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A geode painted with ochre by the Neanderthal man

Une géode peinte à l'ocre par l'homme de Neandertal

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ABSTRACT

The archaeological research carried out at Cioarei-Boroşteni Cave, Romania, exposed, in the H Mousterian layer (GrN 15054: 47.900 + 1800/–1500 BP), a spherical-ellipsoidal geode. Its structure was determined using a tomograph with special resolution. The particular morphology, aspect and features of the geode drew the attention of the Neanderthal man who introduced it into the cave due to its unusual look as compared to the other rocks. Using a fibre-optic digital microscope, it has been observed that the geode was painted with ochre. The Neanderthal man must have certainly attached an aesthetic importance to it, while its having been painted with ochre was an addition meant to confer symbolic value. Also, in Cioarei Cave, in addition to the ochre samples, the oldest ochre preparation containers made of stalagmites and stalagmite crusts were uncovered.

RÉSUMÉ

Au cours des recherches archéologiques menées dans la grotte Cioarei de Boroşteni, en Roumanie, on a découvert dans la couche Moustérien H (GrN 15054 : 47,900 + 1800/–1500 BP) une géode de forme sphérique-ellipsoïdale. Sa structure a été déterminée à l'aide d'un tomographe à résolution spéciale. La géode doit avoir attiré l'attention de l'homme de Neandertal par sa morphologie, son aspect et ses traits tout à fait spéciaux, ayant été introduite dans la grotte à cause de son aspect insolite par rapport aux autres roches. À l'aide du microscope digital à fibre optique, nous avons constaté que la géode avait été peinte à l'ocre. L'homme de Neandertal a considéré sans doute qu'elle avait une importance esthétique, et l'avoir peinte à l'ocre a été une manière supplémentaire de l'investir d'une valeur symbolique. Dans la grotte Cioarei, on a découvert aussi, à côté des échantillons d'ocre, les récipients les plus anciens utilisés pour la préparation de l'ocre, réalisés à partir de stalagmites et de croûtes stalagmitiques.

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1. Introduction

In order to understand the Neanderthal man's modern behaviour and cognitive abilities, researchers have appealed, throughout the time, to several types of findings, some of them interpreted as evidence of symbolism. The Neanderthal man introduced numerous materials into his settlements and conferred symbolic value on them, often called "curiosities" by researchers (Otte, 1996; Soressi and d'Errico, 2007). Of these, we shall refer only to three categories, the ochre, name used in the broad sense for several colorants, the fossils and the minerals-rocks, and, following the Cioarei Cave findings, we shall provide new evidence regarding the symbolic significance of these types of materials.

According to Leroi-Gourhan (1964a,b), the ochre, alongside the fossils, is the first evidence of the existence of objects with ritual value. The first mentions of ochre in Mousterian settlements, especially in the form of manganese dioxide, belong to Capitan and Peyrony (1912) in the shelter under the rock of La Ferrassie, Martin (1923) at La Quina, Bordes (1952) in Pech de l'Azé Cave and Sonneville-Bordes (1969) in the shelter of Caminade-East. Emphasis is sometimes laid on scraping marks of samples resulting from their usage.

Both ochre and fossils introduced by the Neanderthal man into his settlements as unusual objects, were separately mentioned by several generations of archaeologists, but lately they have been increasingly interpreted as evidence of a symbolic thinking (d'Errico, 2003; d'Errico et al., 2003; Soressi and d'Errico, 2007; Zilhão et al., 2010). Some authors consider that if ochre had indeed a proved symbolic function in the African Middle Stone Age (MSA), it is but natural that this function should also be extended to the ochre found in the European Middle Palaeolithic (d'Errico, 2003; d'Errico et al., 2003; Zilhão et al., 2010). As a matter of fact, the oldest evidences of symbolism similar to those found in the European Upper Palaeolithic are known to have appeared much earlier in the MSA (d'Errico et al., 2003; d'Errico et al., 2005; Henshilwood and Marean, 2003; Henshilwood et al., 2001, 2002, 2004; McBrearty and Brooks, 2000).

On the other hand, many experts believe that the mere presence of ochre in Mousterian sites does not necessarily prove its symbolic nature. It might have had utility functions as well (Chase and Dibble, 1987), as several studies showed that ochre was used for tool hafting (Lombard, 2007; Wadley, 2005; Wadley et al., 2004).

Direct material evidence regarding the use of ochre for painting was provided by the discovery of ochre preparation containers in the Mousterian layers, dated more than 50.000 years, in Cioarei Cave from Boroşteni, Romania (Cârciumaru et al., 2002; Cârciumaru et al., 2012; Cârciumaru and Ţuţuianu-Cârciumaru, 2009). They are direct material evidence of mixing the pigments in order to use it for painting various surfaces (Figs. 1 and 2). Also, analyses performed on the pigments found at Pech de l'Azé have showed that they were used to mark soft materials such as animal or human skin (d'Errico et al., 2009). Furthermore, Zilhão et al. (2010) publish perforated and pigment-stained marine shells found in two Mousterian layers in Spain. Some were used as containers; others were included in the body ornamentation category by comparison to the discoveries made in Africa, which might represent evidence of symbolism of the Neanderthals.

