First Sculpted Human Face in the Western Mediterranean Early Neolithic

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The development of the Neolithic way of life in the western Mediterranean during the sixth millennium cal. BC is the consequence of the spread of populations from the Near East after successive stages of cultural remodelling. Despite the clear contribution of the Near Eastern and Aegean Neolithic to the economic and technical changes that happened to the west, little is known here about their symbolic legacies, because of the scarcity of representations and ritual evidences associated to the earliest western Neolithic contexts. Excavations at the rock shelter of Pendimoun (southeastern France) yielded the first anthropomorphic stone sculpture from the western Mediterranean Neolithic (early sixth millennium cal. BC). Using both carving and painting techniques, it represents a realistic-looking human face and is a unique example within the western Mediterranean and European frameworks. After describing the shaping and colouring details of the mask, the authors here deal with its possible social significances and cultural connections.

The western Neolithic colonization background

The Neolithic spread of seafaring within the northwestern Mediterranean region has recently been highlighted thanks to the excavation of a small set of settlements located in Italy and southeastern France dating from the first half of the sixth millennium BC. Pioneer groups originating from different places in southern Italy sailed along the Tyrrhenian and French coasts between 5800 and 5600 cal. BC, a rather short interval considering that the first development of the early Impressed Ware culture in the Adriatic took place around 6000 cal. BC (Fig. 1). This pioneering Impressa phase predates the typical western Cardial complex which spread widely after the mid-sixth millennium cal. BC and then resulted in the Neolithization of the western Mediterranean as a whole (Binder 2000; 2013; Guilaine & Manen 2007; Zilhão 2001).

Despite the scarcity of data recovered at the earliest western Mediterranean sites, it is now accepted that the first colonists shared a large part of the eastern Neolithic package including agriculture and herding, as well as a set of new practices such as pottery or novelties in bone- and lithic-processing techniques. Considering that the spread of this Neolithic 'paradigm' included several phases of stasis and acceleration, the western situation suggests that interaction processes between Neolithic farmers and Mesolithic hunters could have created many situations with different degrees of acceptance/rejection of new life-styles, even at a rather local scale, at the origin of material culture variability (Binder 2013; Guilaine 2001).

Surprisingly, symbolic aspects that were supposed to be a part of the original Neolithic fundaments (Cauvin 2000b; Hodder 2010), and particularly human representations (including clay figurines, plastic and impressed decorations on pots as well as painted rock art) are, however, very poorly known within the western Impressed Ware culture (Grifoni Cremonesi *et al.* 2007; Robb 2007). One might then wonder if the lack of symbolic evidence and human representations in the western Mediterranean, compared to the east, could be considered as a result of a Mesolithic hunter-gatherer imprint within the transcription of the Neolithic paradigm; might it be the consequence

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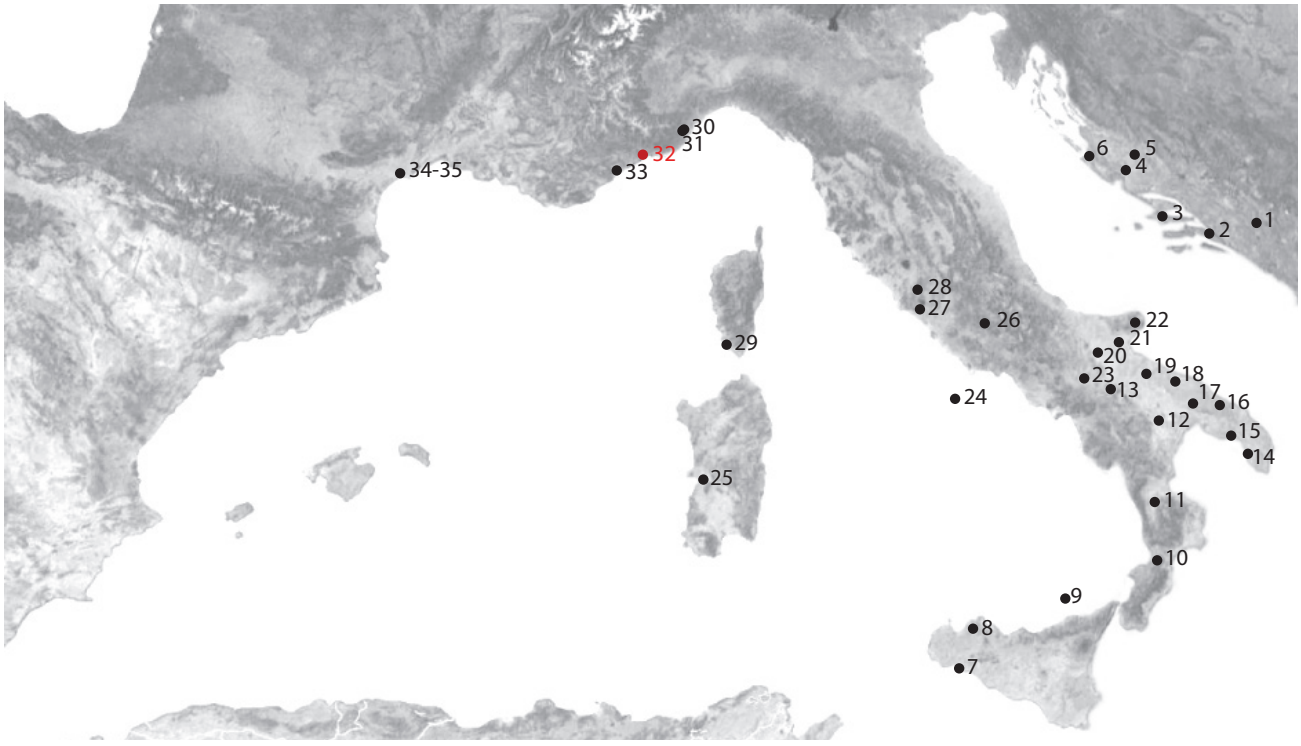


Figure 1. *Map of the main western Mediterranean Neolithic pioneer sites providing radiocarbon dates between 6000 and 5600 cal. BC: (1) Otmut (Montenegro); (2) Gudnja (Mostar); (3) Grapceva 1400 (Hvar); (4) Skarin Samograd (Šibenik); (5) Gospodska C (Šibenik); (6) Tinj 1 (Zadar); (7) Stufe di San Calogero al Kronio (Agrigente); (8) Grotta de l'Uzzo (Trapani); (9) Lipari obsidian sources (Messine)*; (10) Piana di Curinga (Catanzaro); (11) Favella della Corte (Cosenza); (12) Rendina (Potenza); (13) Trasano 1 (Matera); (14) Torre Sabea (Lecce); (15) Terragne (Tarente); (16) Grotta S. Angelo (Brindisi); (17) Torre Cane (Brindisi); (18) Pulo di Molfetta (Bari); (19) Scamuso (Bari); (20) Rippa Tetta (Foggia); (21) Coppa Nevigata (Foggia); (22) Defensola (Foggia); (23) La Starza (Avellino); (24) Palmarolla obsidian sources (Ponza Latina)*; (25) Monte Arci obsidian sources (Cagliari)*; (26) Colle San Stefano (L'Aquila); (27) La Marmotta (Roma); (28) Monte Venere (Viterbo); (29) Renaghju (Corse du sud); (30) Arene Candide (Savona); (31) San Sebastiano di Perti (Savona); (32) Pendimoun (Alpes-Maritimes); (33) Caucade (Alpes-Maritimes); (34) Peyro Signado (Hérault); (35) Pont-de-Roque-Haute (Hérault); * refers to dates from the earliest sites where these obsidians were certainly used. (Drawing: S. Sorin.)*

of a shift in the Neolithic paradigm itself, or is it just due to the current availability of data?

