

SEMIOLOGICAL METHODS IN ROCK ART STUDIES

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INTRODUCTION: Semiologists of Central Asia

In the history of the petroglyphic research in Central Asia only two authors attempted semiological analyses, both in the late 70'ies: Alan Medoev and Jakob Sher (Medoev 1979, Sher 1980).

Medoev introduced pragmatic methods for the study of the environmental and archaeological context, which are largely followed today in Kazakhstan. He also developed a brilliant methodological exposition of the steps for the study of syntactic elements (called aesthetic by the author), going from the locational factors down to the complex analysis of styles: this part of his work is still poorly understood. Weak is his approach to semantic analyses.

Sher introduced 2 semiological contributions. He elaborated formal methods for the analysis of the iconographic style, intended for the stylistic classification of the whole petroglyph record, a contribution which is largely followed today. And, in the semantic field, he studied analogies between images and written formulas in order to use their indirect literary context.

Today semiotic research on petroglyphs is more or less inexistent, substituted by intuitive interpretation for popular diffusion. The main attention is dedicated to methods of documentation and conservation, which eventually will favor a new start of formal analyses.

1 - THEORY OF COMMUNICATION

Any act of engraving or of reading a sign happens within a process of communication made of 6 elements: *source, coding, message, channel, decoding, receptor*. In the case of petroglyphs:

- Source is the author
- Coding is the way the author exteriorizes his mental object (vision or concept)
- Message is the engraved image
- Channel of transmission is the rock surface and the reflected solar light. The nature of the channel defines *3 main generations of communication systems*: the first main channel of communication has been the stone, followed by paper and finally by microchips.
- Decoding is the way the spectator connects the engraved image with a mental object (vision or concept)
- Receptor is the spectator

2 - SEMIOLOGY

Referring to petroglyphs, source and coding are lost in the past. Only message and channel are present. Semiology studies message and channel in order to reconstruct the full process of communication. The study is done through 3 disciplines:

- *pragmatics* : study of the relation between message and author
- *syntactic* : study of the spatial visual forms of the message in itself
- *semantics* : study of the relation between message and code

The 3 fields are interdependent and partially overlapping each other.

2.1 - Pragmatics

Pragmatics concerns the cultural background of the author and the material execution of images. It mainly applies on data external to the message itself and is supported by disciplines like paleo-geography, archaeology, history, ethnography. Pragmatic reconstruction is rarely complete but even small details can sort out data important for the semantic analysis. Pragmatics can be of 3 types, by applying to the:

- *environmental and socio-historical context of the author*
- *intended and/or effective function and use of the image*
- *material execution of the image*

2.2 - Syntactic

Syntactic features (spatial forms) of the message engraved on a rock surface are of 2 types and 10 sub-types.

Type 1 - locational features: preliminary choice of pre-existing spatial features