In turn, fossils found in Mousterian contexts are being increasingly attributed to a symbolic behaviour of the Neanderthal man. Bednarik (2003) calls this class of artefacts "manuports suggestive of non-utilitarian functions" (p. 89). Archaeological excavations performed in Combe-Grenal Cave during 1953–1965 gave Bordes the chance to identify in layer 24, assigned to the Quina Mousterian, a fossil of the *Zeillerinae* species and in layer 61, typically Acheulean, a second fossil of the *Rhynchonellidae* species, both of *Terebratulina* genus specific to the Upper Cretaceous. They would pass into the scientific circulation much later when Demars (1992) publishes them alongside the ochre samples found in the Mousterian layers of Périgord.

Leroi-Gourhan (1964a,b) identified in the Mousterian layers of Arcy-sur-Cure, alongside the internal mould of a gastropod fossil and a spherical polypidom from the secondary age, an iron pyrite aggregate as well. Lhomme and Freneix (1993) also described in great detail a fossil of the *Glyptoactis (Baluchicardia)* species (characteristic of the Maastrichtian–Palaeocene geological period) recovered from the Charentian Mousterian of evolved aspect in Chez-Pourré-Chez-Comte Cave (Corrèze). The fossil could not have been found but in areas which implied the Neanderthal man's moving a few hundred kilometres away, therefore emphasizing its special importance to those particular human communities.

While studying the collection of materials from the lower level of Pech de l'Azé I cave, Soressi has recently recognized a brachiopod assigned to the *Terebratulides* family, which was carried to this settlement from about 30 km away (Soressi and d'Errico, 2007). In Tata settlement from Hungary, a nummulite (*Nummulites perforatus*) with a cross engraved was found next to a mammoth tooth, incised as well (Vértes, 1964). They seem to have been the first findings interpreted as symbolic evidence for the Neanderthal man. Such attestations are actually the closest to Romania.

Of the minerals and rocks introduced by the Neanderthal man into his settlements, alongside the pyrite aggregate of Arcy-sur-Cure Cave (Leroi-Gourhan, 1964 a, b), there are also mentions of a small galena block in a Châtelperronian level of Roche-au-Loup (France) (Demnard and Neraudeau, 2001) and probably a very small quartz crystal found in Abri des Pêcheurs (France) (Moncel, 2003).

As can be seen, among the strange objects introduced by the Neanderthal man into his settlements, ochre and fossils are the most frequent, while minerals and rocks, not used to obtain lithic tools but bearing a certain symbolic connotation, are rather rare.

2. The Cioarei Cave geode

Cioarei Cave from Boroşteni, Peştişani commune, Gorj County, is the most important Mousterian settlement in Romania as regards the complex interdisciplinary research conducted over more than 20 years (Cârciumaru, 2000; Cârciumaru et al., 2000, 2002). The cave was carved in a

