

Decorating the Neolithic: an Evaluation of the Use of Plaster in the Enhancement of Daily Life in the Middle Pre-pottery Neolithic B of the Southern Levant

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During the Middle Pre-pottery Neolithic B in the southern Levant the use of lime plaster in both ritual and domestic contexts increased significantly relative to previous periods. Its properties of whiteness, purity, plasticity and antisepsis would have made it a natural choice for decorating, and through the act of colouring disparate categories of objects were linked together. Plaster appears to have transcended its own inherent value as a material due to its interconnectedness with mortuary ritual. Because of its ubiquity, this socially ascribed value was accessible to everyone. This article will claim that plaster, and the act of plastering both ritual and domestic contexts played a key role in the creation and maintenance of community cohesion and social well-being.

Plaster and plaster-like substances came to be used extensively in the southern Levant during the ninth and eighth millennia cal. bc. Although the use of gypsum¹ and mud plasters is recorded from eleventh-millennium cal. bc Natufian contexts² and recently fired lime plaster has been reported as having been used in small quantities at 'Ain Mallaha and Hayonim Cave (Chu *et al.* 2008, 911) widespread use of all types of plasters,³ for domestic purposes and more importantly in mortuary rituals, was a feature of the Middle Pre-pottery Neolithic B (MPPNB).⁴ The employment of plaster within domestic spaces for the construction of floors, for coating walls and installations, such as hearths, bins, platforms etc., has been recorded at most sites during the PPNB (Kingery *et al.* 1988; Rollefson 1990, 36). In many cases these features were re-modelled, re-plastered and re-painted, often generationally (Banning & Byrd 1984, 17; Garfinkel 1987, 72; Rollefson 1990, 36), or in the case of floors and platforms, with the insertion or removal of skeletal material associated with secondary burial of the dead. Indeed, it is the practice of intra-mural burial, secondary skull removal, modelling and caching, and associated mortuary practices, such as ritualized feasting, that has come to define the MPPNB and this is why the period still dominates the literature (see

more recently, Asouti 2006; Bonogofsky 2006; Kuijt & Goring-Morris 2002; Simmons 2008; Verhoeven 2002). Plaster was integral to MPPNB mortuary practices; it was used for modelling facial features on skulls, in the construction of mortuary architecture (as at Kfar HaHoresh, see Goring-Morris 1991; 2000) and in feasting associated with mortuary rituals.⁵ In addition, plaster was used in the creation of statuary,⁶ jewellery, ornamentation and for the modelling of more obscure items such as small plastered and painted clay balls, found in association with plastered skulls at Ramad.⁷

Although ritual and mortuary practices in the Neolithic of the southern Levant have been widely studied (most recently, Goring-Morris & Horwitz 2007; Grossman *et al.* 2008; Horwitz & Goring-Morris 2004; Kuijt 2008) this article will focus specifically on plaster and the way in which it may have impacted Neolithic daily life. The argument will be made that plaster, and the act of coating the floors and walls of houses with plaster, played a key role in the creation and maintenance of community cohesion and social well-being. The ubiquity of plaster, coupled with the fact that it transcended its own inherent value as a material through its interconnectedness with mortuary ritual, established its efficacy. Yet, its properties of whiteness (which created a 'canvas' upon which

colour was frequently applied), purity and antiseptics (which may partly account for its use in mortuary practices, as well as for floors and walls),⁸ and its plasticity (which enabled it to be modelled), ensured its widespread use across a range of contexts and a variety of media, including domestic installations, containers and small figurative art. Importantly, plaster appears to have been accessible to all members of society and therefore, potentially everyone could benefit from its use.

Although still largely anecdotal owing to the paucity of accessible data, the evidence is compelling that MPPNB society ascribed plaster with special qualities.

