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DOMESTICITY BY DEFAULT. RITUAL, RITUALIZATION AND CAVE-USE IN THE NEOLITHIC AEGEAN

Summary. Neolithic caves in the Aegean are conventionally understood in domestic terms, principally as temporary homes for farmers or pastoralists. This paper challenges the theoretical and empirical foundations of this orthodoxy and develops an alternative model grounded in an understanding of Neolithic ritual and how through ritualization the everyday is referenced and transformed. This model is explored with reference to the corpus of well-published cave-sites. Although further testing remains a priority, facilitated by the development of new ways of studying cave assemblages, ritual explanations are considered to provide a more credible explanation for Neolithic cave-use in all its aspects, from the selection of caves as locales for activity to the complexity and diversity of their material records. In this way the Aegean may be seen to fit within a broader pattern of ritual cave-use in the Mediterranean during the Neolithic and Chalcolithic.

Caves exercise a power of attraction over people, suggesting themselves as places for activity, demanding explanation. For archaeologists in search of the Aegean prehistoric past, caves were a primary target of investigation (e.g. Perlès 2001, 116) to the extent that in some areas they have become an over-represented site type for certain phases of human existence. After more than a century of exploration a large number of Neolithic cave-sites are known, the majority from surface collections or small trials, some from larger excavations, of which a small number have been fully published (Figs. 1 and 2; Table 1). What attracted the people of the Neolithic to these caves has long been considered uncontroversial. The popular perception that Stone Age people were cave-dwellers by preference has been reinforced by traditions of cave usage from the recent Greek past. Neolithic caves must have been domestic sites, perhaps temporary homes for farmers or transhumant pastoralists, refuges for threatened communities, places for banishing the wicked, quarantining the sick or storing perishable goods (e.g. Hood 1981, 13; Lambert 1981, 688–90; Halstead and Jones 1987, 144; Papathanassopoulos 1996b; 1996c; 1996d; Vitelli 1993; 1999; Kyparissi-Apostolika 1999, 150–1; Zachos 1999, 161; Sampson 1984, 239; 1987, 187; 1992, 95–101; 1993, 263–9; Karkanas 2006). In time the domestic model has come to be viewed as self-evident, the default interpretation of Neolithic cave-use. Data from caves have generally been used to illustrate rather than evaluate the efficacy of the domestic model and the onus of proof has been placed upon those seeking alternative explanations.

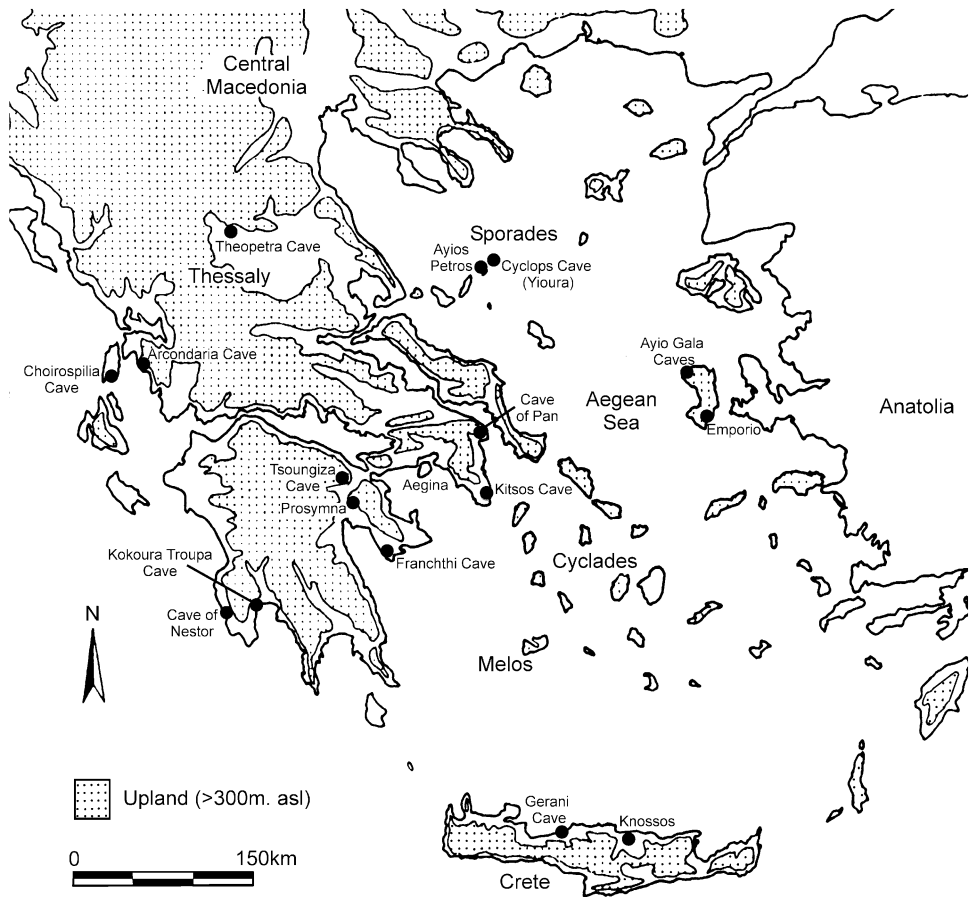


Figure 1
Early and Middle Neolithic sites mentioned in the text.

DE-CONSTRUCTING DOMESTICITY

When people inhabit caves they do so for specific reasons that are largely determined by how they produce their livelihood, the scales at which they move around the landscape and the socio-economic advantages offered by occupying a particular cave location. For the hunter-gatherer communities active in the Aegean during the Upper Palaeolithic and Mesolithic, cave habitation formed part of a strategy of seasonal foraging, where certain caves offered convenient shelter close to important resources (Bailey 1992; Bailey *et al.* 1999). Nevertheless, open-air sites, under-represented in the archaeological record through taphonomic and research biases, offered a range of complementary habitation options (Runnels 2001, 236–7, 239, 241, 244–5, 253).

The logic of an adaptive use of caves, so hard to deny for mobile seasonal foragers, is rather more difficult to accept for the very different regimes of subsistence and mobility

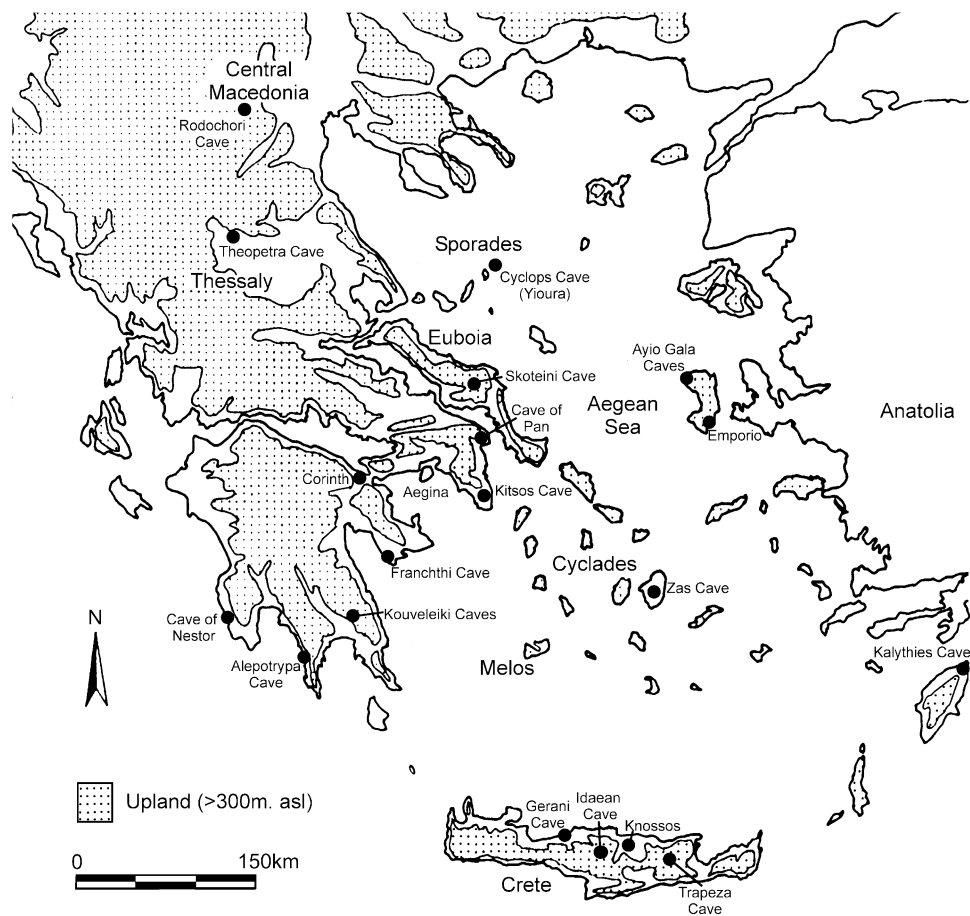


Figure 2
Late and Final Neolithic sites mentioned in the text.

TABLE 1
Aegean Neolithic chronology

Phase	Absolute date range
Initial Neolithic (IN)	c.7000–6500/6400 BC
Early Neolithic (EN)	c.6500/6400–6000/5900 BC
Middle Neolithic (MN)	c.6000/5900–5500/5300 BC
Late Neolithic I (LN I)	c.5500/5300–4900 BC
Late Neolithic II (LN II)	c.4900–4500 BC
Final Neolithic (FN)	c.4500–3100/3000 BC

practised by early farmers. The modal form of Neolithic settlement in the Aegean is the open-air village, located directly adjacent to the fertile niches of arable land that formed the principal focus of subsistence production (Halstead 1994, 198, 200). Studies of Neolithic food production suggest that village communities fulfilled their normal subsistence requirements by labour-intensive, year-round cultivation of land in their immediate vicinity, relying almost entirely on a range of domesticated plants and animals (Halstead 1989, 70–1; 1996a, 301–3). Sustained habitation close to subsistence resources was essential to this intensive horticultural strategy, both to minimize energy expenditure and to protect livelihood (Jones, G. 2005). In contrast to the village, caves seem to have been a relatively rare site type (e.g. <3 per cent of known EN sites; Perlès 2001, 113, 116; Fig. 1), even during the later phases of the Neolithic when their incidence increases. Neolithic caves represent but a tiny fraction of the total known caves from the Aegean regions, suggesting that certain aspects of their location were critical to their function. However, the idea that farmers occupied caves in order to exploit agricultural land in their immediate vicinity is rendered problematic by the fact that most Neolithic cave-sites lie on high hills and steep slopes, inconveniently located in relation to arable land and sometimes also water (Diamant 1974). Access to agricultural land from a cave always requires greater effort than from an open-air settlement located directly next to the area of cultivation. In addition, while pockets of modern or historically cultivated land occur in the vicinity of caves, even those located in upland areas, it does not always follow that this land was always deemed attractive or cultivable in the past. The agricultural colonization of most marginal upland regions in the southern Aegean actually seems to take place only towards the end of the Neolithic or early in the EBA (Tomkins 2008, 37–42). In such cases caves remain a minority site in a landscape of dispersed, small open-air sites or may even decline in usage, as is the case for Skoteini when a late FN open-air settlement is founded nearby (Sampson 1992, 86, 92). Later still was the introduction of agricultural terracing on steeper slopes, which is currently placed no earlier than the Middle Bronze Age (French and Whitelaw 1999, 173–5). This presents a paradox: if, as seems clear, the artificial built environment of the open-air village was the social, political and economic nexus of Neolithic life, why should caves have been used by farmers as habitation sites when they are located at a more inconvenient distance from agricultural land, often in agriculturally more marginal environments? In order to account for this paradox proponents of the domestic hypothesis need to demonstrate not only the existence of subsistence strategies that might have made cave habitation viable and advantageous, but also how those strategies gave rise to the excavated material records from caves in all their complexity.

