



Fig. 14.1.1 Formed clay: **a** <TAF10-7517b>; **b** <c> from the same piece of clay. – (Photos J. Morales). – Scale 1 cm.

14. INORGANIC MATERIAL

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14.1 LARGER CLAY OBJECTS

Tiny clay fragments, sometimes burnt, have been noted throughout the Grey Series (see **Chapters 2 and 3**). In 2010, excavations in Sector 8 revealed a small selection of larger objects that appear to be of baked clay. The five or six objects were recorded in Units L17 and L20 and were conspicuous by their bright orange colour and because they seem to have been deliberately shaped out of soft clay and then heated (**figs 14.1.1-14.1.3**).

Of particular interest are <TAF10-7517b> and <c>, which belong to the same piece of clay with a modern break (**fig. 14.1.1**). The object is approximately 40 mm in length and is 10-12 mm in diameter. It appears to have been shaped by moulding in the fingers and by partial rolling into a cylindrical form, therefore fitting the definition of a deliberately fashioned artefact. However, it is unclear whether the heating was accidental or done intentionally to produce a fired earthenware object.

Looking closely at the surface of these pieces, in particular of <TAF10-7517b> (**fig. 14.1.1a**) and of <TAF10-9380> (**fig. 14.1.2b**), there are linear impressions that seem to have been caused by plant material; fine cordage might also be possible, although there are no impressions of a twist or plaiting. The impressions are simple (implying long, narrow tissues, lacking leaves, secondary branches and nodes) and are largely oriented parallel with the clay surface, suggesting a single taxon (or at least similar taxa, such as sedges), deliberately



Fig. 14.1.2 <TAF10-9380> Baked clay irregular fragment. – (Photos J. Morales). – Scale 1 cm.

<Site ID>	Square	Unit	Description
TAF10-9380a	A24	L17	Irregular fragment
TAF10-9380b	A24	L17	Irregular fragment
TAF10-9380c	A24	L17	Irregular fragment
TAF10-9383	A24	L17	Irregular fragment
TAF10-9517b	A24	L20	Cylindrical piece
TAF10-9517c	A24	L20	Fragment of same cylindrical piece

Tab. 14.1.1 Larger baked clay fragments from Sector 8.



Fig. 14.1.3 <TAF10-9383> Baked clay irregular fragment. – (Photos J. Morales). – Scale 1 cm.

placed (Jacob Morales and Miguel del Pino Curbelo, pers. comm.). There also appear to be fine holes (of comparable dimensions) actually within the clay, which may owe their similarly face-parallel orientation to compression of the matrix. Whether the objective might have been to add plant material to clay to lend strength or to add clay to plant material to help with water-proofing, or both, is not immediately obvious from these specimens.

Further tests would be required to see if these objects were exposed to temperatures significantly higher than those of a small fire (400°-600°C). On present evidence, therefore, it is uncertain whether these objects can be described as ceramic in the strict sense, i.e. “clay that has been fashioned into a desired shape & dried to reduce its water content before being fired or baked to fix its form” (Darvill 2002, 337-338). It is worth noting that none of the

objects at Taforalt was found in direct association with a hearth.

Other objects of fired clay have been noted in Iberomaurusian contexts from sites in North Africa. These include modelled ceramic zoomorphic figurines from the site of Afalou Bou Rhummel in Algeria (Hachi 2003). The anthropomorphic and animal figures from this site were made out of different types of clays and then intentionally baked at temperatures of 500-800°C (Hachi et al. 2002). Similar figurative art has been recognised at Tamar Hat, Algeria (Saxon et al. 1974), while small balls of modelled clay have been found in Iberomaurusian contexts at Ifri n’Ammar, Morocco (Moser 2003), which lies on the northwest side of the Moulouya Valley, not far from Taforalt. Returning to Afalou Bou Rhummel, Hachi (2006) has also reported: “des fragments et des morceaux d’argile mouillée, modelée et portant, généralement sur une seule face, des traces de moules externes de tiges ou de feuilles végétales” [fragments and pieces of clay, wetted and formed, and carrying, generally only on one surface, traces of the imprints of vegetable stems or leaves], objects apparently similar to the Taforalt examples. On balance, therefore, it seems highly plausible that knowledge of embryonic ceramic technology was well established in the Iberomaurusian.

