
Chapter 23

The Consumption of Obsidian in the Early Bronze Age Cyclades

Tristan Carter

To R.C. Bosanquet for his remarkable insight and Robin Torrence for setting the bar so high.

Introduction

This paper focuses on what I consider to be five significant themes concerning the consumption of obsidian in the later Neolithic and Early Bronze Age Cyclades/southern Aegean, namely:

1. sourcing studies;
2. interpreting the Late Neolithic–Early Cycladic shift in obsidian technology;
3. locating the adoption of pressure-flaked blade technology, temporally and contextually;
4. deconstructing EC pressure-flaked blade technology;
5. the nature of the procurement and exchange of Melian obsidian in the EBA.

These are obviously substantial topics in their own right, whereby this paper necessarily represents a précis of current thoughts and debates.

Sourcing studies

Melos was the primary source of obsidian exploited by prehistoric Aegean communities — case closed?

Obsidian provenance studies arguably represent one of the great success stories of archaeometry (Henderson 2000, 305–15; Cauvin *et al.* 1998; Shackley 1998). In an Aegean context it took Renfrew and others less than 20 years to discriminate each of the local and surrounding sources (Shelford *et al.* 1982), yet since the publication of *Island Polity* in 1982 (Renfrew & Wagstaff 1982), disappointingly few characterization studies have been published from the region (Carter 2003, 75). It might be argued that this is due to the received impression that aside from a few pieces of Anatolian and Carpathian exotica (e.g. Kilikoglou *et al.* 1996; Panagiotaki 1998, 180, fn. 59), Melos was the major supplier of obsidian throughout the pre-

historic Aegean; end of story. This might indeed be the case; however there is much within this field of research that requires critical reappraisal, and many questions that remain to be asked of our material. Most importantly we have to remind ourselves that there are two sources on Melos: Sta Nychia and Dhemenegaki. Do we assume that they were used simultaneously, quarried by the same communities, their raw materials travelling in the same directions and consumed in the same manner? New studies at NCSR Demokritos (National Centre for Scientific Research, Demokritos) are suggesting that in fact there were major regional and chronological distinctions in these sources' exploitation. In Crete for example, we are beginning to get the impression that during the Neolithic Dhemenegaki was the primary source exploited, as for example indicated by recent work by Moundrea-Agrafioti and Kilikoglou at EN Knossos (Efstratiou *et al.* 2004), with procurement shifting to Sta Nychia in the Bronze Age, perhaps within EB I, as suggested by recent analysis of obsidian from Poros-Katsambas (Kilikoglou pers. comm.). Another study focusing on EM I–LM IIIB Mochlos (126 samples), MM IB–IIB Quartier Mu, Malia (60 samples) and LM IIIA–B Quartier Nu, Malia (36 samples) indicates clearly that the overwhelming majority of obsidian being used by these BA communities derived from Sta Nychia (Carter & Kilikoglou 2007). This pattern is repeated at Phaistos and Haghia Triada (26 samples) where the Neolithic samples were all provenanced to Dhemenegaki, while most of the pieces from BA contexts had trace-elemental signatures corresponding to the Sta Nychia source (Karydas *et al.* 2003).

But why should a differential use of these two sources matter? After all, they are located on the same island, their exploitation involving much the same distance, effort, skill and danger for anyone coming from beyond Melos. My response to this question lies in my belief that ultimately we have to appreciate that

the procurer's choice of quarry was a cultural one, drawing on a range of experience and knowledge that included not only the practicalities of how to cross the land and sea, but also a conceptual framework of 'how things should be' based on a variety of cultural constructs. When considering the issue of raw material procurement, the lithic analyst's mindset has traditionally been informed by such concerns as fracture mechanics, sharpness, nodule size, availability and ease of access (cf. Ericson & Purdy 1982; Torrence 1986; Inizan *et al.* 1992, 15–20). However, there is a growing body of ethno-historical literature suggesting that for many societies (small-scale to state level) these 'practical' concerns are often subsumed, or completely overridden by, quite different matters, such as a stone's ancestral, cosmological or totemic powers, its colour and brilliance (Gould 1980, 141; Aufrère 1991; Taçon 1991; Decourt 1998; Saunders 2001). As such, we might start to wonder whether any of our lithic industries employed one of the Melian sources to the exclusion of the other and what possible reasons may have lain behind the knappers' choices. Perhaps only the obsidian from Dhemenegaki was associated with the hunting magic appropriate for making projectiles? Maybe the long EC necrolithic blades (Carter 2007) could only have been fashioned from Sta Nychia obsidian due to its being the only quarry with large enough angular nodules? Sourcing studies also offer potential insights as to contemporary spheres of interaction and socio-political relations. We have to consider whether different communities employed different obsidians based on their participation in different exchange networks. For example, did Phylakopi exploit both quarries? Might we see the renewed interest in using Dhemenegaki in LM III Crete (Carter & Kilikoglou in prep.) reflect contemporary changes in the Melian political landscape with the establishment of the acropolis site at Agios Spyridon in the western half of the island (Cherry 1982b, 306), a possible rival to Phylakopi? Finally, could one consider the apparent change in Cretan procurement strategies towards the end of the Neolithic a reflection of new maritime technology that led to different ways of traversing the Aegean?