A much favoured incarnation of the domestic model explains Neolithic cave-use in terms of seasonal occupation by mobile pastoralist groups exploiting traditional transhumance routes (Watrous 1982; Jacobsen 1984; Wickens 1986, 126, 134–6; Sampson 1993, 271–81; Talalay 1993, 47; Vitelli 1999, 100–1; Zachos 1999, 161). However, for much of the Neolithic evidence for a coherent system of cave or open-air sites in upland areas is lacking (Kyparissi-Apostolika 1999, 144–9; Perlès 2001, 116). Moreover, studies of faunal and botanical assemblages from caves consistently indicate a mixed farming mode of subsistence identical to that practised at open-air sites throughout the Neolithic (Halstead and Jones 1987, 144–5; Halstead 2008, 241–3). Seemingly at no stage during the Neolithic were domesticated animals managed so as to maximize their calorific yield via dairying, but were kept in small numbers and culled periodically for their meat (Halstead 1996a; 2008, 241–4). Micromorphological study of sediments from the Kouveleiki caves has claimed evidence for the stabling of animals in a cave,

but in truth demonstrated only the use of dung alongside wood as a fuel within one of the cave chambers; moreover, traces of cereal phytoliths in the dung indicated that the animals had been raised in a mixed farming context (Karkanis 2002). Indirect evidence for dairying is also absent from caves: on Crete the so-called cheese-pots of the late FN, if, that is, they had anything to do with cheese production, are generally found in coastal zones away from the inland/upland interior where many cave-sites are situated (Tomkins 2008, 42). Stable isotope analysis of human skeletal material from caves further confirms this picture, indicating a daily diet focused on cereals and legumes, with no evidence for a significant intake of red meat or marine food resources (Papathanasiou 2001, 24–6, 38–40, 44).

Those who favour a domestic model bolster their arguments with modern Greek traditions and ethnographies of domestic cave-use, often gathered in the immediate environs of a specific cave (e.g. Watrous 1982; Jacobsen 1984, 29–30; Sampson 1992, 95–101; Papathanassopoulos 1996b, 39–40; Zachos 1999, 161). Such a privileging of modern ethnography in the interpretation of the prehistoric past is flawed in that it assumes a series of questionable socio-economic constants, such as attitudes to landscape, subsistence practices or mobility, with time as the only variable (Halstead 1996b; Nixon and Price 2001, 395–7). ‘Pastoralism’ and ‘agriculture’ are integral to the traditional Mediterranean rural economy, which, far from being a timeless response to the environment, is dependent upon the existence of specific socio-economic conditions (e.g. global market economy, extensive agriculture) which are unlikely to have been in operation before the Middle Bronze Age (*c.* 2000 BC), if not much later (Cherry 1988; Halstead 1996a, 301–2; Nixon and Price 2001).

The efficacy of the habitation hypothesis is further called into question by certain aspects of the material record from excavated caves. Frequently caves are described as unsuitable for habitation, whether due to their distance from agricultural land or water sources (e.g. Kitsos Cave: Lambert 1981, 690), the dampness of their interior (e.g. Theopetra: Kyparissi-Apostolika 1999, 150), a lack of natural light (e.g. Rodochori Cave: Demoule and Perlès 1993, 404–5) or challenging internal or external topographies (e.g. Zas: Zachos 1999, 153–4). In Attica at least half of the later Neolithic (LN–FN) caves have small entrances and dark, damp interiors (Wickens 1986). Equally problematic is the frequent presence of human skeletal material (Demoule and Perlès 1993, 404–5). Some proponents of the habitation hypothesis have tried to claim that this material represents the remains of inhabitants trapped in caves by rockfalls (e.g. Tsoungiza: Weinberg 1970, 579; Gerani: Godart and Tzedakis 1992, 77–8; Alepotrypa: Papathanassopoulos 1996c, 82), even though it is frequently disarticulated and associated with different stratigraphic units. Others assume that it was typical domestic practice to intermingle living areas with mortuary space (e.g. Papathanassopoulos 1996b; 1996c). In fact, but for the odd isolated fragment, human skeletal material is usually absent from domestic living spaces in Neolithic villages and mainly occurs in discrete and separate contexts, such as pits, walls or else in peripheral spaces, such as ditches and cemeteries (Triantaphyllou 1999, 128–30; 2008, 142–7; Perlès 2001, 273, 281).

Similarly problematic is the rich and diverse range of artefacts deposited in Neolithic caves. Most notable are those in metal, whose high value is assured by their rarity, the qualities of their raw material and their great distance from their original, probably Balkan, sources of manufacture (Figure 3; Nakou 1995, 4–7; Zachos 1999, 154; 2007, 168–81; Muhly 2002, 78). Metal objects most frequently occur at open-air sites in the northern Aegean, while further south they are heavily concentrated at caves, a pattern interpreted as reflecting a practice of deliberate, ritual deposition in caves (Nakou 1995, 6–7, fig. 2). In view of the presence also of unworked

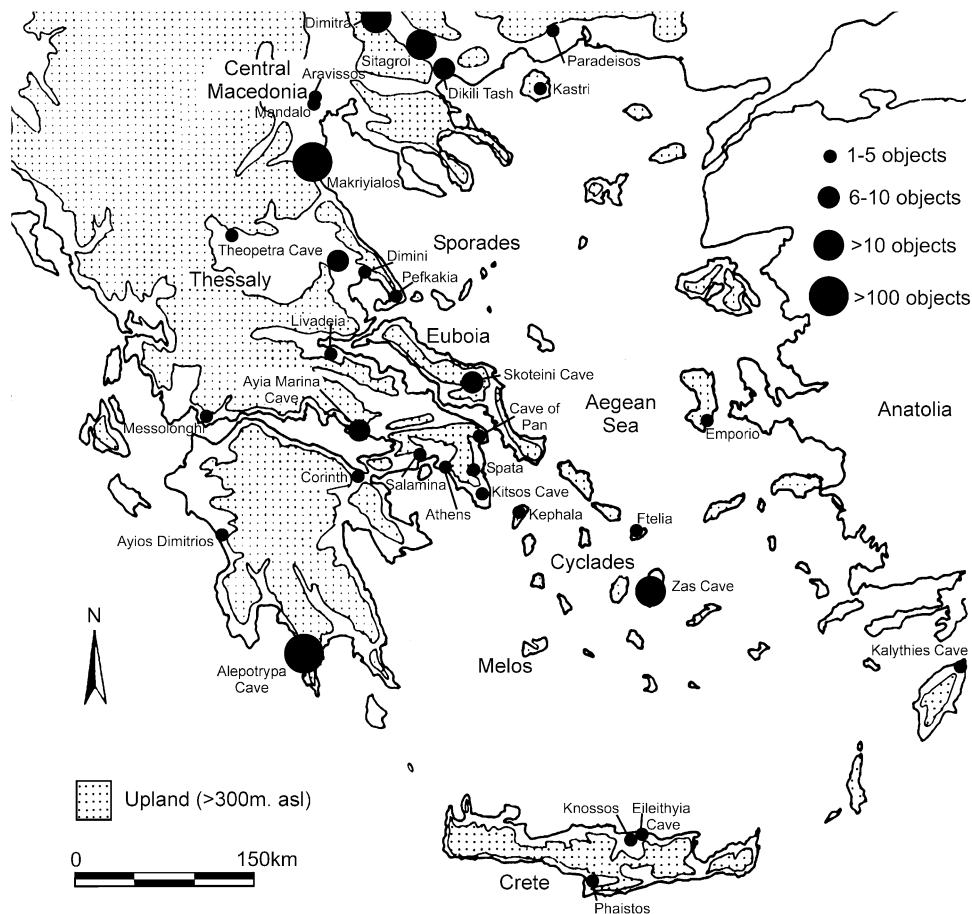


Figure 3
Neolithic sites where metal objects have been found.

copper nuggets and copper slag at Alepotrypa and a crucible¹ containing traces of silver and lead at Kitsos, this practice may at the end of the FN have extended to include objects symbolic of metallurgy itself. In recent years it has been tentatively suggested, mainly on the basis of these metal finds, that a handful of later Neolithic caves may at certain times have enjoyed some sort of ritual significance (Demoule and Perlès 1993, 404–5; Nakou 1995, 21–2; Broodbank 2000, 165; also Hall 1999 for Crete). There has been resistance to this idea (e.g. Zachos 1999, 158–61) even though, or perhaps precisely because, the case for a non-domestic usage of caves has yet to be made in any detail.

¹ Found in the uppermost mixed late FN/Classical level and conventionally dated to the Classical period (Bourhis *et al.* 1981, 423, figs. 285, 287.2), the crucible finds parallels at late FN sites, such as Kephala on the nearby island of Kea, and Nisiros in the Dodecanese (e.g. Zachos 1996b, fig. 140; Papathanassopoulos 1996a, no. 186).

DEFINING AND IDENTIFYING NEOLITHIC RITUAL

Ritual is one of the most misunderstood aspects of Neolithic life in the Aegean, fraught with difficulties of definition and identification, to the extent even that some have doubted its very existence (e.g. Sampson 1992, 96). If we call domestic that which is daily, familiar and habitual, ritual is something deliberately odd, in the sense that it belies functional or economic explanation and is unusual, striking and symbolic when placed within its temporal and spatial context (Hodder 1982, 164). It is frequently considered to be a separate domain of activity, in opposition to the domestic or everyday, and the conventional methodology for its identification, at least in the prehistoric Aegean, has been to rely on the presence of signifiers that are interdependent and defy explanation in domestic terms (Renfrew 1985, 11–26). This approach has been most successful in cases where ritual signification is unambiguous and strong, such as the specialized ritual architecture, iconography and equipment characteristic of the Cretan Bronze Age (Peatfield 1987; Watrous 1996). For the Aegean Neolithic, however, where such clear-cut examples of ritual signification appear to be lacking, it is difficult to know where the boundary between domestic and ritual should be drawn. Although artefacts that are rare, unusual or functionally redundant, at least in terms of adaptation (e.g. figurines), have been termed ritual, their depositional signatures rarely, if ever, describe discrete and unambiguous locales of ritual activity. Likewise objects that are frequently thought of as ‘utilitarian’ or ‘domestic’, such as ceramic containers or lithic tools, also occur in obviously ritual contexts, such as burials. Contexts may be equally ambiguous. Houses, supposedly *the* domestic context *par excellence*, appear in reality to have been venues for both the everyday and repeated and the unusual and unique. The latter is most obvious in special forms of deposition, such as structured pit deposits or the incorporation of human skeletal material in the fabric of buildings, which take place at key moments in the biography of the house, such as construction or abandonment. Particularly elaborate rituals, such as floor cleaning, the deposition of complete vessels and deliberate destruction by burning, may accompany the abandonment of a house (Stevanović 1997; Bradley 2005, 41–80; Tringham 2005; Tomkins 2007a). The ideological significance of houses is further supported by the production of house models and the deep intergenerational continuity of some houses and house-plots. The communal, open areas between houses and on the edge of settlements may also have been venues for domestic and ritual activity (Halstead 1995; Tomkins 2007a).

Clearly ritual could occur in a variety of Neolithic contexts and at a range of temporal, spatial and social scales. Particularly noteworthy is the failure of the material record to conform to expectations aroused by terms such as ‘utilitarian’, ‘domestic’ or ‘ritual’. Such terms speak to a modern Western conceptualization of society, but should not be confused for cultural universals. Few small-scale societies conceive of the world in the same way and, significantly, many lack a conception of ritual as a distinct and separate domain of activity (Brück 1999, 314–18; Bradley 2005, 29–30, 119). Bradley (2005) has challenged the notion that rituality and domesticity were opposing and largely separable domains of behaviour and has suggested that ritual was a particular form of practice or performance, described by its own conventions and occupying a continuum between the local and informal and the public and highly structured. Prehistoric ritual was intentionally ambiguous, drawing upon elements of domestic life and delivering new insights and emphases through distinctive kinds of performance or forms of ritualization. Ritual thus offered a different way of experiencing the domestic and through it people were able to develop an understanding of their world that connected the everyday with the

cosmological. Understanding ritualization is thus key to the identification and interpretation of prehistoric ritual in the archaeological record.

Temporality

Time is a key component of ritualization, not just in the sense that rituals occur at specific, often fixed times, but also in the sense that ritual time is experienced in very different ways to the time of the everyday. In cases where ritual speech, thought and action are formalized and incontestable, participants are drawn out of the time of the everyday and situated in a time that runs more slowly or is even still and where the boundaries between past, present and future enactments of the ritual are collapsed (Bradley 1998, 88–90; Rappaport 1999, 181). Seemingly more mundane, but equally suggestive of ritualization and ritual time, is the way in which objects, such as ceramic vessels or shell bead necklaces, were produced at earlier Neolithic (IN–MN) sites in the Aegean (Miller 1996; Tomkins 2004, 45–50). Far from being utilitarian *chaînes opératoires*, these seem to correspond to a form of production confined to specific occasions and involving and affirming larger, supra-household or communal groups (Tomkins 2004, 49). The deliberate re-creation of past knowledge, practice and categories effectively situates the producing group in a cyclical, timeless state between past, present and future, where the community of the present joins communities of the ancestral past.