14.2 GRINDSTONES AND PESTLES

A number of objects that can be described as grindstones and pestles have been recorded in our excavations. Characteristically, the grindstones comprise large, flat water-worn cobbles and vary in shape from elliptical to sub-triangular forms (cf. de Beaune 1993). The objects range in dimension from complete examples of up to 35 cm in diameter (fig. 14.2.1 <5861>) to broken fragments of less than 10 cm in size, though these are less common. A usual characteristic feature is the presence of a shallow dish-shaped concavity on one of the flatter surfaces which can be associated with traces of crushed red ochre pigment (fig. 14.2.2 unprovenanced). The pestles are sometimes no more than small hand-size rocks with smooth, flat surfaces and covered in red pigment.

The petrology of the stones is yet to be formally identified but they are believed to be mainly sedimentary rocks (including limestones) similar to those found today in river or plateau gravels near the cave. In terms of original function it appears that, amongst other things, they were used for grinding pigment into powder, although the surfaces also reveal heavy use wear and deep pitting and grooves that might suggest

Fig. 14.2.1 <TAF08-5861>
A large triangular-shaped stone slab, slightly rounded (water-worn?) cobble with patches of pigment. – (Photo I. Cartwright). – Scale bar 5 cm.





Fig. 14.2.2 <TAF uncatalogued> Found *ex situ* inside the cave. – (Photo I. Cartwright). – Scale bar 5 cm.



Fig. 14.2.4 <TAF10-13632> [S10] Pestle associated with Individual 14. – (Photo I. Cartwright). – Scale bar 10 mm.

earlier stages of preparation including crushing and pounding, as well as grinding of mineral pigments. A preliminary study of <TAF10-11456> (fig. 14.2.3) by A. Henry (pers. comm.) has revealed no traces of plant residues such as phytoliths that might indicate the grinding of grass seeds. However, since no systematic wear studies or residue analyses have yet been undertaken on the rest of the collection, it cannot be ruled out that they were also used for processing soft plant material or for pulverising acorns and other nuts. One potential candidate of this kind (<TAF16-13999>, tab. 14.2.1) has a smooth main surface covered in small pecks and scratches but with no ochre residues.

The four typical grindstones recorded in our excavations all come from Sector 10, in positions that suggest they were deliberately placed either close to or within burials (see Chapter 15). For example, <TAF10-11456> (fig. 14.2.3) was found in an undisturbed grave pit directly alongside the right leg of Individual 14; it is believed that it was either intentionally placed there or possibly slipped from higher up on the body as it decomposed *in situ*. On the opposite side of the same skeleton near the elbow was located an ochre-stained pestle <TAF10-13632> (fig. 14.2.4) that was probably paired with this tool. Another instance of a funerary association is a grindstone (fig. 14.2.5 <6084>) deliberately placed on top of the remains of an infant (Individual 8). The grindstone lay with its dished surface facing down on the body. It has been hypothesised that ochre may have transferred from Individual 8 to the grindstone given the absence of staining in the depressed central area of the stone. An ochre-stained grindstone of similar size was also placed above Individual 9 (fig. 14.2.6 <8057>).

One significant early discovery of a grinding artefact was made by Ruhlmann in August 1947 in the stony unit between his upper and middle archaeological layers, towards the inner end of his northern trench (i.e. just alongside what would later turn out to be the main burial area in the cave). This is a large grindstone, 23 × 17 × 3 cm, exhibiting a central concave depression on one side and copiously stained in red ochre. On the same face, it shows engraved