Plaster as embodying ritual and mortuary practice

Goring-Morris argued that lime plaster must have had major ritual significance, far beyond the mere utilitarian, as indicated by its elaborate use for modelling facial features on skulls and for statuary (Goring-Morris 2000, 126) and that ‘the massive use of lime plaster for profane construction ... probably had symbolic significance’ (Goring-Morris 2000, 126). The argument put forward in this article, that plaster played a central role in the creation and maintenance of social well-being, is predicated to a certain degree on the validity of Goring-Morris’s hypothesis. By imbuing materials with special significance, people ascribe to them cultural value. Plaster, and the act of plastering, was not in itself enough to create feelings of social inclusiveness, community cohesion and well-being, but by being integral to mortuary ritual, plaster acquired special significance, which in turn gave it cultural value beyond that afforded it by its natural properties. Its ability to enhance was thus reinforced by its acquired cultural value and the coupling of the two had profound implications for PPNB society.

In Hodder’s view ‘the lime-rich marl clays used to make plaster, the canvas on which the artists of Çatalhöyük created their imaginative works, and the shared symbolic expression that this enabled, held the community together’ (Hodder, quoted by Balter 2001, 2279). In this context, it is interesting to note that despite the rapid increase in the size of villages in the southern Levant after 8000 cal. BC and the concomitant pressure that this had on land and resources, the MPPNB appears to have been an inherently peaceful period and one where community structures appear to have been maintained in a largely egalitarian, acephalous mode for upwards of a thousand years.⁹

It has been argued that in early agricultural communities, as villages grew in size, increased pressure on land and resources led to the emergence of elites

(Rowan 2009). This did not happen in the MPPNB of the southern Levant, or at least not in a way that is evident in the archaeological record. Even though settlement structures and economic practices had begun to change,¹⁰ and populations within settlements were expanding at a considerable rate, no domestic space was larger or better equipped than any other and no domestic space had more removable objects on its floors than any other.¹¹ Large communal buildings were rare in the MPPNB¹² and there was no obvious storage of surplus. Yet a form of social inequality can be documented in the differential treatment of the dead. Where most of the population were afforded no special mortuary treatment, a small number of individuals were buried under house floors and were subject to secondary skull removal, plaster modelling and caching (Kuijt 2000, 156–7). Special treatment of the dead was not the preserve of young men, or elders but was offered across the full spectrum of society, including children and infants (Bonogofsky 2003).

Kuijt has contended that MPPNB mortuary rituals acted as social-levelling mechanisms for the whole community. By engaging in the performance of death and burial, and in the accompanying ceremonial activities, such as feasts, all members of a community became participants in the special treatment of the few (Kuijt 1996; 2000). Yet, it is arguable whether participation in mortuary rituals alone would have been sufficient to foster feelings of social inclusiveness. It is just as likely that special treatment of the dead, reserved for only some members of society, might have reinforced social differentiation and exclusivity. In my view it was not solely the mortuary rituals that created cultural capital but the way in which plaster, an everyday material available to the whole community, was incorporated into these rituals.

Garfinkel wrote some time ago that:

Up to now in Near Eastern Neolithic research, the importance of the distribution of burnt lime products between structures in the same village has been overlooked ... some thick floors are the result of the function of the structure, some are the result of its long duration, and others are symbols of status and prestige positions within the community (Garfinkel 1987, 84).

If this is correct¹³ then social differentiation may have been expressed through the production and use of plaster; and its widespread availability and use would have acted as an index of ‘wealth’ and as a means of establishing individual social position.

Thus, plaster may have acted as both a means of expressing differential status and as a way of maintaining social order. At a *meta* level, it may also have acted as a means of transcending the ritual

and secular worlds. The use of plaster in mortuary contexts and in domestic contexts obscured the boundaries between the living and dead, sacred and domestic, actor and observer, high status and low status. In the following sections I will explore this assertion through a review of the evidence, but first I want to focus on the natural qualities of plaster that enabled it to enhance daily life and I will begin with some anthropology of art.

Enhancing the Neolithic with plaster

The anthropologist Coote argues that people from different cultures live in different visual worlds (Coote 1992, 248) and in order to begin to understand how people lived, we need to understand how they 'see'. Coote believes that, 'Perception is an active and cognitive process in which cultural factors play a dominant role' (Coote 1992, 247). People's perception of form, colour, light and shade in the world around them is inextricably linked with their recognition of the material and immaterial things that constitute their world. In order to understand how MPPNB communities experienced and lived in their world, we need to begin to understand the way in which they saw their world. What particular qualities of form, light and shade, colour and brilliance, pattern and proportion were recognized by MPPNB society? The ways in which MPPNB society perceived their world was manifested in a natural world, expressed with few sharp angles or straight lines,¹⁴ but presumably in the same bright light characteristic of the southern Mediterranean today.