Spatiality

The archaeological record has long been understood to have been formed by the interplay of a variety of natural and cultural processes (Hodder 1982; Schiffer 1987; Chapman and Gaydarska 2007, 71–9). However, the degree to which ritual may have influenced its formation, specifically the order that archaeologists discern in it, has only recently been subject to serious consideration (Bradley 2005, 108–9, 207–9; Chapman and Gaydarska 2007, 71–112). While a large proportion of the deposits from Neolithic settlement contexts are in the form of accumulations of broken artefacts, animal bone and organic matter, often glossed as domestic refuse, others have a greater spatial and temporal restriction (e.g. pits; house abandonments). This restriction, together with the structured deposition of their contents, marks these out as ritual contexts (e.g. Pappa *et al.* 2004; Bradley 2005, 13–15, 170–80). Moreover, it is worth remembering that ‘rubbish’ is itself a cultural construct and that behind the complex array of processes through which such deposits were formed, there might also lurk forms of ritualized material manipulation (Hodder 1982; Chapman and Gaydarska 2007, 2–4, 75–201).

Parts and wholes: fragmentation, enchainment, accumulation

Fragmentation refers to the deliberate breakage or division of something and the distribution of its parts in order to construct relations among people and objects (Chapman and Gaydarska 2007; Gamble 2007, 132–52). Such part-whole relationships may serve as metaphors for social relations through processes of accumulation, where parts or wholes are collected together as sets, or enchainment, where a chain of social relations is achieved through exchange. Fragmentation reflects a ritualization technique, whereby everyday objects might be transformed into important social statements. Its identification requires a commitment to contextual study and is most easy in the spatially restricted forms of deposition noted above. For example, an EN pit

at the village-site of Knossos (Crete) produced a fill of ash and earth together with the broken fragments of a bowl and two possibly non-local stone figurines (Tomkins 2007a, 185–91 for discussion and references). It is clear that both the vessel and the figurines had been deliberately fragmented prior to deposition, the figurines each by the removal of the head and one of the legs, the vessel by its breakage accompanied by the removal of a sherd from its base. The missing fragments must have been deliberately removed for circulation above ground and could have served as ‘material citations’ of the ritual act (see Jones, A. 2005). Likely Neolithic examples of this practice are the sherds worked into disc form and sometimes pierced that occur at village sites around the Aegean (e.g. Knossos: Evans 1964, 235, pls. 58.1–2). Piercing would have facilitated the accumulation of fragments on a string that could then be displayed upon the body or in the house. Fragmentation practices may also extend to include the human body or what has been termed corporal culture (Gamble 2007, 87–110), good examples of which are the isolated human skeletal fragments in settlement contexts that seem to have circulated amongst the living as expressions of relationships with the dead (Triantaphyllou 1999; 2008). Exploration of the full extent of fragmentation across or between sites remains a major methodological challenge, but, as demonstrated by recent studies, the potential insights into social categorization and social relations are great (Bradley 2005, 145–64; Chapman and Gaydarska 2007, 53–112).

Distance and scale: liminality, enlargement, miniaturization

Ritualization has at its heart the notion of creating distance from the everyday. In non-industrial societies geographical distance is frequently equated with supernatural distance, and locales that are in some way liminal to the domestic may come to evoke qualities associated with the cosmological realm (Renfrew 1985, 16–20; Helms 1993). This is clearest when locales in the landscape, such as natural places (caves, mountain tops or rivers) or monuments, become the focus for ritual practice and deposition (Bradley 1998). Liminality also operates at smaller scales, as illustrated by ritual contexts that are adjacent to or overlap with domestic space. Distance from the everyday may also be invoked by enlarging or miniaturizing familiar subjects. An example of the former is the widespread practice of scaling up the house form to create large, communal ceremonial buildings, whether meeting-houses, temples or burial sites (Bradley 2005, 65–80), while the latter is illustrated by the house models that are a feature of MN–FN settlements in the Aegean (Gallis 1985; Tomkins 2004, 51–2). Enlargement or miniaturization has the effect of creating an emotionally more intense version of its source, increasing its ideological properties and with losses or changes in functionality adding further to the emphasis on form (Knappett in press). With these significant increases or reductions in scale normal time–space relations are transformed, resisting conventional explanation and forcing new forms of experience and narrative.

Value and substance

It is also important to be sensitive to different regimes of value operating within and between different artefact types and media and how their selective deployment may serve to raise an everyday activity to the level of ritual performance. For example, the earliest ceramic vessels appear to have been rare and highly valued and were probably used only on special occasions, the daily burden of container usage being borne by a range of more durable non-ceramic containers (Vitelli 1993, 213–16; Tomkins 2007a). In this way the preference of ceramic vessels

over those in wood or basket would have been a means of ritualizing an everyday activity. Other regimes of value may be glimpsed operating within object–substance categories, such as pottery, where preferential use and deposition of finewares or vessels from non-local sources may serve to mark unusual contexts of deposition.

Food and cuisine

Eating and drinking are activities that occur on a daily basis, but also form part of ritual. In addition to temporality, spatiality and social context, food consumption may be ritualized by consuming everyday food in association with special or high-value object types, by consuming unusual forms of food or by preparing food in a special way. Although the etiquette and meaning of Neolithic cuisine is lost to us, we can nevertheless note certain differences in the frequency with which basic foodstuffs, such as cereals or meat, were consumed. The main dietary staples of Neolithic village communities appear to have been cultivated cereals and pulses, while all evidence, including bioarchaeological and stable isotope analyses of human bone (Angel 1984; Papathanasiou 2001, 24–6, 38–40, 44), suggests that meat was consumed very infrequently, probably only on special occasions (see Halstead 2007). Meat consumption not only had simple rarity value, but also carried with it certain ideological and social implications in that it involved the killing of livestock, the possession of which is likely to have been a source of status. Generally the carcasses of large animals spoil easily and are thus most amenable to short-term, larger-scale consumption by groups larger than a single household (Halstead 2007, 27, 39, 41–3). Taken together these factors suggest that meat consumption was an infrequent, communal and probably ritualized practice.

NEOLITHIC CAVES AS RITUAL PLACES

Having established a framework for the identification of Neolithic ritual practice, we may return to the question of Neolithic cave-use in the Aegean. The following discussion does not aim to be comprehensive, but focuses on a group of the most comprehensively explored and published cave-sites. These will serve as the basis for an exploration of ritualization in cave usage and how it related to, drew upon, but frequently departed from that of open-air sites.

Temporality and spatiality

While villages have produced an array of data to demonstrate permanent year-round occupation (Halstead 1999, 77–8), the stratigraphic and micromorphological records from caves indicate that activity was markedly episodic in nature, periodically punctuated by longer hiatus (e.g. Vitelli 1999, 12, 15, 61–2, 96; Karkanas 2002, 250–1). Faunal and botanical remains indicate that visitation took place at most times of the year, with a particular emphasis on the winter at the LN–FN Zas Cave (Zachos 1999) and late winter and summer at LN–FN Kalythies (Halstead and Jones 1987). Despite their episodic nature, cave sequences present clear evidence for deep continuities in practice and deposition, which may extend over longer periods than any single open-air site in their vicinity, suggesting that caves were often constants in an otherwise changing social landscape. For example, all Neolithic phases are represented in the Theopetra Cave, while most open-air settlements nearby had more limited periods of occupation (Kyparissi-Apostolika 1999, 144). Typically the total depth of deposition at Theopetra is

insubstantial (0.5–1.5 m in total), especially when compared to a village-site like Knossos (*c.* 7–8 m) occupied continuously throughout the Neolithic (Tomkins 2007b). That said, however, it is important to stress that the temporality of deposition varies greatly across open-air settlement sites and far closer analogies to cave sequences can be found in areas peripheral to habitation, with their thin deposits, pits or ditches and alternating episodes of deposition and hiatus (Triantaphyllou 1999; 2008; Efstratiou *et al.* 2004, 47; Tomkins 2007a, 187–9; 2008, 30).

Continuities of use and deposition, often stretching across long periods of hiatus, suggest that the significance of a cave was not simply constructed on the basis of immediate physical involvement. Memory, maintained through oral tradition and ancestral geographies (Tilley 1994, 7–75; Edmonds 1999, 15–31) and reinforced by an ongoing landscape presence, is likely to have ensured that caves remained candidates for further activity. Thus, although centuries of hiatus separate an EN phase of use from a preceding phase of Mesolithic habitation at several caves (i.e. Cyclops: Sampson 1999; Franchthi: Jacobsen and Farrand 1988; Theopetra: Kyparissi-Apostolika 2000), it is worth considering the possibility that old places, through origin myths and oral tradition, continued to play a role in the new visions of landscape developed by early farmers. After all, in the process in which indigenous Mesolithic communities adopted farming and settled down in new locations (see Perlès 2001, 38–51), it is unlikely that oral geographies were entirely reconfigured. In a similar way, the embedded position of Neolithic caves in traditional knowledge may have played a part in their reuse during the Bronze Age (Fig. 4). On Crete most FN caves continue to see activity during the EBA (e.g. Trapeza) and many more rock-shelters and narrow crawl-in caves gain a specialized funerary function (Tomkins *in press* 2). Elsewhere cave-use is generally thought to peter out after the Neolithic (Wickens 1986, 140; Nakou 1995, 7); however, EBA depositional activity, sometimes of a similar character to that of the Neolithic, is evident at several caves (Fig. 4; e.g. Vathy (Kalymnos): Furness 1956, 191–2; Kitsos: Lambert 1981, 691; Aspri Petra (Kos): Sampson 1987, 187; Skoteini: Sampson 1992, 66, 68; Franchthi: Vitelli 1999, 18, 91; Zas: Zachos 1999, 153).²

Clearly absent from caves are the complex spatial sub-divisions, widely considered to be commensurate with individual household groups (Renfrew 1972, 365; Halstead 1999, 79–81), that are such a conspicuous feature of settlement sites. Artefact distributions and micromorphological studies in caves suggest that natural features of internal topography, such as niches, passages, chambers and pools, were exploited as a means of separating and structuring activities, principally deposition, and access (e.g. Perlès 1981, 136–40; Papathanassopoulos 1996c, 83; 1996d, 175–6; Karkanas 2006). The main constructed features are hearths, pits and surfaces; when walls occasionally occur they demarcate much simpler divisions within or outside a cave (e.g. Lambert 1981, 71–110; Vitelli 1993, 32–87; 1999, 7–21; Karkanas 2002). The lack of decaying artificial structures and the slow rate of accumulation meant that specific depositional episodes were frequently disturbed by subsequent interventions running up to the present day (e.g. Franchthi: Vitelli 1993, 31; Skoteini: Halstead 1996b; Kouveleiki: Karkanas 2006).

2 For example EBA deposits at Skoteini included a hearth, EB II sauceboats, a seal of clay, multiple sealings on a pithos handle and a cache of metal objects (two copper knives, a chisel and brooches) in a pit (Sampson 1992, 66, 68), while at Zas an EB III level (Zas IV) containing pottery, food remains, bone, stone and metal objects, and several clay sealings, originally pressed onto boxes or containers to seal valuable contents (Dousougli-Zachos 1993; Zachos 1999, 153).

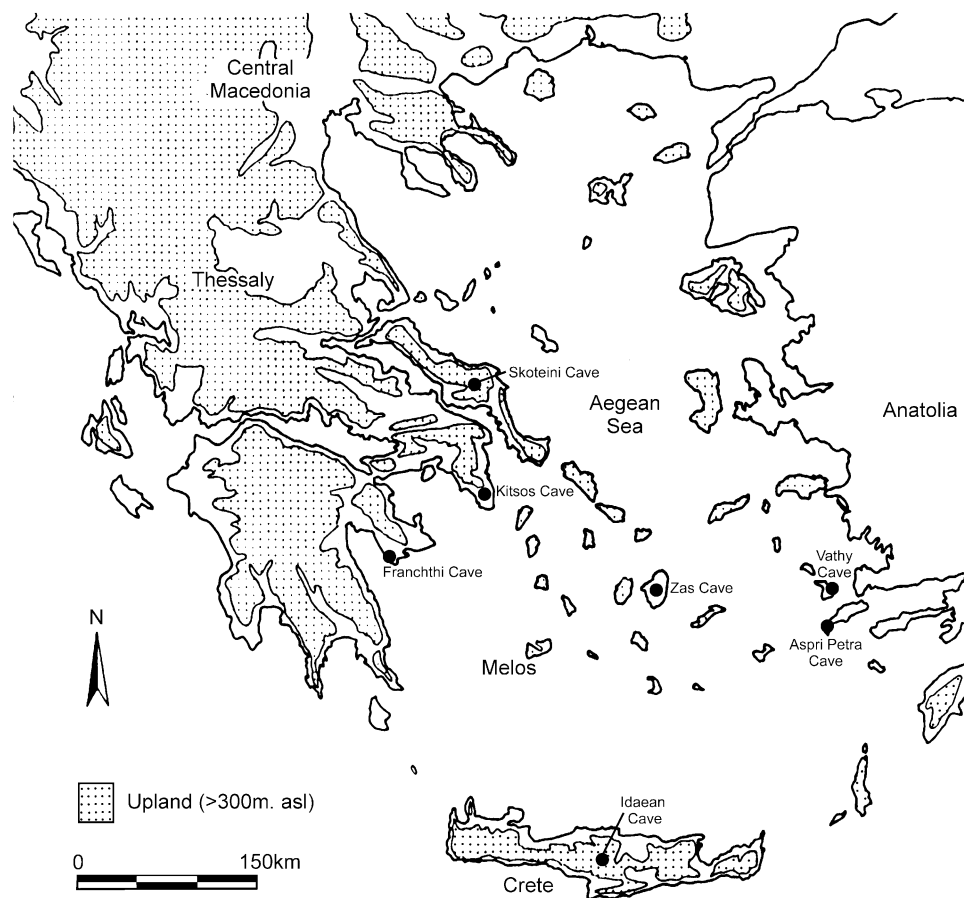


Figure 4
Early Bronze Age sites mentioned in the text.

