about the way it appeared to its makers, because much or most of the empirical information that would be required to experience the 'living system' is no longer recoverable, having fallen victim to reduction processes of various types (Bednarik 1994). For instance, the modern visitor may look at a panel of cupules and try to make sense of their arrangement, because his/her culture suggests that arrangements must have meanings, they must be spatially purposeful, there *must* be a way to 'read' them in a way comprehensible to the modern viewer. But if the cupules are the cumulative result of the work of many generations, perhaps even of culturally unconnected societies, how could the arrangement of what has survived have any cohesive meaning? First, it was added to by many different people at different times, perhaps separated by many millennia. Second, most of the empirical traces related to the art production (e.g. paint, shallow engravings, offerings, other work traces etc.) have long disappeared. Therefore we cannot see what was visible to the ancient artists, even if we shared their perception. In this taphonomic regime, simplistic interpretation by a completely uninformed, self-appointed expert is merely an ethnocentric aberration.

The explanation of cupules as patterns of heavenly bodies is particularly popular in China and parts of Europe, but is always offered without any tangible evidence. Star constellations, we can reasonably assume, are random features determined by the projection of three-dimensional arrangements onto a two-dimensional plane as viewed from a particular location, and it is then not surprising that they resemble other random or fortuitous arrangements (indeed, I have witnessed an advocate of this belief surveying a group of potholes, for the purpose of determining their astronomical meaning, unaware that they are purely natural features). However, large groupings of cupules tend to be cumulative, i.e. the marks constituting them were made singly and at greatly different times. That renders such an explanation highly unlikely, if not impossible. In all cases I am aware of, including the sepulchral La Ferrassie block, the resemblance with star constellations is only vague. For the vast majority of cupule constellations, no corresponding star charts have been proposed, and this notion appears to be without empirical basis as well as being unfalsifiable. Moreover, the greater the number of cupules on a single panel, the lesser the resemblance to any star pattern; so when there are several hundred the weakness of the notion becomes clear. But most importantly, it cannot be tested; it is therefore not a scientific proposition.

The explanation of random cupule groups as maps, popular in the Alpine regions of Europe, falls into the same category. It is untestable, has no ethnographic support, and is a priori unlikely unless all cupules and spatially related other features were made at the same time. It is also reminiscent of other endeavours of seeking rock art explanations, in which various patterns are thought to be pre-Historic maps, apparently without justification.

More promising is the notion of the use of cupules in board games. Odak (1992) considers the possibility that cupule patterns at two sites in southern Kenya represent *boa* game boards. Pohle (2000: 199–202) discusses the conceivability of geometrically arranged cupules having been used in the *uluk* and *rama rildok* games of Nepal and accepts that many of the cupule arrangements relate to the latter game (Pohle 2000: Pls 1.1, 14–16, 18.1, 28.2). *Rama rildok* is a mancala game, which Bandini-König (1999) also cites for cupules at Hodar, in the uppermost Indus valley, and Fu (1989: 179) for Chinese sites. Cupules proposed to have been used in board games occur typically in closely packed geometric alignments, i.e. in multiple rows, and on horizontal rock panels. Obviously the ethnographic foundation of this interpretation requires further investigation, but it can be regarded as a possible explanation in certain cases. Mancala (or mankala) games occur widely in Africa and Asia (Murray 1952: 162) and seem to have an ancient history (e.g. Robinson 1959: Pl. 27), apparently extending back to the Neolithic in the Middle East (Rollefson 1992).

Summary

Somewhat better based appears Flood's suggestion that, in central Australia, 'a strong case can be made that cupules are the by-product of increase ceremonies, but the usual caveats must of course be added' (Flood 1997: 149). Mountford's (1976) solid ethnographic account is among the most authoritative we have, and there are similarly sound explanations available from the Southwest of the United States. We therefore have limited ethnographic information that in some of the tens of thousands of cultural traditions that can be said to have existed since the first known cupules were made, they served for purposes related to fertility and to increase rituals (see chapter on the ethnography of cupules, this volume), and we know that many cupules designate lithophones (see chapter on lithophones). However, faced by the immensity of numbers of cupules ever made (very probably many times their surviving number) and of the enormous time span accounting for them (hundreds of millennia), it is obvious that these glimpses are of very limited value in explaining the general phenomenon. For instance, I might consider the sepulchral block with cupules from La Ferrassie, supposedly of the Mousterian (Figure 2). I might note the 'fissure' on it, which several commentators have pointed out, and suggest that it resembles a vulva, flanked on both sides by several cupules. That gels well with the ethnographic observation that some cupules are