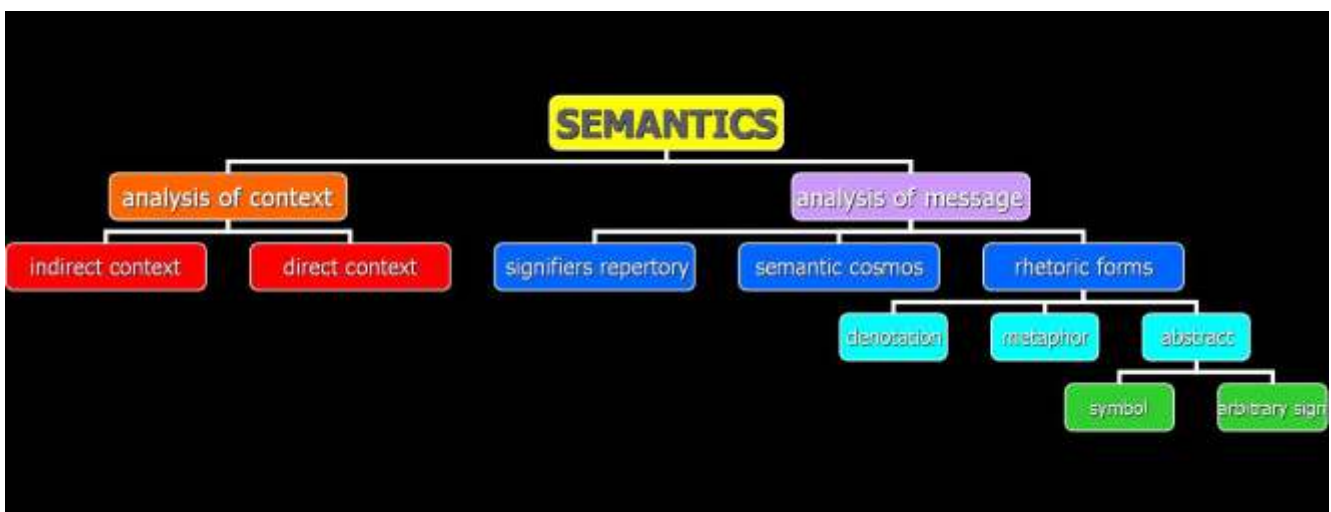
1. *accessibility to the site (and eventual neighbouring complex of rock art sites)*
2. *insertion in the local landscape (and in the eventual surrounding archaeological complex)*
3. *architecture of the whole rocky outcrop (and of eventual pre-existing engraved rock surfaces)*
4. *character of the natural rock surface: quality, dimension, inclination, colour and desert varnish, etc (and of eventual pre-existing cultural engravings)*
5. *spatial arrangement of image on the rock surface: centre, periphery, etc*

Type 2 - graphic features: active engraving performance

6. *technique of removal of rock material: pecking, hammering, scratching, polishing*
7. *style-1 graphic: contour, silhouette, etc*
8. *style-2 spatial (virtual dimension of the image): 2D, 3D, planes, etc*
9. *style-3 photographic: size, point of view, dynamism*
10. *style-4 iconographic: primary elements constituting the image*

Accessibility, landscape insertion and technique intermingle with pragmatics; iconography with semantics

2.3 - Semantics



The semantic study of the relation between message and code (sign and meaning) is most complex. What can be clearly seen is the *signifier*, just a bunch of signs on the rock. What we look for is the *signified*, a visual or phonetic element only present in the receiver's or the author's mind. Signifier and signified are both present in the message, indissoluble, forming a *significant complex*. It is why decoding is still a possibility.

Petroglyphs are approached as pictographies (pictorial writing) or phonographies, depending if they are directly related to visual or to phonetic meaning.

In the case of petroglyphs, receiver and source, decoding and coding criteria are far in time and are rarely the same. Subjective reconstructions unaware of this gap are, at the best, just literary products. In order to avoid, to reduce or to point out the hidden decoding proclivities of the receiver, the decoding procedure must be clearly expressed, and widened and sharpened by:

- *reference to the context of the signifier or of an analogue of it, in order to widen the data base of the decoding procedure*
- *careful formal steps in the analysis of the significant complex, in order to sharpen the decoding tools*

2.3.1 – Reference to contexts of the message

The message will be related to contexts in order to provide additional data (mainly of pragmatic nature): or directly to its context or indirectly to other contexts

2.3.1.1 - Direct contexts of a petroglyph image are

- sets of other engraved messages in *spatial or chronological proximity*
- the *environmental-archaeological complex* surrounding the site
- additional information by *ethological data* in case of animal and human images, by *praxeological data* in case of objects.