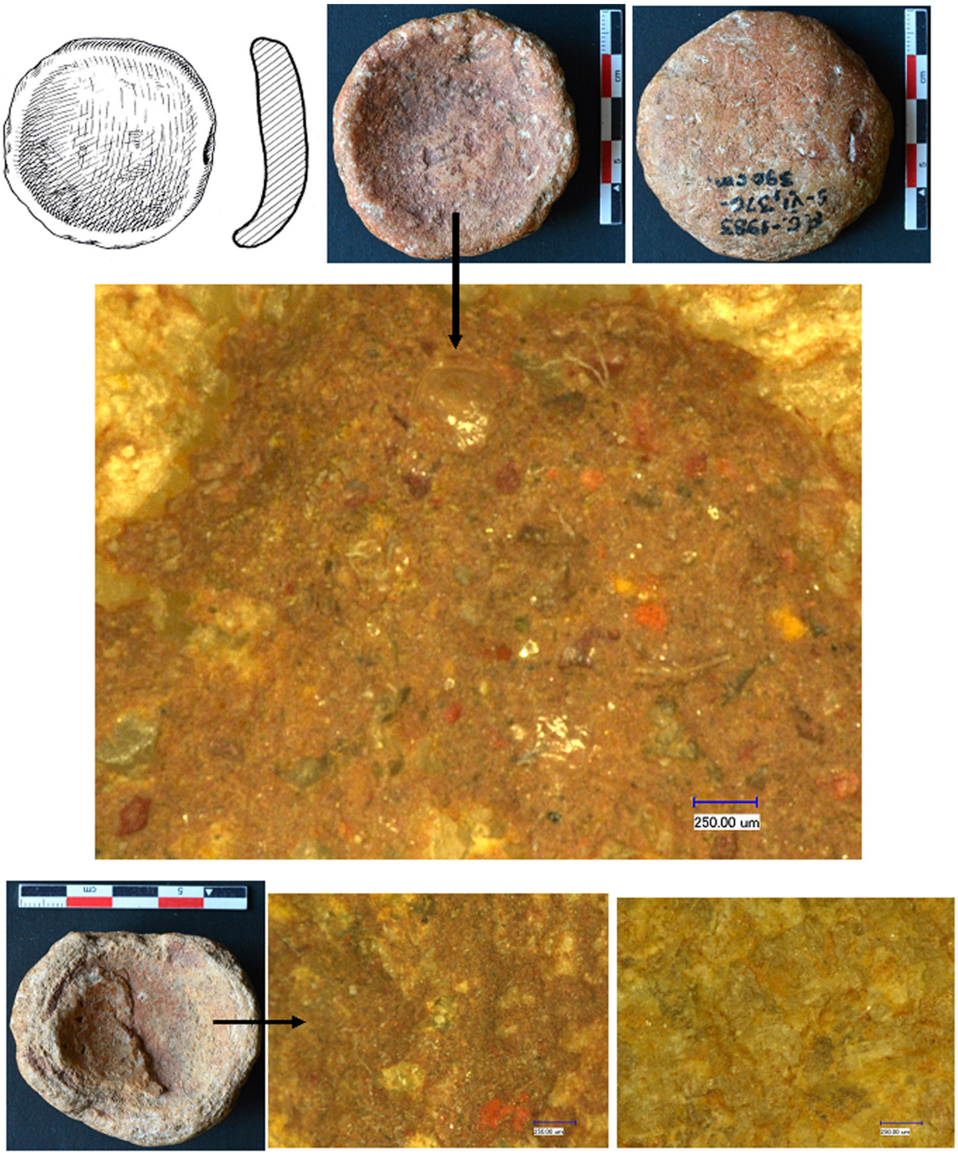

Fig. 1. (Colour online.) Two of the eight ochre preparation containers found in Cioarei-Boroteni Cave, Romania, and traces of ochre observed by means of the digital microscope (× 200), inside the ochre preparation containers.

Fig. 1. (Couleur en ligne.) Deux des huit récipients utilisés pour la préparation de l'ocre, découverts dans la grotte Cioarei de Boroşteni, Roumanie, et nuances d'ocre observées à l'intérieur des récipients, découvertes à l'aide du microscope digital (× 200).

limestone spur of Barremian–Aptian age which descends from the Vâlcan Mountains, part of the southern Carpathians, located at an absolute altitude of 350 m and a relative altitude of approximately 30 m in relation to the Bistricioara river flowing nearby. The access to the cave is easy and the entrance is southwest oriented. It is a relatively small cave, only 27 m long, roughly 7 m wide and an area of about 85 square metres. It is completely dry, slightly descending, devoid of currents. All possible couloirs and siphons, which had existed in the active period of the cave were clogged or closed by thick crusts of calcite before the deposit sedimentation. In the approximately 5-m-thick deposit of Cioarei Cave, was discovered the oldest Romanian Mousterian, assigned to the last interglacial and first half of the Würm glacial stage, represented mainly by lithic tools made of a great variety of local raw material sources (Cârciumaru, 2000; Cârciumaru et al., 2000, 2002). Of the entire cave deposit, the Mousterian was identified in layers A–J, but high densities of materials were recorded in five layers: E, F, G, H and J. C-14 dating provided ages ranging between 51.900 + 5.300/–3.200 BP (GrN 15048) and 37.750 ± 950 BP (GrN 13005).

The oldest stone ochre preparation containers known so far have been recovered from the Mousterian layers of Cioarei Cave. They are unique in terms of their being made of the upper part of stalagmites and stalagmite crusts. Scraping and polish marks in the middle of the hollows were observed under microscope (Fig. 2). Ochre deposits

Table 1
Chemical analysis of some ochre samples from Cioarei Cave.
Tableau 1
Analyse chimique de quelques échantillons d'ocre de la grotte Cioarei.

Section-square	Depth in cm	Color Munsell soil color	SiO_2	Al_2O_3	Fe_2O_3	FeO	MnO	CaO	MgO	$P1O_5$	TiO_2	K_2O	H2O	P.C.
V-3	230–240	Reddish yellow 5YR 6/6	15.88	4.97	2.20	–	0.05	40.31	0.64	0.60	0.25	0.85	0.60	32.31
V-2	290–300	Pink 5YR 7/4	4.61	1.47	0.90	–	0.02	46.62	0.27	2.40	–	0.33	4.05	36.87
V-3	405–415	Pink-Light reddish brown 5YR 7/4-6/4	6.06	3.10	1.40	0.23	0.04	47.30	0.40	0.90	0.04	0.47	0.90	38.54
XIII	375–395	Reddish yellow 5YR 7/8	9.88	16.00	3.21	–	0.03	34.16	0.80	6.64	0.25	–	–	27.47
VI	425–440	Very pale brown 10YR 8/4	4.65	31.02	0.35	–	0.02	14.00	0.70	30.83	0.25	–	–	12.43
XII	440–460	Red 2,5YR 5/8	15.10	2.24	3.14	–	0.03	39.48	0.50	3.37	0.60	–	–	32.67
XIII	460–480	Reddish yellow 7,5YR 7/8	12.33	1.54	3.14	–	0.02	43.12	0.20	1.50	0.60	–	–	34.91
XIII	470–485	Yellow 10YR 7/6	20.84	10.93	3.21	–	0.02	28.98	0.90	8.46	0.60	–	–	23.52
XIII	500–515	Very pale brown 10YR 8/4	12.20	15.06	2.86	–	0.02	22.40	2.20	20.78	1.20	–	–	15.30

According to M. Cârciumaru, 2000.