In villages, structured forms of deposition suggest a need for direct physical concealment. While this certainly also occurs at caves, there are clear indications that many depositions, whether material or corporal, were left exposed on the surface, often for long periods. This practice enhanced the potential for the accumulation and reorganization of sets or tableaux of objects, which, in remaining visible, actively contributed to the ongoing significance of the cave. The impression gained is that objects were safe from unsanctioned removal, although not from deliberate or accidental fragmentation. In this way caves could be said to function as single depositional contexts, which, in remaining open, allowed activities to play out over different time-scales and involving multiple visits. At various times material or corporal culture could be deposited, reorganized or part/whole combinations removed to create new networks of enchainment. In this respect caves resemble pits, which were equally open to repeated access, and it may well be that a more fundamental conceptual link between the two should be noted, with both offering sub-surface, hidden contexts for ritualized deposition. Their differences in

scale would place them at opposite ends of a depositional continuum, in the middle of which would be the space of the everyday.

Liminality

Some of the most obvious differences between caves and villages concern morphology and topography. Caves are naturally formed, enclosed, dark places; villages are open-air, light, artificially built environments. Entry into a cave is an assault on the senses, encompassing dramatic changes in light, sound, smell and freedom of movement that force visitors momentarily to reorientate themselves. In some cases, such as the LN–FN Kalythies Cave (Rhodes), the sense of dislocation is further enhanced by the need to surmount physical obstacles, such as a steep rock-face, in order to gain access (Sampson 1987, 21–65, 183–4). As has already been emphasized, this quality of liminality also plays out across the wider landscape (see also Hall 1999). Neolithic caves often appear to have been deliberately selected because of their distance from the diurnal sphere and encounters with them are likely to have been infrequent and intentional. For example, during the earlier Neolithic the closest known farming village to the Cyclops Cave, situated on the barren, rocky islet of Yioura (Sampson 1999, 18), was that of Ayios Petros located on another island and in a location that furnished a water source and arable land (Efstratiou 1985; Broodbank 2000, 145–9, fig. 41). The EN–FN caves at Ayio Gala, situated on the rocky and inhospitable north-west coast of Chios (Hood 1981, 11), also currently lack a corresponding earlier Neolithic settlement on the island, although deeper excavations of lower-lying cultural material at the LN–FN open-air site of Emporio, at the opposite end of the island, might one day furnish an example (Hood 1981; 1982). Similarly the LN–FN caves of Alepotrypa and Skoteini are in arid, rocky, mountainous landscapes, close to rivers but where arable land, if available, is cultivated mainly by means of modern terraces (Sampson 1992, 61; 1993, pls. 1–4; Papathanassopoulos 1996b, 40; 1996c, 80–3). The main advantages offered by the Alepotrypa Cave are its shelter, its freshwater supply and its proximity to two sheltered beaches on the sea route around the southern tip of mainland Greece (Papathanassopoulos 1996c, 80–3). The LN–early FN Kouveleiki Caves in the southern Peloponnese are situated on a limestone cliff above an infertile plain (Karkanas 2006). In the case of Theopetra, although the cave lies close to a fertile agricultural hinterland, this appears to have been puzzlingly under-settled when compared to the rest of the Thessalian plain (Kyparissi-Apostolika 1999, 142, 144; Perlès 1999), a pattern which, if real, might reflect a liminality that was enforced rather than natural.

Exceptions to the trend towards geographical liminality include Tsoungiza, Prosymna and Franchthi, a group of earlier Neolithic caves from the north-east Peloponnese that lie next to open-air settlements (Blegen 1937; 1975, fig. 1; Cherry *et al.* 1988, 172, fig. 12; Johnson 1996, 277). Such sites seem to reflect a tradition of using caves on the periphery of a village as ritual foci, where the emphasis was placed more on the liminal qualities of the cave itself. Although all three have produced some evidence for ritualized forms of deposition (see below), the picture is best documented at Franchthi. It is generally thought that the Paralia area immediately outside the cave formed part of an EN–MN settlement now submerged beneath the Koilada Bay (e.g. Jacobsen 1981, 309; van Andel and Sutton 1987, 38–44; Wilkinson and Duhon 1991); however, its main features (i.e. terrace walls, hearths, pits, burials; Vitelli 1993, 43, 54–5, 59, 64, 70–1, 81, plans 2–18), together with the presence of EN shell bead manufacturing debris, thought to reflect a form of ritualized communal production (Miller 1996, 10–12, 23; Perlès and Vitelli 1999,

104–5; Tomkins 2004, 46–7), suggest it served as a peripheral communal arena for the settlement.³ During this period the cave itself seems to have been preferred over the Paralia as the main focus of material and corporal deposition (Jacobsen and Cullen 1981, 84–8; Vitelli 1993; 1999; Stroulia 2003), suggesting a hierarchical ordering of peripheral space.

Centrality

In many cases the significance of a cave may also have been informed by its centrality in relation to other prominent natural features in the landscape. Strikingly obvious in this regard is the Theopetra Cave, situated within the distinctive limestone rock formation that gives the site its name and dominates the surrounding landscape (Papathanassopoulos 1996a, 67, fig. 19). Kitsos lies just below the peak of Mikro Ripari and commands extensive views across south-eastern Attica and the islands of Euboia and the western Cyclades (Lambert 1981, 13–15, 689, figs. 1–4). Other examples include Zas close to the summit of Mount Zas the highest peak in the Cyclades (Zachos 1999, 153), the cave of Nestor below the rock of Palaionavarino in Messenia (Davis 1998, fig. 34), Skoteini below the rocky Plataki plateau (Sampson 1992, 61, figs. 1–3; 1993, pls. 1–4) and the Idaean Cave high on Mount Ida on Crete. Some caves, such as Skoteini, Cyclops and Alepotrypa, are also conspicuous for being the largest in their respective regions (Sampson 1992; 1999, 1). In this way some caves may have served as focal points or *axes mundi*, within wider sacred landscapes, where other natural features, such as rocks, rivers or mountains, were invested with special meanings. Cave ritual would thus have been one of the ways in which the significance of this wider cosmic landscape could have been perpetuated, contested or altered.

Neolithic caves may therefore have served as central places for interaction between familiar and outside worlds (Hall 1999), access to which shaped identities and indexed status. Outside need not simply denote the divine, but, via the equation of geographical distance with supernatural distance, may extend to include individuals and groups from distant places (Helms 1993). A feature of earlier Neolithic caves is their marked preference for locations close to the sea and along the main routes of long-range marine-based movement (Fig. 1; Broodbank 1999, 28–9, fig. 1.6; Perlès 2001, 113, n. 13, 115; Tomkins 2007b, 25, 27). Caves situated inland, such as Theopetra, appear to have been equally well located in relation to the main dry-shod pathways of regional interaction (Jacobsen 1984; Kotsakis 2005, 13). Neolithic caves may thus have been frequented as much because they were places out there on the way to elsewhere as for their distance from the domestic. Their liminal position in relation to economic resources would perhaps have granted them a neutrality that made them especially suitable locations for different communities to come together (Nakou 1995, 21–2). Gatherings could have taken place at commonly observed times of the year and could have been venues for exchange, the negotiation of status and the forging of new social relationships and identities, whether personal or communal, local or regional.

Places of investment

Once caves are viewed in such terms, the ritualized deposition of valued items of material or corporal culture becomes more easily comprehensible in terms of the special

3 Parallels for this can be found at IN–LN I Knossos, where edge-of-site communal areas, similarly testifying to a range of ritual activities, have been defined (Tomkins 2007a; 2008).

investment that often marks out sacred places (Renfrew 1985). Metal may have attracted most of the attention, but it is by no means the only object of value to occur in Neolithic cave assemblages. Several LN–FN caves (e.g. Zas, Kitsos, Alepotrypa, Theopetra) have produced finely worked spondylus shell objects, thin-walled stone bowls, beads/necklaces and/or stone ring idols (Lambert 1981, 407–19; Papathanassopoulos 1996a, nos. 30–46; Papathanasiou 2001, 25; Zachos 1996b, 140–3, 166–7; 1999, 159, fig. 13.6–8; Kyparissi-Apostolika 1999; 2000). The incidence (per excavated cubic metre) of any one of these items is notably lower at villages, even well-sampled sites. This tends to invalidate the claim (Zachos 1999, 159) that their high concentration at caves, most of which have been explored in limited soundings, is simply an artefact of a containing or concentrating effect of cave interiors on sample size.

Unfortunately, other types of artefact made from pottery, stone or bone have tended to be glossed, rather anachronistically, as domestic or utilitarian items (e.g. Sampson 1992, 95; Perlès 1992, 148–9; Zachos 1996a, 88–9; Papathanassopoulos 1996b; 1996c; Karkanis 2006). Value is not, however, an inherent property of objects, but a human judgement about them, with a high value associated with that which is esteemed as rare or difficult to access (Appadurai 1986). Access is overcome through the act of exchange, in which the value of objects is reciprocally determined and manipulated. Any object may thus be of potential high value, an insight of most significance for earlier phases of cave-use, where so-called domestic items predominate. Moreover, when closer attention is paid to the substance, source and depositional signature of these objects in caves, they reveal evidence for ritualization of a form similar to that noted for the deposition of metal.

Ceramic vessels, especially during their earliest phase of use, appear to have been rare and highly valued, their use restricted to special occasions, where they served to ritualize food consumption (Vitelli 1993, 213–16; Tomkins 2007a). Their presence in caves should therefore not be simply taken for granted, but treated as something of potential significance, especially when aspects of their deposition are considered in more detail. For example, MN or LN levels in several caves indicate the deposition of unusually high proportions of ceramic finewares, when compared to settlement contexts, suggesting a preference for more valued types inexplicable in functionalist terms (e.g. Ayio Gala Upper Cave: Hood 1981, 25, 34–5, 76, 79; Franchthi: Vitelli 1999, 11, 35, 138; Cyclops Cave: Sampson 1999, 4–8, 59, figs. 5–8). Also noteworthy are the notably higher densities of sherd material (*c.* 250–800 sherds/cubic metre; Lambert 1981, 281; Sampson 1992, 70, 74) and complete/semi-complete ceramic vessels that occur in caves, suggestive of a pattern of deliberate and highly focused deposition and accumulation. For example, the ceramic assemblages from Ayio Gala (Lower Cave) or Tsoungiza are both notable for the relatively high number of complete EN pots or profiles (Hood 1981, 14–25, 74, 77–9; e.g. nos. 9–20).⁴ At Tsoungiza 20 complete or semi-complete EN–MN vases were found in the upper part of the crevice (contexts IV–XV) and represent a phase of deposition post-dating the collapse of the cave roof (Blegen 1975, 255–6, 273–5, N1–20). At Franchthi two complete MN vessels were deposited with primary or secondary burials outside the cave (Vitelli 1993, 59, 70).

4 The early date of this group has been questioned by some (Sampson 1984, 242) and cautiously accepted by others (see Davis 1992, 726; Broodbank 1999, 30), with doubts consistently expressed regarding its correlation with other Aegean Neolithic sites. However, there are numerous close parallels for this group (and for sherd material from the lower cave) with earlier Neolithic assemblages in Greece and especially sites on the Anatolian mainland dating to the Anatolian Late Neolithic, a period broadly contemporary with the Greek Early Neolithic (*c.* 6500–5900 BC) (Furness 1956, 194–7, 208–9, figs. 12 and 16; Mellaart 1975, table I; Hood 1982, 717; Tomkins 2007b).