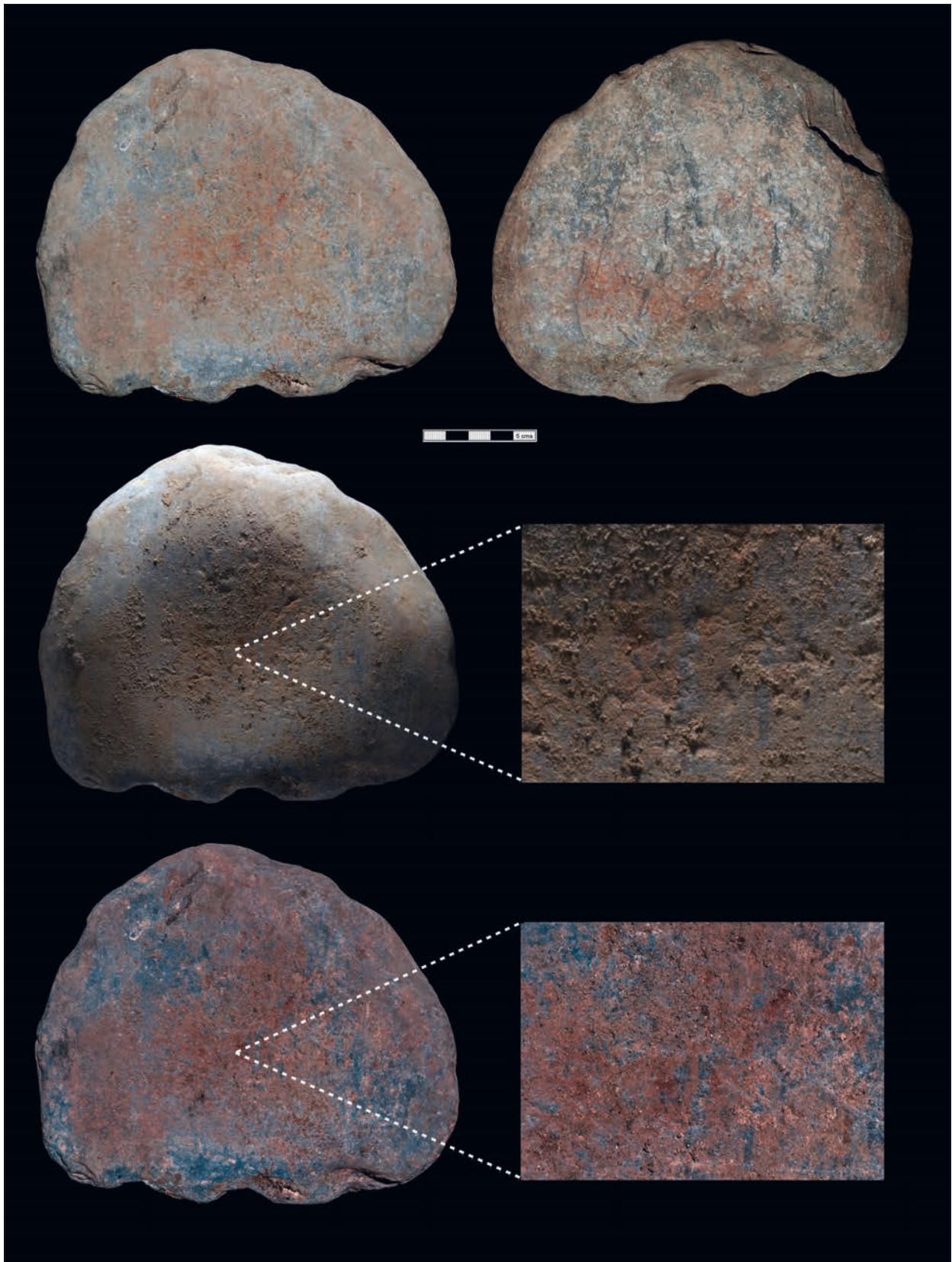


Fig. 14.2.3 <TAF10-11456> [S10] A large disc-like cobble with three deeply flaked notches along one edge; found with a pestle in the same grave fill as Individual 14 (see also **fig. 6.7**). – (Photos I. Cartwright). – Scale bar 5 cm.



Fig. 14.2.5 <TAF08-6084> [S10] A large sub-triangular stone with a sub-circular stain of red pigment; it lay atop Individual 8. – (Photos I. Cartwright). – Scale bar 5 cm.

lines; Ruhlmann sketched the piece in his notebook but gave no interpretation, whilst Roche (1963, 89) interpreted the engraving as the stylised back-curving horns of two opposed Barbary sheep (fig. 14.2.7). This piece is in the *Musée archéologique* in Rabat and has not yet been fully re-studied.