Until now, the earliest western Mediterranean evidence for human representation has been confined to the southern Italian Neolithic, regarded as the core location of the first Neolithic migrations from Greece and/or the Aegean. Most of these representations are clay figurines and diverse types of pot decorations.

Only a small set of clay figurines has been found within Italian earliest domestic contexts, for instance at Favella della Corte (Tiné 2009) or Rendina di Melfi (Cipolloni Sampo 1982), interpreted as the expression of a narrow semantic context associated with women, pregnancy and fertility (Fugazzola Delpino & Tiné 2002–2003). However, some are ambiguous in terms of gender, associating explicit female details and a general phallic shape (Whittle 1998). These figurines clearly refer to Near Eastern, Aegean and Balkan prototypes, if not ideologies (Gimbutas 1974a; Grifoni Cremonesi *et al.* 2007; Perlès 2001; Tiné 2009).

On the other hand, some specimens of anthropomorphic vessels highlight the details of human facial features. This kind of 'mask' (Gimbutas 1974b) is attested during the Early Neolithic in Puglia and Abruzzi, showing a realistic or more schematic design, e.g. at Rippa Tetta and Colle San Stefano respectively (Coppola 2001; Grifoni Cremonesi 1998; Radi & Tozzi 2009). This tradition has also been linked to practices in use in Early Pottery Neolithic villages from Thessaly, e.g. Nea Nikomedia (Perlès 2001), eastern Aegean, e.g. Ulucak (Çilingiroğlu *et al.* 2012) and, further afield, central Anatolia, e.g. Kösk Höyük (Öztan 2011) or Çatalhöyük (Hodder & Meskell 2010).

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Figure 2. *Pendimoun rock-shelter landscape at the piedmont of the Roc d'Ormea, France. (Photograph: D. Binder.)*

Later, during the second half of the sixth millennium cal. BC, plastic or incised anthropomorphic decorations are visible on Fiorano phase vessels in central and northern Italy (Pessina 1998). In Spain, a few impressed pots from the Mediterranean Levante, i.e. at the Cova de l'Or dated around 5400 cal. BC or later, display an impressive Cardium decoration featuring schematic representations of people sometimes in a 'praying' position (Marti Oliver 2011). These anthropomorphic designs have been compared to the macro-schematic style of the Levantine rock art (Marti Oliver & Hernandes Perez 1988), an analogy that has been stressed thanks to direct radiocarbon dates (Ruiz *et al.* 2006). During the second part of the sixth millennium cal. BC, within the Franco-Iberian Cardial context, part of the pottery decoration made of Cardium-impressed panels might reasonably be interpreted as schematized anthropomorphic designs inherited from the figurative tradition (Bernabeu Auban 1989) and sometimes evoking dance scenes (Guilaine 1985) as also suggested in several Balkan Early Neolithic contexts (Garfinkel 2010).

In the northwestern Mediterranean basin and surrounding areas early stone sculptures are quite rare. During the Late Mesolithic and/or Early Neolithic (seventh and sixth millennium cal. BC) funerary contexts at Lepenski Vir (Iron Gates, Serbia) provide monumental fish (or half-fish half-human) stone figurines supposed to evoke 'water deities' (Srejovic 1972; Whittle 1998). They are very different from the incised geometric designs on stone plaques or pebbles which are usually seen in Late Mesolithic western Mediterranean contexts (Aparicio Perez 1979), but interesting and important parallels with smaller fish sculptures from Late Mesolithic Maghreb (Camps-Fabrer 1975) are worth noting. Later, Neolithic anthropomorphic stone sculptures are attributed to Middle Neolithic contexts, e.g. an anthropomorphic pebble from Riparo Gaban (Italian Alps) at the beginning of the fifth millennium cal. BC (Bagolini 1973) and impressive specimens from the Sardinian hypogea at the end of the fifth millennium cal. BC (Santoni 1999).

Dated to 5640–5480 cal. BC, an anthropomorphic representation found on a limestone block at Pendimoun (Castellar, Alpes-Maritimes, France) raises new questions about the symbolic systems at the very beginning of western Mediterranean Neolithic colonization and their eastern connections.

The stone sculpture from Pendimoun

Archaeological context

Located on the French Riviera, Pendimoun is a recently re-excavated rock shelter facing the Mediterranean at 690 m above sea level (Figs. 2 & 3). Described in detail in the 1990s (Binder *et al.* 1993), its earliest Neolithic occupation attributed to the beginnings of the Impressed Ware culture (Impressa, early sixth millennium cal. BC) is covered with 2 to 3 metres of stratified anthropic layers deposited during the late sixth millennium (Cardial), the fifth millennium (Early Square Mouth Pottery to Early Chassey cultures), the

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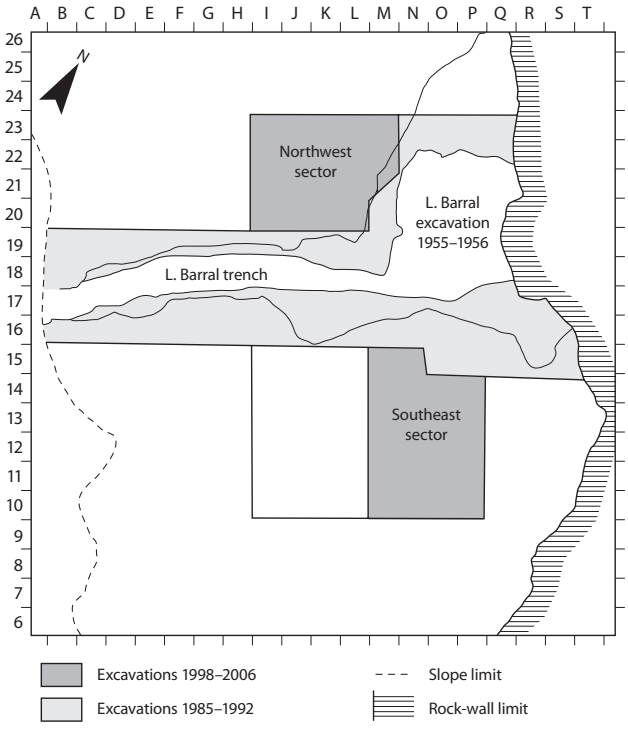


Figure 3. *Pendimoun rock-shelter excavations: map of successive operations. (Drawing D. Binder and S. Sorin.)*

early fourth millennium (Late Chassey) and, after a gap, during the late third millennium cal. BC (Bell Beakers) (Fig. 4).

Recent excavations have revealed several *in situ* structures (shallow pits, hearths and burials) belonging to the Impresso-cardial phases in both north-western and southeastern sectors of the settlement. Stratified structures and deposits belonging to the Impressa phase have provided a set of AMS measurements performed on charred cereal seeds and indicating a range of dates between 5730 and 5480 cal. BC (Binder & Sénépart 2010). According to these early dates, the related pottery assemblage shows distinctive features compared to Liguria, Corsica and to western Provence, while providing clear similarities with contemporary sites of southern and central Italy (Binder & Sénépart 2010; Binder *et al.* 1993). The following Cardial phase provided classical assemblages of this culture and included a unique set of burials closely dated to between 5475 and 5375 cal. BC (Binder *et al.* 1993; Duday 2008; Zemour 2013).