Within the context of perception Coote argues that, 'All things being equal, people try to maximize their aesthetic satisfaction' (Coote 1992, 269) but this is mediated by the cultural and visual parameters of day-to-day experience; where one lives and what one sees affects what is imagined to be visually and aesthetically pleasing.¹⁵ For communities living within the limestone regions of the southern Levant it is not difficult to imagine how limestone and limestone products, having the properties of whiteness and brilliance, may have been viewed as desirable at their intrinsic level. In order to maximize aesthetic satisfaction however, the intrinsic properties of limestone were enhanced and augmented through the widespread manufacture and employment of pure lime plaster, which has a whiteness and brilliance greater than gypsum or crushed limestone plasters (Goren *et al.* 1991; 2001; Kingery 1988; Rollefson 1990). This was augmented even further through the addition of light-reflective materials¹⁶ and burnishing. The surfaces at Kfar HaHoresh and house floors at many sites were

often burnished to a high sheen (Goring-Morris & Hershkovitz 2007, 904; Rollefson 1990, 36). Indeed, a proportion of MPPNB plaster was also painted, so desirability resided in its whiteness that gave it both contrast (against painted elements) and the quality of a 'canvas' onto which colour could be added. Many of the plastered skulls and floors of MPPNB houses were 'finished' with pure lime plaster coatings over layers of non-fired plasters, which had different percentages of pure lime plaster added to them (Goren *et al.* 2001). These were then frequently decorated with red pigment or reddish-pink washes, mostly of ochre but in one instance the exotic mineral cinnabar was used (Goren *et al.* 2001, 685). Thus, a technology that enabled the visual experience of colour and brilliance to be enhanced must have been desired. It is the relationship between the technical virtuosity of plaster and its aesthetic qualities that I would like to explore briefly now.

The enchantment of plaster

Gell proposed in 1992 that 'the efficacy of [art] objects resides in the fact that the technical processes by which they are created are construed magically, that is, they cast a spell over us so that we see the world in an enchanted form' (Gell 1992, 43). Gell is clear, however, that technologies only enchant when societies are willing to be enchanted, that is, the efficacy of a technology is dependent on 'networks of intentionality' where individuals contrive to serve the community at the level of collectives and their dynamics (Gell 1992, 43). If individuals were not willing to acquiesce then communities would ultimately fail. Given that PPNB communities did not fail, one can presume that people effectively 'bought into' networks of intentionality, including belief systems, ritual practices and other socially constructed behaviours.

In the MPPNB, lime-plaster production would have been undertaken by individuals who understood how to produce and use different types of plasters. Plaster making was not difficult, but like many technologies there are degrees of skill involved, which will be reflected in the quality of the finished product. At its most basic level all that is required for plaster making is to dig a pit, fill it with pieces of limestone and feed it with a quantity of dry wood that can be kept burning for a few days. Discovering how to burn and slake lime, however, would not have been straightforward and would have required a degree of knowledge transmission (Ulf Fornhammar, plaster maker, pers. comm.). Much more difficult would have been mastering how to use plaster to create statues and model skulls.¹⁷