Also in the Museum are examples of pestles, mortars and grindstones from the Roche excavations (Roche 1963). He referred to them under a variety of terms, including "*broyeurs*", "*molettes*" and "*molettes de champ*", and occasionally "*meules*". Comparing Roche's text and illustrations, these three categories can

<TAF find>	Sector/unit	Find	Description
TAF08-5861	<i>Ex situ</i> , inside cave	Grindstone [Possible equivalent of Roche <i>meule</i>]	A large triangular-shaped stone slab, slightly rounded (waterworn?) cobble. The object has two flattened sides and measures 34 × 30 cm in maximum dimension. It is covered in small patches of red pigment, especially developed on one of its flat surfaces. Pitting and short parallel grooves (use wear?) are also visible on the stone. The find came from the surface and is suspected of being a discard from the Roche excavations.
Uncatalogued	<i>Ex situ</i> , inside cave	Grindstone [Possible equivalent of Roche <i>meule</i>]	A broken fragment of a thin water-worn cobble that measures 21 × 17 × 3. It is much thinner than any other comparable artefact and shows a series of wide grooves on both of its surfaces that might be structural to the rock rather than artificial. Both surfaces are pitted and show copious traces of red pigment.
TAF10-11456	S10	Grindstone [Possible equivalent of Roche <i>meule</i>]	A large disc-like cobble with three deeply flaked notches along one edge. It measures approximately 21 × 19 × 7 cm in maximum dimension. The distinctive notches appear to have been flaked and are heavily worn (rounded) possibly through use. The two faces of the stone comprise one slightly dished (concave) surface and one almost flat surface. Both surfaces are scored and pitted and show visible patches of red pigment. The find occurs with a pestle in the same grave fill as Individual 14.
TAF10-13632	S10	Pestle [Potential equivalent of Roche <i>molette</i> ?]	Associated with Individual 14. A short cylindrical cobble, with flat surfaces at either end. It is about 4.5 cm thick and 8.5 cm in length and fits comfortably into an adult's hand. One of the flat surfaces is stained a reddish purple. Many multi-directional striations are also clearly visible on this surface, most likely due to abrasion against another stone surface and an intermediary substance. For these reasons we have provisionally interpreted this as a hand stone or pestle which was used for grinding ochre against a grinding stone to prepare pigment.
TAF08-6084	S10	Grindstone [Possible equivalent of Roche <i>meule</i>]	A large sub-triangular stone with two major surfaces, one of which is slightly dished (concave) in appearance. It has maximum dimensions of 30 × 27 × 16 cm. There are signs of pitting or pecking on the dished surface, near the centre in the deepest part of the concavity and these are surrounded by a sub-circular stain of red pigment. There is no staining in the depressed central portion of the stone. The pitting does not appear to be part of the natural surface of the rock and seems to have been the result of pounding and grinding, despite the absence of pigment traces within the depressed central area. The stone lay atop Individual 8.
TAF09-8057	S10	Grindstone [Possible equivalent of Roche <i>meule</i>]	A large elliptical cobble slab measuring 28 × 18 × 14 cm. It has one fairly rounded side and the lower side, which covered baby Individual 9, was flattish and very slightly dished. Unlike the other mortars in this category it shows signs of pecking along its perimeter and traces of red pigment also extend onto its edges.
TAF10-10030	S8-L24	Pestle? [Possible equivalent of Roche <i>Pierre ocrée</i>]	A sub-rectangular partially flaked cobble made of limestone with maximum dimensions of 6 × 6 cm. Traces of red pigment occur on part of its flaked edge that appear to extend onto the natural surface. It may plausibly have served as a pestle. The find comes from L24 relatively low in the Grey Series
TAF15-12628	S10	Pestle [Potential equivalent of Roche <i>molette</i> ?]	A broken pestle measuring 4 cm × 6 cm. It has a rounded outline with several flat surfaces, one of which is stained a reddish purple colour, presumably as a result of the tool being used to prepare pigment. The stained surface also bears several multi-directional striations/scratches.

Tab. 14.2.1 Grindstones and pestles from Sector 10 and elsewhere in the cave (recent excavations).