Numerous later Neolithic examples of this form of ceramic deposition also exist, so much so that caves disproportionately dominate the corpus of later Neolithic vessels familiar from exhibition catalogues, especially in the southern Aegean (e.g. Papathanassopoulos 1996a, nos. 4–5, 17–26, 89–90, 96–8, 125–7, 129–31, 133, 135, 146, 152–6, 166–8). Notable among these is the large group of 43 LN II–FN vessels from the Kitsos Cave (Lambert 1981, 304–16), many showing signs of structured deposition: for example, CP 20, a unique type of bowl, contained bones of hare and bird; fragments of a large vessel had been surrounded by a small circular area of paving (Lambert 1981, 83–5); and CP 24, an unusual large, relief-decorated vessel with perforated base, had been placed in a hearth on the terrace outside the cave.

Analogous to these ceramic examples are the high numbers of unbroken (e.g. c.30–40 per cent at Kitsos: Perlès 1981, 140, table 7), possibly unused (especially arrowheads, e.g. Skoteini: Perlès 1993, 490) and very high quality (e.g. Kitsos: Perlès 1981, 135; Skoteini: Perlès 1993, 490) lithic tools that occur in caves, in marked contrast to lithic assemblages at open-air sites (Perlès 1993, 491–3). The high number of unbroken tools may have been higher still, if some broken pieces were fragmented deliberately, prior to deposition, or accidentally, having originally been deposited intact. Unbroken lithic tools (e.g. arrowheads) illustrated or mentioned in preliminary reports from other caves further strengthen the case for seeing this as a widespread form of intentional deposition (e.g. Zachos 1990, 38, nos. 10–11; Papathanassopoulos 1996a, nos. 36–9). In one such example from Kitsos a rare flint arrowhead of great quality, together presumably with its shaft, appears to have been deliberately thrown into a fire (Lambert 1981, 96).

Fragmentation and accumulation

In some cases, contextual information is suggestive of deliberate fragmentation. For example, at Franchthi fragmentation has been independently argued for ceramic vessels, figurines, stone axes and even millstones (Vitelli 1993, 60; Talalay 1993, 45–6; Stroulia 2003, 24). In general, however, fragmentation remains a question rarely asked of cave assemblages and one for which satisfactory answers are currently lacking. At Kitsos mapping of the distribution of fragments from mended ceramic vessels indicated a limited degree of dispersal suggestive of breakage *in situ*, but could not determine whether this occurred at the moment of deposition or as a result of subsequent activity (Lambert 1981, 318–22, pls. xix–xxii). Nevertheless, cases where a few large fragments of a vessel are deliberately ringed with stones suggest that the breakage and removal of fragments were sometimes intentional (Lambert 1981, fig. 84). Equally suggestive is a set of fragmentary or whole objects (context 4n) which included sherds, a small polished axe and 108 polished marble beads, presumably originally from one or more fragmented necklaces, which were found scattered throughout the deposit (Lambert 1981, 75–6). At Tsoungiza additional complete ceramic vessels were suspected in the large body of mixed, stylistically homogeneous sherd material (Blegen 1975, 259); a suspicion equally valid for other cave assemblages until such time that they can be tested by more intensive refitting methodologies, capable of mapping connections within very large assemblages (Chapman and Gaydarska 2007, 71–112). We are surely entitled to wonder what forms of material manipulation such studies might reveal, if, as suggested above, caves functioned as large containers for ritual practices, gigantic versions of the pit or ditch sequences found at open-air sites. One way of reducing large cave assemblages into smaller units more amenable to refitting would be via integrated macroscopic–microscopic (petrographic) studies of fabric (e.g. Tomkins *et al.* 2004;

TABLE 2
Assemblages of human skeletal material from Neolithic caves in the Aegean

Cave	Date of sample	Total skeletal fragments	Children	Adults	Estimated minimum individuals
Tsougiza (Blegen 1975, 258, n. 17)	EN–MN	>5		•	2
Franchthi (Jacobsen and Cullen 1981; Cullen, pers. comm.)	EN–MN, LN, FN	c.4300	•	•	46
Theopetra (Kyparissi-Apostolika 1999, 149)	EN–MN		•	•	14
Skoteini (Stravopodi 1993)	LN–FN		•	•	14
Kitsos (Duday and Lambert 1981; Lambert 1981, 704–6)	LN–FN	624	•	•	18
Kalythies (Foundoulakis 1987)	LN–FN	165	•	•	20
Alepotrypa (Papathanasiou 2001, appendix II; Cullen, pers. comm.)	LN–FN	c.5400	•	•	161
Limnon (Stravopodi <i>et al.</i> 1997, fig. 77)	LN II–early FN	15	•	•	15

Tomkins in press 1). Until such studies are standard practice, one can only suspect, on the basis of the occasional more clear-cut example, that the deliberate fragmentation and accumulation of material culture was a widespread practice at cave-sites.

Rather clearer is the case for deliberate deposition and fragmentation of the human body and its curation and circulation as corporal culture. Almost all caves subjected to modern standards of excavation have produced assemblages of human skeletal material, the majority in the form of isolated, disarticulated fragments, usually mixed with other debris (Table 2). The relatively small size of each sample and the long history of cave-use suggest a significant degree of selection with archaeologically visible forms of corporal deposition very much the exception (Perlès 2001, 274). The rarity of this form of treatment and the special effort involved in placing a body in a cave suggest a link with status. This is given additional credence by the Theopetra skeletal material, which exhibits above average health and an absence of typically Neolithic pathological conditions (e.g. anaemia, malnutrition) (Kyparissi-Apostolika 1999, 149).

Examples of actual burials, such as the LN pit inhumations in the more open areas of the Alepotrypa Cave (Papathanassopoulos 1996d, 175, fig. 46; Papathanasiou 2001, 40), are generally rare. More often deposition of complete bodies or semi-articulated parts appears to occur on the surface of cave chambers (exarnation), with subsequent interventions resulting in intentional or accidental fragmentation and, in some cases, the curation of skeletal material for use in another location within or perhaps beyond the cave. For example, at MN Franchthi the unusual posture and treatment of a semi-complete skeleton of a young woman indicate intentional disarticulation, including the removal of the spinal column from the rib-cage, that is suggestive of ritualized treatment (Jacobsen and Cullen 1981, 87; Vitelli 1993, 60). At Kalythies and Kitsos studies indicate differential treatment by age: infant burials tended to be left intact within the cave, while juveniles/adults are represented mainly by the sort of small bone fragments left behind when fragmentation takes place (Halstead and Jones 1987; Duday and Lambert 1981; Lambert 1981, 704–6). At Kitsos skeletal material is sometimes calcified suggesting long exposure on the surface.

This is also known from Alepotrypa, where articulated skeletons were seen lying on the surface by its first modern visitors (Papathanassopoulos 1996c, 82, fig. 28).

In caves, the frequent juxtaposition of human skeletal material with activity surfaces and debris from the preparation and consumption of food marks an obvious contrast with village sites (see above; Triantaphyllou 1999, 128–30; 2008, 143–7). An absence of small bone fragments from settlement contexts suggests that the primary disposal of bodies took place away from domestic space, while the occasional presence of isolated fragments would appear to reflect the deliberate removal of skeletal fragments from a primary exposure site and their introduction into the realm of the living as corporal culture with its own resonant biographies and value. Although unverifiable, it is worth considering the possibility that some of the corporal culture found in settlement contexts originally came from cave-sites and vice versa.

Although recognition of intentionality in the frequently mixed deposits from caves is often far from easy, strategies of fragmentation and accumulation, analogous to those suggested for material culture, can nevertheless be glimpsed in the deposition of corporal culture at caves. In the mainly EN and MN scatters of skeletal material recovered from Franchthi, skull and lower limb fragments are significantly over-represented, suggesting special treatment (Cullen 1999, 165–70). At LN–FN Alepotrypa corporal culture is treated in a variety of different ways without any obvious signs of gender or age preference (Papathanasiou 2001, 1, 33–5). There are several examples of extensive, disarticulated accumulations of skeletal material, probably reflecting a single, collective act of reorganization focusing especially on cranial bones (Papathanassopoulos 1996d, 175–6; Papathanasiou 2001, 33; cf. also Triantaphyllou 2008, 148). Specific fragments, such as skulls, also appear to have been displayed in niches (see also Skoteini: Sampson 1992, 68) or by propping or encircling them with stones (Hourmouziadis 1973). In another case, where two children ornamented with shell beads were covered by a mass of deliberately smashed ceramic vessels (Papathanassopoulos 1996d, 176, figs. 47–9; Papathanasiou 2001, 33), the human body remains whole, while fragmentation and accumulation are played out materially.

Sometimes depositions take the form of sets of whole or fragmentary material and/or corporal culture. At Kitsos a group of brown polished vessels (CP 13, 23, 33) were found in association with a concentration of human bone (Lambert 1981, 81–8, 308, 310, 313). Just outside the Franchthi Cave, two out of four infant burials (EN?) contained an adult tooth and were surrounded by the scattered remains of a further 12 individuals (Vitelli 1993, 43, 47, n. 7; Perlès 2001, 273, n. 2); and in a MN pit the largely articulated but tightly packed remains of an adult female (Fr 59) were accompanied by a complete bowl, obsidian and bone tools (Vitelli 1993, 70; Cullen, pers. comm.). Inside the cave and associated with the MN partially fragmented skeleton mentioned above was a pit, filled with densely packed ash, carbon and many large and joining vessel fragments (Vitelli 1993, 60). Such examples suggest that the treatment and deposition of material and corporal culture at caves were interlinked ritualized practices, each drawing upon strategies of fragmentation and accumulation and standing in metaphorical relationship to the other. In this way the deployment and accumulation of parts and wholes draw attention to specific contexts within caves and mark caves out as special places in the collective conscious.

Arenas of consumption

While rich in evidence for consumption and deposition, the material record from Neolithic caves is more equivocal with regard to production. Under the influence of the

habitation hypothesis the default option has been to assume local production, wherever possible, although rarely has this been demonstrated conclusively through the presence of tools, manufacturing debris and rigorously established links to proximate raw material sources. Once the habitation hypothesis is called into question, issues of production and provenance become significantly more important, not just because of the way they introduce additional dimensions of value to the study of consumption and deposition, but also because of what they reveal about how caves functioned within wider social networks.

Ceramic assemblages from caves are often interpreted as produced by resident potters (e.g. Vitelli 1993, 207–10). Such conclusions tend to result less from analysis and geological prospection and more from assumptions regarding the utilitarian nature of ceramic vessels and their perceived unattractiveness as exchange items (e.g. Perlès 1992, 148–9) and from methodological and interpretational difficulties in characterizing and explaining Neolithic ceramic variation (Tomkins 2001, 24–31, 312–45; in press 1). Frequently ceramic assemblages from caves exhibit such a high stylistic diversity as to attract special comment (e.g. Sampson 1999, 4–8). In those rare cases where (small-scale) ceramic analyses (e.g. petrology) have been performed, stylistic diversity tends to correlate with mineralogical and technological diversity, suggesting that the ceramic vessels deposited in caves derived from diverse and sometimes very distant sources of origin. Although the EN–MN ceramics from the Franchthi Cave are conventionally viewed as produced by resident potters (Vitelli 1993, 207–10), the exemplary detail of their publication and the availability of some analytical data (Vitelli 1993, 13–19; Jones 1986, 386–402) allow alternative readings acknowledging both the absence of direct evidence for production in the cave and a diverse range of possible provenances, from the distant (island of Aegina) to the broadly local (e.g. south Argolid) (Tomkins in press 1). The LN–FN pottery from Franchthi has a notably wide range of form types and forms of decoration, with parallels at a variety of distant sites, both within southern Greece (e.g. Corinth) and beyond to the north (e.g. Thessaly) and south (e.g. Crete) (Vitelli 1999, 64–86, 88–92, 97–8; Tomkins 2007b, 29). Likewise, the LN II–FN ceramic assemblage from the Kitsos Cave has a wide range of finewares, most of which can be shown by style or fabric (petrology) to have sources at some distance from the cave, from the Cyclades to northern Greece (Lambert 1981, 275–347; Courtois 1981).