The Neolithic sculpture has been discovered in the upper part of the filling of a shallow pit belonging to the Impressa phase (US.41678) (Fig. 4), dated to 5640–5480 cal. BC (Table 1). This pit included pottery shards, faunal remains, charcoal, charred cereal seeds

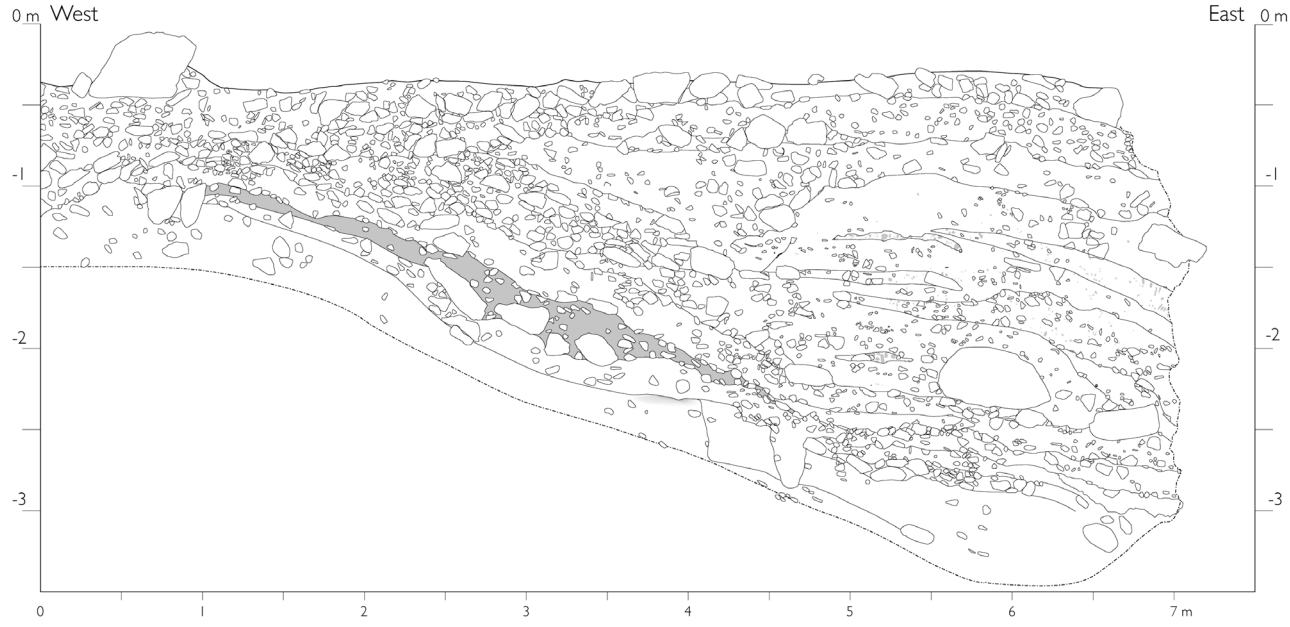


Figure 4. *Pendimoun: stratigraphy of the northwestern sector at the intersection of bands 23 and 24, with indication of the Unit 41678 location in grey. (Fieldwork: D. Binder, J.E. Brochier, S. Sorin, J.D. Strich; drawing S. Sorin.)*

Table 1. *AMS dates for Pendimoun Unit 41678.*

Laboratory reference	Conventional age BP	Dated material	Field reference	Calibrated age BC (2σ)
LTL-8005A	6599±45	*Triticum* seeds	US.41678	5620–5480
LTL-8006A	6649±45	*Triticum* seeds	US.41678	5640–5480

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Figure 5. *Early Neolithic mask* in situ *among the blocks at the top of Unit 41678. The latter fills a shallow depression that continues in the section. (Photograph: D. Binder.)*

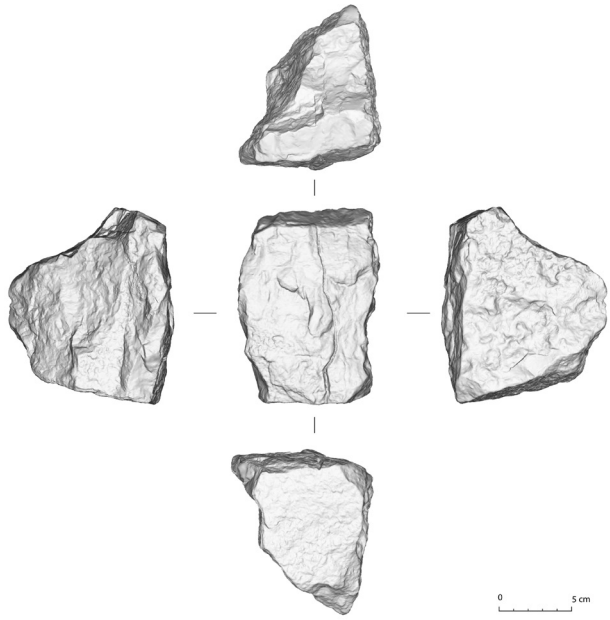


Figure 6. *3D laser scan of the Early Neolithic mask. (Scanning: F. Vautier, O. Voldoire; composition S. Sorin.)*

and a set of limestone blocks of various sizes. Among them a block of limestone with an obvious application of pigment on a side has revealed the presence of a carved and engraved human representation. This sculpture was lying on the right, with left side visible and face turned to the east towards the rock face (Fig. 5).

General description

The sculpture (Figs. 6 & 7) is shaped out of a dihedral block (dimensions *c.* 14 cm, 10 cm, 11 cm; weight 1.7 kg) of fairly soft white limestone with thin veins of calcite; this probably corresponds to one of the various types of Jurassic limestone available at the site (study in progress). No brush has been used to clean the surface of the sculpture, owing to the softness of the limestone, therefore a few sediment deposits still cover small parts of the surface. Most of the time they did not create any problem for systematic microscopic observation.

Most sides of the block were shaped in order to create a human face on the front with a characteristic 'T'-facial design. The bottom side of the block exhibits a flat, dotted surface obtained from careful pecking. It was probably shaped thus in order to enable the block to stand upright on its own (Fig. 7c). The right side was obtained by flaking (Fig. 7a). The top side also displays a partly dotted surface, secondarily reduced by percussion towards the back of the piece. The left side, which exhibits two levels of irregular

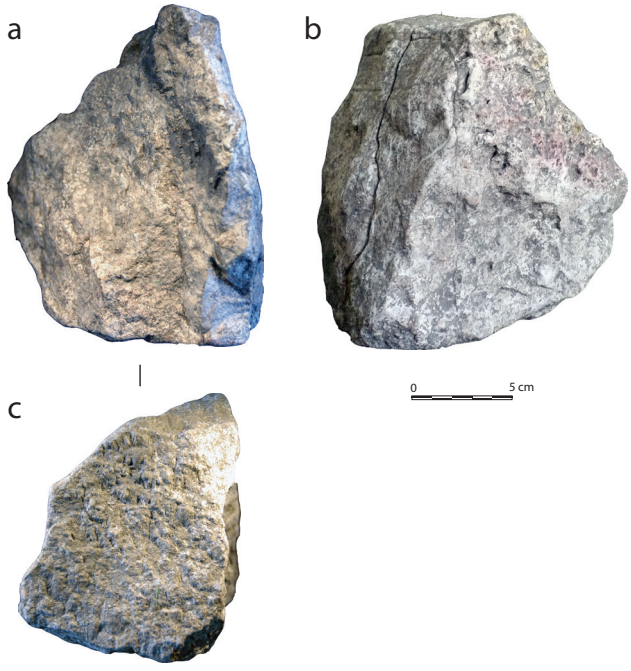


Figure 7. *Early Neolithic mask views (sides lateralization are following anatomic norms): (a) right side shaped by flaking; (b) left side with traces of red and yellow colour on the upper natural part; (c) bottom side of the sculpture: systematic pecking has regularized and flattened the surface so as to make the sculpture stand upright. (Photographs: C. Hamon.)*