2.3.1.2 - Indirect contexts are the ones related to the message through analogy

- analogy between the message and material objects from *archaeological strata* of which the context provides information about chronology and function
- analogy between the message and *linguistic formulas* from ancient texts, providing indirect relation with their literary context
- analogy between the message and objects or actions recorded by *ethnographic* or *historical* documents

2.3.2 - Formal semantic analysis of the message itself

Formal semantic analysis applies to 3 fields of growing complexity:

- *Spatial-chronological repertory*: consists in the analysis of molecular clusters (repertories) of signifiers
- *Semantic cosmos*: consists in the analysis of molecular clusters (cosmoses) of signified
- *Rhetoric form*: consists in the analysis of the atomic relation between signifier and signified, which is going from 2 extreme cases: from concrete univocal to abstract arbitrary

2.3.2.1 – Spatial-chronological repertory of signifiers

Signifiers can have morphological or, in case of composition of several figures, also syntactic-connective nature. Clusters of signifiers can be established at different hierarchic levels:

- *morpheme (minimal unit made of iconographic elements)*
- *single image*
- *composition of images on the same surface*
- *group of several engraved surfaces*
- *whole petroglyph site*
- *all precedent cases classed by chronological periods*

To each level corresponds a specific *repertory* of signs, which is included in the repertory of the superior level. Repertories change by number and quality in space and time

2.3.2.2 – Semantic cosmos of signified

To each of the repertories of the signifiers' levels is related a correspondent meaningful set of signified called *semantic cosmos*.

The analysis by statistical methods of the content of the semantic cosmos will sort out the absolute and relative number of different single images and of recurrent compositions of images (*scenes*).

The statistical analysis of composition of images shows the existence of compatible associations by dyads, triads, etc called *isotopies*; and of incompatible associations.

Some single images and isotopies are more recurrent than others, witnessing the existence, within the cosmos, of a non-homogeneous *structure*.

The structure of the cosmos can be formalized, bringing to the classification of cosmoses of different type: compact

(with every element interrelated), coherent (without oppositions), monocentric (when only one image is related with all the other mutually unrelated images), poliocentric, etc.

The cosmos' structure changes in space and time, representing a most important tracer of semantic and cultural changes.

2.3.2.3 – Rhetoric forms

A rhetoric form consists of the specific relation established between signifier and signified, between repertory and semantic cosmos. In that sense it constitutes the basis of the coding of the message.

As example let's consider the simplest case of the composition of just 2 images. It is made of 6 terms: 2 signifiers and 1 relation between them are rhetorically referred to 2 signified and 1 property between them. Each of these 6 terms can be manifested or hidden, real or unreal or absurd, present or absent, providing the distinction of forms and families of forms.

Three families and fifteen rhetoric forms are most significant for the semiotic analysis of petroglyphs: they are ordered here below from concrete univocal to abstract arbitrary, from denotative of real elements to connotative of properties and concepts.

- **Denotation family** - identity or similarity between signifiers and signified, between relation and property. It is the most concrete family. Main forms: *denotation* (imitative analogy), *metonymy and synecdoque* (condensation of meaning, respectively of parts and of totality), *prosopography* (denotation of real personages or events), *narrative* (sequence of prosopographies)
- **Metaphor family** – relation to property which pertains to only one of the two objects (fragmentation and displacement of meaning). In that way the main accent is put not on terms but on properties, and the family is transitional from denotative of concrete elements to connotative of abstract properties. Main forms: *metaphor*, *icon* (fixed metaphor), *absurd construction* (metaphor introducing an absurd property), *allegory* (system of metaphors).
- **Abstract family** – relation and property don't pertain to any of the objects, so that they play as abstract, from symbolic (of properties or ideas) to arbitrary. Main forms: *symbol*, *emblem* (fixed symbol), *mythem* (system of symbols where terms are unreal but sensuous), *myth* (narrative by mythem); and finally *ideography* (system of symbols where the signified is an unreal or abstract idea) and *arbitrary sign*. The last two forms, when referring as *phonography* to a phonetic signified, provide scripture as basis for writing. Depending from the unit (gramma) to which they apply (name, syllable, single phonemes) they can be logographs, syllabographs, alphabetographs.