There are two types of lime plaster: pure lime plaster, which is made from raw materials with a high concentration of calcium, such as limestone, chalk and shell, and which hardens by reaction with carbon dioxide in the air, and hydraulic lime, which is made from clay-bearing limestone and which sets by reaction with air.¹⁸ Both types of plaster were used in the MPPNB of the southern Levant (for example in skull modelling: Goren *et al.* 2001) and those obtaining raw material for the production of lime plaster would have known whether or not the raw material had a high clay content and, therefore, they would have known from the very beginning of the process what sort of plaster they were making and how to make, use and store the end product. They would also have known to what use the plaster they were making would be put, as pure lime plaster and hydraulic lime plaster would have had different uses. For example, the process of making hydraulic plaster that sets quickly in contact with water in air would have been an expedient process, probably carried out by most individuals within a community to repair buildings and to model emplacements, such as hearths and storage bins. Hydraulic lime plaster is nowadays stored in plastic airtight containers but in the Neolithic period it would have been used almost immediately as storage would not have been possible given the absence of any airtight containers in the Neolithic period. Evidence of expedient use of plaster is documented at Çatalhöyük in Turkey (Matthews 2005) and also at Kfar HaHoresh (Goring-Morris & Horwitz 2007, 904). Intentionality and forethought were thus integral to plaster technology. Unlike hydraulic plaster, pure lime plaster can be stored in pits under water. Traditionally, pure lime plaster was stored as putty for months or years in storage pits (Holmes & Wingate 1997, 12). Although no excavated features have yet come to light that have been described as storage pits for plaster, there are many instances of pits and storage bins at PPNB sites. At Shaqarat Mazyad, for example, storage bins for unknown use were found in many of the structures and in open areas (Hermansen & Jensen 2002).

Access to lime plaster and the knowledge to make it appears to have been unequal across the southern Levant in the MPPNB. Some sites have lime kilns and evidence of lime-plaster manufacture, for example Kfar HaHoresh and 'Ain Ghazal (Goring-Morris & Horwitz 2007, 904; Rollefson 1990, 51–4), while at other sites evidence for lime-plaster production is absent.¹⁹ Although this may, in part, be due to the geology of the region and the fact that sites with evidence of lime-plaster making are located in the limestone regions of Israel and Jordan, it may also have to do with the way in which knowledge was transmitted. If plaster was

differentially available throughout the region, this may have also increased its cultural value. Imitation then, seems to have been a feature of some sites that had no direct access to limestone, such as Jericho.

Studies in the use of lime plaster at 'Ain Ghazal, Beisamoun and Kfar HaHoresh by Goren *et al.* (2001) suggest that plaster was used both discriminately and expertly and that 'each site employed its own specific technological sequence for the production of "precious" artefacts' (Goren *et al.* 2001, 688). Pure lime plaster is softer than its admixtures but can dry as hard as cement when applied over the surface of a substrate that will absorb moisture from it (Griffin *et al.* 1998, 66). Thus, whiteness would not have been directly correlated with function. Yet, at 'Ain Ghazal, Rollefson has said that 'it appears that there was a "hierarchy" in the use of lime in plasters, with floor plaster having the least, then the statuary, and finally the plaster used for modelling skulls with the highest amount of lime' (Rollefson pers. comm.).

Evidence that the differential use of plasters was based purely on practical considerations is therefore inconclusive (Goren *et al.* 2001, 688) and indeed there is some evidence from Çatalhöyük that aesthetic and/or ritual considerations may have played a role in the decision making. Jones and MacGregor (2002, 12) note that 'colour is powerful in the construction of difference in social and material arenas such as food consumption and architecture'. Platforms, under which burials were placed, were made of a much whiter, higher lime-content plaster than that used for domestic areas (Hodder 2006, 60). And at 'Ain Ghazal, wall plaster was made of field stones coated in mud plaster, which was then coated in a 1–3 mm thick layer of pure lime plaster, presumably to provide a bright white interior, or a surface that could be painted (Rollefson 1990, 39).

That lime plaster was relatively 'costly' to produce in terms of time and fuel compared with mud, gypsum and crushed-lime plasters, was available differentially (albeit widely) across communities, was habitually used in ritual performance and looked good either plain or painted, is sufficient to ensure its cultural value within society and its efficacy in the enhancement of daily life. Yet there is another aspect of lime plaster that enabled it to acquire special status beyond that which other materials were capable of achieving. For this we should return to Gell's concept of technical virtuosity, where he maintains that in order to become enchanted individuals have to acquiesce in a network of intentionalities (Gell 1992, 43).

To be enchanted by lime plaster, MPPNB society had to be duly socialized and responsive to it in the first place. The use of lime plaster in ritual and

Table 1. Presence/absence of plaster elements found on MPPNB sites in the southern Levant.