This picture of diversity and distance from source is rather clearer for the ground and chipped stone artefacts deposited in caves. Instead of exploiting local chipped stone sources, cave-users tended to favour obsidian from the distant island of Melos, overwhelmingly so in the later Neolithic (e.g. Perlès 1981; 1993, 451, 490). Given the likely high value of obsidian tools, defined as a function of their distant source and their superior performance, one is entitled to wonder whether a preference for obsidian, over local sources, is itself an example of special investment or ritualized consumption. At LN II–FN Kitsos some obsidian tool types, such as arrowheads, display such diversity in form and size as to suggest multiple producing groups, probably located beyond the cave. Lithic tools in other valued materials (jasper, brown-red flint, yellow flint) from Kitsos and Skoteini also arrived as final products, but from still more distant sources, such as Thessaly, the Adriatic or the Balkans (Perlès 1981, 135; 1993, 451–7). The EN–MN lithics from the Cyclops Cave (Yioura) similarly indicated a range of distant Thessalian and Balkan sources (Sampson 1999, 4–8). Ground stone axes and mortars, when they occur at caves, also seem to be in non-local materials and no cave has yet produced any traces of debris that might be associated with their production on-site (e.g. Kitsos: Perlès 1981, 196–9; Franchthi: Stroulia 2003, 5–9, 14–15).

Relevant also is the evidence for food production, which suggests a diverse taskscape (Ingold 1993) of activities, within which the location of the cave itself is a minority component. At Zas the great diversity of legumes and cereals and the absence of weed species are thought to indicate that domesticated crops were processed and cleaned elsewhere before being brought to the cave (Zachos 1999, 157). Suggestive also is the scarcity at caves (e.g. EN–MN Franchthi; LN II–FN Kitsos) of the stone tools conventionally associated with cereal gathering (e.g. sickles) and processing (e.g. mortars) at village sites (Lambert 1981, 102; Perlès 1981; 1988, 484). The domesticated animals that so dominate subsistence assemblages were probably slaughtered and butchered near, but probably not within caves (e.g. Kalythies: Halstead and Jones 1987, 139), and were most likely driven there for the purpose from village locations. Wild species, whether marine or terrestrial, would have been hunted or gathered elsewhere and there is evidence to suggest that at least some carcasses were butchered off-site, with only selected cuts reaching the cave (e.g. deer at Kalythies: Halstead and Jones 1987, 139).

However, it is important to be clear that certain acts of production did take place at caves. In addition to some food processing, there is evidence at EN Franchthi for shell bead production in the area just outside the cave (Paralia) (Miller 1996). Obsidian blades dominate the lithic industries at Kitsos and Skoteini and the presence of debitage suggests that at least some were flaked on-site (Perlès 1981, 136, table 5; 1993, 452). At Skoteini, these blades are diverse, technically varied and lack standardization, the debitage derives from a high number of different cores and the cores themselves are all but absent (Perlès 1993, 454–72). This suggests that obsidian cores were brought pre-formed, worked at the cave, probably by a variety of different producers, before being taken away from the site when activity in the cave ceased. Alternatively, a significant proportion of the obsidian industry may, like the pieces in flint, have not been produced at the cave (Perlès 1993, 474).

A case can be made for seeing all of these as ritualized acts of production: the production of obsidian blades at Kitsos was specific and small-scale, presumably to serve a specific activity in the cave, the nature of which remains open; the production of the occasional shell bead necklace at Franchthi was labour-intensive, communally organized and may reflect a specific, ritualized form of production (Tomkins 2004, 45–50); the processing of animal carcasses also takes on special significance, if, as has been argued, meat consumption was an infrequent, special and ritualized practice, most likely involving groups larger than a single household (Halstead 2007). Notions of the ‘wild’ versus the ‘domestic’ (Hodder 1990, 44–99), which may lie behind the very high proportion of hunted wild species consumed at some later Neolithic caves, may have rendered additional value and meaning to meat consumption.

Places of experience and understanding

It would thus appear that cave assemblages were composed of items (material, corporal, organic) that had an origin and often also a life elsewhere prior to deposition. In this sense caves were remarkably connected places, despite their liminal locations. The biographies of these items are likely to have been entwined with the lives of the people, who brought them to the cave from their village homes. Through the ritualized deployment of these objects, people made connections between the everyday and the other. More importantly they *experienced* the order of their world and their place within it through direct participation, the liminal qualities of caves making them especially suitable places to develop such perspectives on the everyday.

Much of the material record from Neolithic caves may be viewed as referencing the human body and its transformation. Most obvious is the transformation rendered by death and marked by the deposition and manipulation of body parts and wholes in caves, which seems to reflect an ongoing dialogue with the collective ancestral past (Triantaphyllou 1999; 2008, 148–9; Talalay 2004, 152–6). More subtle are transformations of the living, marked by physical alteration of the body, whether through inscription (e.g. piercing, scarification, tattooing), abridgement (e.g. shaving) or adornment (Gamble 2007, 107–9). At Kitsos the presence of bone needles, colorants (malachite) and ground stone tools with traces of colorant on them would appear to indicate technologies of corporal inscription. Traces of red pigment on a stone pestle from Zas (Zachos 1999, 159) may suggest something similar. It is worth noting also that the obsidian blades, which so dominate the lithic assemblages from caves, could have been used for scarification or shaving of the body, while the beads and pendants deposited at cave-sites might reflect the acquisition or abandonment of particular forms of identity or status in life or death.

The location of caves on prominent mountains, often credited in the anthropological and ethnographic literature as sources of life-giving water, the metaphorical connections that are frequently drawn between caves, the earth and the womb, and the frequent equation made in ritual between death and the harvest (Bradley 2005, 3–40) may have made caves particularly appropriate places for fertility rituals. Techniques for the collection of archaeobotanical material at caves have often left something to be desired (Perlès 1981, 134); however, in the case of Zas I–IIa a large ($n = 9300$) and highly diverse assemblage was recovered (Zachos 1999, 156–7). An absence of processing residues and weed species from the Zas assemblage and the general scarcity of cereal processing tools at cave-sites could reflect deliberate, ritualized deposition of crops grown, cleaned and processed at village sites. Fertility rituals could also lie behind the presence of ceramic storage vessels (pithoi) at caves, sometimes in very large quantities (e.g. >700 at Skoteini: Sampson 1992, 96–7; Alepotrypa: Papathanassopoulos 1996c, 84). The recurring phallus-imagery at several later Neolithic cave-sites, examples of which also occur in relief on the pithoi (e.g. Skoteini: Sampson 1992, figs. 24–8; Kitsos: Lambert 1981, 412, fig. 284) could also be interpreted in this light.

The wild, in the form of hunting equipment (i.e. arrowheads) and faunal assemblages, is also well represented at later Neolithic caves, but rare at open-air sites. Hunting was neither an economic necessity (Halstead 1999, 83–8) nor a dietary staple (Papathanasiou 2001, 24–6, 38–40, 44), but was most likely a restricted ritualized practice linked to status and initiation. Particularly suggestive in this regard is the presence at some caves of predatory animals and birds (e.g. jackal, wolf, lynx), together with other animals, such as stag (notably present at Kitsos in the form of butchered carcasses and collected shed antlers), which may have had symbolic or totemic qualities (Lambert 1981, 706–10; Halstead and Jones 1987).

While the significance of a cave was probably strongest in its immediate locale, scales of identity and influence seemingly varied in time and space. This is best appreciated when comprehensive and fully integrated studies of provenance have been carried out across the full breadth of a cave assemblage. For example, provenance and depositional practice at Franchthi during EN–MN suggest a broadly local focus, intimately associated with its adjacent settlement. However, once this settlement is abandoned, LN activity in the cave suggests a more regional sphere of influence (Vitelli 1999, 101–2): evidenced by an increase in finewares and a greater diversity of sources, a marked drop in the quantity of human skeletal material (Vitelli 1999, 12–15, tables 1–8), an increase in fish-bones (Vitelli 1999, 15), the near absence of local chipped stone sources and a marked increase in Melian obsidian (Perlès 1990, 36). Other later Neolithic

caves (e.g. Alepotrypa, Kitsos, Zas) may be similarly identified as regional or supra-regional arenas for the reproduction of identity and status through their rich and diverse material records (e.g. metal, shell, pottery), their nodal position within regional networks of mobility and sometimes also their extensive viewsheds and intimate association with prominent, regional landscape features.

CONCLUSIONS

Following a review of domestic hypotheses of Neolithic cave-use in the Aegean, several areas of difficulty were identified, principally an absence of adaptive logic, a lack of empirical or theoretical justification for the role of caves in subsistence production and a failure adequately to account for certain aspects of the material records from caves, such as the presence of human skeletal material, high value objects and unusual or ritualized forms of deposition. The absence of an alternative interpretative framework that might challenge the domestic model is considered to be the main reason why such difficulties have not been fully explored. Neolithic ritual in the Aegean has long suffered from problems of definition and identification, largely because of a failure to comprehend its true nature, its relationship with the domestic and, most importantly, its materiality. Drawing on recent work on ritual practice and ritualization techniques and based on a selection of the best published Neolithic cave-sites around the Aegean, a ritual model for cave-use has been developed that addresses and provides credible explanations for all aspects of Neolithic cave-use, from the selection of caves as locales for activity to the complexity and diversity of their material records. Although the study is of necessity restricted to the best published sites, there seems little reason for thinking that these are not representative of the larger body of known caves. In this way Neolithic cave-use in the Aegean may be seen to fit within a much broader pattern of ritual cave-use in the Mediterranean during the Neolithic and Chalcolithic (e.g. Malone 1985, 135–46; Whitehouse 1992).

Part of the importance of Neolithic caves lies in their liminality, expressed not just in their obvious morphological and topographical differences from the village, but often also in their spatial and temporal distance from the everyday. Caves generally lay at a distance from and were visited episodically by farming groups, whose diurnal sphere encompassed the open-air settlements, in which they resided, and the adjacent garden plots, where they practised their intensive horticulture. Caves formed focal points in this space of the outside, landmarks of long-distance movement and places of interaction between the domestic and cosmological sphere. In many cases, caves remained constants in the memory, traditions and cosmologies of people inhabiting the changing social landscapes of the Aegean between the Mesolithic and Bronze Age. The nature and content of depositional activity at caves further underline their ritual importance, revealing repeated cycles of investment using whatever currency or forms of value that were esteemed as significant at the time.

However, caves were more than just repositories of value, but served as theatres of experience and understanding. In cases where the deposition and manipulation of material and corporal culture in caves are well preserved or well recorded, a range of ritualization techniques, such as fragmentation and accumulation, may be identified, all of them in some way drawing upon and transforming the domestic and enchainning people and places across time and space. Caves seem to be places where people went in order to gain a sense of the order of their world and their place within it, to mark important transitions in their lives and to connect with other worlds. Identity and status, belonging and affiliation, fertility and livelihood, the ancestral past

and the place of the present within it, all may be glimpsed in the material records from caves. Thus far, methodologies of cave investigation have been guided by the domestic model. In order to test or refine the model presented here, new, more intensive and time-consuming methodologies of excavation, recording and study will be required. These will inevitably draw more heavily on available resources; however, hopefully in the end we may be able to weigh this against an improved understanding of the materiality of cave-use and thereby of the material and social conditions of existence during the Neolithic.

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REFERENCES

- ANGEL, J.L. 1984: Health as a crucial factor in the changes from hunting to developed farming in the eastern Mediterranean. In Cohen, M.N. and Armelagos, G.J. (eds.), *Palaeopathology at the Origins of Agriculture* (Orlando), 51–73.
- APPADURAI, A. 1986: *The Social Life of Things* (Cambridge).
- BAILEY, G.N. 1992: The Palaeolithic of Klithi in its wider context. *Annual of the British School at Athens* 87, 1–28.
- BAILEY, G.N., ADAM, E., PANAGOPOULOU, E., PERLÈS, C. and ZACHOS, K. (eds.) 1999: *The Palaeolithic Archaeology of Greece and adjacent areas, Proceedings of the ICOPAG Conference, Ioannina, September 1994* (London).
- BLEGEN, C.W. 1937: *Prosymna. The Helladic settlement preceding the Argive Heraeum, Vols. 1 and 2* (Cambridge).
- BLEGEN, C.W. 1975: Neolithic Remains at Nemea. *Hesperia* 46, 324–39.
- BOURHIS, J., CONOPHAGOS, C. and LAMBERT, N. 1981: Les métaux trouvés à Kitsos. In Lambert, N. (ed.), *La Grotte Préhistorique de Kitsos (Attique). Missions 1968–1978. Vols. I–II L'occupation néolithique les vestiges des temps paléolithiques, de l'antiquité et d'histoire récente* (Paris), 421–7.
- BRADLEY, R. 1998: *The Significance of Monuments: On the Shaping of Human Experience in Neolithic and Bronze Age Europe* (London).
- BRADLEY, R. 2005: *Ritual and Domestic Life in Prehistoric Europe* (London).
- BROODBANK, C. 1999: Colonization and Configuration in the Insular Neolithic of the Aegean. In Halstead, P. (ed.), *Neolithic Society in Greece* (Sheffield, Sheffield Studies in Aegean Archaeology 2), 15–41.
- BROODBANK, C. 2000: *An Island Archaeology of the Early Cyclades* (Cambridge).
- BRÜCK, J. 1999: Ritual and rationality: some problems of interpretation in European archaeology. *European Journal of Archaeology* 2, 313–44.
- CHAPMAN, J. and GAYDARSKA, B. 2007: *Parts and Wholes. Fragmentation in Prehistoric Context* (Oxford).
- CHERRY, J.F. 1988: Pastoralism and the role of animals in the Pre- and Protohistoric periods of the Aegean. In Whittaker, C.R. (ed.), *Pastoral economies in Classical Antiquity* (Cambridge), 6–34.
- CHERRY, J.F., DAVIS, J.L., DEMITRACK, A., MANTZOURANI, E., STRASSER, T.F. and TALALAY, L.E. 1988: Archaeological Survey in an Artifact-Rich Landscape: A Middle Neolithic Example from Nemea. *American Journal of Archaeology* 92, 159–76.