Future characterization studies should thus aim to provide a clearer and more subtle insight into the history of use of the two Melian obsidians, considering their consumption by region, site, technology, time period and context (domestic/funerary/ritual). It is imperative however, that such analyses employ sampling strategies that are statistically significant and furthermore provide us with information as to the sample's technical and typological details (including an illustration!) and its exact archaeological findspot (cf. Carter *et al.* 2005a; Carter & Kilikoglou 2007). Fur-

thermore, we need to develop a far more integrated relationship between archaeometry and archaeology. I would argue that it is only after one has undertaken a full 'traditional' technological and typological analysis and gained an in-depth understanding of an assemblage, that one is justified in selecting samples for sourcing. For instance, there has long been a tradition in obsidian provenience studies to select relatively insignificant knapping debris for export to laboratories, based largely on the bureaucracy that binds most archaeologists, i.e. one is not permitted – quite rightly – to undertake destructive analysis of museum-quality finds. I recently followed this tradition in choosing obsidian from Çatalhöyük in central Anatolia to be sent for analysis (Carter *et al.* 2005a), setting aside a group of samples dominated by relatively inconspicuous pieces of debris. While these flakes were selected carefully on the basis of their date, context, colour and texture, it remained that many were technologically undiagnostic, i.e. that one would be hard-pressed to assign them to just one of our many industries (Carter *et al.* 2005b). With hindsight, I appreciate that such an approach is flawed and that I should have targeted samples that could have been related directly to our various lithic traditions, a sampling strategy subsequently employed for the recent analyses of Cretan material (Carter 2003; Carter & Kilikoglou 2007). The amount of time and money spent undertaking a sourcing project is not insignificant, from the selection of the obsidian, its recording and illustration, via the paperwork associated with exporting the material, the time expended in sample preparation, the running costs of the instrumentation, to the analysis and presentation of the data. As such we shoulder a great responsibility in making sure that the intellectual return on this investment is maximized.

Interpreting the LN–EC shift in obsidian technology

Why do the projectiles and scrapers of the Saliagos Culture disappear?

A diagnostic feature of chipped stone assemblages from the LN Cyclades and mainland is a range of implements relating to hunting and/or warfare, including the relatively common tanged arrowheads (usually obsidian) and the markedly rarer flat-based spearheads (usually flint), plus scrapers and boring implements that were likely used to work animal skins (Evans & Renfrew 1968, 46–62; Cherry 1979, 34, fig. 4; Cherry & Torrence 1984; Perlès 1981, 1994; Carter & Ydo 1996, 151–7, 164–5). By the EBA these distinctive retouched pieces had disappeared, replaced by a largely unmodified prismatic blade industry (Cherry & Torrence 1984, 17–22; van Horn 1980). As detailed

by Torrence (1979) and Perlès (1984; 1990b), this typological shift represents part of a deeper structural change in how obsidian was being consumed during this time in the Cyclades and southern mainland, with pressure-flaking replacing indirect percussion as the dominant mode of blade manufacture. Explaining this technological change has been problematic. The claim by Torrence (1986, 136) that pressure-flaking technology was adopted as an economizing measure (following Sheets & Muto 1972) to offset the increased 'cost' in raw material procurement due to the rising demand for obsidian in the EBA is contentious given that these changes occur at a time of population growth in the Cyclades (Cherry 1981; 1982a), which theoretically should have resulted in greater quantities of obsidian being put into circulation. Indeed, Torrence (1986, 13–15, 135–6) herself had argued that the increased consumption of obsidian in the LN mainland was due to the islands' colonization. Moreover, such a model fails to explain why an economizing measure should have been adopted by those living in the Cyclades themselves (not least the EBA knappers of Phylakopi), given Torrence's contention that the Melian quarries were openly accessible, i.e. not under any form of control, nor restriction (Torrence 1986, 214–15).