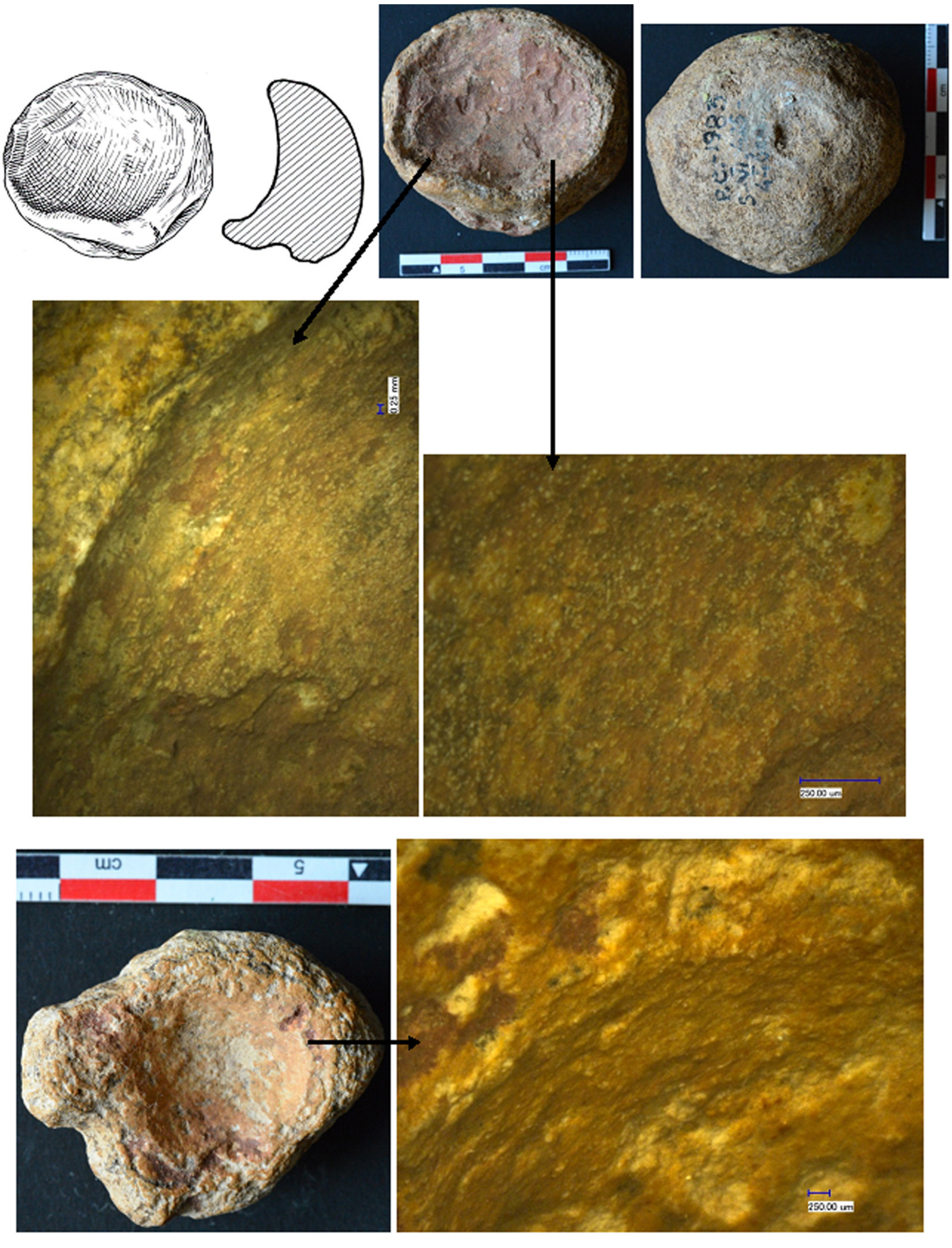

Fig. 2. (Colour online.) Two of the eight ochre preparation containers found in Cioarei-Boroteni Cave, Romania, and microscopic traces of scraping marks (× 200).

Fig. 2. (Couleur en ligne.) Deux des huit récipients utilisés pour la préparation de l'ocre, découverts dans la grotte Cioarei de Boroşteni, Roumanie, et traces microscopiques de raclage (× 200).

are visible mainly inside them and only in one case on the outer surface (Fig. 1). Also, ochre fragments of different shades, whose composition was chemically analysed, were also recovered from these layers (Cârciumaru et al., 2012; Cârciumaru and Ţuţuianu-Cârciumaru, 2009). During excavations, ochre was systematically gathered from four sections, X–XIII (an overall area of 14 square metres) totalling 55 samples. The total weight of ochre in these sections is 375.34 g. Chemically, several samples seem to be aluminium silicates rich in calcium carbonate. What is surprising about the chemically analysed samples is that they contain low levels of oxide and iron trioxide, as well as manganese oxide (Table 1) (Cârciumaru, 2000).

Most samples (182.5 g, 51.71%) come from layer E and a few from layer F (61.14 g, 10.34%). As related to the volume of the excavated sediment, depending on sections, ochre

Table 2
Frequency of samples and percentages in different geological strata of sections X–XIII.
Tableau 2
Fréquence des échantillons et leurs proportions dans les différentes couches géologiques des sections X–XIII.

Geological strata	Number of samples	%
E	30	51.71
F	6	10.34
G	2	3.44
H	1	1.72
J	5	8.62
L	5	8.62
M	3	5.17
N	2	3.44
O	2	3.44
P	1	1.72

According to M. Cârciumaru, 2000.

Table 3
The weight of ochre in each stratum and percentages calculated in relation to the total amount in sections X–XIII.
Tableau 3
Poids de l'ocre dans chaque couche et pourcentages calculés par rapport à la quantité totale dans les sections X–XIII.