- COURTOIS, L. 1981: Etude physico-chimique des céramiques. In Lambert, N. (ed.), *La Grotte Préhistorique de Kitsos (Attique). Missions 1968–1978. Vols. I–II L'occupation néolithique les vestiges des temps paléolithiques, de l'antiquité et d'histoire récente* (Paris), 373–89.
- CULLEN, T. 1999: Scattered human bones at Franchthi Cave: remnants of ritual or refuse? In Betancourt, P., Karageorghis, V., Laffineur, R. and Niemeier, W.-D. (eds.), *MELETEMATATA: Studies in Aegean Archaeology Presented to Malcolm H. Wiener as He Enters His 65th Year* (Liège/Austin, Aegaeum 20), 165–70.
- DAVIS, J.L. 1992: Review of Aegean Prehistory I: The Islands of the Aegean. *American Journal of Archaeology* 96, 699–756.
- DAVIS, J. 1998: The Palace and its dependencies. In Davis, J. (ed.), *Sandy Pylos. An Archaeological History from Nestor to Navarino* (Austin), 53–68.
- DEMOULE, J.-P. and PERLÈS, C. 1993: The Greek Neolithic: a new review. *Journal of World Prehistory* 7, 355–416.
- DIAMANT, S.R. 1974: *The Later Village Farming Stage in Southern Greece* (Ph.D. Dissertation, Ann Arbor).
- DOUSOUGLI-ZACHOS, A. 1993: Sas-Höhle. In Pini, I. (ed.), *Corpus der minoischen und mykenischen Siegel* 5, Supplement IB (Berlin), 103–9.
- DUDAY, H. and LAMBERT, N. 1981: Remarques sur les Depots d'Ossements Humains dans la Grotte de Kitsos. In Lambert, N. (ed.), *La Grotte Préhistorique de Kitsos (Attique). Missions 1968–1978. Vols. I–II L'occupation néolithique les vestiges des temps paléolithiques, de l'antiquité et d'histoire récente* (Paris), 555–66.
- EDMONDS, M. 1999: *Ancestral Geographies of the Neolithic. Landscape, Monuments and Memory* (London).
- EFSTRATIOU, N. 1985: *Agios Petros. A Neolithic Site in the Northern Sporades. Aegean Relationships during the Neolithic of the 5th Millennium* (Oxford, BAR Int. Ser. 241).
- EFSTRATIOU, N., KARETSOU, A., BANOU, E.S. and MARGOMENOU, D. 2004: The Neolithic settlement of Knossos: new light on an old picture. In Cadogan, G., Hatzaki, E. and Vasilakis, A. (eds.), *Knossos: Palace, City, State. Proceedings of the Conference in Herakleion in November 2000* (London), 39–49.
- EVANS, J.D. 1964: Excavations in the Neolithic settlement at Knossos, 1957–60. *Annual of the British School at Athens* 59, 132–240.
- FOUNDOLAKIS, M. 1987: Neolithic Skeletal Remains from Ayios Georgios Cave at Kalythies, Rhodes. In Sampson, A. (ed.), *I Neolithiki Periodos sta Dodekanisa* (Athens), 195.
- FRENCH, C.A. and WHITELAW, T.M. 1999: Soil erosion, agricultural terracing and site formation processes at Markiani, Amorgos, Greece: the micromorphological perspective. *Geoarchaeology* 14, 151–89.
- FURNESS, A. 1956: Some early pottery of Samos, Kalimnos and Chios. *Proceedings of the Prehistoric Society* 22, 194–212.
- GALLIS, K.J. 1985: A Late Neolithic Foundation Offering from Thessaly. *Antiquity* 59, 20–4.
- GAMBLE, C. 2007: *Origins and Revolutions: Human Identity in Earliest Prehistory* (Cambridge).
- GODART, L. and TZEDAKIS, I. 1992: *Témoignages Archéologiques et Épigraphiques en Crète Occidentale du Néolithique au Minoen Récent IIIB* (Rome, Incunabula Graeca 93).
- HALL, H.K. 1999: *Ritual in Neolithic Crete* (M.Litt. Dissertation, Dublin).
- HALSTEAD, P. 1989: The economy has a normal surplus: economic stability and social change among early farming communities of Thessaly, Greece. In Halstead, P. and O'Shea, J. (eds.), *Bad Year Economics* (Cambridge), 68–80.
- HALSTEAD, P. 1994: The north-south divide: regional paths to complexity in prehistoric Greece. In Mathers, C. and Stoddart, S. (eds.), *Development and Decline in the Mediterranean Bronze Age* (Sheffield), 195–219.

- HALSTEAD, P. 1995: From sharing to hoarding: the Neolithic foundations of Aegean Bronze Age Society. In Laffineur, R. and Niemeier, W.-D. (eds.), *Politeia. Society and State in the Aegean Bronze Age* (Liège, Aegaeum 12), 11–21.
- HALSTEAD, P. 1996a: The development of agriculture and pastoralism in Greece: when, how, who, what? In Harris, D.R. (ed.), *The Origins and Spread of Agriculture and Pastoralism in Eurasia* (London), 296–309.
- HALSTEAD, P. 1996b: Skoteini, Tharrounia: The Cave, The Settlement and The Cemetery, by Adamantios Sampson. *American Journal of Archaeology* 100, 179–80.
- HALSTEAD, P. 1999: Neighbours from Hell? The Household in Neolithic Greece. In Halstead, P. (ed.), *Neolithic Society in Greece* (Sheffield, Sheffield Studies in Aegean Archaeology 2), 77–95.
- HALSTEAD, P. 2007: Carcasses and Commensality: Investigating the social context of meat consumption in Neolithic and Early Bronze Age Greece. In Mee, C. and Renard, J. (eds.), *Cooking up the Past: Food and Culinary Practices in the Neolithic and Bronze Age Aegean* (Oxford), 25–48.
- HALSTEAD, P. 2008: Between a Rock and a Hard Place: Coping with Marginal Colonisation in the Later Neolithic and Early Bronze Age of Crete and the Aegean. In Isaakidou, V. and Tomkins, P. (eds.), *Escaping the Labyrinth. New Perspectives on the Neolithic of Crete* (Oxford, Sheffield Studies in Aegean Archaeology 8), 232–60.
- HALSTEAD, P. and JONES, G. 1987: Bioarchaeological remains from Kalythies Cave, Rhodes. In Sampson, A. (ed.), *I Neolithiki Periodos sta Dodekanisa* (Athens), 135–52.
- HELMS, M. 1993: *Craft and the Kingly Ideal: Art, Trade and Power* (Austin).
- HODDER, I. 1982: *The Present Past* (Oxford).
- HODDER, I. 1990: *The Domestication of Europe* (Oxford).
- HOOD, M.S.F. 1981: *Excavations in Chios 1938–1955. Prehistoric Emporio and Ayio Gala, Vol. 1* (London).
- HOOD, M.S.F. 1982: *Excavations in Chios 1938–1955. Prehistoric Emporio and Ayio Gala, Vol. 2* (London).
- HOUMOUZIADIS, G. 1973: Tafika ethima. In Theocharis, D.R. (ed.), *Neolithiki Ellas* (Athens), 201–12.
- INGOLD, T. 1993: The Temporality of Landscape. *World Archaeology* 25(2), 152–74.
- JACOBSEN, T.W. 1981: Franchthi Cave and the Beginning of Settled Village Life in Greece. *Hesperia* 50, 303–19.
- JACOBSEN, T.W. 1984: Seasonal Pastoralism in Southern Greece: A Consideration of the Ecology of Neolithic Urfirnis Pottery. In Rice, P.M. (ed.), *Pots and Potters. Current Approaches in Ceramic Archaeology* (Los Angeles), 27–43.
- JACOBSEN, T.W. and CULLEN, T. 1981: A Consideration of Mortuary Practices in Neolithic Greece: burials from Franchthi Cave. In Humphreys, S.C. and King, H. (eds.), *Mortality and Immortality. The Anthropology and Archaeology of Death* (London), 79–101.
- JACOBSEN, T.W. and FARRAND, W.R. 1988: *Franchthi Cave and Paralia: Maps, Plans, and Sections* (Bloomington and Indianapolis, Excavations at Franchthi Cave, Greece, Fascicle 1).
- JOHNSON, M. 1996: Water, Animals and Agricultural Technology: A Study of Settlement Patterns and Economic Change in Neolithic Southern Greece. *Oxford Journal of Archaeology* 15(3), 267–95.
- JONES, A. 2005: Lives in fragments? Personhood and the European Neolithic. *Journal of Social Archaeology* 5(2), 193–224.
- JONES, G. 2005: Garden cultivation of staple crops and its implications for settlement location and continuity. *World Archaeology* 37(2), 164–76.
- JONES, R.E. 1986: *Greek and Cypriot Pottery. A Review of Scientific Studies* (Athens, Fitch Laboratory Occasional Paper no. 1).
- KARKANAS, P. 2002: Micromorphological Studies of Greek Prehistoric Sites: New Insights in the Interpretation of the Archaeological Record. *Geoarchaeology* 17(3), 237–59.