Figure 2. *The cupules on the sepulchral limestone block of burial No. 6 in La Ferrassie, France, of a Neanderthal child, either Aurignacian or Mousterian.*

fertility-related, and even receives good support from the occurrence of cupules in 'vulvar triangles' (Figure 3). But does it justify the application of this interpretation to a specimen that is clearly over 30,000 years old, and either Aurignacian (cf. Bednarik 2007) or Mousterian?

Perhaps that explanation is right (it is certainly more likely so than the various alternative ones we have seen), but scientifically it remains unsatisfactory. It may be more circumspect to regard the snippets of sound explanations we do have as being incidental to some other, less obvious but generic principle. In particular, they raise unanswered questions that imply some unknown cultural dimension in these extremely limited cases we have reasonable explanations for. In all the secure ethnographic interpretations, there is no obvious need for the marks to assume precisely the very specific form of cupules. There is some merit in the assumption that, for lithophonic cupules, impact was focused on a very specific point because it yielded the best sound. However, even this is limited to some specimens, whereas on most lithophones there are numerous markings (Figure 4), all consisting of perfectly formed cupules, i.e. percussion was not just focused in their production, but was highly focused and quite deliberately so.

This, I have noted, is perhaps the most distinguishing characteristic of all cupules: most appear to be as small as technically possible, but made very deeply, relative to rock hardness. Which brings us to the notion that those on the softest rocks are perhaps those most likely to provide the basis of explanatory hypotheses. The harder the rock, the greater the technological limitation imposed on a cupule (see chapter on the relevance of site lithology). It is simply impossible to create a cupule that has a diameter: depth ratio of <1 (i.e. that is deeper than wide) on quartzite, using the means available in pre-History. But it is possible to do so on very soft rock. To me, the most stunning aspect of cupules is that already the earliest examples we have, at such sites as Daraki-Chattan, clearly externalise the principle

Figure 3. *Cupules and 'vulvar triangle', Middle Aurignacian, clast No, 16 from La Ferrassie, France.*

of smallest diameter and greatest depth achievable. They already seem to be statements of perfection, deliberately made to formalised qualities — an observation I made previously concerning the earliest disc beads we have, also from the Lower Palaeolithic (Bednarik 1997). I found that ostrich eggshell beads of the Acheulian had been made as small as possible, and that the precise central placement of their perforations could only be achieved by a very deliberate process of production. Much the same can be said about the earliest cupules available to us. Having explored the implications of such observations on our concepts of hominin cognition elsewhere, I draw here attention to the idea that the inherent 'mental template' perhaps expressed in cupules appears not to have changed over hundreds of millennia, nor does it seem to vary across the globe. I find it difficult to see this as an artefact of our taxonomy. Therefore, if we are to approach the topic of meaning or purpose of non-utilitarian cupules, we need to consider them as the surviving traces — and probably the *only* surviving traces — of specific behaviour patterns. In some form or fashion, they represent an endeavour of penetrating into rock in a very specific way. This is most evident where they occur on the softest rock types, and where the work traces most clearly express the principle of 'penetrating the rock'. At this stage more should not be said; it is not my purpose here to interpret, and our database

Figure 4. *Cupules on a lithophone of gneissic granite, Morajhari, Rajasthan, India.*

is quite clearly inadequate for attempting interpretation.

Nevertheless, we can observe profitably that, when we consider that cupules are one of the simplest possible forms of 'rock art', and our profound inability to understand them — even to effectively quantify the surviving corpus so far, or to in any way deal with them comprehensively in the ways of science — we begin to faintly comprehend our academic impotence in dealing with the many far more complex forms of rock art or other palaeoart we have. We glimpse a fleeting proof that, when I emphasise that the *scientific* study of rock art is infinitely more complex than we had imagined, I am quite probably right.

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