Geological strata	Total weight of ochre in grams	Percentages calculated in relation to the total amount
E	182.5	48.62
F	61.14	16.28
G	12.39	3.30
H	3.33	0.88
J	41.53	11.06
L	22.28	5.93
M	14.26	3.80
N	25.60	6.82
O	10.40	2.77
P	5.95	1.58

According to M. Cârciumaru, 2000.

is not really that frequent. Thus, for the richest strata of ochre, in layer E, section X, density is 15.41 g/cubic metre while in layer F it is 5.79 g/cubic metre, and in section XI for layer E density reaches 31 g/cubic metre (Cârciumaru, 2000). Therefore, given that in four sections, totalling 14 square metres, excavated as far as about 5 m deep, only 375.34 g of ochre were discovered, it is unlikely that there should have been such so powerful a contamination of containers in the sediment (Tables 2 and 3).

Of all layers assigned to the Mousterian, geological layer H represents the richest habitation, dated 47.900 + 1800/−1500 B.P. (GrN 15054). According to palynological studies, it was deposited in a "steppe-tundra" landscape (Cârciumaru, 1977). Mammal fauna associations indicated in this part of the deposit reveal a succession of sequences of cold climate such as *Chionomys nivalis, Crocuta spelaea, Ursus spelaeus, Cervus elaphus, Equus* sp., *Capra ibex*, Bovidae, with others typical of climatic improvement like *Hystrix vinogradovi*, *Vulpes vulpes, Ursus arctos, Sus scrofa, Cervus elaphus* (Patou-Mathis, 2000-2001; Terzea, 1987).

Geologically, layer H is made mostly of a sedimentary mass of loamy-argillaceous fraction, mixed discontinuously with angular cryoclastic limestone fragments. Limestone fragments lack a marked frost-susceptible character, while intense alteration processes are not quite visible. Moreover, ferric hydroxides are completely missing (Cârciumaru, 2000).

Culturally speaking, layer H is characterized by numerous lithic tools (245 items) as it was the most intensely inhabited layer of the entire period in which the Neanderthal man was present in the cave. The lithic materials were made mostly of magmatic rocks and are represented by blanks, flakes with a cutting edge on a large part of the periphery, flakes with one or two backs, cores, tools etc. (Cârciumaru, 2000; Cârciumaru et al., 2002; Cârciumaru et al., 2000).

In layer H, at 275–285 cm deep, among the lithic tools, was found a strange spherical-ellipsoidal object, which we have likened to a "bubble". When found in the cave deposit, it was covered with a film of calcium carbonate, white in colour. The most striking thing was the rather large weight of the piece in relation to its volume. Curiosity prompted us to remove the crust using a weak hydrochloric acid solution, which made us abandon this assumption.

Later on, given the discovery of several urchins in Mousterian layers in Europe and the relatively spherical shape, resembling to certain species of this type, we also assumed that our own finding could have belonged to an urchin internal mould. The absence of external ornamentation, specific to an urchin, urged us to perform the tomographic analysis of this object. The internal images obtained using a "General Electric HiSpeed Dual" tomograph which allows 3D reconstructions and digital image processing (Fig. 3) did not confirm a typically urchin inner structure. Instead, we found that it was a "petrographic formation" with a spherical to ellipsoidal morphology, with the concretionary aspect of a geode. Images revealed the typical characteristics of a geode, defined by successive concentric growth, and the presence of an inner cavity, which might contain forms of crystals (Fig. 3/3–6). The high hardness of the geode and the aspect of the surface indicate the origin from an amorphous state (opal?). Such geodes are common especially in hydrothermal areas in the vicinity of volcanic regions and, rarely, in areas with metamorphism. Anyway, the origin of geodes excludes their formation in limestones of Barremian–Aptian age in which Cioarei Cave was formed. This means that the geode was undoubtedly introduced into the cave by the Neanderthal man, to the extent that natural phenomena which might have caused its transportation to the cave deposit are also excluded.

The existence of volcanic activity near the cave is proved by the emergences of Palaeozoic magmatites in the shape of granites and granodiorites formed and crossed by the tributaries of the valley of the Bistricioara which flows at the foot of the cave. Magmatic and metamorphic rocks have a highly significant spread in the region (Bercia et al., 1968). Consequently, the geode is likely to have been found by the Neanderthal man in the Bistricioara valley gravels that were the main source of supply with magmatic and metamorphic rocks used to make specific lithic tools.

The geode is in the shape of a sphere with a maximum diameter, after removing the crust, of 77.0 mm and a minimum of 61.2 mm. It weighs 479.43 g. The relatively large weight of the object compared to its volume is given by the very high density of the geode of