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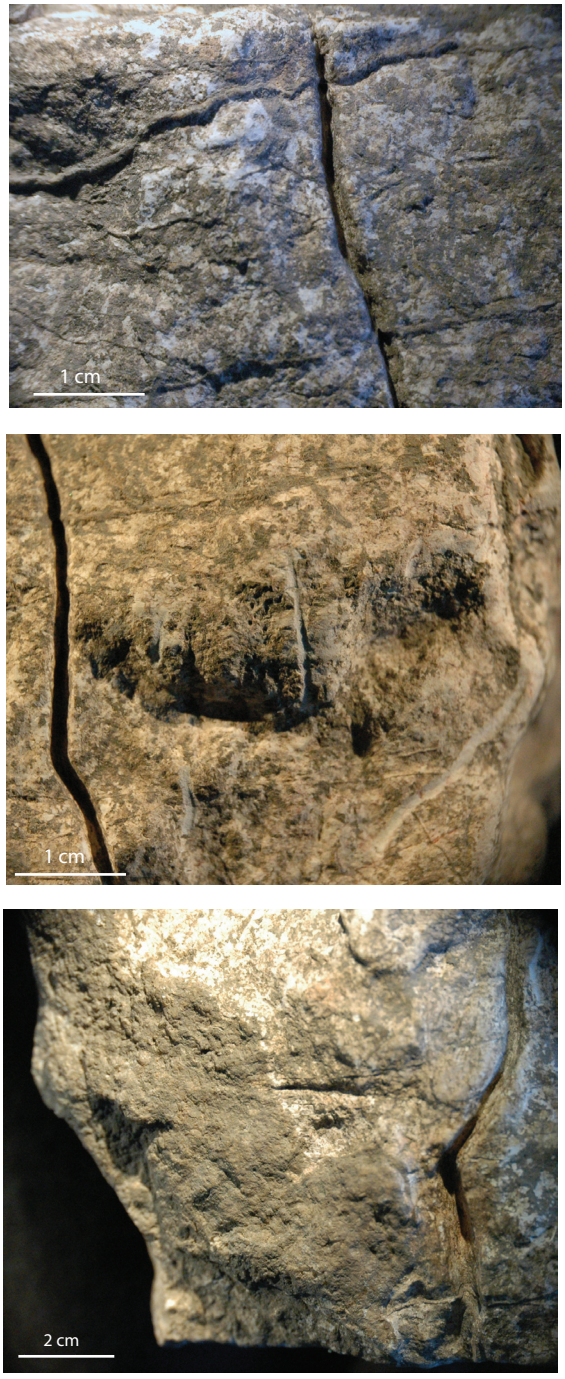




Figure 8. *Early Neolithic mask. Details of the natural traces: (a) calcite veins crossing horizontally the 'forehead' of the figure; (b) taphonomic striations (in white) on the left eye; (c) calcite deposit at the base of the face. (Photographs: C. Hamon.)*

natural surface without obvious carving or traces of scraping, bears clear evidence of pigment (Fig. 7b). Few post-depositional and/or excavation traces can be easily distinguished from the original carving and engraving traces (Fig. 8b).

The front side,with the human face, is delineated to the left by the smooth edge of the block and to the right by thin linear incisions. A large calcite area is preserved on the right distal part, while thin calcite lines are visible on the forehead (Fig. 8a & c). The anthropomorphic figure is formed by taking advantage of the visual opposition of two different parts: the lower part (cheeks, mouth and chin) was gouged in order to put into relief the clearly interconnected nose, eyes and forehead (Fig. 9). The maximum elevation of the relief is about 5 mm above the flat gouged surface.

The symmetry of the facial features is not strict: the globular eyes are not exactly the same shape, nor

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are they at the same level. The nose is not well centred, but is closer to the right than the left eye. The mouth lies slightly to the right.

The whole front face is crossed by a deep vertical zigzag which is probably one of the last steps in the carving process (Fig. 10).

Yellow and red pigments are distributed unequally over the surface of the block. They are mainly located at the top of the left side, where the succession of two painted bands is visible to the naked eye on the irregular natural surface of the stone: a very shallow yellow stripe near the top edge and a wider red one beneath (*c.* 22 mm wide). Traces of yellow colour can also be observed on the top of the front side with the naked eye. Visible red traces are also displayed within the different incisions, under the eyes as well as around the upper lip.

Carving techniques

Carving and engraving techniques were used in order to design the anatomic features of the face. The eyes, nose and ears were created by engraving and carving in-the-round, whereas the mouth was marked only by a thin linear incision. According to the morphology of the traces, the incisions were made with a sharp tool with a narrow contact surface, such as the edge of a flint blade or flake. The carving notches were made by indirect percussion with a chisel-type tool; their visible traces indicate the use of tools with a rather rectilinear working surface (Fig. 9a).

Only the lower edges of the eyeballs are underlined. Their delineation was carved, although an initial curvilinear incision was made below the right eye. A set of deep regular notches, more or less perpendicular to the eye's delineation, enhances the relief and shadow effect. A small appendage between the right eye and the proximal part of the nose was fashioned by applying several alternating incisions (Fig. 9c).

The nose has a sinuous shape and both sides are delimited by deep 'V'-shaped incisions. The right side is deeper, highlighting the nose profile (Fig. 9c); the left is modified by a secondary zigzag scar (Fig. 9d). The nostrils are not visible since the tip of the nose was cut off by secondary removals (Fig. 9d).

In order to put the eyes and nose into relief, the cheeks were completely hollowed out and flattened by carving. Linear carving grooves show clear oblique orientation from the sides toward the centre of the face (Fig. 9a).

The mouth consists of a thin and irregular, horizontal 'V'-shaped incision (Fig. 9e); between this line and the nose, a small smoothed relief suggests the upper lip. Concentrated thin vertical incisions are also visible across the left side of the mouth, perhaps representing the upper labial groove (Fig. 9e).

The possible use of more superficial carving techniques in order to regularize the forehead remains unclear. Indeed, it is difficult to assess whether the thin calcite lines are internal layers of the limestone block or secondary infillings of carved incisions. In either case it is plausible that the carver paid special attention to them since the alignment of the eyes is parallel to the lowest line.

The carved ears are small. Located above the edge of the block, the left one (Fig. 9b) appears as a small quadrangular appendix isolated by light flaking, the centre of which is hollowed out to a depth of several millimetres. Its surface was finally blunted and smoothed together with the associated edge. Similar traces are visible on the right side.

The whole sculpted face is crossed by a sinuous scar (Figs. 9 & 10). It is posterior to the facial carving and bypasses the main elements of the face. Starting more or less from the middle of the top edge, it bypasses the previously shaped nose and mouth. Changes in orientation are formed by two main jagged turns. Starting from the top, this 'V'-shaped groove is 1.3 mm wide and 1 mm deep, reaching a width of 3.9 mm and a depth of 3.3 mm at the base where it is 'U'-shaped (Fig. 9f). Traces of stone-tool use are attested by the presence of thin but long parallel incisions and the correlating smoothing of the sides (Fig. 10b).