I would suggest that we should instead consider the radical differences between LN and EBA chipped stone industries in the light of incipient metallurgy. Here I am not advocating that the change in obsidian technology represented a response to the introduction of superior copper tools, as arguably there is little functional overlap between the two technologies; obsidian is razor sharp but fragile, while copper is duller but much stronger. As such, the emergence of copper technology might be considered as more of a threat to obsidian-working in terms of its symbolic capital, with certain factions gaining privileged access to the practice of metallurgy as a means of establishing new, competing claims to social distinction. Here we return to the chipped stone arrow- and spearheads of the later Neolithic Cyclades and mainland and their role in the creation and maintenance of power in the world before metals.

With a proportion of our Aegean projectiles being highly stylized in form (Perlès 1981, 175–86), or made from exotic resources such as honey flint (D. Keller pers. comm.), or imported ready-made from as far away as the Balkans (Carter & Ydo 1996, 156–7, ill. 18.9a), it seems fair to suggest that their ownership, display and use imparted status (Perlès 1992, 143), as indeed would the practice (performance) of hunting and warfare more generally (cf. Helms 1993, 153–7; Keeley 1996, 159–60). Previous discussions have tended to view Cycladic projectiles in primarily eco-

nomic terms, used to spear tunny (Evans & Renfrew 1968, 58) or kill the occasional wild animal to supplement the diet of those otherwise reliant upon sheep and goat. It is time to reconfigure the significance of hunting in the later Neolithic islands and to raise the profile (spectrum) of inter-group conflict.

In terms of subsistence practices, the importance of tunny fishing has since been re-evaluated and downplayed (Gamble 1979), while only limited evidence exists for the exploitation of terrestrial wild animals at this time (Broodbank 2000a, 85, 148). While hunting may not have played a major role in the everyday diet of the later Neolithic islanders, this is not to claim that the practice was unimportant, far from it. Socially there may have been much to gain from participating in the hunt, the performance of the chase and kill as a form of skilled behaviour that for many societies has 'long informed the formal qualities of leadership and political influence' (Helms 1993, 153). One might also think of when, where and how these animals were consumed. At which events might these beasts' skulls have been displayed, their skins worn or their flesh eaten? What meanings and memories would have been evoked by the distinctive tastes, smells and textures from such an exclusive repast (cf. Hamilakis 2002c) and what status would have been accorded those who experienced them? For the later Neolithic Cyclades we now have a clear indication of hunting's importance through the rock art of Strofílas, with its depiction of deer, wolves and jackals being hunted (Televantou this volume, Chapter 6), a set of images that likely form part of a far broader Aegean (Mediterranean/Balkan) iconography of the hunt and conflict during the fifth and fourth millennia BC (Papoutsakis 1972; Bradley *et al.* 2001, 507–14, figs. 16.17–20; Monks 1997, 25).

Turning to warfare, it might be naïve of us to draw too strong a distinction between animals and humans as forms of desirable quarry (albeit occupying different contexts), their capture/defeat/slaying a means through which the hunter-warrior might achieve status via their display of bravery, tenacity, strength, cunning and skill. The topic of war in Neolithic/prehistoric Europe has been the recent focus of attention (Keeley 1996; Monks 1997; Laffineur 1999), with one author suggesting that the increased volume and longer-distance movement of goods during the later Neolithic might in part be a result of warfare and plunder (Chapman 1999, 122). In a Cycladic context one might also point to the increased human activity in the islands at this time, with the sources of obsidian, copper, silver and emery representing potential arenas of inter-group meeting and conflict. One could further conceptualize stress and violence in the context of relations between

existing population and incoming settlers, though one should be careful not to exceptionalize the Cycladic setting, given that the manufacture of obsidian and flint projectiles is a pan-Aegean phenomenon (though Crete remains poorly documented). While our stone arrows and spearheads provide tantalizing (circumstantial) evidence for later Neolithic warfare, far more revealing are the recently excavated FN fortified settlements of Strofilas on Andros (Televantou this volume, Chapter 6) and Spata in nearby Attica (also referred to as EH I: Steinhauer 2001, 31–3; Georgopoulos *et al.* 1999), which in turn represent part of an Aegean-wide group of later Neolithic defended sites (Kokkinidou & Nikolaidou 1999; Nowicki 1999).