	Skulls	Statuary	Burial elements	Performance elements	Architectural elements (floors)	Plastered bins	Lime-burning pits
'Ain Ghazal	x	x	x	x	x		x
Aswad	x			x	x		
Beidha	x				x		
Beisamoun	x				x		
Wadi Ghuwayr					x		
Jericho	x	x			x		
Kfar HaHoresh	x		x	x	x		x
Nahal Hemar	x	x					
Ramad	x	x			x		x
Shaqarat Mazyad					x	x	
Yiftahel					x	x	

mortuary practices, and in the creation of art and imagery, suggests that communities accepted it as both embodying and symbolizing a magical world. As such, even things made with only traces of lime plaster may have contained symbolic significance, linking them with ritual practices in which lime plaster played a role. Plastered skulls, which tended to contain higher percentages of lime plaster (Griffin *et al.* 1998, 65) may have been symbolically and magically more potent than floors of houses, containing lower percentages of lime plaster.²⁰ The addition of pure lime plaster to the make-up of floor and wall plaster, however, may have acted to incorporate ritual significance within domestic space and in the process diluted the distinction between the ritual world and the domestic world.²¹ Indeed, the re-plasterings of domestic space may have occurred in conjunction with, or as part of, mortuary and/or ritual events.²² All evidence thus suggests that ritual and secular worlds were part of a continuum in which mortuary practices, ritual performances and domestic activities were all deeply enmeshed (Christensen & Warburton 2002, 163–73).

The presence and absence of different types of plastered elements at eleven sites in the southern Levant are presented in Table 1.

The most widely represented plastered elements are modelled skulls and plastered floors. These are often in association, that is, skulls are cached under plastered floors or displayed prominently in corners of rooms. Other plaster elements less commonly found are statuary, such as the cached figures at 'Ain Ghazal, which may or may not have mortuary associations, burial elements, such as the plaster surfaces at Kfar HaHoresh and performative elements, such as the *Bos* pit at the same site, where feasting was interpreted as the principal focus of ritual activity in what appears materially as a structured set of events, possibly occurring over some period of time (Goring-Morris & Horwitz 2007, 906). Unfortunately, although

evidence from the southern Levant that categorically illustrates a relationship between plaster and ritual significance is sadly still largely anecdotal, beyond the southern Levant the evidence is more indicative of such a relationship.²³

Even so, there does appear to be more than just a superficial relationship between plastered floors and plastered skulls. At most sites where plastered skulls are found there are also plastered floors. The exception is Nahal Hemar, where skulls were modelled in bitumen not in plaster (Schick 1988). The relationship may be more than just the simple need to cache skulls; caching could just as easily be done outside in pits or other features. The fact that skulls were cached inside domestic buildings under plaster floors suggests a strong relationship between the act of caching skulls and burying bodies and the act of plastering and re-plastering floors.²⁴

In a recent article on the social implications of colour, Young has suggested that the colour of material objects in the social world might be better considered as a relational quality (Young 2006, 180): materials of different classes may be linked together by the application of the same colour. Young says that colours can 'connect whole panoplies of otherwise disparate cultural categories ... [and] ... things that are similarly coloured will produce the same effect on the grounds that if things have similar attributes then they will have other similarities' (Young 2006, 180). This concept has considerable relevance in the context of plastered elements in the MPPNB, where the linking of disparate objects, such as skulls and floors, may have been facilitated by the application of white. It is also known that a proportion of MPPNB plaster was painted (for example at 'Ain Ghazal: see Rollefson 1990, 37) and this too may have created a connectedness and relevancy between the various material categories. Thus, whiteness and redness may well have acted as a visual mnemonic device for evoking remembrance, or the precipitation of remembering (Jones 2004, 174).

The development of mortuary ritual in the southern Levant

In contrast with lime-plaster production, which does not come into use on a large scale until the PPNB, there is a long tradition of secondary mortuary practice dating back to the Early Natufian period. Skull detachment is documented in the Late Natufian at 'Ain Mallaha and Hayonim Cave (Kuijt 1996, 332; Perrot 1975). During the PPNA, the practice of skull detachment increased considerably to the extent that it was common at many sites and was the dominant procedure at Jericho and Netiv Hagdud (Bar-Yosef *et al.* 1991, 405–24; Kuijt 1996, 332). Burials were also, for the first time, predominantly located under house floors, although there is speculation regarding the extent to which this was deliberate post-mortem emplacement or simply an outcome of superimposition of domestic space above burial features. Art and other imagery increased in line with the elaboration of mortuary practices, but again there is no direct evidence of a relationship between the two, at least not in the southern Levant.²⁵ Although there are variations in the ways in which mortuary rituals are performed, across the Levant, from Anatolia to southern Jordan, there is broad correspondence during the PPNB in the form and nature that these rituals take.