- KARKANAS, P. 2006: Late Neolithic household activities in marginal areas: the micromorphological evidence from the Kouveleiki caves, Peloponnese, Greece. *Journal of Archaeological Science* 33(11), 1628–41.
- KNAPPETT, C. in press: Meaning in miniature: semiotic networks in material culture. In Jessen, M., Johannsen, N. and Juel Jensen, H. (eds.), *Excavating the mind* (Aarhus).
- KOTSAKIS, K. 2005: Across the border: unstable dwellings and landscapes in the earliest Neolithic of Greece. In Bailey, D., Whittle, A. and Cummings, V. (eds.), *(Un)settling the Neolithic* (Oxford), 8–15.
- KYPARISSI-APOSTOLIKA, N. 1999: The Neolithic Use of the Theopetra Cave in Thessaly. In Halstead, P. (ed.), *Neolithic Society in Greece* (Sheffield, Sheffield Studies in Aegean Archaeology 2), 142–52.
- KYPARISSI-APOSTOLIKA, N. 2000: *Theopetra Cave. Twelve years of excavation and research 1987–1998* (Athens).
- LAMBERT, N. (ed.) 1981: *La Grotte Préhistorique de Kitsos (Attique). Missions 1968–1978. Vols. I–II L'occupation néolithique les vestiges des temps paléolithiques, de l'antiquité et d'histoire récente* (Paris).
- MALONE, C. 1985: Pots, prestige and ritual in Neolithic Southern Italy. In Malone, C. and Stoddart, S. (eds.), *Papers in Italian Archaeology, Vol. IV* (Oxford, BAR Int. Ser. 244).
- MELLAART, J. 1975: *The Neolithic of the Near East* (London).
- MILLER, M.A. 1996: The Manufacture of Cockle Shell Beads at Early Neolithic Franchthi Cave, Greece: A Case of Craft Specialization? *Journal of Mediterranean Archaeology* 9, 7–37.
- MUHLY, J.D. 2002: Early metallurgy in Greece and Cyprus. *Der Anschnitt. Zeitschrift für Kunst und Kultur im Bergbau* 15, 77–82.
- NAKOU, G. 1995: The cutting edge: a new look at early Aegean metallurgy. *Journal of Mediterranean Archaeology* 8, 1–32.
- NIXON, L. and PRICE, S. 2001: The diachronic analysis of pastoralism through comparative variables. *Annual of the British School at Athens* 96, 395–424.
- PAPATHANASIOU, A. 2001: *A Bioarchaeological Analysis of Neolithic Alepotrypa Cave, Greece* (Oxford, BAR Int. Ser. 961).
- PAPATHANASSOPOULOS, G.A. (ed.) 1996a: *Neolithic Culture in Greece* (Athens).
- PAPATHANASSOPOULOS, G.A. 1996b: Habitation in Caves. In Papathanassopoulos, G.A. (ed.), *Neolithic Culture in Greece* (Athens), 38–40.
- PAPATHANASSOPOULOS, G.A. 1996c: Neolithic Diros: The Alepotrypa Cave. In Papathanassopoulos, G.A. (ed.), *Neolithic Culture in Greece* (Athens), 80–4.
- PAPATHANASSOPOULOS, G.A. 1996d: Burial Customs at Diros. In Papathanassopoulos, G.A. (ed.), *Neolithic Culture in Greece* (Athens), 175–7.
- PAPPA, M., HALSTEAD, P., KOTSAKIS, K. and UREM-KOTSOU, D. 2004: Evidence for Large-scale Feasting at Late Neolithic Makriyalos, Northern Greece. In Halstead, P. and Barrett, J. (eds.), *Food, Cuisine and Society in Prehistoric Greece* (Oxford, Sheffield Studies in Aegean Archaeology 6), 16–44.
- PEATFIELD, A.A.D. 1987: Palace and peak: the political and religious relationship between palaces and peak sanctuaries. In Hägg, R. and Marinatos, N. (eds.), *The Function of the Minoan Palaces* (Stockholm), 89–93.
- PERLÈS, C. 1981: Les industries lithiques de la grotte de Kitsos. In Lambert, N. (ed.), *La Grotte Préhistorique de Kitsos (Attique). Missions 1968–1978. Vols. I–II L'occupation néolithique les vestiges des temps paléolithiques, de l'antiquité et d'histoire récente* (Paris), 129–222.
- PERLÈS, C. 1988: New ways with an old problem. Chipped stone assemblages as an index of cultural discontinuity. In French, E.B. and Wardle, K.A. (eds.), *Problems in Greek Prehistory* (Bristol), 477–88.
- PERLÈS, C. 1990: L'outillage de pierre taillée néolithique en Grèce: approvisionnement et exploitation des matières premières. *Bulletin de Correspondance Hellénique* 114(1), 1–42.

- PERLÈS, C. 1992: Systems of exchange and organization in Neolithic Greece. *Journal of Mediterranean Studies* 5(2), 115–64.
- PERLÈS, C. 1993: Les industries lithiques taillées de Tharrounia. In Sampson, A. (ed.), *Skoteini Tharrounia: to Spilaio, o Oikismos kai to Nekrotapheio* (Athens), 448–95.
- PERLÈS, C. 1999: The distribution of *Magoules* in eastern Thessaly. In Halstead, P. (ed.), *Neolithic Society in Greece* (Sheffield, Sheffield Studies in Aegean Archaeology 2), 42–56.
- PERLÈS, C. 2001: *The Early Neolithic in Greece* (Cambridge).
- PERLÈS, C. and VITELLI, K.D. 1999: Craft Specialization in the Greek Neolithic. In Halstead, P. (ed.), *Neolithic Society in Greece* (Sheffield, Sheffield Studies in Aegean Archaeology 1), 96–107.
- RAPPAPORT, R.A. 1999: *Ritual and Religion in the Making of Humanity* (Cambridge).
- RENFREW, C. 1972: *The Emergence of Civilisation. The Cyclades and the Aegean in the Third Millennium B.C.* (London).
- RENFREW, A.C. 1985: Towards a framework for the archaeology of cult practice. In Renfrew, C., *The Archaeology of Cult: The Sanctuary at Phylakopi* (London), 11–26.
- RUNNELS, C. 2001: Review of Aegean Prehistory IV: The Stone Age of Greece from the Palaeolithic to the advent of the Neolithic. In Cullen, T. (ed.), *Aegean Prehistory. A Review* (Boston), 225–54.
- SAMPSON, A. 1984: The Neolithic of the Dodecanese and the Aegean Neolithic. *Annual of the British School at Athens* 79, 239–49.
- SAMPSON, A. 1987: *I Neolithiki Periodos sta Dodekanisa* (Athens).
- SAMPSON, A. 1992: Late Neolithic Remains at Tharrounia, Euboea: a Model for the Seasonal Use of Settlements and Caves. *Annual of the British School at Athens* 87, 61–101.
- SAMPSON, A. 1993: *Skoteini Tharrounia: to Spilaio, o Oikismos kai to Nekrotapheio* (Athens).
- SAMPSON, A. 1999: The Neolithic and Mesolithic Occupation of the Cave of Cyclope, Youra, Alonnessos, Greece. *Annual of the British School at Athens* 94, 1–22.
- SCHIFFER, M.B. 1987: *Formation Processes of the archaeological record* (Albuquerque).
- STEVANOVIĆ, M. 1997: The Age of Clay: The Social Dynamics of House Destruction. *Journal of Anthropological Archaeology* 16, 334–95.
- STRAVOPODI, E. 1993: An anthropological assessment of the human findings from the cave and the cemetery. In Sampson, A. (ed.), *Skoteini Tharrounia: to Spilaio, o Oikismos kai to Nekrotapheio* (Athens), 378–91.
- STRAVOPODI, E., MANOLIS, S.K. and NEROUTSOS, A. 1997: Meleti tou anthropinou skeletikou ulikou apo to spilaio Limnon. In Sampson, A. (ed.), *To Spilaio ton Limnon sta Kastria Kalavryton* (Athens, Society of Peloponnesian Studies no. 7), 456–82.
- STROULIA, A. 2003: Ground stone celts from Franchthi Cave. *Hesperia* 72, 1–30.
- TALALAY, L. 1993: *Deities, Dolls and Devices: Neolithic Figurines from Franchthi Cave* (Bloomington and Indianapolis, Excavations at Franchthi Cave, Greece, Fascicle 9).
- TALALAY, L. 2004: Heady Business: Skulls, Heads and Decapitation in Neolithic Anatolia and Greece. *Journal of Mediterranean Archaeology* 17(2), 139–63.
- TILLEY, C. 1994: *A Phenomenology of Landscape: Places, Paths and Monuments* (London).
- TOMKINS, P. 2001: *The Production, Circulation and Consumption of Ceramic Vessels at Early Neolithic Knossos, Crete* (Ph.D. Thesis, Sheffield).
- TOMKINS, P. 2004: Filling in the ‘Neolithic Background’: Social Life and Social Transformation in the Aegean Before the Bronze Age. In Barrett, J.C. and Halstead, P. (eds.), *The Emergence of Civilisation Revisited* (Oxford, Sheffield Studies in Aegean Archaeology 5), 38–63.

- TOMKINS, P. 2007a: Communitality and Competition. The Social Life of Food and Containers at Aceramic and Early Neolithic Knossos, Crete. In Mee, C. and Renard, J. (eds.), *Cooking up the Past: Food and Culinary Practices in the Neolithic and Bronze Age Aegean* (Oxford), 174–99.
- TOMKINS, P. 2007b: Neolithic: Strata IX–VIII, VII–VIB, VIA–V, IV, IIIB, IIIA, IIB, IIA and IC Groups. In Momigliano, N. (ed.), *Knossos Pottery Handbook. Vol. I Neolithic and Bronze Age (Minoan)* (London, British School at Athens Special Studies 14), 9–48.
- TOMKINS, P. 2008: Time, Space and the Reinvention of the Cretan Neolithic. In Isaakidou, V. and Tomkins, P. (eds.), *Escaping the Labyrinth. New Perspectives on the Neolithic of Crete* (Oxford, Sheffield Studies in Aegean Archaeology 8), 22–51.
- TOMKINS, P. in press 1: Re-configuring macroscopic and microscopic forms of analysis in the study of Greek Neolithic ceramics. In Day, P.M. and Quinn, P.S. (eds.), *Analytical Approaches to Prehistoric Ceramics: Technologies and Exchange in the Aegean* (Oxford, Sheffield Studies in Aegean Archaeology).
- TOMKINS, P. in press 2: Ritual, Identity and Memory. Re-thinking Cave-Use on Crete between the Neolithic and Early Bronze Age. In Moyes, H. (ed.), *Journeys into the Dark Zone. Cross Cultural Perspectives on the Ritual Use of Caves* (Colorado).
- TOMKINS, P., DAY, P.M. and KILIKOGLU, V. 2004: Knossos and the Early Neolithic Landscape of the Herakleion Basin. In Cadogan, G., Hatzaki, E. and Vasilakis, A. (eds.), *Knossos: Palace, City, State. Proceedings of the Conference in Herakleion in November 2000* (London), 51–9.
- TRIANAPHYLLOU, S. 1999: Prehistoric Makriyalos: a story from the fragments. In Halstead, P. (ed.), *Neolithic Society in Greece* (Sheffield, Sheffield Studies in Aegean Archaeology 2), 128–35.
- TRIANAPHYLLOU, S. 2008: Living with the Dead: a Re-Consideration of Mortuary Practices in the Greek Neolithic. In Isaakidou, V. and Tomkins, P. (eds.), *Escaping the Labyrinth. New Perspectives on the Neolithic of Crete* (Oxford, Sheffield Studies in Aegean Archaeology 8), 139–57.
- TRINGHAM, R. 2005: Weaving house life and death into places: a blueprint for a hypermedia narrative. In Bailey, D., Whittle, A. and Cummings, V. (eds.), *(Un)settling the Neolithic* (Oxford), 98–111.
- VAN ANDEL, T.H. and SUTTON, S.B. 1987: *Landscape and People of the Franchthi Region* (Bloomington and Indianapolis, Excavations at the Franchthi Cave, Greece, Fascicle 2).
- VITELLI, K.D. 1993: *Franchthi Neolithic Pottery: Classification and Ceramic Phases 1 and 2* (Bloomington and Indianapolis, Excavations at the Franchthi Cave, Greece, Fascicle 8).
- VITELLI, K.D. 1999: *Franchthi Neolithic Pottery. Vol. 2 The Later Neolithic Ceramic Phases 3 to 5* (Bloomington and Indianapolis, Excavations at the Franchthi Cave, Greece, Fascicle 10).
- WATROUS, L.V. 1982: *Lasithi, A History of Settlement on a Highland Plain in Crete* (Princeton, Hesperia Supplement 18).
- WATROUS, L.V. 1996: *The Cave Sanctuary of Zeus at Psychro. A Study of Extra-Urban Sanctuaries in Minoan and Early Iron Age Crete* (Liège/Austin, Aegaeum 15).
- WEINBERG, S.S. 1970: The Stone Age in the Aegean. In Edwards, I.E.S., Gadd, C.J. and Hammond, N.G.L. (eds.), *Cambridge Ancient History. Vol. I Part 1 Prolegomena and Prehistory* (Cambridge), 557–618.
- WHITEHOUSE, R.D. 1992: *Underground Religion. Cult and Culture in prehistoric Italy* (London, Accordia Research Institute Specialist Studies on Italy).
- WICKENS, J.M. 1986: *The archaeology and history of cave use in Attica, Greece from Prehistoric through late Roman times* (Ph.D thesis, Indiana).
- WILKINSON, T.J. and DUHON, S.T. 1991: *Franchthi Paralia. The Sediments, Stratigraphy, and Offshore Investigations* (Bloomington and Indianapolis, Excavations at Franchthi Cave, Greece, Fascicle 6).
- ZACHOS, K. 1990: The Neolithic period in Naxos. In Marangou, L. (ed.), *Cycladic Culture. Naxos in the 3rd Millennium BC* (Athens), 29–38.
- ZACHOS, K.L. 1996a: The Zas Cave. In Papathanassopoulos, G.A. (ed.), *Neolithic Culture in Greece* (Athens), 88–9.

ZACHOS, K.L. 1996b: Metallurgy. In Papathanassopoulos, G.A. (ed.), *Neolithic Culture in Greece* (Athens), 140–3.

ZACHOS, K.L. 1999: Zas Cave on Naxos and the Role of Caves in the Aegean Late Neolithic. In Halstead, P. (ed.), *Neolithic Society in Greece* (Sheffield, Sheffield Studies in Aegean Archaeology 2), 153–63.

ZACHOS, K. 2007: The Neolithic Background: A Reassessment. In Day, P.M. and Doonan, R.C.P. (eds.), *Metallurgy in the Early Bronze Age Aegean* (Oxford, Sheffield Studies in Aegean Archaeology 7), 168–206.