<TAF find>	Sector/unit	Find	Description
TAF16-14418	S10	Pestle? [Potential equivalent of Roche <i>molette</i> or <i>broyeur</i> ?]	8 × 7 × 6 cm, c. 500 g weight (estimated); limestone block, good size to hold in the hand; rough surfaces on most faces but with patches of red ochre; one surface is very smooth (pecks and scratches), with ochre in the peck marks and strong ochre stains around (beyond) the peripheries of the worn surface; possible pestle but note that the supposed grinding surface is quite flat (not rounded at edges), suggesting that motion was gentle, not 'pushed-rolled' [SNC].
TAF16-13999	S10	Grindstone? [Potential equivalent of Roche <i>broyeur</i> ?]	Approximately 13 cm long, 10 cm wide, 2-2.5 cm thick; 'plaquette' of dense dolomitic limestone; break surfaces all around and on the 'back'; 'top' surface has a peripheral mechanical scar with red ochre but the main surface is smooth (covered in small pecks and scratches) and no ochre at all; a possible grindstone for soft (plant?) material [SNC].

Tab. 14.2.1 (continued)



Fig. 14.2.6 <TAF09-8057> [S10] A large elliptical grindstone cobble showing signs of pecking along its perimeter and traces of red pigment also extend onto its edges; the object was found above Individual 9. – (Photo I. Cartwright). – Scale bar 5 cm.



Fig. 14.2.7 Grinding stone with stylised zoomorphic engraving (excavated by Ruhlmann 1947). – (Photo J. Hogue). – Scale bar 5 cm.

be described as follows. A "*meule*" (of which Roche recorded only 2) is a larger (>20 cm) grindstone, sometimes with a marked central concavity; one can think of these as the passive lower stone in a grinding process. A "*broyeur*" (of which Roche recorded 47) carries wear facets on one or both major opposed surfaces of a flattened rock/pebble, interpreted as a hand-held upper stone. A "*molette*" (of which Roche recorded 25) carries smaller wear facets (sometimes converging from two main surfaces to form an angle/ridge at an

Fig. 14.2.8 <TAF10-10030> [S8] A sub-rectangular, partially flaked cobble made of limestone with traces of red pigment on part of its flaked edge that appear to extend on to the natural surface; the find comes from L24 well above the base of the Grey Series. – (Photo I. Cartwright). – Scale bar 5 cm.



Fig. 14.2.9 <TAF16-14418> [S10] Possible pestle with ochre in the peck marks and strong ochre stains around (beyond) the peripheries of the worn surface. – (Photo I. Cartwright). – Scale bar 5 cm.



edge) at one or more ends and/or along all peripheries of a rock/pebble, also interpreted as a hand-held upper stone. Many of Roche's "*broyeurs*" and "*molette*" also carry zones of pecking or battering, sometimes overlaying wear-facets, sometimes on a separate part of the same stone.

Using the broad stratigraphic and cave geographic divisions recognised in **Chapter 2** from Roche's published and unpublished commentaries, certain interesting patterns emerge. First, the unpublished Rabat archive contains records of a small number of ochred stones from the two main burial areas (*Nécropoles I & II*) but there is only one explicit reference to a pair of grinding tools, "*meule et molette*", from *Nécropole II*, an area immediately adjacent to our Sector 10. Indeed, looking at the lower level of the Grey Series right through the cave to the entrance, Roche recovered relatively few grinding tools of any kind (10 in all, some 14 % of his total). Although a rigorous calculation of comparability (involving volume excavated, adjusted for sedimentation rate) has not yet been attempted, it seems likely that some of the apparent numerical trends are real. With over 55 % of the total, the upper level of the Grey Series seems to have the most grinding tools

(especially since the real volume excavated was probably lower than for deeper levels), perhaps a few more towards the front than further back. The middle level of the Grey Series has more tools in the middle of the cave, although fewer overall (31 %) than the upper level. The *molette* type is definitely concentrated further forward (over 75 % of these tools are from the outer part of the cave); these pieces are not usually ochred. The *broyeur* type is quite common in all geographic areas, counts rising somewhat towards the back; there is a tendency, increasing inwards (from about one sixth near the front to a half at the back), for these pieces to be ochred. There are too few large *meules* to see any patterns. These figures would support the propositions, (a) that the use of grinding tools increased through time, (b) that the *molette* type (with localised end-and-edge facets, usually lacking ochre) was preferentially located towards the cave exterior, and (c) that intensity of ochre association with grinding tools increased towards the cave interior.