By the MPPNB, emphasis began to be placed upon the elaboration and enhancement of mortuary practices that had emerged millennia earlier. Plaster was incorporated into these practices on a much larger scale than previously, while the associated rituals appear to have become more performative, as indicated by the increasing number of structured depositions, such as feasts and deliberate emplacement of skulls in domestic spaces (Goring-Morris & Horwitz 2007). Thus, MPPNB societies elaborated rituals with which they were already familiar.

Mortuary rituals are acts of commemoration and can be performative in their nature (Laneri 2007, 2). In instances where the whole community treats its dead in the same way, these rituals have the effect of binding a community together in collective commemoration. In so doing, it produces and reproduces the act of socialization of individuals among specific groups and is a moment during which social cohesion of the living community is reinforced (Laneri 2007, 3).

In instances where the dead are treated differentially, as in the case of the MPPNB, mortuary rituals can act to accentuate difference by making explicit social distinctions (Schwartz 2007, 39). Materials are intrinsic to commemoration as they aid in the act of remembering. In ethnographic and historic examples these may take the form of sculpted and painted

portraits, medals, sepulchres, coffins, inscriptions, religious reliquaries, tokens, memorabilia or photographs. In MPPNB society remembering was at least partially achieved through the protracted practice of burial and reburial and through the intimate act of modelling, displaying and caching skulls (Kuijt 2001), mainly done within the house. Plasters were elemental in these activities, contributing to the commemorative process through both the act of plastering itself, and the resulting elaboration of those mortuary rituals that plastering affected.

To illustrate this point: at 'Ain Ghazal one particular structure²⁶ incorporated the remains of twelve burials²⁷ beneath its floors, representing a span of approximately 400 years,²⁸ or one burial per 30-year generation. Given that houses were lived in for many hundreds of years with individuals buried beneath floors from time to time over entire periods of use, it is not difficult to imagine a mythology conceived of and practised over millennia.²⁹ People thus acted out their lives over hundreds of years in spaces that were both habitations for the living and 'cemeteries' for the dead. Contact with these 'special' deceased persons was protracted by structured and formalized post-mortem rituals that (at least) involved opening up floor spaces to insert or remove body elements and the attendant re-plastering of floors.

Morton has suggested that:

[the] social processes of remembering and the materiality of the house are intimately interconnected over time. As material entities that are fluid both spatially and temporally, houses have particular connections with the way people locate their memories, activate them, and make them meaningful as part of life. (Morton 2007, 178)

Houses are seen as containers for memories and biographies, and the materiality of the house is involved with the way in which such memories are formed and articulated (Morton 2007, 157).

By the MPPNB mortuary practices regularly incorporated lime plaster, a substance which I have argued was imbued with symbolic meaning and magical properties. The use of lime plaster in the elaboration of mortuary practices and in ritual performances was a method by which these activities could be made more potent and therefore more effective in structuring and maintaining social cohesion. People accepted and were complicit in the elaboration of ritual practices because as individuals and as part of a community they were linked at their most fundamental level into belief systems that had existed for thousands of years. Therefore, belief systems were enacted through the dimension of time, reinforcing social identity and a deep sense of belonging to community and place.

Decorating the Neolithic

During the MPPNB in the southern Levant the use of lime plaster in both ritual and domestic contexts increased significantly relative to previous periods. Its properties of whiteness, purity, plasticity and antiseptics would have made it a natural choice for decorating, and through the act of colouring it would have linked together disparate categories of materials. The use of crushed limestone plasters also increased and these were often mixed with lime plaster. The antiseptic qualities of lime plaster (Boynton 1980, 217) no doubt added to its desirability as a sealing agent for burials, but perhaps also in the 'renewal' of houses through the seasonal plastering of floors and walls. Its plasticity made it a versatile material that could be modelled into hearths, benches, platforms, basins and later, into vessels and this, combined with its aesthetic qualities of whiteness (which made it perfect for painting in ochre or cinnabar) and its luminosity (when burnished or mixed with calcite) meant that it was also used in the modelling of skulls, for the creation of statuary, for the decoration of floors and walls and for the elaboration of feasting rituals.