Painting evidence

Non-invasive micro-Raman analyses were performed in order to characterize the paintings and their distribution on the surface of the sculpture, mainly on the left and front sides (Figs. 11 & 12). More than forty Raman analyses of coloured areas revealed two distinct main spectra: hematite for the red and goethite for the yellow pigment. In the case of a few spots still showing light colouration under the microscope, the analyses indicate that the pigment signal was not detectable due to insufficient material. In addition, calcite and amorphous carbon have been found either isolated or associated with the colouring matter. Selected spectra corresponding to both pigments are presented in Figure 11 (Fig. 11a, b, e & g). Hematite spectra are characterized by bands at 220, 287 and 405 cm^{-1}; the 1310 cm^{-1} band is weak because of non-resonant excitation at 458 nm (Bellot-Gurlet *et al.* 2009). Goethite spectra are characterized by bands at 300, 390, 480 and 552 cm^{-1}. Calcite was found under different states of crystallization, either alone or close to or mixed with hematite or goethite; this signature corresponds to the composition of the block or even to post-depositional additions. Small dots of carbon

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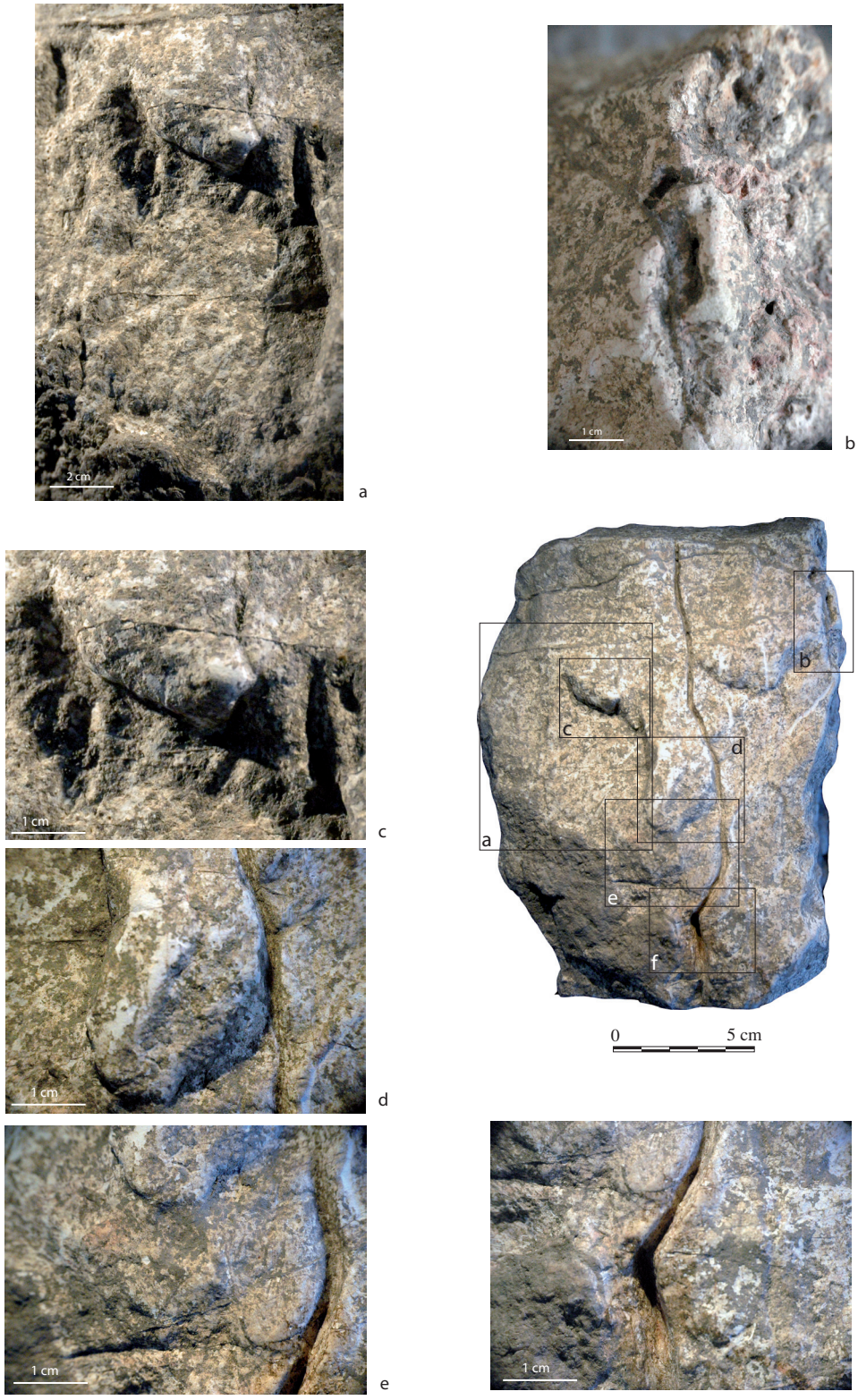


Figure 9. *Early Neolithic mask. Details of the different shaped elements composing the face: (a) detail of the cheek carved in order to emphasize the eye and nose in relief — notice the oblique carving grooves on the cheeks; (b) shaped and smoothed left ear; (c) carving grooves and incisions delimiting the eye, an appendage ('tear'?) and the base of the nose; (d) scar following the right side of the nose; (e) incised mouth ; (f) detail of the bottom part of the scar. (Photographs: C. Hamon.)*

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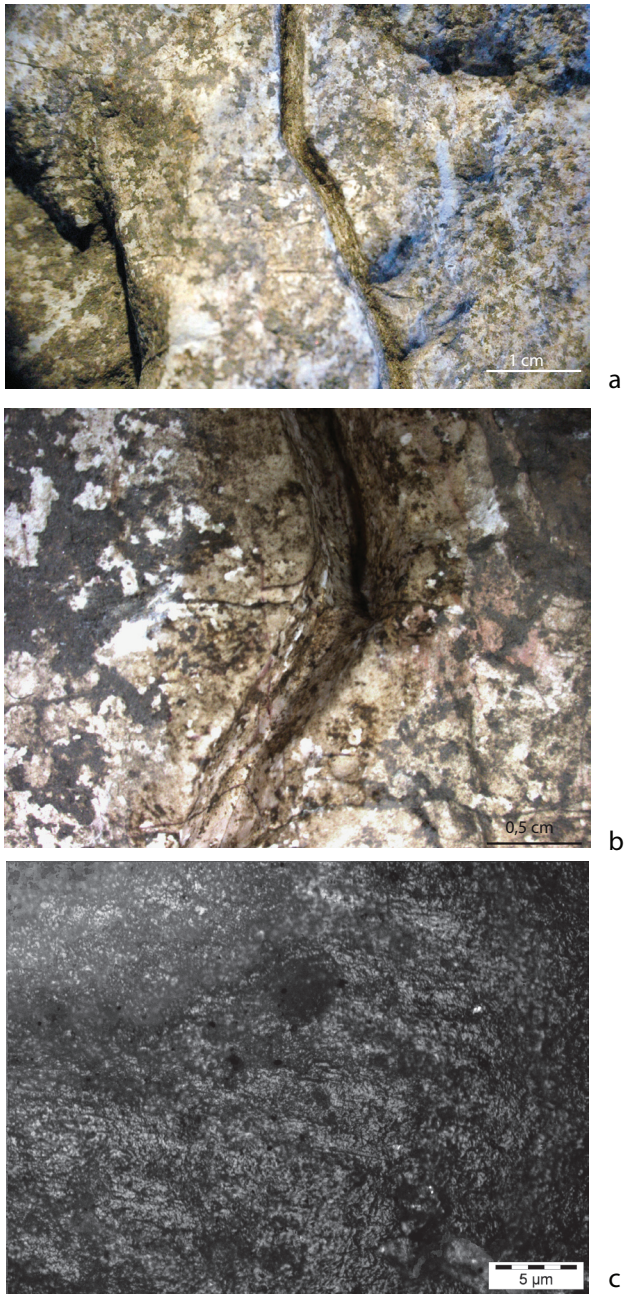


Figure 10. *Early Neolithic mask. Details of the zigzag scar: (a) detail of the carving; (b) detail of the bottom enlarged scar (cf. Fig. 9f); (c) microscopic view of multiples parallel striations made by a flint tool at the bottom of the scar during the incision process. (Photographs: a–b, C. Hamon; c, S. Beyries.)*