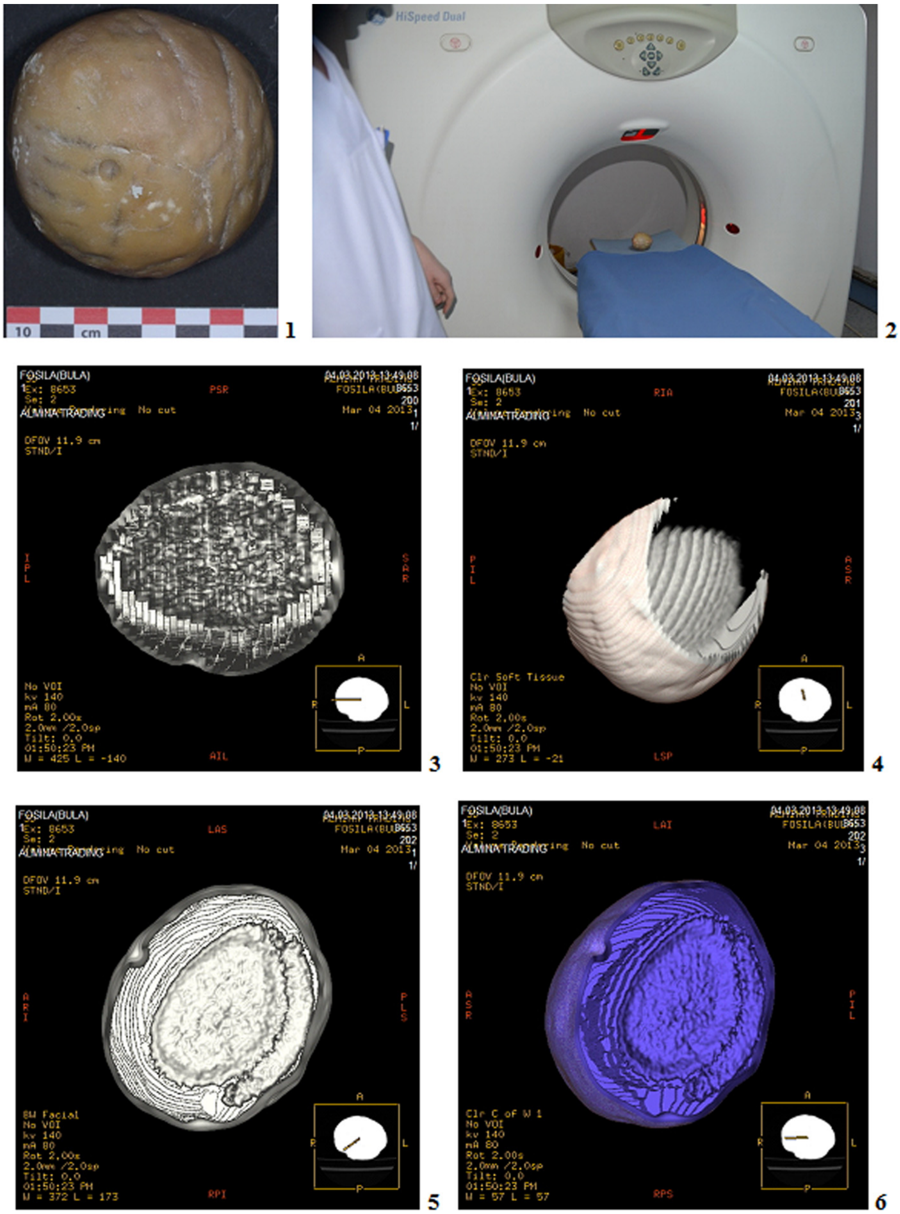

Fig. 3. (Colour online.) **1**–**2**. The geode and tomograph that provided images of its internal structure; **3–6.** images provided by the tomograph regarding the internal structure of the geode found in Cioarei Cave.

Fig. 3. (Couleur en ligne.) **1**–**2**. La géode et le tomographe qui offre des images de sa structure interne; **3**–**6** images obtenues à l'aide du tomographe, illustrant la structure interne de la géode découverte dans la grotte Cioarei.

3.99525 g/cm^3. We now have in mind the fact that the most common rocks used by the Neanderthals for knapping have much lower densities: flint and jasper – 2.1–2.4 g/cm^3, quartz – 2.65 g/cm^3, granite – 2.7 g/cm^3, basalt – 3.0 g/cm^3, gneiss – 2.8 g/cm^3, compact limestone – 2.7 g/cm^3. The high density of the geode is probably caused by the existence of metalliferous formations in its composition. Geode surface is not uniform, having numerous circular cuts 6–8 mm in diameter and slightly deep ditches of various lengths, resulting from the dehydration of the surface (Fig. 4/1–3).

Although that particular geode was dipped into hydrochloric acid, its surface preserved traces of red ochre used by the Neanderthal man to paint it (Fig. 4/4–11) and even the sediment of the layer in which it had lain. In most cases, the red ochre is covered by a black substance (some kind of resin or perhaps black bitumen) (Fig. 4/6–8; 10–11). The overlapping of the two layers is fairly visible, the black substance being probably responsible for the proper conservation of the red ochre. These observations were only possible after the recent examination of the geode under the Keyence VHX-600 high-resolution digital microscope. In this stage of research, the chemical composition of the material covering the red ochre is difficult to determine for the amount preserved is insignificant. A physicochemical

