On the origin of the wisent, *Bison bonasus* (Linnaeus, 1758): presence of the wisent in the Upper Palaeolithic art of Eurasia

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Abstract - Data provided by prehistoric rock art are insufficiently used not only in archaeology but also in palaeozoological investigations. Very useful would be a new and detailed review of the thousands zoomorphic depictions of mammals dating from the Late Palaeolithic and published during the last century, which allow the reconstructions of the exterior, palaeozoogeography and even the ecology of numerous extinct species. Pictograms from the French caves Pair-non-Pair and Carriot and from the open-air site Karauzoungau in Kazakhstan, which we interpret as depictions of the Wisent (*Bison bonasus*), provide new data on the origin of this species. These are the first rock engravings used more profoundly for the study of the evolution of this bison species.

Keywords: *Bison bonasus*, *Bison* evolution, Pleistocene mammals, Palaeolithic rock art.

Résumé - Les données provenant de l’art parietal ne sont pas suffisamment utilisées non seulement en archéologie mais aussi en paléontologie. Une nouvelle revue détaillée sera très utile en ce qui concerne les milliers d’images de mammifères pléistocènes publiées le dernier siècle, ce qui aidera la restauration de l’extérieur, la paléozoogéographie ainsi que l’écologie de plusieurs espèces disparues. Les pictogrammes des grottes françaises Pair-non-Pair et Carriot ainsi que du site Karauzoungau au Kazakhstan que nous interprétons comme images du wisent récent d’Europe (*Bison bonasus*) présentent de nouvelles données sur l’origine de cette espèce. Les gravures en question sont les premières utilisées d’une manière plus précise pour l’étude de l’évolution de cette espèce de bison.

Mots-clés: *Bison bonasus*, évolution de *Bison*, mammifères pléistocènes, art parietal.

INTRODUCTION

The skill and realism of the Palaeolithic art style, as well as the detailed knowledge of the animals, makes the Upper Palaeolithic animal depictions a valuable source for the study of Late Pleistocene fauna (Gutiérrez 2008). Animal depictions from prehistoric time are still insufficiently used as a source of information for the palaeontology and the understanding of the Late Pleistocene - Holocene faunal evolution. The best results could be achieved by the joint efforts of palaeontologists, archaeologists and rock art specialists. With this short paper we are trying not only to contribute to the study of a concrete faunistic problem, but we also hope to demonstrate that such an interdisciplinary approach has its results and perspectives in future research.

LOCATIONS, DESCRIPTION, DETERMINATION AND COMPARISON OF THE INVESTIGATED IMAGES

The first of the studied zoomorphic pictograms (Fig. 1) is from the Pair-non-Pair Cave, situated on the right bank of the river Dordogne near Marcamps, Gironde, France. For comparative purposes in the illustrations captions we used area codes suggested by E. Anati and commissioned by the UNESCO - International Council on Monuments and Sites (Anati 1993).