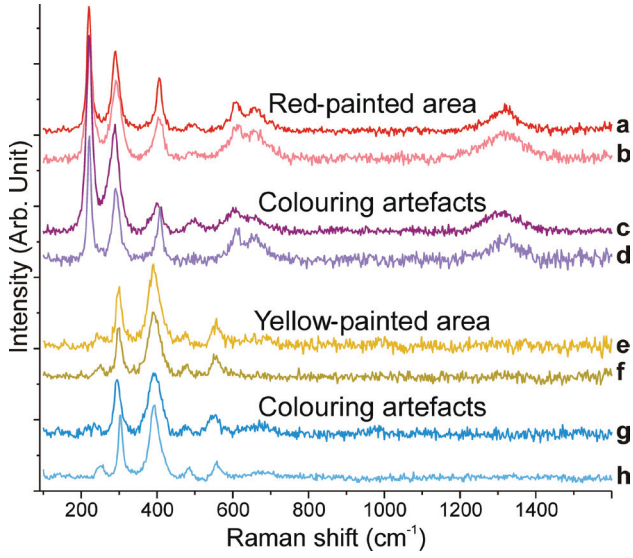


Figure 11. *Representative Raman spectra from the mask and colouring materials from the Neolithic deposits: (a) and (b) hematite spectra nos. 50 and 25, from the Neolithic sculpture; (c) hematite spectra from a red lutite aggregate no. 284-2 and (d) a probably heated marcasite nodule no. 221-4; (e) and (f) goethite spectra nos. 54 and 53 from the Neolithic sculpture; (g) goethite spectra from a yellow limonite aggregate no. 291-1 and (h) a non-heated marcasite nodule no. 251-1. Spectra presented are baseline corrected to remove the fluorescence. (Drawing: L. Bellot-Gurlet.)*

undoubtedly derive from micro-charcoals, which are very abundant within the pit filling. The fact that carbon grains are rarely associated with pigment but instead appear, most of the time, to be isolated or mixed with calcite, suggests that calcite and carbon were not added to the pigments intentionally.

The hematite and goethite spectra from the paint on the sculpture have been compared to five samples of colouring materials sampled from within the sixth- to the fifth-millennium cal. BC deposits from Pendimoun. The levels from the Early Neolithic provide large quantities of ferruginous material in the form of raw aggregates or, in some cases, heated, broken and crushed.

The characterization of the colouring materials used at the site is still in progress, but different types have already been identified: oxidized marcasite composed by hematite and quartz (non-heated and probably-heated), calcareous limonite and lutite *sensu lato*, with a wide range of yellowish to reddish tones. Neolithic samples from the site, probably heat-treated marcasite and lutite *sensu lato*, show quite clear hematite

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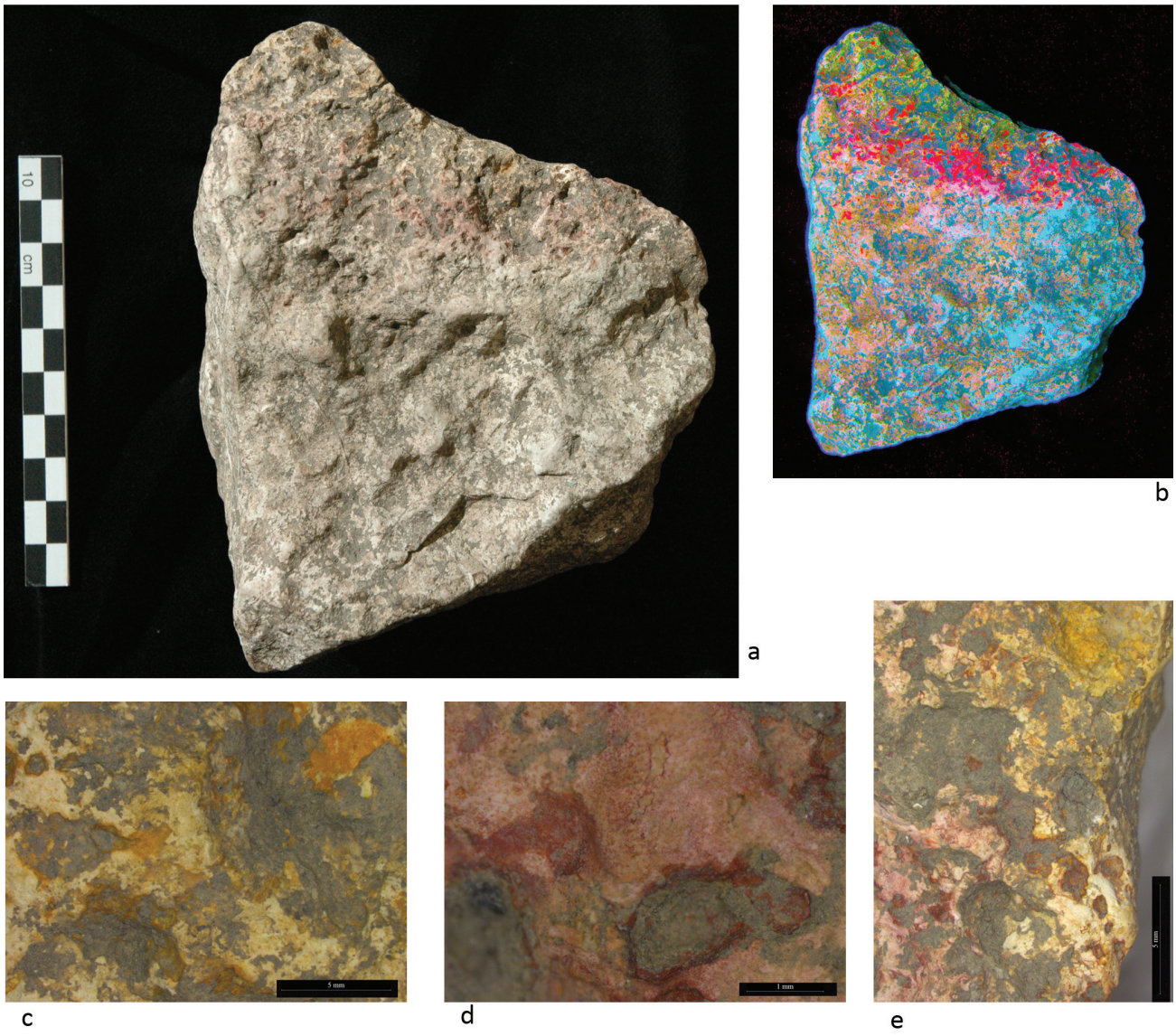


Figure 12. *Early Neolithic mask. Distribution of the pigments: (a) general view of painting remains on the left side; (b) general view enhanced with DStrech; (c) details of goethite spots; (d) details of hematite spots; (e) details of goethite application overlapping on hematite. (Photographs: S. Beyries.)*

spectra (Fig. 11c & d), while non-heated marcasite and limonite provide goethite spectra (Fig. 11g & h). These spectra are highly similar to those obtained for the colouring materials of the sculpture.These results demonstrate the possibility of using easily available raw materials brought to the site to be used in painting.

Since Raman methods tell us, with the utmost confidence, that the yellow matter is goethite and the red matter is hematite, a detailed survey of the whole piece was performed with a stereo-microscope in order to confirm the distribution of colours on the different surfaces of the sculpture. Numerous microphotographs were taken. Pigments are totally absent from the right side, supporting the secondary-modification hypothesis. They are present in the form of very small yellow and red dots on the bottom side, where their distribution seems to be random. Goethite spots are strictly distributed on the top and the top margins of the front and left sides (Fig. 12c). Hematite is widely distributed on the front and left sides (Fig. 12d), with the exception of the top margins. On the left side there is a ribbon-like spread of hematite which has a much higher density of red matter compared to the other parts of the sculpture. At a microscopic scale,

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hematite clearly overlaps goethite (Fig. 12e). As the limit between yellow and red is very well preserved, despite the fact that the left side of the block was probably exposed to weathering agents, we can conclude that the original application was limited to a proximal red ribbon and that the small dots visible on its distal part correspond to random traces rather than to the remains of an extended solid red colour.

Interpretation

A Neolithic mask as a memory

Intrinsic analysis of the object highlights a sculpted and painted mask, bearing the appearance of the dead, exposed and manipulated, involved within social practices and/or funerary memories.