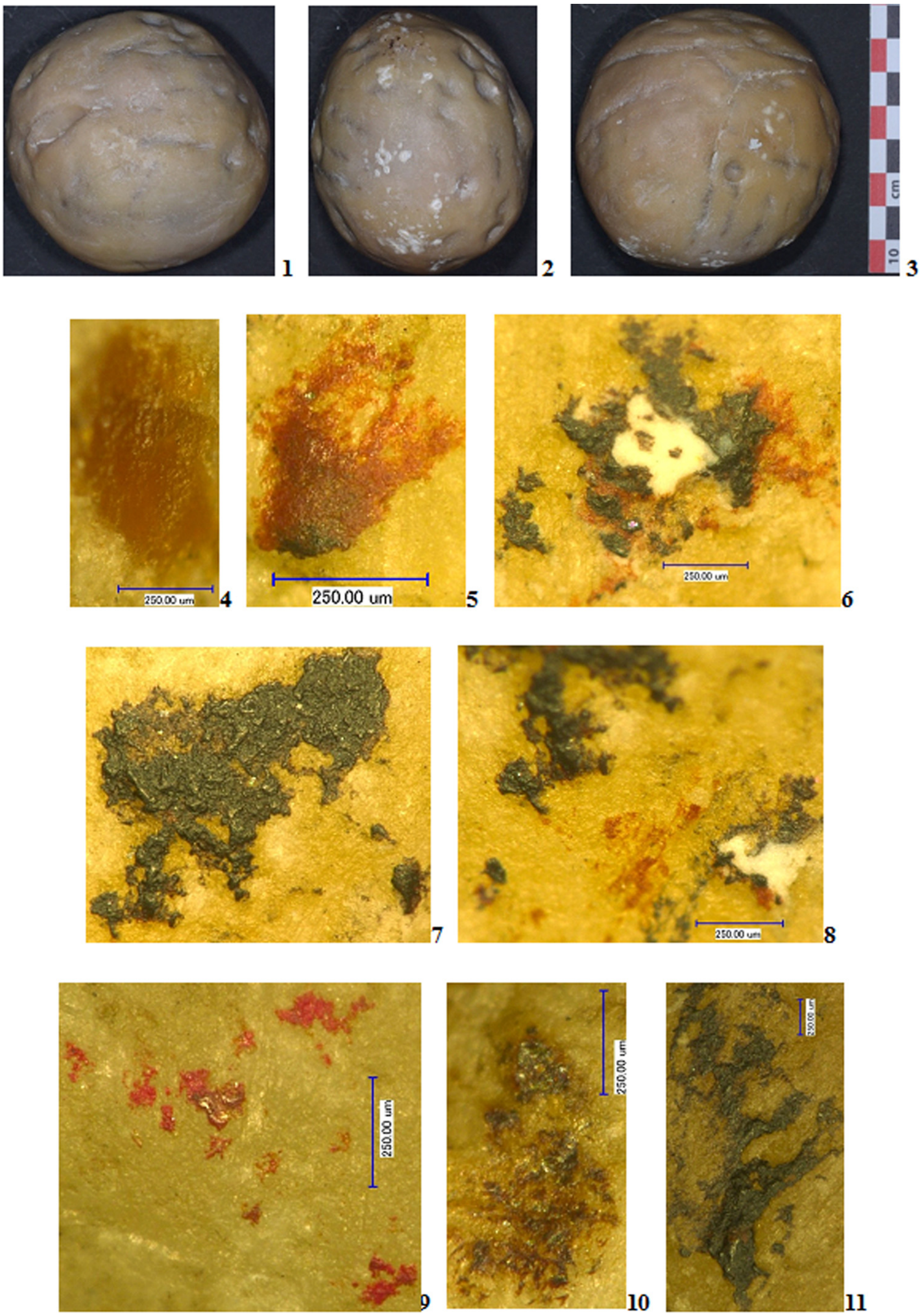

Fig. 4. (Colour online.) The geode (**1**–**3**) and traces of red ochre covered with black substance observed under the digital microscope (**4**–**11** × 200).
Fig. 4. (Couleur en ligne.) La géode (**1**–**3**) et traces d'ocre rouge couvert d'une substance noire observées à l'aide du microscope digital (**4**–**11** × 200).

determination would mean to sacrifice the evidence which proves the overlapping of the two layers applied by the Neanderthal man.

As regards the possibility of some contamination of the geode having occurred in the sediment, certain things should be mentioned. As can be seen in Tables 2 and 3, stratum H revealed the smallest quantity of ochre in Mousterian layers, with samples totalling 3.33 g gathered from four sections. Furthermore, stratum H lies between two layers which are low in ochre, namely stratum I, in which no sample was found, and stratum G from which only two samples were taken. The insignificant quantity of ochre discovered in stratum H and related strata could not have contaminated an artefact to such an extent. As previously mentioned, the sedimentological analysis also revealed that stratum H lacks ferric hydroxides (Cârciumaru, 2000).

Taking into account the recent discussions on the symbolic significance of ochre, fossils and minerals to the Neanderthal man, we consider that the Cioarei Cave finding of a geode painted with ochre increases its aesthetic value and gives additional attributes which allow some symbolic interpretation. We now have at least one certainty regarding the use of ochre by Neanderthals, namely to paint certain objects that, at first sight, have no direct practical use, in order to confer possible symbolic attributes on them, as in this particular case, by applying the ochre on the geode which itself carries a definite significance.

3. Discussions and conclusions

Bordes (1952) stated that it is difficult to think that colorants might have served to anything else but to the body painting of the Neanderthal man or maybe to the painting of animal skins used to make clothes. In turn, Leroi-Gourhan (1964a) acknowledged the presence of ochre fragments in layers specific to the end of the Mousterian, but found no accessible explanation regarding its use, so long as we do not know it to have been used by the Neanderthal man for paintings or burials with ochre. Nevertheless, he discarded the idea that, in the Mousterian, ochre was completely devoid of significance (Leroi-Gourhan, 1964b). Moreover, he considered it an equivalent of blood and, consequently, a symbol of life.