Table 1 – Graphic of main rhetoric families and forms

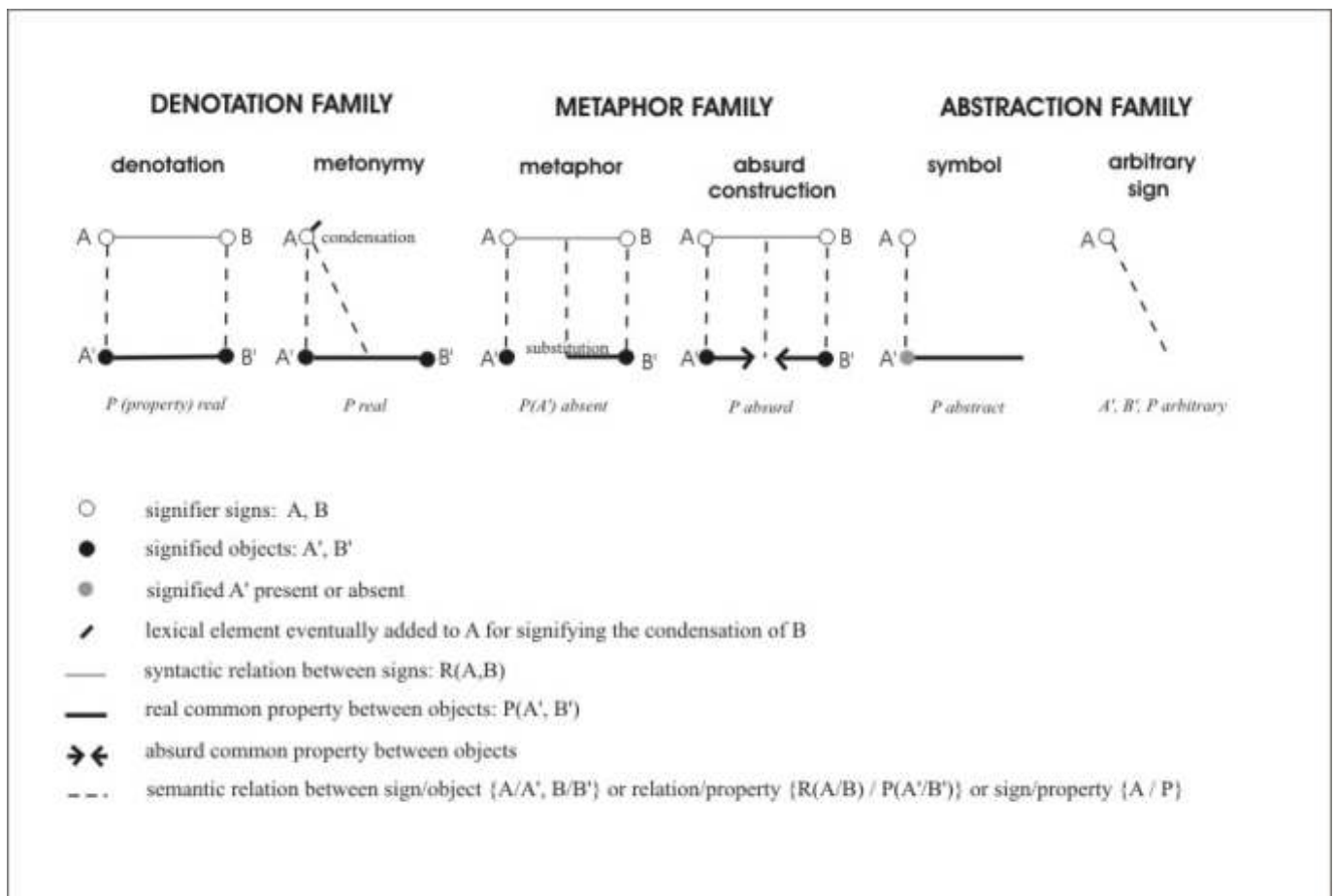


Table-2 - Rhetoric forms and mental operations

Each of these rhetoric forms, because built through semiotic logical procedures, is correlated with different mental logical operations, with different space-time conceptions and with different unconscious oneiric transformations.