We now return to the question of how incipient metallurgy acted as one of the driving forces behind the changes in chipped stone tool production during the LN–EB periods. It is during the LN/FN that we witness the first major developments in Aegean metallurgy (Nakou 1995, 3–9; Zachos 1996a), yet despite the aforementioned significance of hunting and warfare, it is quite striking that copper was not used to make projectiles, nor anything else that one could readily associate with the paraphernalia of the hunter-warrior as described above. Instead, metalwork makes its first appearance primarily as items of adornment, i.e. acting as a new ‘vehicle for display’ (Renfrew 1986, 152), together with a variety of tools such as awls and flat axes (Zachos & Dousougli 1999). This early use of metals in the Aegean essentially mimics what we see throughout the later Neolithic Balkans, former USSR and beyond (cf. Nikolova 1999, 287–308; Chernykh 1992, 26–53; Renfrew 1986), with only the rarest occurrence of copper spears — as for example in the famous Tomb 43 at Varna, Bulgaria (Ivanov & Avramova 2000, 52, no. 8). I would thus suggest that the later Neolithic Aegean (and beyond) witnessed the emergence of different factions employing distinct and competitive power strategies. It is not quite so simple as to suggest an opposition between violent warrior-hunters and peaceful pin-wearing dandies, because we also have the introduction of the copper dagger and the shaft-hole axe into the LN Aegean (Nakou 1995, 9–13; Zachos & Dousougli 1999, 966, pl. 234a, f–g, i–j), though one appreciates that these weapons involve a far more individualized performance of violence, i.e. one-on-one duelling, quite different to the type of group conflict indicated by the use of stone projectiles (Keeley 1996, 49–55; Chapman 1999, 124–35).

Given that there seems to be no major change in the ecology and economic base for those living in the Cyclades from the LN to the EBA (Gamble 1979; Broodbank 2000a, 81–5), it can be argued that the disappearance of the lithic hunting-warfare paraphernalia

indicates that the new power strategy prevailed. The apparent demise of these once meaningful practices forms parts of a far wider suite of changes in the societies of the southern Aegean, perhaps best characterized as a shift in emphasis from the corporate body to the individual body. This is witnessed both physically and conceptually (Carter 2002), as evidenced not only with regard to new forms of violence, but also changes in burial practices, ways of living (Broodbank 2000a, 247–9) and the form and role of anthropomorphic figurines (Carter in press b).

Locating the adoption of pressure-flaked blade technology, temporally and contextually

Can obsidian blade technology still be used as a chronological index?

Data generated by survey and excavation over the past 20 years have served to complicate previous claims concerning the chronological implications of distinct obsidian blade technologies in the Cyclades. It had been argued that in the islands knapping blades by the indirect percussion method was characteristic of a later Neolithic date (Torrence 1979; Cherry & Torrence 1984; Pérles 1990b), as represented most clearly by the assemblages from LN Saliagos and FN Kephala (Evans & Renfrew 1968; Coleman 1977a). In contrast, pressure-flaking was perceived as a technological index of the Cycladic EBA, having been recorded from the basal levels at Phylakopi in association with pottery of the Pelos group (Cherry & Torrence 1984, 20).

Two important data sets now challenge these alleged techno-chronological correlations. Firstly, at the Zas Cave on Naxos, pressure-flaking appears first during the FN (Zachos 1990, 31), while secondly, the 1989 Melos survey recovered considerable evidence to show that indirect percussion remained the primary technique of blade manufacture for many Melian communities up to and including EB II (including Agios Nikolaos, Agios Panteleimon, Agios Theodoros, Kato Komia, Mavrogremna, Pelos Pyrgaki, Provotas and Spathi) (Figs. 23.1, 23.2), despite the fact that their contemporaries at the north coast sites of Phylakopi, Kaminia and Mandrakia, were using the ‘new’ technology (Carter 1999, chap. four; in press a) (Fig. 23.3). These data suggest that we can no longer rely on obsidian blade industries *alone* as means of dating an archaeological horizon, or a surface assemblage recovered by survey.

In order to interpret why these two industries should have been performed in tandem on EC II Melos, one has to shift again from considering lithic technology in purely economic, or utilitarian terms and accord the practice its social context. As with the

aforementioned case of metallurgy, the introduction of pressure-flaked blade technology into the Cyclades (probably from the mainland) arguably offered certain groups of people in island society a new form of social currency, through their exclusive performance of, or control over, this new and exotic technology and their consumption of its distinctive end products (cf. Carter 1994). As noted above, the introduction of pressure-flaked blade technology in the islands has largely been conceptualized in terms of economizing practices (Torrence 1986, 136), yet one should never underestimate the potential symbolic capital of foreign knowledge and crafting skills (Helms 1988; 1993). While Torrence (1986) focused on raw material as a means of elucidating the 'value' of the working and exchange of obsidian in the EBA Cyclades (attributing it little socio-economic significance: Torrence 1986, 97, 119), I would argue that it was access to technical know-how, not the raw material itself that was of the greatest importance. Throughout the southern Aegean, the evidence from survey and excavation alike suggests that preferential access to pressure-flaked blade technology consistently represented one of the means through which certain communities (or members thereof) were able to create, maintain and express their social distinction, from Knossos, via Lerna, Agios Kosmas and Manika, to the 'trader sites' of the Cyclades (Carter 1994; 1999). To my mind, it is thus far from coincidental that we find some of the earliest evidence for the consumption of this technique at the Zas Cave, given the existing evidence we have for 'a striking array of prestige or symbolic objects' from the habitation, data that suggests the site (community) played an important role in contemporary island political geography (Broodbank 2000a, 164–5; Zachos 1996b).