No detailed study has yet been made of the distribution in Sector 10 of pestles (figs 14.2.8 <10030> and 14.2.9 <14418>) but it is interesting that only one was found in direct association with a burial, while others were scattered in the surrounding deposits implying that they were either discarded there or were part of the re-used sediments brought in as a matrix for the burials (see Chapter 2). With respect to the grindstones, does the spatial link with individual burials in Sector 10 suggest that these were special items of equipment (and prized personal possessions) that were sometimes incorporated into the graves for symbolic purposes? Or could their presence be related to more practical purposes such as the preparation of ochre beside the graves as part of a funerary ritual, as has been suggested in other burial settings by Dubreuil/Savage (2014, 143)?

S. N. COLLCUTT

14.3 OCHRE, MINERALS AND OTHER CURIOSITIES

By the end of 1947, Ruhlmann had already noted a number of implements carrying red ochre from his northern trench. Roche (1963) reported a wide variety of mineral components from the different zones of the 1950s excavations, including: red ochre source ores (haematite, 'oligist' or specular iron ore, etc.) and yellow ochre source ores (limonite), together with pigmentation (usually red) on bones, bone tools, shells, stones, sediment, etc.; anthracite; galena; mica; pyrites and gypsum crystals; crystalline quartz; a fossil ammonite fragment; and often brightly-coloured river pebbles (e. g. in chalcedony). Because the categories of personal ornaments, on the one hand, and curiosities or 'baubles', on the other, are not always clear cut, especially given the potential of any of these objects to carry pigmentation, one may also mention pierced shells (discussed in Chapter 13.2 of the present text) and four stone pendants, three pierced and one circumferentially grooved. Similarly, the issue of preparation of pigments in powder form has been mentioned in Chapter 14.2 on grinding implements.

Probably the most striking occurrences of ochre were noted in passing by Roche (1963, 151): "[...] *Certains niveaux des nécropoles ont les terres absolument imbibées d'ocre. Certains objets de parure, certains outils ont été enduits d'ocre. [...]*" [At certain levels in the burial areas, the ground have been absolutely drenched in ochre. Certain decorative objects and tools have been daubed in ochre.]. The occurrence of ochre, especially of the red varieties, in the burial areas has been discussed in detail in relation to both the 1950s finds and those from the present campaign (Mariotti et al. 2009; Belcastro/Condemi/Mariotti 2010; Aoudia-Chouakri 2013; Humphrey et al. 2012; Mariotti/Condemi/Belcastro 2014; see Chapter 15). The extent to which ochre was deliberately applied to full burials and associated objects (some of which may already have

Fig. 14.3.1 <TAF16-S10-14460> Large block of Fe-dominant ore. – Scale 10cm.



Fig. 14.3.2 <TAF16-S10-14838> Fe-dominant vein ore. – Scale 5cm.



been ochred), was applied to regrouped remains, came into contact with matrix objects inadvertently during a burial event or transferred (especially from, or in the presence of, decaying organic matter) after deposition may now be difficult to ascertain, although a better understanding will become available once the photographic archive and the as yet unpublished excavation notes (Jodin 1954/1955) have been fully analysed. However, Roche recorded exotic mineral components from most of his excavation units, right through the cave. His short commentaries on these materials, although not quantified, seem to imply a slight increase in curiosities and 'baubles', and possibly even colourants, upward through time in his excavations of the Grey Series. Colourants (especially iron-ores) are perhaps more commonly reported in the middle to back of the cave (thus, closer to the burial areas), although they are not absent from the front; in the lowest levels of the outer cave, there are no colourants in the main entrance area but there is a concentration in the outer zone near the north wall (Roche's *Niveau C*). Ochred objects were also found in the uppermost Yellow Series (Roche's *Niveau X*), already with a concentration of colourants towards the back of the cave.



Fig. 14.3.3 <TAF16-S10-15161>
Glittering Pb-dominant ore, with plausibly worked groove. – Scale 3 cm.

In respect of colourants, Roche noted that many of the fragments of mineral ore (especially the ochres) showed various types of wear facets, striation and general polish, implying that they were either used directly upon the substrate to be coloured or that small quantities of powder were needed on occasion and were scraped off an ore fragment with a tool of some type.