mental operations	rhetoric forms
<i>Mental logical operations</i>	Denotative family forms are connected with pre-operative and operative-concrete logical operations
	Metaphor and abstract family forms are connected with operative-abstract logical operations
<i>Space-time conceptions</i>	Denotative family forms are connected with pragmatic conceptions of space and with cyclical conceptions of time
	Abstract family forms are connected with abstract linear conceptions of space-time
<i>Unconscious oneiric transformations</i>	Denotative forms are connected with dramatization
	Synecdoque, metonymy and symbol with condensation of meaning
	Metaphor and abstract construction with fragmentation and displacement of meaning

Table 3 – Rhetoric forms and petroglyph images in Kazakhstan

rhetoric forms ordered from concrete to abstract	petroglyph samples	period
<i>denotation</i>	flock of linear goats; horse and rider	every period, <u>Early Iron Hunnic</u>
<i>prosopography, narrative</i>	warrior with banner	Turkic
<i>metonymy</i>	ringed horns with solar point in center	Early-Middle Bronze
<i>synecdoque</i>	bull as condensation for rain cycle; deer as condensation for vegetation cycle	Archaic, Early-Middle Bronze
<i>metaphor</i>	bow and arrow for sexual intercourse	Middle-Late Bronze
<i>absurd construction</i>	horned horse, sun-head	Late Bronze
<i>symbol</i>	animalistic style deer or predator for abstract qualities	<u>Early Iron Saka</u> , Turkic, Adai
<i>arbitrary sign</i>	writing	Turkic, Ethnographic

Rhetoric forms, when ordered by historical appearance in petroglyph images, show the following succession:

rhetoric form ordered by time of appearance	historical period	absolute date
<i>denotation, synecdoque</i>	Archaic period	before 2000 BC
<i>metonymy</i>	Early-Middle Bronze	2000-1200 BC
<i>metaphor</i>	Middle Bronze	1600-1200 BC
<i>absurd construction</i>	Late Bronze	1200 - 800 BC
<i>symbol</i>	Early Iron Saka	800 - 200 BC
<i>prosopography, narrative</i>	Turkic period	500-1200 AD
<i>arbitrary sign, writing</i>	Turkic and Ethnographic period	500-1900 AD

The historical development of rhetoric forms follows quite precisely a trend of growing abstraction. But two interesting exceptions are remarked: synecdoque (condensation of totalities) anticipates metonymy (condensation of parts); and prosopography appears almost as last, evidently growing together with individualism and historical consciousness.

Correspondently, the historical development of rhetoric forms points to an analogous development of mental operations, i.e. a progression of:

- *mental logical operations* from pre-operative (Archaic) to operative concrete (Early-Mid Bronze) to operative abstract (Late Bronze, Early Iron)
- *space time conceptions* from concrete cyclical (early periods) to abstract linear (Turkic)
- *unconscious oneiric transformations* from dramatization and condensation (Archaic, Bronze) to fragmentation and displacement of meaning (Late Bronze)

The detection of rhetoric forms in petroglyph images and scenes is sometimes exposed to *ambiguities*.

Ambiguities mainly appear in case of rhetoric forms based on omission and condensation of part of the signified. The distinction between the denotation of a single image and the condensation by metonymy or synecdoque of the meaning of two images into one of them can only be detected by the presence of secondary signs or by contextual considerations.

The same can be said about symbols, which can be surely distinguished from denotation only when are repeated and fixed as emblems.

The easiest forms to individuate are metaphors and absurd constructions, because based not on omissions but on evident unreal or absurd relations. Anyhow the border between unreality and absurdity, between metaphor and absurd construction, can sometimes be quite fuzzy.

Clear are also prosopographies and narratives: the first because their realistic details, the second because their sequential alignment.

Samples of rhetoric forms from the Kazakhstan petroglyph archive

Here below are analyzed 11 petroglyph samples of rhetoric forms, provided with picture and commentary



1) *denotation (imitative analogy): flock or herd of goats / Eshkiolmes Valley-13 / Early Iron Hunnic period (200 BC - 500 AD)*

Given the absence of any other sign or contextual element widening the semantic reference, this composition of mid size linear goats can be interpreted as a denotation by imitative analogy of a flock or a herd of goats.