Similarly, one might consider the early appearance of pressure-flaking at Phylakopi, as a reflection of one of the means through which the settlement gained its pre-eminent status in Melos and became one of the major players of the EBA Cyclades (Broodbank 2000a, 220–21; Carter in press a) through gaining its own 'attached specialists' (cf. Clark & Parry 1990, 298–9). How this occurred is another matter. Arguably the likeliest means through which such a skilled technology could have been introduced into an island community is via the movement of knowledgeable

(foreign) individuals (cf. Brodie 1997, 307), through intermarriage, exchange, coercion or a form of long-term patronage (cf. Helms 1993, 33–5).

Deconstructing EC pressure-flaked blade technology

Can regional and chronological knapping traditions be discerned within the Cycladic pressure-flaked blade industry?

It has long been acknowledged that, during the Bronze Age, Melian obsidian was exploited *primarily* (see above) for the manufacture of pressure-flaked prismatic blades in the Cyclades, mainland and Crete (Torrence 1979; 1986; van Horn 1980; Evely 1993, 119–41). In turn, it has also been apparent for quite some time that variability can be discerned amongst these pressure-flaked industries, on the basis of core/product size, and how a nucleus was prepared, initiated, reduced and rejuvenated (Perlès 1984; 1992, 139; Torrence 1985, 470). While some of these technical distinctions might be seen within a single assemblage, as for example the four major types of platform preparation noted among the cores and blades of the Phylakopi 'workshop' (Torrence 1986, 160–62), it is also clear that some of these traditions enjoyed quite specific chronological, geographical and contextual associations (Carter 1998, 71; 1999; 2004). In the Cyclades I have argued for the late EB I emergence of a new type of pressure-flaked blade production dedicated to making particularly

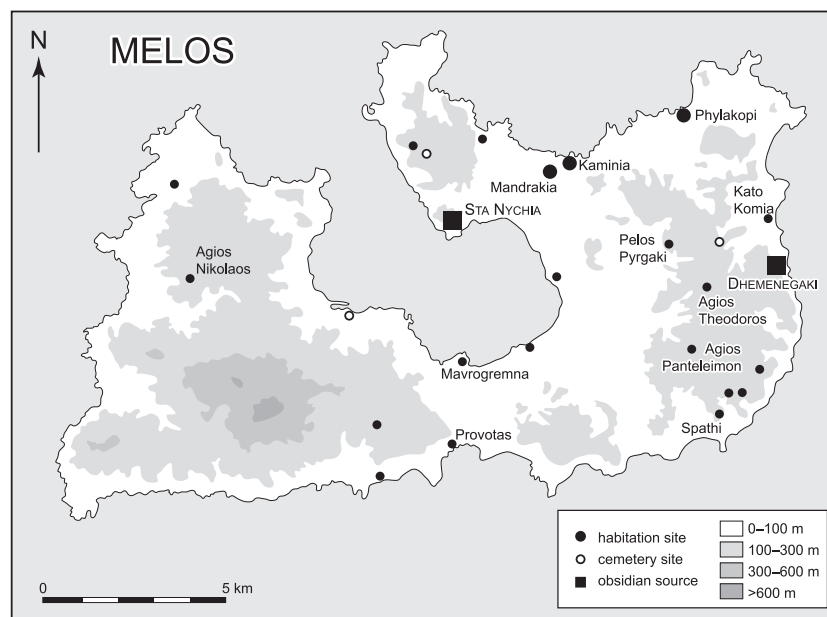


Figure 23.1. Map of Early Cycladic Melos. (Illustration: A.B. Carter and D. Kemp.)

