



Bronze age cosmology and rock art images. Solar ships, deer and charts

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Abstract

Bronze Age societies were technologically complex. The impressive production of metal artefacts embodies clearly their astronomical culture and cosmological viewpoint. Same ascertainment is valid also for rock art. In fact, around the European landscape were discovered several cliffs engraved with solar ships, deer and charts. How one could be interpret them? Which is the hidden mentality? From the end of 3rd millennium-early 2nd millennium B. C. deep technological transformations are made by metals. New inventions such metal extraction for weapon production, horse pulling chariot used for war and the bull pulling one used for trade may shorten the culture and material distances between Central Europe and South Mediterranean area. Indeed, taphonomic studies indicate a specific modification of the human body mortuary traditional disposition (orientated to significant astronomical targets) below a substantial transformation of mortuary apparatus with spot evidence of weapons (halberds, swords, knives) and ornaments (double spiral, lunar shape pectorals). The famous Trundhold Solar chart, the 2nd millennium terracotta chart form Dupljaja, the solar boats petroglyph in Bohusland and the horse rider carved on Philippi's cliffs were conceived by the same mentality: communion with the divinity. Culture expressions as communicate manifestation attested in rock art were produced by the same mentality presented in Bronze Age art-crafts such as, 1. Culture epidemiologic patterns dispersion took place through out iconographic motives, and, 2. Animals can play a double face function inside an analogical-mythological system: a. animal-reflex; b. animal-agent. The question is: Could such petroglyphs help us to "read" archaeoastronomical properly in an archaeological site?

Keywords: Bronze Age, Cosmology, European landscape, prehistoric mentality, rock art.

1. Introduction: Cosmogony vs. Gasmology

"...the real think is a liminal idea."

(Hermann Weyl)

The term Cosmogony derives from the Greek world κόσμος (Universe) plus the phonetic form γεν-γον-γεν, expression of the concept generation and birth. So, every discussion about cosmogony implies fundamentally a religious-mythological analysis. In fact it is better to treat this matter by the use of gnoseological models which can treat "the science of myth" throughout figures. Figures are defined as forms which repeated in time dressed different contours (Jesi 1989).

Besides the term Cosmology derives from the Greek terms κόσμος meaning order and harmony and λόγος (talk, discourse). Generally indicates a branch of astronomy which studying the Universe as an ordinary system and limited only to describe the most significant element of it with the categories of Space, Time and Matter. It may be Greeks after a long militancy along the corridors of myth, producing variegated mythological version of Cosmos, tried a non-mythological understanding of the Universe based on deterministic principles (cause-effect) and cutting the link between science and metaphysics. Indeed, we talk about the emancipation of thought from myth (Gratton 1987, 65).

1.1. Reality and cosmos

"Real is only the union, the unit of space, time and things: each of it, itself, is an abstract. Space and time are not measurable by own. It constitutes only a schema of coordinates for the physical events. A coordinate frame not exists itself, but acquire reality only through ordinate things" (Schlick 1922).

Indeed, the reality could be perceived by its fundamental elements: space and time consequently by the possibility to establish relations between the state-of-the-objects, which fulfil the intermediate spaces. If Truth and False are not embodied in things, but in "judgment", what science does is to

explain how things became ordinary (cosmos), how they can be generated (cosmogony) and once more, time seeks the relations-conditions (λόγοι) to stimulate the discourse about "reality" (cf. Phaeton, 99e).

According to Axelos (1964) the space and time where κόσμος is dwelling is the non-pronounced (ανομάτιστον). It manifested as quality of God and Nature. Contenting humanity produces history, poetry and the art, which is trying to express. If the archetypal name of Nature for Greeks is φύσις, this one is well weaving by an enigmatic way with art. Art is the first and final link of humans with Cosmos. Art is a manner to act and produce.

2. Symbolic culture in bronze age societies

Thus, if raw materials embody culture and culture consists by patterned and interrelated ideas expressed by standard symbolic traits, raw materials in its turn embody ideas and symbolic patterns (Nash 2003) and consequently symbolic culture is an integral and crucial part of human life.