During the present campaign, various mineral components, plausibly collected and imported by humans, have been encountered, some at least in all the sectors in which we have excavated. These materials have not yet been analysed. However, a few examples (all excavated from Sector 10 in 2016), with field notes, will suffice here to illustrate the potential for future work. Object <14460> (fig. 14.3.1) is a large block of dominantly Fe-ore, 12 cm long; vuggy; silver grey metallic, red and yellow ochres, a little green Cu at one end (right of photo); high density suggests Pb content; dark red-brown streak. Object <14838> (fig. 14.3.2) is an angular fragment of vein (ore) mineral; Fe dominant and present even as red sub-veins; red streak even from 'grey' matrix; vugs in places; small patches of dark grey/green/blue possibly Cu; some light coloured 'silvery' metallic cubic crystals possibly Pb; 29.93 g, displaces 7.8-7.2 g of water, thus estimated bulk specific gravity of c. 3.8-4.2 g/cm³ (consistent with many impure iron ores). Object <15161> (fig. 14.3.3) is a high sheen, 'silvery' metallic ore; only very light 'grey' streak but the 'glitter' detaches easily on the skin, soft; 15.13 g, displaces 2.8-2.2 g of water, thus estimated bulk specific gravity of c. 5.4-6.9 g/cm³ (a very high value indicating Pb is likely to be dominant, although typical cubic galena crystals were not observed, suggesting a possible argentiferous ore with tiny crystals of Ag interrupting the Pb lattice to give this overall glittering habit). On the flat side, there is at least one long groove that appears man-made (there is no explanation in the geological structure of the specimen as seen beyond the 'ends' of the grooving); this piece would seem to be an excellent pigment source.

Recent studies of material, a little older and a little younger than the LSA (e.g. Rifkin 2012 for the MSA; di Lernia et al. 2016 for early Holocene material), have shown that a combination of advanced physico-chemical analyses and experimental replication can provide considerable information on mineral use in the Stone Age. It is hoped that such work will be carried out on the Taforalt collections in due course. Certainly,

mineral 'manuports' of various types, and especially ochres, are quite common in the North African LSA (e.g. Grotte des Contrebandiers and Ifri n'Ammar in Morocco, or Tamar Hat in Algeria), and not only in cave/shelter sites but also in the open-air (cf. the shaped ochre discussed by Sari 2009). Indeed, red ochre seems already to have been applied (whether deliberately or via stringing material) to MSA shell beads at Taforalt, whilst Blombos Cave (South Africa) has, at a similarly early date, not only ochred shells but also faceted ochre fragments. Less well known and understood perhaps is the use of galena, although this mineral was amongst the first to be reported from LSA/Iberomaurusian sites (cf. La Mouillah and Abri Alain (Algeria); Pallary 1934). The question as to the purpose, or purposes, of these mineral components often remains contentious and it cannot yet be said that the range or diversification/intensification of uses has been fully explored, either chronologically or geographically. Many of the 'baubles' probably served no purpose beyond the apparently deep-rooted human interest in the unusual and the curious, although it is not impossible that this was taken a further step, perhaps as memory tokens or charms or other markers of individual identity. Traditional archaeological interpretations of colourants (cf. Camps-Fabrer 1960; Camps 1974) have included body-painting and funerary rituals. More 'practical' uses for ochres have also been suggested. Inclusion with resins seems to improve the performance of mastics (cf. Wadley 2005; Lombard 2007) but there are many other, more easily assembled or gathered materials that do equally well. Similarly, ochre can be used in hide preparation, although it is more obviously involved in desiccation and subsequent preservation (as an anti-microbial) than as an actual leather tanning agent. It has even been suggested that red ochre powder would have served as a human sun-screen (Rifkin et al. 2015) and an insect-repellent (Rifkin 2015). Rifkin (2011; 2012) has drawn attention to the most practically useful dichotomy in the archaeological context concerning minerals, namely that it is extremely laborious to prepare large quantities of mineral powder using pestle and mortar (and yet this was demonstrably done in many cases, including at Taforalt), whilst it is relatively easy (even allowing for the effort needed for any required adjustment of colour through prior heat treatment) to transport and use small mineral fragments (thus creating wear-facets and striations from either scraping or direct application), especially given the wide range of both organic and rock surfaces that would have been available upon which to 'draw'. Whilst each ore source will behave differently, Rifkin was grinding good quality haematite that, as an average in 22 replications, gave reasonably fine powder at the rate of only 37.3 g (10-15 cm³) per hour. This ergonomic dichotomy should perhaps guide future investigation of likely uses at LSA sites such as Taforalt.