The same simple figure, in presence of other signs or contextual elements, could represent more complex concrete forms like metonymy and synecdoque, or more abstract forms like symbols and emblems.

The rhetoric form of denotation is present in some degree during all historical periods but, due to its extreme simplicity, becomes predominant during phases of decay and simplification of the petroglyph performance, like the Early Iron Hunnic period in Kazakhstan.



2) *synecdoque - 1: auroch / Kuljabasy Valley-4 / Archaic period (before 2000 BC)*

This kind of image of auroch is typical of the earliest Archaic petroglyph executions of the Chu-Ili mountains. It is realized by pecking technique on horizontal rectangular surfaces hidden in a shadowing corner of the rocky outcrop, in very large size 2 m long, with contour lines and square striped body, 2-dimensional but with 4 legs. Horns and tail are prolonged into cracks of the rock; male and female sex organs are both evidenced.

The morphological similarity between the signifier's body and the rectangular shape of the rock surface, and the presence of elements underlining the intimacy of the image with the underground dimension, make suspect the presence of a

synecdoque, i.e. the representation of an object referring to the entire world to which it pertains. In this case the signified could consist of 2-3 variants of synecdoque, not so different from each other.

- It could be the humid fertile underground world generating vegetation and animals, of which the auroch incontestably represents the biggest in size and most humid.
- It could be the groundwater and springs that in the Kuljabasy valley represent the only water resource supporting the life of aurochs, animals and humans.
- It could even be the whole hydrological cycle, of which in arid landscapes groundwater represents a main phase.



3) *synecdoque - 2: auroch surrounded by worshippers and killers / Kuljabasy Valley-14 / Middle Bronze period (1600-1200 BC)*

This splendid composition is engraved on a vertical surface framed by an astonishing landscape view. It consists of figures of animals and humans realized by hammering technique in a 3-dimensional space as silhouettes endowed with voluminous effects.

The central and largest figure is the one of an auroch realized in large size and perspective effects, with prolonged horns reaching a crack of the rock. It is surrounded on the right by a man, a woman and a child, in worshipping attitude; and on the left aggressed by 3 animal predators and pierced by 2 humans with spear and bow.

The auroch in South Kazakhstan, during the Archaic and Bronze period, represents the most frequent petroglyph image and will totally disappear from all repertoires after this animal became extinct around 1000 BC.

The composition seems to refer, as synecdoque, to the presence of two opposite trends in the relation between humans and animals: a contrast, within the human species, between killers and lovers, which provokes death and divinization of the victim.

Eventually this synecdoque, by changing the central personage from auroch to ram and then to human, and by finally growing in abstraction, changed into metaphor and became the central icon (fixed metaphor) of the Christian religion.



4) *metonymy: linear goats, solar circle and spots / Kuljabasy Valley-2 / Late Bronze period (1200-800 BC)*

This composition of linear goats and geometric signs is engraved on a vertical surface along the bottom footpath of Valley-2

Horns, particularly the ones of ovi-caprides, have the peculiar quality to grow annually by regular rings so that, during prehistoric times, they surely provided one of the best measures of the succession of solar years.

This property, during the Bronze age, confers to the isotopy horns-sun a concrete character which, together with the condensation of the sun image as spots between the horns themselves, allows classifying this composition as metonymy. Eventually horns could refer not just to their chronometric function but to the solar cycle as generator and regenerator of life, developing the basic metonymy into a synecdoque.

This chronometric character endowed horns of a very wide semantic potential and favored their later use in the context of more abstract forms as metaphors and symbols.



5) *metaphor: archer with arrow and phallus in inverted positions / Arpauzen Group 9 / Middle Bronze period (1600-1200 BC)*

This image of archer is engraved on a vertical red surface in the context of a large composition of analogous representations.

The inversion of the iconographic elements arrow-phallus brings to the image an unreal element which excludes the classification of its rhetoric form as concrete. The fact that a similarity of just morphological nature is established between the 2 kinds of penetration makes this rhetoric form not totally abstract. It is transitional between concrete and abstract.