The present statement is useful in my study of European Bronze age rock art analysis. Indeed, Bronze Age societies were well stratified, technologically complex and is possible to recognize a character of continuity in time and space specially expressed by a European well connected trade network (long distance interactions). Besides, it is a constant in human behaviour organizing "very large social systems, networks of interactions that require cooperation between individuals who may never seen one another before and who may expect never to see one another again. Probably symbolic culture makes them possible" (Chase 2003, 37).

The impressive production of metal artefacts embodies clearly their culture and cosmological viewpoint. In the end of 3rd - early 2nd millennium until the 1st millennium BC there is a deep technological transformations by metals. New inventions such as metal extraction for weapon production, the horse pulling cart used for war and the bull pulling one used for trade make shorten the culture and

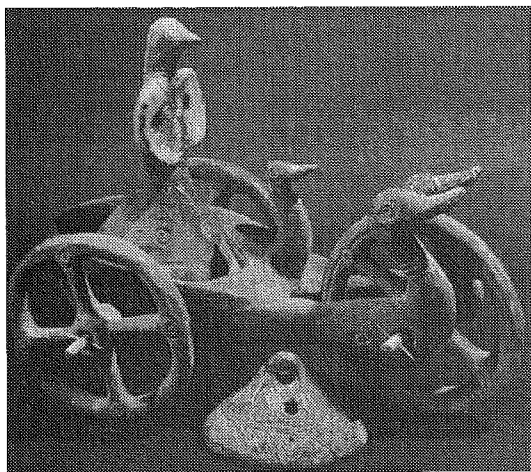


Fig. 1: Clay chart. II millennium, Dupljaja, Serbia.

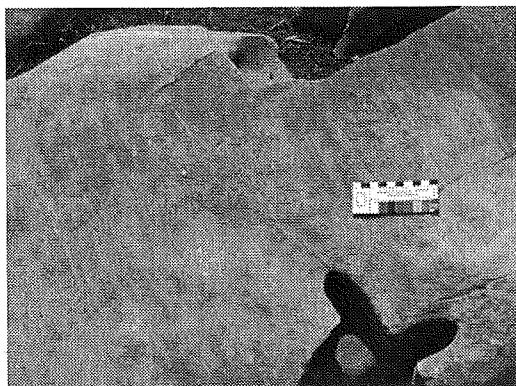


Fig. 3: Ritual gold "conus". Late Nordic Bronze Age-initial I millennium. Gjerndrup, Denmark.

material distances between central Europe and south Mediterranean area (Shennan 1982, 33-45). Goods, such as gold, copper, amber and glass circulate around the Mediterranean Sea and throughout the large European rivers penetrate into the hinterland and the vice versa.

Indeed, taphonomy studies indicate a specific modification of the human body mortuary traditional disposition (orientated to significant astronomical targets) below a substantial transformation of mortuary apparatus with spot evidence of weapons (halberds, swords, knives; cf. Dendra tumulus, Greece; aka tumulus, Slovakia) and ornaments (double spiral, lunar shape pectorals; cf. Leiro, Galicia, Spain;



Fig. 2: Solar boat. Scandinavian Bronze Age, Asperberg, Bohusland, Sweden.

Rinyaszentkirály, Hungary etc.).

The famous Trundhold Solar chart in Denmark, the 2nd millennium terracotta chart form Dupljaja, Serbia (Fig.1), the solar boats engraved in Bohusland, Sweden (Fig.2) and the gold calyx from Gjerndrup, Denmark (Fig.3) or the horse rider carved on Philippi's cliffs were conceived by the same mentality: communion with the divinity. Cosmological elements were embodied in Bronze Age manufactures and cosmogony was their linguistic expressive tool. The time was circular patterned and the possibility to travel through out in time and space (up/down; left/right; left/right; dark/light) was deep-rooted.

3. The evaluation of time during bronze age

Considering that most of Bronze Age societies conserve almost unaltered their oral culture transmission system is easy to understand how this narrative frame was transported integrally on manufacturing and artifacts. Time is expressed in spatial terms. Indeed the representation of a spiral in Nature is given by *Nautilus pompilius*. In this way time become anchored on space and the space acquire sacred value by memory (Scoditi 2000). The archaic thought express its fundamental "constant" of trio by twins plus one (masculine/feminine) "iconographic short-circuit". As Aveni (1992) notes: the scared family is organized around the combination dual-triad.