The Pendimoun sculpture displays realistic anatomic details (i.e. eyes, ears, mouth and nose) which make up the incontravertable anthropomorphic aspect of the representation, even if their proportions are not themselves realistic (e.g. the small size of the ears compared to the nose, eyes and mouth sizes). Despite the fact that we do not suppose, *a priori*, any aesthetic connotation, we will here use the term of 'mask'.[1] The rather rough aspect of this mask-shaping could be due to the deliberate intention to embed the face within the raw material in a symbolic way. Indeed, the sculpture from Pendimoun reveals that those carving the sculpture had a large range of techniques available to them, such as knapping, pecking, gouging, incising, colour processing and painting, which also required the use of specific tools. Human action is not limited to opportunistic enhancement of natural features transformed in masks, as Palaeolithic data sometimes illustrate (e.g. at Altamira: Leroi-Gourhan 1971). The combination of different techniques denotes a set of extended knowledge and *savoir-faire* that was probably inscribed within cultural traditions and refers, besides, to successive transformations of the representation.

Moreover, it is necessary to underline the fact that this stone has not been modified as a whole in order to inscribe a three-dimensional head shape: indeed, all the anatomical details, embedded in stone, are only visible on the front face as a shallow relief. This also raises the question as to the independence and relative chronology of modifications that were processed on each side of the block, especially the carving of the human face versus the painting of the stripe(s). The presence of small residues of yellow and red paint on the front face suggests that at least the top of the visage had also been painted. The visage and the left painted side could have formed a unique composition; the lateral coloured stripe offers visual continuity with the band delineated on the forehead by the thin parallel calcite lines. The latter could then be part of the representation, maybe indicating a kind of headband or hairdressing enhanced with colour. It raises the question as to whether the narrow band of yellow pigment applied next to the wide red one had a visual effect; it would certainly have had much more impact when it was first created and the pigments were fresh, than it does today. In addition, the fact that the base of the block was carefully picked so as to form a flat installation surface stresses that the object was meant to stand upright. The significant contrast between the front and left worked sides on the one hand, and the relatively unworked back and right sides on the other hand, supports the idea that the standing block was exposed obliquely showing both the front carved and left painted sides.

The diachrony between the actions of the carver(s) is demonstrated by the crossing zigzag which clearly corresponds to one of the final actions on this block, prior to its deposition in pit unit 41678. The unknown time gap between the face-shaping and scar-incising makes reaching a conclusion about their association somewhat difficult: is it a case of a unique composition associating, *ab initio,* the face and scar as a symbol, or a sequence of manipulations, exhibitions and distinct actions on the material during the long lifetime of the stone block? There is plausible evidence of manipulation of the block, visible in particular on the left painted side, since the latter shows clear smoothing. These observations suggest that the mask might have been used during successive events, performances and manipulations (Cochrane & Meirion Jones 2012).

Ambiguous 'stylistic' comparisons

The Pendimoun mask cannot support any direct 'stylistic' comparison, neither with anthropomorphic representations from the Impresso-Cardial context of which it is a part nor with contemporary Mesolithic or later western Mediterranean contexts. Looking back towards the western European Upper Palaeolithic legacies is also unfruitful, considering the scarcity of human engraved or carved representations at that time (Leroi-Gourhan 1971), as well as the lack of data from Late Glacial and Early Holocene contexts (Rozoy 1978). Mesolithic and Neolithic settlements from the Maghreb and Sahara yield anthropomorphic stone sculptures but unfortunately these lack precise chronological and cultural attributions (Camps-Fabrer 1966). The eastern Mediterranean Neolithic offers a large set of anthropomorphic stone sculptures indicating that carving knowledge is associated with the earliest Pre-Pottery Neolithic (PPN) legacy and continues into the Pottery Neolithic (PN). The devel-

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opment of human representation has been described by Cauvin as the principal mark of the '*Révolution des symboles*' at the origin of the Neolithic Revolution (Cauvin 2000a,b). Indeed, in the Levant, human carved stone statues are known from the PPNA (9600–8700 cal. BC) at Gilgal (Hershman & Belfer-Cohen 2010). A few realistic stone masks are also known within the PPNB (*c.* 8700–7000 cal. BC) (Bar-Yosef 2003). In the valleys of Upper Mesopotamia, the impressive megalithic pillars of Göbekli Tepe, dated to the late PPNA, include several anthropomorphic representations using in-the-round techniques and diverse anthropomorphic stone statues. The latter are also known in Early PPN contexts, e.g. at Nevala Çori and Urfa-Yeni Mahalle (Schmidt 2010) prior to Middle PPNB plaster specimens, such as those from 'Ain Ghazal (Rollefson 2000), and before limestone figurines dated to the PPN–PN transition, e.g. at Mezraa Teleilat (Özdoğan 2011). On Cyprus, stone-carving techniques are in use at least since the PPNB at Schillourokambos (Guilaine 2000). They increase noticeably during the Khirokitia Late PPN and PN phases (Le Brun *et al.* 1987; Dikaios 1953). In central Anatolia, PN Çatalhöyük deposits dated to the seventh millennium cal. BC also provide a large set of stone sculptures, including numerous male representations (Kulaçoğlu 1992; Mellaart 1967). Perhaps the carvers from Pendimoun shared, to some degree, similar carving techniques with those in Cyprus, e.g. the Schillourokambos 'cat' (Guilaine 2000), or Euphrates, e.g. Mezraa figurines (Özdoğan 2011) which show similar 'T'-facial designs. Despite the great geographical gap between the rare western Mediterranean specimens and their numerous eastern counterparts limiting comparison, the fact remains that carving techniques used for drawing human bodies and faces in stone appeared in the Near East within the context of Neolithization.

Social prospects

Interpreting the details further is risky, for it convokes concepts and analogies that could quickly raise controversial issues, but a wide range of topics must be discussed.

Thus far it has proved impossible to determine the gender of the individual represented in the Pendimoun sculpture. Similarly, the status of the character ('deity', 'hero', 'ancestor', 'powerful' or 'ordinary' individual etc.) if any, cannot be addressed thanks to currently available archaeological context, data and methods. However, at least one hypothesis may be proposed, i.e. the role of this mask as a medium within mortuary practices and/or death representation processing.

As only their lower edges are underlined, the eyes of the Pendimoun mask were probably designed to be shut. This calls for close analogies with several Iron Age cut heads or ancestor statues (Arcelin 2008; Menez *et al.* 1999) and also with many Near Eastern Neolithic plastered skulls or clay figurines whose closed eyelids or 'coffee-bean' eyes directly or indirectly evoke the visage of the dead (Perlès 2001; Stordeur & Khawam 2007) .

Red pigments are commonly used within funerary contexts; for example at Pendimoun an ochre crusher was deposited as a gift in a Cardial burial (H2), while red-painted blocks are associated with the tomb architecture (Zemour 2013) and also probably to the connected soil (study in progress). Despite the settlement providing direct examples of such symbolic uses, its mortuary role can not be considered to be exclusive, for red colouring materials are actually known to be involved in a larger sphere of technical and symbolic practices. Nevertheless it should be considered as one among several plausible interpretations.

Interpreting secondary scars is even more risky. Even if clearly posterior to the visage design, the vertical zigzag scar should not be considered as destruction of the mask. The scar-processing avoids the main elements of the face as if the intention of the carver was actually to add a distinctive element to the composition. Zigzag marks are not meaningless within Neolithic contexts. Associated with some clay figurines from the southern Italian Neolithic (e.g. at Passo di Corvo), they have been described as 'fundamental' symbols: 'grass snakes' 'linked to water' and 'generally associated to a source of life' (Fugazzola Delpino & Tiné 2002–2003; Gimbutas 1974a). This converges with Escalon's idea, relying on the work of Eliade (Eliade 1953), for interpreting Early Cardial zigzags as 'fecundation symbols' (Escalon de Fonton 1957). However, this conception is heavily connoted from an ideological point of view bringing out the 'Mother Goddess' and old Europe pantheon concepts (Gimbutas 1974a), departing somewhat from the perspective of material culture studies.