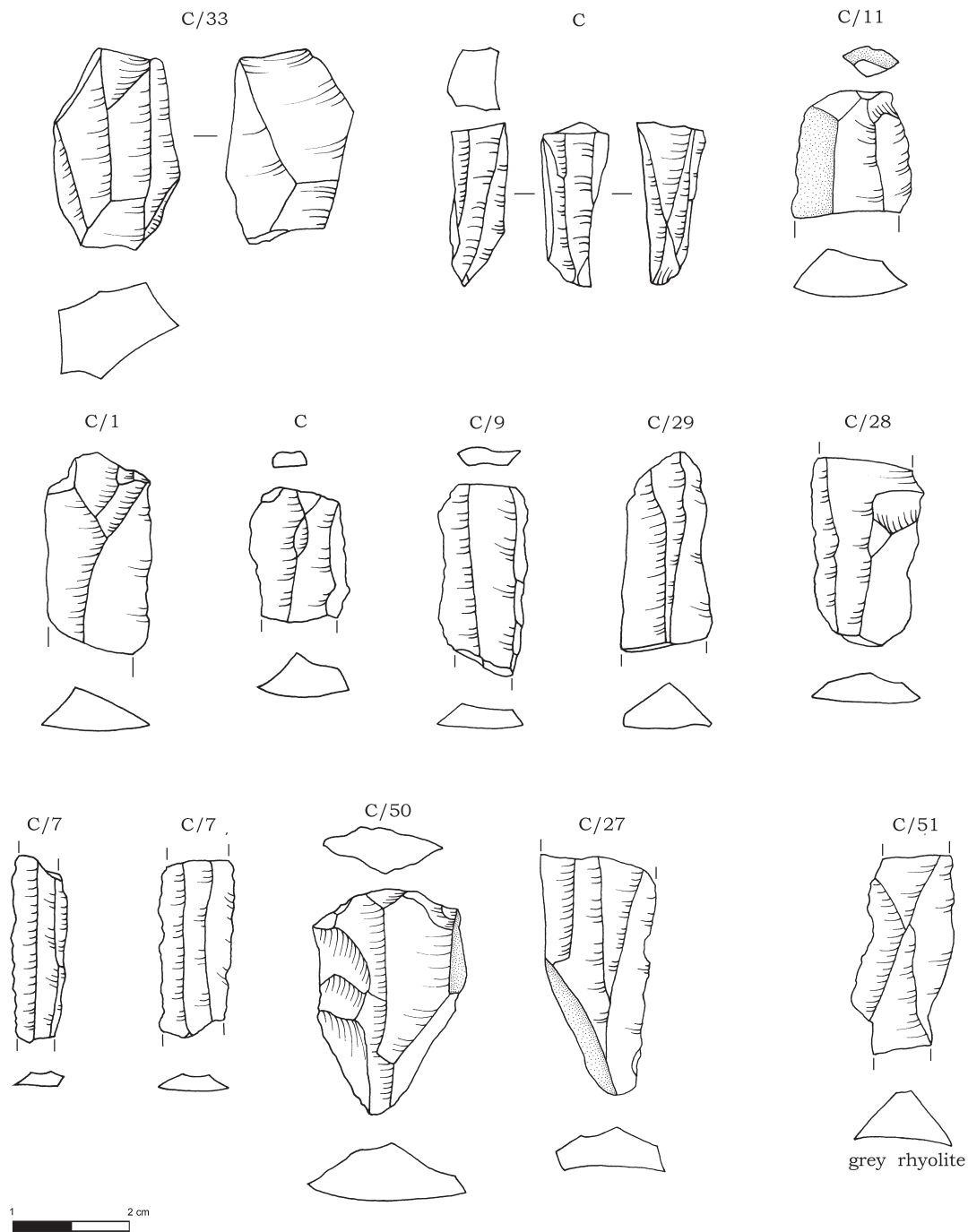


Figure 23.2. Percussion technology obsidian blades from the EC II site of Provotas, Melos. (Illustration: M. Milić.)

long blades, significantly longer than their domestic counterparts, a technique that was *developed for*, and *restricted to*, the burial arena and thus referred to as the ‘necrolithic’ (Carter 2007). This mode of ‘conspicuous production’ (Clark & Parry 1990, 293) was responsible for the manufacture of numerous blades over 10 cm

long (Carter 1998, 69, table 4.4), while some from the rich early EB II cemetery of Aplomata on Naxos exceed 20 cm (Televantou 1990, 76, pl. 63), the longest obsidian blades in Aegean prehistory (Fig. 23.4). We should not however, be thinking simply about a distinction between domestic and funerary pressure-flaked