In order to demonstrate the Neanderthal man's use of ochre, emphasis was laid on usage traces preserved directly on the ochre blocks found. Furthermore, Couraud (1983) attempted to systematize the way of ochre use in prehistory. It is more a logical-imaginative model, unfortunately not supported by direct evidence regarding the use of ochre for a particular purpose. More recently, technological, traseological and experimental observations have been made (Soressi and d'Errico, 2007). Surprisingly, of the samples examined from Pech de l'Azé I and Pech de l'Azé IV, only the manganese dioxide ones, black in colour, preserve use traces, while the red and yellow ochre lacks such marks. The authors assure us that the scraping and abrading marks resulted from the use of a flint tool or bone flake, through gestures following certain rules, in order to use it directly probably on dry or wet animal skin or for body painting of the human skin as well as to obtain powder. The Neanderthal man admittedly obtained powder of different shades of ochre and used it as such or, more likely, in mixture with a binder.

According to Otte (1996), the Neanderthal man would bring, into his caves, unusual objects he recognized and extracted from their natural context in order to confer on them a new value in a "cultured" environment (p. 177). He considers that choice and transport of these objects to the Neanderthal man's settlements are sufficient to demonstrate their symbolic nature. Soressi and d'Errico (2007) seem to doubt this and consider that these aspects "evoke, but do not demonstrate their symbolic use" (p. 303), insisting upon the need to study ochre and other materials with symbolic value using modern microscopic means in order to discover possible marks resulted from their usage in various ways.

Studies in recent years have shown that the presence of ochre in several Mousterian settlements may be directly associated with its use by the Neanderthal man (Cârciumaru and Ţuţuianu-Cârciumaru, 2009; Cârciumaru et al., 2012; Soressi and d'Errico, 2007). Most findings fall into a time frame ranging between 60.000 and 40.000 years (Langley et al., 2008; Roebroeks et al., 2012), but recent finds from Maastricht-Belvédère, Netherlands, have revealed that ochre was used as early as 200–250 kyr (Roebroeks et al., 2012). If its use cannot be questioned, the association with symbolism is rather difficult for, in this case, evidence of how it was used must be brought. Chase and Dibble (1987) note that, although the findings of pigments may reveal some aesthetic sense, it is not quite clear how these colours were used. As a matter of fact, Belfer-Cohen and Hovers (2010) remarked that, throughout the time, modern behaviour was connected to modern people, while its association with the Neanderthal man requires rigorous evidence. Given these considerations, following the analyses conducted and presented in this study, the discovery of the geode in Cioarei Cave provides evidence which is necessary to understand how ochre was used by the Neanderthal man, namely to paint objects that possess certain particular connotations.

As we have seen, tomographic research led to the identification of the Cioarei Cave "bubble", as was initially called (Moncel et al., 2009), and its assignment to a geode-type concretion. Of course, to the Neanderthal man the genesis of the object itself was less important as he was drawn by the external aspect of the geode which presented a number of cavities (Fig. 4/1-3), its polished appearance, spherical to ellipsoidal shape, heavy as compared to the other rocks of the same volume, high surface hardness and even its colour. As he was extremely familiar with the mechanical characteristics of rocks, the Neanderthal man could not have ignored these features or let himself be unimpressed by them. Leroi-Gourhan (1964a,b) offers an interpretation of these materials, considering that they represent the oldest evidence which confirms the Neanderthal man's recognizing shapes, a very important sign of the search for the natural fantastic and a proof of an increasing aesthetic sense pushing him towards the mystery of the bizarre shapes of fossils.

According to petrographic studies, the raw material used in Cioarei Cave can be found in abundance along the Bistricioara Valley, which flows at the foot of the cave, and around the cave. The geode might have very well been found among the pebble of the same valley. It is the morphology, aspect and extremely special features, somewhat different from the other rocks, which drew the Neanderthal man's attention, especially its very large weight in relation to its volume, due to the special density given by the internal structure with possible metalliferous constituents. Although its shape suggests its usage as a hammer, the Neanderthal man did not use it for this purpose. Though probably well aware from the beginning that the geode was not in his sphere of interest as were the other types of pebble used to make lithic tools, curiosity, and maybe not only that, pushed him to transport the geode to the cave. We may assume that the unusualness of the geode as compared to the other materials, so necessary for his daily activities and essential for his survival, was what prompted him to endow the geode with aesthetic attributes that could not leave him indifferent. He might just as well have regarded it as a precious object that, later on, he would treat in a particularly different manner from other objects (Moncel et al., 2009).

If the Neanderthal man introduced the geode in its current form into Cioarei Cave, we may think about his extraordinary ability to recognize the uncommonness of such an object and consequently treat it as a strange object. In fact, Eliade (1987, 1989) would admit that we can imagine that prehistoric man perceived certain objects as carrying meanings associating the perception of the eye and of spirit. The aesthetic significance conferred by the Neanderthal man is beyond any suspicion because it is not confined to its identification as a strange object. Its having been painted with ochre is certainly an addition that might confer symbolic value on it.

In our opinion, the discovery of the ochre preparation containers and the ochre-painted geode in Cioarei Cave is already a certainty of the Neanderthal man's awareness of the meaning of painting objects with ochre in order to give or emphasize their symbolic role.

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