The mortuary practices of the PPNB have their roots many millennia earlier, in the Natufian period. Secondary burial and skull removal are reported from Late Natufian contexts and become much more prevalent in the PPNA but the elaboration of these rituals with plaster is a feature of the PPNB. It is likely that PPNB society was fundamentally linked to the past via these mortuary rituals. They would have had a sense of the deep antiquity of these practices through the temporality of the performance and its relationship to the house. Individuals were buried under house floors from time to time in a span of hundreds of years, thus the act of remembering and re-enactment of rituals performed in the past would have acted to re-affirm the significance and ancientness of the rituals.

Special mortuary practices were reserved for a minority of the population. People were selected, probably on a generational basis (Rollefson 1990, 36) for special subfloor burial, while the majority had no special burial treatment afforded to them. Others were 'dumped' in rubbish heaps rather than being buried at all.³⁰ Although the associated mortuary rituals probably included a wider spectrum of the community, many people would simply have been observers. This would have reinforced social difference rather than eroding it, as suggested by Kuijt (2000). Over time, the repeated use of plaster in mortuary and other ritual practices imbued it with symbolic significance and cultural value. Plaster became the embodiment of certain MPPNB ritual practices. As all members of

society had access on some level to plaster they also had access to the rituals it embodied; its efficacy therefore transcended the ritual realm, infusing daily life. The ritual world and the secular world thus became a continuum within which all members of society were enmeshed and which linked the living and the dead in ritual, spatial and temporal continuity.

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Notes

1. A type of plaster found more commonly on Syrian sites.
2. Plasters were used as bonding material for composite sickles at Lagama North VIII (Kingery *et al.* 1988, 220; Rollefson 1990, 33), at 'Ain Mallaha (Bar Yosef & Goren 1973) and for benches and hearths within structures at 'Ain Mallaha and Hayonim Cave (Bar-Yosef & Goren 1973; Bar-Yosef & Alon 1988; Kingery *et al.* 1988, 224; Perrot 1975).
3. In Jordan, sites mentioned in the text are 'Ain Ghazal, Beidha, Wadi Ghuwayr, Shaqarat Mazyad. In Israel, Beisamoun, Kfar HaHoresh, Nahal Hemar and Yiftahel. In the Palestinian Territories, Jericho and in Syria, Aswad and Ramad.
4. There is some evidence of the use of gypsum plaster in non-domestic contexts from the PPNA at Wadi Faynan 16 (B. Finlayson pers. comm.).
5. See Goring-Morris & Horwitz 2007 for an account of the structured use of plaster in feasting rituals at Kfar HaHoresh. See also Hermansen *et al.* (2006, 4) for feasting evidence at Shaqarat Mazyad.
6. Cached plaster statues have been found at 'Ain Ghazal, but there were a number of fragments of plaster statuary found at Jericho (Garstang 1936; Garstang & Garstang 1940) and at Nahal Hemar (Arensburg & Hershkovitz 1988; 1989; Bar-Yosef & Alon 1988).
7. Bonogofsky 2006, 17. Plastered balls are also known from PPNA contexts at Wadi Faynan 16 in southern Jordan (B. Finlayson pers. comm.) and from Abu Hureyra (Kingery *et al.* 1988, 227) in Syria. Plaster balls are also known from the PPNA site, Bonçuklu, in Anatolia (D. Baird pers. comm.).
8. Rollefson (1990, 36) notes that at 'Ain Ghazal every domestic structure uncovered was characterized by substantial floors of high-quality plaster and that in every case where a house displayed multiple burials, there were multiple re-plasterings (pers. comm.).