Some images from this cave have been published as early as the end of the 19th century (Dixizau 1896); later this locality of rock engravings has been dated back to Oriniacian and Perigordian, Upper Palaeolithic (Breuil 1985). Another French expert - A. Leroi-Gourhan argued that the cave art in Pair-non-Pair Cave should be referred to the Oriniacian and the beginning of Solutrenian. We will discuss a photo of a bovid depiction (Fig. 1) published by Stoljar (1985) after Gräzer (1956) from the Early Oriniacian. The pictogram's technique of execution is linear rock engraving; its length is 75 cm. The depiction is very precise permitting taxonomical conclusions. The Pair-non-Pair bovid differs markedly from most European Palaeolithic bison images. Differences include the highly positioned head, the size and shape of the horns (the horn is depicted in profile with upper and lower contours, and although unfinished doesn't seem to be long), the relatively low hump, the lack of developed mane on the head and neck, and the small beard. The position of the horns and the lack of long hair at the anterior part of the body indeed makes at first look the image similar to the aurochs (*Bos primigenius* Hufnagel, 1827), as A. Stolyar suggests. The Pair-non-Pair depiction, however, is obviously different from an aurochs and from depictions of aurochs of the same style, place and time as Pair-non-Pair.
The contemporaneous to the Pair-non-Pair Peptide image parts of aurochs (Bos primigenius) from the Franco-Cantabrian region (Fig. 2) have all the principal features of this animal. They are different from the Pair-non-Pair engraving in the shape of the muzzle, the position of the head relative to the body, the shape and size of the horns, the curve of the neck and the back contour. In the pictogram studied by us the beard has been deliberately rock image from Karaoungour supports the suggestion that the Palaeolithic art of West Europe (Fig. 3). All mentioned features have all the principal features of this animal. They are exceptional in profile, in its realism permits an optimal analysis of its outline morphology (Lorblanchet 1989). The description shows an animal of genus Bison, obviously a male, standing, immobile, with its head raised, apparently on its guard. All characters - very highly positioned head (above the long hindquarters) and the body in upper and lower part - the horns, the position of the muzzle, the small chin and the moderately large hump differ the animal from the Pleistocene steppe bisons and are typical for the recent wisent. The horns, meticulously marked by the outlining contour, fully correspond to this species in their size, shape and position.

The next of the studied pictograms (Fig. 5) is at Karaoungour open-air site, Sari-Arka, north of Balhash Lake, Central Kazakhstan. Technique of execution is plane rock engraving and the image has an intensive patination, its dimensions are 12 x 19.7 cm. The description is either partially preserved or unfinished - something we cannot be sure about because the source we have is not a photograph, but a graphic illustration (Medoev 1979). It's dated between 12 - 10 000 BC, Sayak culture.

The Karaoungour image obviously represents a bovid. This can be seen from the shape of the large head, the powerful torso, the hoofs and the position of the tail. Typical peculiarities of the rock engraving are the unshaped horns and the concave contour of the abdomen, contrary to the deep chest. From palaeozoogeographical viewpoint it is more probable that this is a representative of Yaka - Bos primigenius (Alexeeva 1980).

1. It is assumed that the long-horned, steppe form of the Pleistocene European bison - Bison priscus priscus Bojanus is gradually replaced during the Late Pleistocene by a some smaller and shorter-horned subspecies - Bison priscus mediator Hilzheimer, 1938, which survived until the end of the Pleistocene. Most probably this is the form depicted in Lascaux and Altamira, and probably in most bison depictions of Gravetian, Solutrean and Magdalenian (Flérov 1979). This subspecies was adapted to forest habitats (Fleerov 1979, Kahlik 1999).

2. After some opinions (Flérov 1979, by the end of the Pleistocene there are bisons which have a seemingly transitional morphology between Bison priscus mediator and Bison bonasus, which could represent an archaic subspecies of the Wisent. In fact, the presence of some wisent-like features (e.g. neck hump etc.) has been noted by some authors in a number of Magdalenian bison depictions from the Palaeolithic rock art of Western Europe (Clottes et. al. 1994) we must note, however, that the presence of a neck hump perhaps is not a character typical for the wisent with their small size, almost hidden in the mane of the head. This immediately brings an association with the Wisent - Bison bonasus. Though not entirely unequivocal, skeletal remains, probably belonging to Wisents and dating from the period around the Pleistocene-Holocene boundary have been found in the southeastern regions of West Siberia (Alexeeva 1980). The rock image from Karaoungour supports the suggestion that the distribution area of the Wisent (Bison bonasus) by the end of the Pleistocene/beginning of the Holocene could reach as far as the southern parts of West Siberia and Kazakhstan.