It is a metaphor, and attributes subtle properties by substitution. It is attributing to the arrow the subtle property of the phallus; and to the phallus the one of the arrow: it emphasized the sexual aspect of hunting and the hunting aspect of sex.



6) *Absurd construction - 1: horned horse / Tamgaly Group-3 / Late Bronze period*

During the Late Bronze period the petroglyphs archive of Kazakhstan sees the first appearance of images and compositions endowed with absurd elements. They eventually developed from metaphors by pushing too far the way to signify a property.

Images of horned horses and horned camels are representative of this phenomenon. They have been engraved totally

anew or, more simply, like in the case of this picture, horns have been just applied on a more ancient horse image. At that time horns of bovine and ovi-capride were able, by metonymy and synecdoque, to condensate the meaning of several signified and played a very high semantic role in the repertory. Then, with the full domestication and use of the horse, the image of this animal entered the semantic cosmos as main subject, substituting in this role the image of the extinct auroch. In the transition, the horse inherited the horns of the auroch (even the ones of the goat) and, with the horns, all their possible isotopies: chronometer of the solar year, representative of the solar cycle, etc. As the result the ancient horn compositions playing as synecdoque changed into absurd constructions. Not even totally absurd because two little relict horns are anyhow detectable on the top of the horse head!



7) *Absurd Construction - 2: tailed humans / Kuljabasy Valley-3 / Middle Bronze period (Fig 43)*

Like horns are applied to the horse during the Late Bronze period, in the same way the tail were often applied to images of men during the Early-Middle Bronze. Why horns and tail?

Horns and tails are similar in representing the two thin mobile extremities of many big mammals; and, already during the Archaic period, on auroch images, they have been both submitted to anomalous augmentation in order to reach cracks of the rock surface.

They are also, particularly the tail, most mobile parts and good communication channels. In fact the two organs are both endowed of special informational functions: the horns, with slow changes, measure the cycles of the sun; the tail, with its rapid vibrations, play as most effective channel of communication between animals and between animals and humans.

During the Early-Middle Bronze age both organs are often applied to human figures. The isotopy man-tail is possibly the most ancient absurd construction... and, again, not totally absurd. On one side, the absence or presence of horns is a good criterion for differentiating horses (and camels) from all the other big mammals; and the absence or presence of horns and tails for differentiating humans from animals: and the violation of this criterion makes absurdity. But on the other side four-five tail vertebrae are still remaining in every human body: their augmentation is just metaphorically pointing to and exalting the energy and communication power that comes from our pertaining to the animal world.

The fact that the absurd images of horned horses and tailed humans are just the fruit of augmentation underlines the concrete link still existing between the 2 elements of the isotopy. The fact that, by excess, this augmentation turns into an absurdity underlines, metaphorically, a pretended qualitative difference: the difference of horses and humans from the rest of the animal world. Very often metaphors and absurd constructions are introduced for supporting the expression of unclear pretensions.



8) *Absurd construction - 3: labyrinth head / Kuljabasy, Valley-19 / Late Bronze period (1200-800 BC)*
 Another very important sample of Late Bronze absurd construction are the so-called sun-head images. They are relatively numerous in Tamgaly and Saimaly-Tash (KG) but present also in Kuljabasy, Eshkiomes, Baikanur.

They consist of anthropomorphic personages with abnormal head, made of concentric circles and/or rays, from which comes their denomination. In reality each of these heads has its specific character morphologically related to a wide class of sub-circular objects like sun, stars, auras, rays, hairs, etc

This anthropomorphic figure newly discovered in Kuljabasy is relevant for its excellent state of conservation. It is 60 cm high with linear body, non erected phallus and 4 arms. The head is shaped as a labyrinth, quite similar to the one engraved few valleys away (see photo here under) and to a labyrinth found in Saimaly-Tash.

Even in this case the absurdity of the labyrinth head is not extreme, because the shape of the labyrinth is morphologically very similar to the lateral section of the human brain, and metaphorically well represents the complexity of human thinking.



labyrinth, Kuljabasy valley I



brain

As a whole during the Late Bronze epoch, together with the use of metaphors and abstract mental operations, petroglyph images start witnessing a self-reflective interest for human mentality.