In Bronze Age it is possible to ascertain the shift or overturn from a lunar culture to a solar one

imposed by warlike societies. Braudel talks about "relativity of historic time" as a phenomenon which embody non only social and production models but also the geo-history and history of mentality.

4. Artifacts and cosmology

The "contagion of ideas" (Sperber 1996) during Neolithic became throughout specific iconographic models impressed on ceramic. The same communication models was repeated in Bronze age where it could be attested by the possibility of representing myth and rituals on metal artifacts.

5. Methodological analysis of iconographic transformation

To discuss methodology of iconographic transformation inside a highly symbolic context one needs a strong dose of abstractness. Usually a symbolic framework is characterized by three important elements, which in practice help the iconographic methodological analysis of key-figures associations: 1. "Continuity" inside the system,¹ 2. "Combinatory power",² and 3. "Inter-changeability" of systemic components.³

Below, I present the analysis of rock art paradigms using archaeological records and ethnographical documents useful for comparison purposes.

6. Bronze age rock art

Around the European landscape several engraved cliffs are found. Most of them present some identical or similar thematic blocks that could be considered as fossil "culture traits". Post Palaeolithic rock art is a special archaeological evidence which reflect social stratification and ideology.

As demonstrated in my past works (Dimitriadis 2004, 2005), Bronze Age rock art could be analyzed and interpreted through the "constants" and "variants" which are key-figures presented on a single cliff or characterize a group of them. Indeed, it is possible to recognise some well documented engraved key-fig-

ures around Europe. The list could include, basically for the Bronze Age, four categories: 1. Solar motives and its combinations, 2. Horse-rider motives and its combinations, 3. Weapons motives and its combinations, and 4. Cup marks and cup-ring marks and its combinations.

The turn point in rock art treatment is to equalize culture transmission "traits" by "constants" and "variants" key-figures. In a second step we shall apply a specific logic-mathematical tool, as "bi-logic" (Dimitriadis 2003a), to analyse processing links.

The best example is coming out by solar motifs analysis. Bronze Age society's cosmological models were expression of metallurgy technologies. Technology is the hide side of social evolution and the vehicle of ideologies. Fire, metals and sun have a common trait: shine. As a semantic element is it enough? Certainly not, but it constitutes a hot point for bronze age mentality and transformations.

6.1. "Solar charts" in Balkan area

A nice clay "solar chart" example is coming from Dupljaja in Serbia, dating late 2nd millennium. It is composed by a double wheel chart on which steering brings a twin water-bird. A third wheel is inserted between the two water-bird heads giving further balance to the artifact. The chart is conducted by an ornithomorphic figure dressed with a long tunica ornamented by small disc. Around the neck it brings a double-spiral pendant. From the same site is also coming a stylistic variant. The chariot men are dressed by a similar tunica decorated by a swastika beneath his heart (process of isomorphic transmutation). Remarkable are the similarities with ornithomorph figures engraved in Valcamonica (Italy).

Various artifacts called "pilos or conus", embodied solar symbology (ornamented by circular motifs), were found in Denmark and in Leria - Iberian Peninsula. An exact corresponding rock art evidence was document by the author at Philippi in Greece (Dimitriadis 1999). A mutilate horse rider wearing a similar cult hat is deeply engraved on the grey marble (Fig. 4).

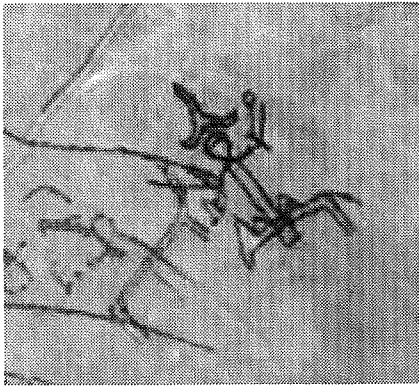


Fig. 4: R.2. Prophet Helias, Philippi. Mutilate horse rider wearing a cult hut called "pilos".