**Discussion**

Palaeozoology, rock art and archaeology. Formally, the archeological comparison between the two depictions, which are so distant geographically, though chronologically close (end of the Upper Palaeolithic), could seem a little unusual. Such a comparison, however, is fully reasonable from the viewpoint of recent global studies on rock art, as well as from zoogeographical point of view. Mention this, the author of "The rock engravings", A. Medoev says he chose the illustrative material among thousands of depictions in such a way as to demonstrate both the common characteristics of Palaeolithic rock art and the regional peculiarities in Kazakhstan (Medoev 1979). One could add the statement by F. Bordes that because Homo sapiens created at the end of the Palaeolithic two most elaborate cultures - Solutrean and Magdalenian, this doesn't mean the rest of the world stood still in expectation of the progress in Western Europe. The tendencies in the evolution of the Late Pleistocene Palaeartic bisons are believed to be well known as a whole. Nevertheless, what we have is mainly hypotheses rather than precise facts on the time and place of origin, the early evolution and distribution of Recent European bisons - the Wisent (Bison bonasus Linnaeus). There are two main hypotheses on the Wisent's origin:

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only - see Flerov (1979) - on B. priscus arctohuskae Rhoods). We believe that two more or less wisent-like images from Spain and France could reflect the habitats precisely of such "transitory" animals as those mentioned by K. Flerov. These are the rock engravings from Llom Cave at Peamelle Alta, Cordillera Cantabrica, northeastern Asturias, Spain (Fig. 6) and the one from La Greze Cave, Dordogne, France (Fig. 7). The first rock engraving represents an unfished bison with its tongue protruding - probably a chased and tired or wounded and agonizing animal (a slightly protruding tongue is also possible in fleeing behavior, but doesn't seem very probable in this case). This could be a female, or a subadult animal. Its occurrence in a forest-mountain area however makes us suggest that this is rather a depiction of a short-horned, late wisent-like form. The second image, of an adult male, has mixed features of Bison priscus and Wisent in its horns, neck mane and hump. The horns, for example, are moderately long, with their tips together, unlike the drawings of Bison in its horns, neck mane and hump. The horns, for example, are moderately long, with their tips curved and apart (Fig. 3).

It is usually assumed that the Wisent appeared as a species around the Pleistocene/Holocene boundary or by the end of the Pleistocene, but it is not known for sure before the beginning of the Holocene (Gromova 1965, Flerov 1999, Cregut-Bonnoure & Gruev 1996). It seems that by the first half of the Holocene there were already two mountain (Caucasic and Carpathian) and one plain subspecies of Bison bonasus, and the species was distributed from Central and Western Europe at least to North Iran (Flerov 1999). Such a diversity and large range support the idea that Bison bonasus should already exist as a species much before the end of the Late Pleistocene (Spassov 1992). The pictographs studied seem to confirm this thesis.

CONCLUSIONS

This study of pictograms, which we have reasons to interpret as hints for the presence of the Wisent (Bison bonasus) in the Ice Age rock art, shows the need of a thorough analysis of the thousands of zoemorphic images of large mammals from the Upper Palaeolithic, published during the past century. Special attention should be paid to those taxonomically determined by rock art specialists and not palaeontologists.

The images from France and Spain, where Bison priscus mediator is depicted contemporaneously with and later than wisent-like bison, seem to support the hypothesis of the parallel occurrence of the steppe long-horned form Bison priscus and a forest (southern) short-horned form of genus Bison during the Late Pleistocene (and probably from the Middle Pleistocene). It seems that the short-horned form evolved into Bison bonasus somewhere in the area between South Europe and the Middle East, much before the end of the Pleistocene but, not later than the Early Ottocian. A depiction from the Karasunour open-air rock art site, north from Balhush Lake, on which we see the silhouette of Bison bonasus, provides indirect data on the reconstruction of the eastern periphery of the distribution area of the Wisent, which seemed to inhabit Kazakhstan and the southern parts of West Siberia by the end of the Pleistocene.

Acknowledgments

We are grateful to the Department of Archaeology and to the Scientific Research Fund in the New Bulgarian University - Sofia for the financial support of our project "Prehistoric Mammals in the Rock Art of the Palaeoarctic Region".

REFERENCES