9) *Symbol: deer in crouch position / Tamgaly Group-5 / Early Iron Saka period (800-250 BC)*

With the Early Iron Saka period the character of the signifiers' repertory and of its relation with the semantic cosmos changes completely. The repertory drastically reduces in number from 30-50 subjects and scenes to just 8-10 of them, practically just horned ovi-caprids, deer and predators. But in the same time the rhetoric form develops from denotative to connotative in order to link these few signifiers with a wide spectrum of possible signified properties. Petroglyphs become symbol and emblem (fixed symbol) of properties of an abstract cosmos.

The appearance of abstract symbols is witnessing a deep epochal change. It goes together with the rise of an aristocratic class of mobile armed shepherds, patriarchal and stratified, organized through genealogies and burial monuments. The petroglyph world loses its centrality and becomes the emblematic support of an impressive funerary culturalization of the landscape, sharing this function with similar images represented on metal works.

Images of crouching deer with beak-like muzzle appeared at the end of the II millennium BC on funerary steles in Western Mongolia, and in few centuries spread as symbol of the cosmos of the ancient Sakas in almost all sites of Central Asia. Like the contemporary and more abundant images of sheep and goats, they play a symbolic role, as witnesses by the standardized shape of their body and by the taste for geometric arrangement of several images. Compositions predator-prey are also frequent, pointing to the conception of a world ruled by conflicting natural forces.

This symbolic phase weakens with the end of the Saka period and is followed by 7 centuries of decadence of petroglyph performances, reduced to simple linear denotative images of sheep and goats. Anyhow the obsessive repetition of sheep and goat images on rock surfaces seems result of the psychotic extroversion of a collective primordial archetypal structure. This phenomenon possibly represents the original rhetoric and psychic contribution of the Early Iron Hunnic period, which operates unchanged among peoples of Kazakhstan up to present times.

Symbolic forms will be reintroduced in Kazakhstan by the Turkic invasion, together with new forms of prosopographic and narrative character.



10) prosopography: rider with banner / Kuljabasy, Valley 3 / Turkic period (500-1200 AD)

The Turkic rule on Central Asia revived everywhere the petroglyph performance in an eclectic way. It mainly reintroduced subjects and symbolic forms of the Saka period, together with new subjects and forms of prosopographic and narrative character and writings in runic alphabetic script.

Prosopography and narrative forms (system of prosopographies) are easy to detect because are denotative and point to real signified. What distinguishes them from simple primitive denotation is their individualistic and historical character. Not animals but personages and events are denoted, like riders with banners, weapons and paraphernalia, with falcons, with detailed representation of portraits, dresses and tools through the use of drawing-like scratching technique.

The introduction of these denotative historical forms goes together with the use of ancient petroglyph sites for political and military propaganda: an aggressive use of the most accessible surfaces, often by superposition and canceling of former images.



11) arbitrary sign: lines and circle / Kuljabasy valley 4 / Early Iron period (800-200 BC)

Abstract arbitrary signs are detected on the basis of their abstract shape and, sometimes, by their serial distribution, and are present in every petroglyph period.

The ones of the Archaic and Bronze period are pointing to mysterious objects or are possibly endowed of syntactic connective functions.

The ones of the Early Iron Saka and Sarmatian period (represented in the figure above) could be already related to a phonetic signified and play as logographs (relating to nouns), syllabographs (to syllables) or alphabetographs (to alphabetic phonemes). In that case they would represent a sub-graphemic early phase of writing.

Abstract arbitrary petroglyph signs used in the context of a well established writing system (graphemic system) make their sure appearance during the Turkic period in runic alphabet and widespread during the following Ethnographic period in Arabic alphabet.

The prosopographies, symbols and written inscriptions of the Adai tradition (1600-1900 AD) represent the last phase of petroglyph performance in Kazakhstan. After this time, the ancient system of communication based on stones definitely ends, substituted by two modern systems of communication on paper and on microchips.

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