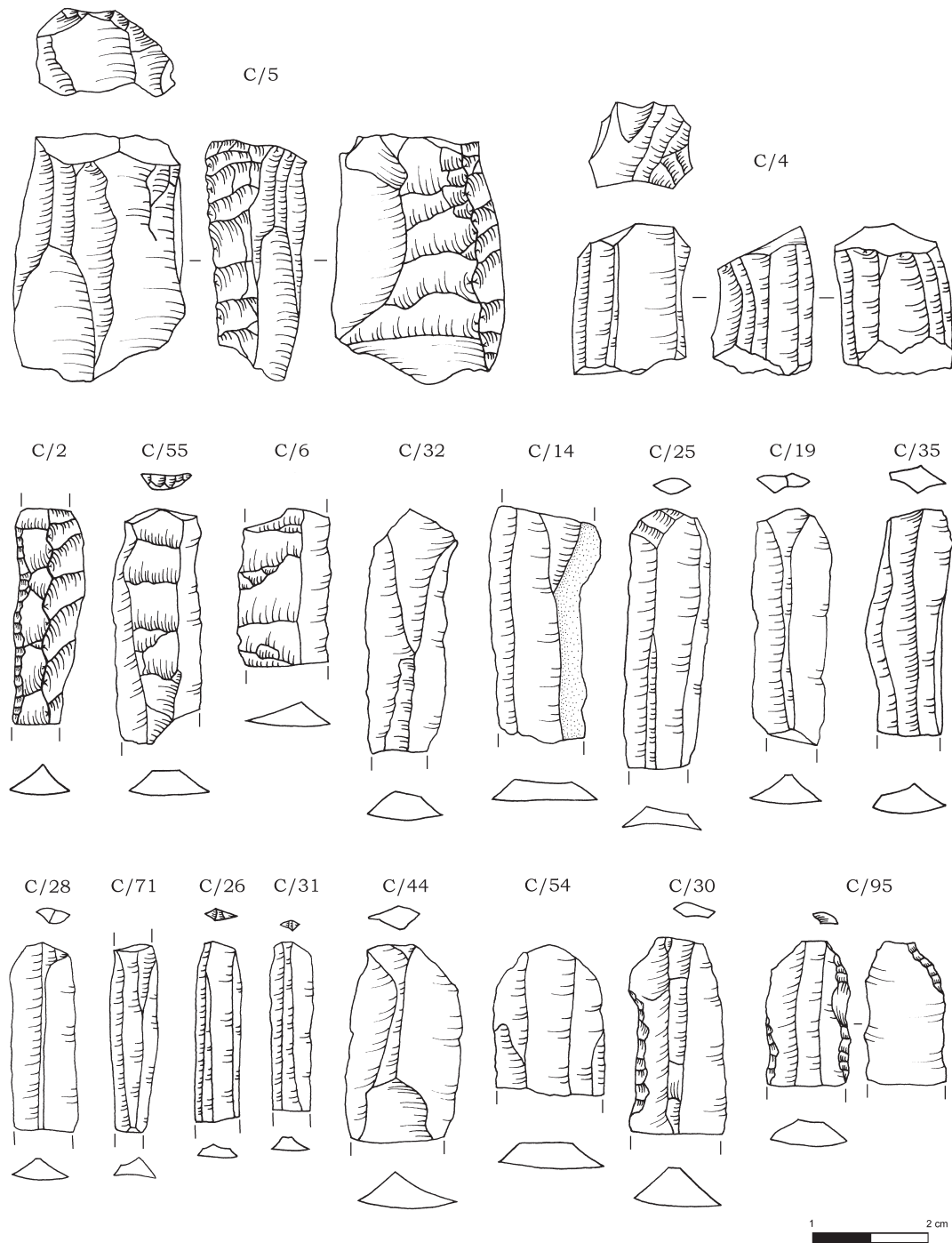


Figure 23.3. Pressure technology obsidian blades from the EC II site of Kaminia, Melos. (Illustration: M. Milić.)

blade technology. It is contended that future research, particularly on settlement material, should be able to discern regional, or perhaps even community-specific knapping techniques conceptually analogous to, if not concomitant with, previously documented potting traditions such as Wilson's 'Keian-East Attic group'

(Wilson 1987, 35). In defining these variant modes of consumption, we are shedding light on some of those pools of knowledge and habituated practices (Dietler & Herbich 1998, 246–7; Bourdieu 1977) that helped both to underwrite and express some of the 'small worlds' discussed by Broodbank (2000a, chap. 6; 2000b).



Figure 23.4. Long pressure-flaked obsidian blades from the EC II cemetery of Aplomata, Naxos. (Illustration: M. Milić.)

What was the nature of the procurement and exchange of Melian obsidian in the EBA?

How well does Renfrew and Torrence's arguments for direct access exploitation of Melian obsidian stand up 20 years later?