Still — and this is probably one of the major issues thanks to this discovery — representing a visage disconnected from its body is certainly not anecdotal, especially if it appears as dead. Within Mediterranean Neolithic contexts, such a disconnection may evoke corpse manipulations and mortuary practices. Many explicit examples of such behaviours are provided in the Levantine Corridor and High Valleys of Mesopotamia throughout the Pre-Pottery Neolithic and, rather surprisingly, this tradition continues during the Pottery Neolithic of central Anatolia between 6300 and 5900 cal. BC (Öztan 2011). One wide-open issue concerns the diversity of mortuary practices

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versus the diversity of representations and their social background, i.e. the existence and degree of social stratification during the Neolithic. In the Near East, the questions of differentiation of elites and mortuary practices are closely tangled (Kuijt 1996; 2000). As a result of the excavations at the Middle PPNB settlement of Tell Aswad (Syria), it has been demonstrated that plastered and painted skulls were involved in funeral commemorations with clear evidence of long-term manipulations and scenic treatment (Stordeur & Khawam 2007). Similarly, data from Jerf el Ahmar (Syria) at the PPNA–PPNB transition illustrate the first phases of this funerary *chaîne opératoire*: a single context from a collective building offers a combination of an acephalous skeleton, a couple of acephalous bodies engraved on a seat and a set of small sculpted heads that could have been avatars of taken skulls (Helmer *et al.* 2004). At the scale of the Franco-Italian Impressa-Cardial complex, a new fact is that recent research on burials and human-bone deposits has revealed high diversity in mortuary rites as well as corpse-manipulation practices (Zemour 2013). The observed range of diversity appears to be somewhat similar to that seen in Starcevo-Körös contexts that include examples of skull removal (Whittle 1998). It is possible that they may share a common origin, i.e. the Near Eastern Neolithic. Since the Pendimoun sculpture played a role in active social practices as discussed above, we can hypothesize that this figure could have been involved in commemorations as a skull-avatar echoing aspects of mortuary practices based on corpse dismemberment and skull separation, if not included in a cenotaph.

The mask from Pendimoun among Mediterranean Neolithic human representations

By emphasizing realistic human features, the Early Neolithic sculpted and painted mask from Pendimoun appears to be connected to the eastern Mediterranean and Aegean Neolithic legacy which foregrounds the human image at the centre of the symbolic system from which it was most often excluded during the Palaeolithic (Cauvin 2000a; Demoule 2007; Naumov 2010).

Neolithic stone and clay images are sources of social identity and reify the consistency of new social links. Looking quickly at Neolithic human representations throughout Europe and the Mediterranean, an opposition appears between (i) interchangeable body representations on figurines, rock-walls scenes, pottery etc., and (ii) separate representations of visage or 'masks' on diverse media including pots. The southeastern Italian Impressed Ware context displays both categories, even if rather poorly documented compared to the Balkans and Near East.

Since the interpretation of clay figurine involvement in deity or ancestor cults has been refuted, in the Balkans for instance, they are more often considered as active individuals (Bailey 1994; Biehl 1996) while the figurine sets could exhibit cultural identities at a restricted spatial scale (Whittle 1998). Similarly, several rock-wall scenes or dance evocations on pots refer to movement. Clay figurines, as avatars and memories, may have reified people's own concept of life and death. This latter aspect might be illustrated, for instance, in their final deliberate breakage within Linearbandkeramik contexts (Hofmann 2012) or in specific rejection structures within Starcevo-Körös (Whittle 1998). Even though less well documented, parallel situations may have occurred within the Italian Impressa-Cardial (Fugazzola Delpino & Tiné 2002–2003) and immediate post-Impressa context (Colombo 2007).

The stone mask from Pendimoun, as well as those modelled on Impressa-Cardial pots, reveals different aspects of human representation. Did masks represent distinct characters or social categories? Or did they reify specific practices or concepts addressed to distinct categories? Today, the Pendimoun figure is a unique example which inhibits further comments. But very few contemporary contexts have been explored westward beyond the Italian peninsula, depriving us of coherent sets similar to those collected in the Near East, the Balkans and, more modestly, in Apulia (Italy). Nevertheless, this find increases the diversity of Early Neolithic images and contributes material to Neolithic social history.

Appendix: methodological details

Traces of carving and painting were studied at the CEPAM, CNRS – Université de Nice Sophia Antipolis, France, with a stereo-microscope with magnification ×10 to ×40 and a metallographic microscope with magnification ×50 to ×200. The precise morphology of the zigzag scar and the associated microscopic incising traces shown in Figure 10c were observed on a replica made of Coltène silicon-based impression material as used in dentistry. Both microscopic devices were equipped with digital cameras and sequential macro-photos were completed with Helicon focus software. Colour contrasts in Figure 12b were enhanced using ImageJ software with Jon Harman's DStrech plug-in.

Raman studies of colouring materials were performed at the LADIR, CNRS – Université Pierre and Marie-Curie, UPMC Paris 6, France, with a Horiba Jobin-Yvon HR800 dispersive Raman spectrometer equipped with Edge filter. Excitation with the 458 nm line of an Ar^+ Laser was chosen to optimize Raman intensity against fluorescence. Scattering collection was performed with a long working distance ×100 objective allowing a spatial resolution close to 1 μm. With this objective the Laser power at sample was

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settled at 100 μW in order to preserve sample integrity. The 600 groves.mm^{-1} grating used gives a spectral resolution below 3 cm^{-1}.

3D laser-scanning (Fig. 6) was performed at GEOLAB, CNRS – Université Blaise-Pascal, Clermont-Ferrand, France, with a Konica Minolta VI 910 scanner (accuracy: 250 μm). 3D Data were treated with the GeoMagic software and edited with Meshlab software. Final projections and composition of the figure were carried out by Sabine Sorin (CEPAM, CNRS – Université de Nice Sophia Antipolis) using Adobe Illustrator and Photoshop.

Radiocarbon dates of the archaeological context (US-41678) (Table 1) were run on charred seeds selected by Alain Carré, CEPAM, CNRS – Université de Nice Sophia Antipolis, France, and identified by Laurent Bouby, CBAE, CNRS – Université des Sciences et Techniques du Languedoc, Montpellier, France. AMS high-resolution measurements have been performed by the Centro di Datazione e Diagnostica (CEDAD), Università del Salento, Italy. All radiocarbon results are expressed in years BC after calibration thanks to OxCal v.3.5 software based on the last atmospheric data set (Reimer, P. *et al.*, 2009. *Radiocarbon* 51, 1111–50).

Note

1. Here we use one of the Collin's on-line dictionary meanings ('9. Carving in a form of a face or head used as an ornament'), which is similar to the French Littré's definition: 'Terme de peinture et de sculpture. Visage séparé du corps, dont les traits sont ordinairement chargés, et que l'on met parfois dans les ornements de ces deux arts').

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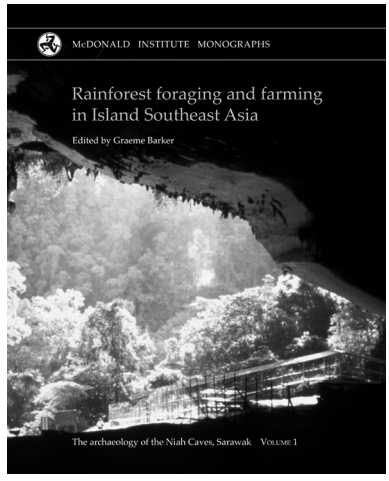
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