6.2. "Solar ships" in Balkan area and the stylistic comparison with alpine rock art and cycladic isle archaeological material

In Baltic area, particular in Böhusland, a huge number of ships (49.23%) are engraved (Bertilsson 1985.). The stylistic isomorphic analysis is based in a process of disintegration of the monumental compositions and acquisition of conceptual and symbolic autonomy from part of the single figures that previously made part of the same compositions.

A detailed nomenclatural study (Dimitriadis 2003b) demonstrate that the ship motifs associations in Baltic are grouped in ten "culture traits", where "constant" is "boat" figure and "variant" a variegated attribute (triskele spiral form, horse-horsemen, footprints or big handprint wheel figure, etc.).

In the Alps the same "culture trait=boat" is well preserved (ca. 10%) as demonstrated by the examined nomenclatura with the same "variant" of different shapes (north Etruscians inscriptions, footprint, anthropomorph, aquatic figure, etc.).

In the Aegean area the specific "culture trait" is presented in safe dated archaeological records and is possible to define eight groups based on "variants" possibilities as spiral form or zigzag, fish-bird paw or textile, swastika, butterfly etc.

Discussion

The cultural elaboration in all three geographic

areas present a standard module which follows obviously different syntax process: "Cultural trait" = "key-figure (constant) + attribute (variant)"

The formal thought is the "production of meanings" not exclusively of symbolic function but of "meaning function" keeping the relationship of the signs or groups of them. The re-distribution of the potential new combinations produce unexpected associations in different geographical context and the variation of symbolic meaning appear differentiated, thanks to the variety of mythological subjects. Especially the animals in mythological-analogical context take place into a social context as "agent-animal" or as "animal-reflex" underlying the deep relationship between humans and Cosmos.

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2. For every symbol/sign exists infinite equal possibilities.
 3. Some times is necessary to use or re-establish equivalencies between different semantic layers.

Endnotes

1. A high abstract system often activate direct relationships between signs situated in round.



Investigating a meteorite impact in Prati del Sirente: First indications from a small Christian Catacomb

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Abstract

A rimmed lake was formed in a highly civilised region of Mt. Sirente, in the central Apennines during the fourth or fifth century AD. The most probable cause is a meteoritic impact and some indications from a local Christian catacomb may provide the first example in the world of a meteoritic impact with direct consequences on man.

Keywords: *Impact crater, Superaequum, Christian catacomb, meteorite.*

The age of the impact

A rimmed lake in a high valley of the Central Apennines (Fig. 1a) was proposed to have formed in historic time and in an highly civilised region (Ormö et al. 2002). New geological data and new age dating have been recently presented by Ormö et al. (2006). The lake represents the main crater of a crater field composed by about 30 satellite structures distributed in an area of 1 squared kilometre. The crater field points to a meteorite that broke up during the passage through the atmosphere. New analysis by radiocarbon and thermoluminescence (TL) were performed on the material recovered from one of the satellite structures. They gave a calibrated ages of B.P. 1712 (^{13}C -corrected radiocarbon age B.P. 1800 \pm 100) and a TL age of B.P. 1825 (calculated error \pm 274 years). New ages and previous radiocarbon age for the main crater (B.P. 1538) suggest a contemporaneous formation of the crater

field at the beginning of the first millennium AD. However, the only age that can be directly linked to the proposed impact is that from the paleosol (target surface) on top of which the rim has been deposited by the impact. It is constrained both above and below by older material. Because of the absence of a well developed rim in the satellite structures, this measurement is only possible for the main crater. Carbon samples were extracted from the upper 50 mm of the target soil under the lake rim and were dated by radiocarbon. AMS gave the calibrated age of 412 \pm 40 AD but, given the inevitably mixed sample, a date of late fourth or early fifth century is probably the best precision that should be claimed. This is coeval with a legend from a village in the North part of the Valle Subequana (Fig. 1b) that describes an approaching star outshining the sun and a subsequent earthquake rupturing a Pagan temple and knocking people