Although antiseptics would not have been scientifically understood as it is today, the extensive use of plaster even in a fired form (at sites such as Kfar HaHoresh for example), would have reduced the unpleasant aspects of the by-products of decomposition.

9. Rollefson & Pine (2009, 476–7) predict that population growth at 'Ain Ghazal was around 2.5 per cent per year during the last centuries of the ninth millennium BC. Although this figure increases quite sharply for the middle of the eighth millennium BC with the onset of the Late PPNB, it is still considerably higher than the population growth for the area today and would have put considerable stress on resources.
10. It was during the PPNB that domestic spaces began to change from the round structures characteristic of the PPNA to the square (potentially agglomerative) structures of the PPNB (although see Beidha, Levels VI–V, 'Ayn Abu Nukhala and Shaqarat Mazyad for exceptions to the rule (Byrd 2005; Hermansen & Jensen 2002; Hermansen *et al.* 2006). Food production also intensified during this period leading ultimately to domestication.
11. But there is an uneven distribution of burnt lime products and thicknesses of plaster coatings on floors at Yiftahel, 'Ain Ghazal and Jericho (Garfinkel 1987).
12. There is a large circular building at Beidha (Byrd 2005).
13. Garfinkel is quick to point out there is still very little data available on the differential thickness of floor plasters in domestic contexts.
14. Straight lines were not unknown in the Neolithic, but were rare. At Beidha and Jericho the application of red paint in bands along the base of walls would have formed straight lines (G. Rollefson pers. comm.). Moreover, straight lines are not wholly unknown in nature and are quite common in geological contexts. That said, compared with the modern world, the differences are stark.
15. I use the term aesthetic in its broadest sense to mean the conditions of sensuous perception.
16. For example calcite to the plaster make-up of two modelled skulls from Beisamoun (Goren *et al.* 2001, 681).
17. In Rollefson's view the use of lime plaster for creating floors and wall coverings wasn't very mysterious but using plaster to model skulls and create statues was certainly not something everybody would have been able, or allowed, to do (pers. comm.).
18. www.limebase.co.uk/qanda.htm#question2; Holmes & Wingate 1997.
19. The plastered skulls at Jericho are made with mud and gypsum plasters, not pure lime plaster (Goren *et al.* 2001).
20. It may be that pure lime plaster was used more often in skull modelling because it was a softer material allowing for easier modelling. However, one could argue that the repeated insertion of burials into floors would justify a softer (and therefore higher lime content) floor. Yet this is not usually the case in the southern Levant.
21. At 'Ain Ghazal the walls and floors of some of the houses were found to be comprised of multiple re-plasterings (like Çatalhöyük). This may have indicated that the house was used for some period of time and needed repair, but floors were often re-plastered after the insertion of burials. Thus, the boundary between practicality and symbolic meaning appears to have been blurred.
22. See Boivin 2000 for evidence of ritual plastering of floors and walls of domestic spaces in rural Rajasthan.
23. At Çatalhöyük in Turkey, differential use of plasters of different qualities and whiteness is documented in individual buildings. Higher-quality, whiter plasters were used for platforms under which skulls and burials were placed, while a 'dirtier' plaster was used for domestic areas (Hodder 2006, 61).
24. Boivin (2000, 377) argues that in lifecycle rites in rural Rajasthan, floor re-plasterings played a role in moving spaces (and the people that occupy them) between states of liminality and non-liminality and that the relationship between purity and liminality has been established by Das (1976).
25. In the northern Levant the rich tradition of art and imagery is well documented at Göbekli Tepe and at Jerf al Ahmar. But it is Dja'de al-Mughara with its plastered and ochred walls that hints at what is to come (Cartwright 2008).
26. Not the only example.
27. This includes eight individuals and four skulls found under the house (G. Rollefson pers. comm.).
28. This calculation is on the basis of one burial per ten years, but Gebel (in Bienert *et al.* 2004, 165) points out that it might be one family group interred at approximately the same time. Rollefson, however, does not take this view and still supports diachronic insertion over time.
29. Mummification is another example of a mortuary ritual with a very long history of practice, for example, in ancient Egypt.
30. Schmandt-Besserat <http://www.laits.utexas.edu/ghazal/ChapV/skull/> [accessed 28/9/2011].

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