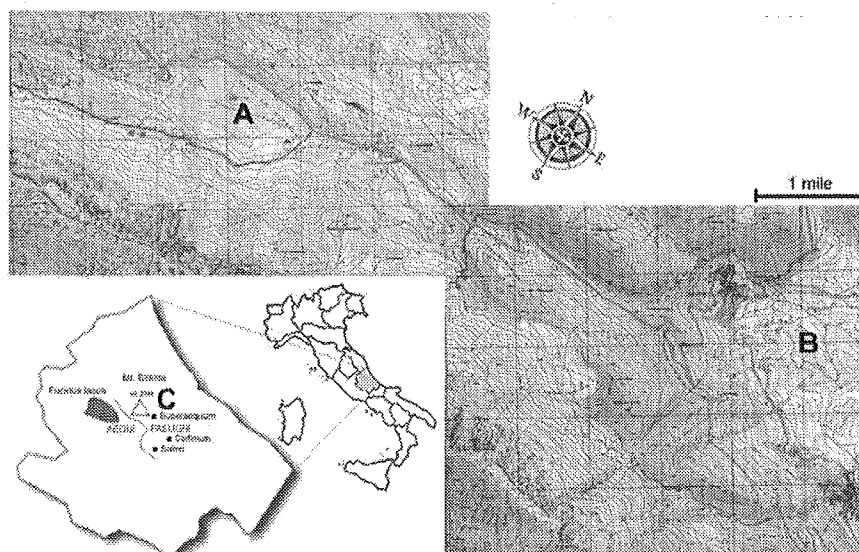


Fig. 1: A. Prati del Sirente' valley, B. Valle Subequana, C. The geographic area of Superaequum.

down. 'After an endless period of time' the valley re-flourished and people built a church on the ruin of the temple (Santilli et al. 2003).

The historical contest

At the age in question, this mountainous area was under the jurisdiction of the roman municipium of Superaequum (Fig. 1c). The exact geographical location of this municipium as well as its sort at the end of the Roman Empire are still uncertain. The area has never been excavated in a systematic way and no ancient town-wall, sewers or roads have been found that may indicate the exact extension of an urban centre in the Imperial age (Wonterghem 1984). Rests of ancient vicus and pagus and various inscriptions have been found in a nearby valley to the lake (Fig. 1b), but the epigraphs were removed from the original places to be reused as building material during the subsequent centuries (Buonocore 1984). The best preserved archaeological evidence dating back to the crater age is a small Christian catacomb 8.6 miles (14 km) from the impact site and consists of the only discovered hypogeum in Superaequum.

Investigating a small Christian catacomb

The catacomb consists of an L shaped tunnel with two perpendicular arms measuring 20 metres in length and 1.15 metres in width. It was excavated by the early local Christian community and preserves many evidences of the funerary tradition of the fourth century: two monograms of Constantine, some oil-lamps on the model Dressel 30 and 31 and various inscriptions with the Christian names Musicus, Renatus, Hilaritas, Maxima. The consistent use of the words depositio and deponio in the burial inscriptions suggest that this catacomb was used for just few decades and went in abandon in the beginning of the fifth century or before. Few forms excavated alongside the wall of the galleries contains some skeletons piled up. They can be considered as an evidence for mass deaths in correspondence with some epidemics or a public calamity (Ferrua 1950). The age for this mass deaths is constrained by the age of the catacomb itself and is coeval with the radiocarbon age for the impact.

Discussion

The energy released by the proposed impact can be estimated as analogue to that of a small atomic

bomb and its main effects remained localized in a valley confined by high hills and mountains (Fig. 1a). It is however possible that some effects (ie. a fire) propagated to the nearby valleys. The catacomb of Superaequum was prematurely abandoned if compared with other rural catacombs in Italy and this was probably due to a change in the local culture or to the abandon of the entire valley. Rests of a Roman village were discovered during a recent archaeological excavation in the North-West side of the valley in question (Fig. 1b). Stratigraphy of the trenched area shows a discontinuity in the wall buildings in correspondence of the fourth century AD and recovered burned objects suggest that this village was suddenly abandoned in consequence of a fire (Tuteri 1998). It is curious that people living in that side of the valley preserves the memory of a disrupted town (Wonterghem 1984).

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