In many respects this is by far the largest issue to broach. Perhaps the most useful starting point is to make the basic statement that there was never an obsidian *trade* (singular) and that we have to appreciate that the 'displacement' (Needham 1993) of this Melian resource was a far more complex process than has been acknowledged previously. Secondly, we have to stop talking about the exploitation of Melian *obsidian* (singular) and recognize the potentially different histories of the two sources, Sta Nychia and Dhemenegaki (Carter 2003). Thirdly, the juxtaposition of a pre- and post-colonized archipelago is an insufficient framework of analysis for us to gain a detailed image of how 'obsidian' was being put into circulation through time (cf. Renfrew 1972, 442–9). Fourthly, we cannot continue to talk about the trade and exchange of *obsidian* (generically) without considering the variety of different ways in which this shiny black glass could have been moved and conceptualized (cf. Carter 1998). On a material level one might consider the flow of obsidian in the form of 'raw material', 'preforms' or 'end products' (a rather unimaginative tripartite division). On a more conceptual level, one has to challenge the assumption that our geologically-underwritten point of departure — 'obsidian' — is necessarily always the appropriate one. For example, one might envisage a late EB I or EB II Cycladic voyager presenting their affine or trade partner in Aghios Kosmas, Manika, Palamari or Poliochni (amongst others) with a gift of a few prismatic blades, a pigment container and a set of tweezers, whereby in this instance it would be more fitting to talk about the exchange of a 'toilet kit', rather than the movement of obsidian, bone and copper (Carter 1999, chaps. 6, 7). Similarly, the EB II cemetery at Manika has generated a few long obsidian blades whose scale and mode of consumption is nigh-identical to what we see at contemporary Chalandriani (Sampson 1985, 198–9), yet we lack evidence for their actual production at the Euboean site, suggesting that there was a low-level flow of necrolithic blades within those exclusive exchange networks that served to link the Cycladic élites with their overseas peers (Carter 1999, chap. 11).

In the context of Broodbank's well-argued and evocative writings on the different forms of maritime activity in the EBA Cyclades (Broodbank 1993; 2000a), it does not involve a huge interpretative leap from the above discussion to start thinking about 'Melian obsidian' as having been moved in quite distinct forms in

the very same boats, in a manner not dissimilar to the multi-faceted trading expeditions of the Melanesian Kula ring (Malinowski 1922; Leach & Leach 1983). This scenario would serve to reintroduce partly the notion of 'obsidian' procurement being embedded in other activities, a theory first discussed by Bintliff (1977, 117–22, 538–43), although here I am entertaining a different context, namely the exchange of 'obsidian' during the events surrounding the hosting of a Cycladic longboat crew/trading party. One might imagine the socially meaningful gifting of skilled and valuable objects, such as necrolithic blades and cores (either alone or as part of a 'toilet kit'), while 'obsidian' in the form of raw material or preformed cores was exchanged in more mundane settings, aside from the 'main event' of a wedding, funeral, gift-giving ceremony or some other exclusive forum (Carter 2007). However, while the work of Malinowski and others on the Kula is 'good to think with', our starting point of analysis has to be context specific, i.e. one's arguments must be located in the archaeology of the third-millennium Cyclades and our understanding thereof. This is perhaps the fundamental problem which I have with some of Torrence's interpretation of the Aegean data (Torrence 1986): yes we can agree that Phylakopi is a minor affair when contrasted with the workshops of Teotihuacan, but the community existed in a small-scale Cycladic society, not state-level Mexico. In an Aegean EBA context the 'great obsidian deposit' represents a remarkable accumulation of knapping debris, whose significance remains to be comprehended fully.

With a range of 'Cycladica' flowing from the islands to numerous communities on the coastlines surrounding the archipelago (Renfrew 1972, 451–5; Sampson 1988a, 113–19; Carter 1998; 1999; Day *et al.* 1998; Broodbank 2000a, chap. 9), it is tempting to argue that in late EB I and during EB II a significant quantity of the obsidian moving around the Aegean *commenced* its movement in the longboats of the Cycladic 'trader sites'. At the same time however, I have recently posited (Carter 2004) that EB II Mochlos (east Crete) was indeed procuring its own obsidian in a manner not dissimilar to Renfrew's model of 'direct access' (Renfrew 1975, 42; Torrence 1986, 103–5). Mochlos seems to have bypassed the exchange networks that linked such communities as Hagia Photia and Poros-Katsambas with their peers in the Cyclades (Day *et al.* 1998), one of the means through which it forged its regional/Aegean identity through engaging in different sets of overseas relations. This argument was based not only on the quantity of obsidian at the site and the idiosyncratic modes of its consumption, but also the pottery, burial practices

and iconography from Mochlos; once again, the discussion of the obsidian was necessarily located in the 'bigger picture'.

While the islanders may have been responsible for moving significant quantities of obsidian around the Aegean in the context of the Cycladic-driven internationalism of the late EB I and early EB II, this is a relatively short time in the long-term history of the exploitation of Melian obsidian, i.e. from the Upper Palaeolithic to the Late Bronze Age/Early Iron Age. For most periods we have little or no evidence that the islanders were central to the mining and redistribution of 'their' mineral resources overseas, whereby Renfrew's model of 'direct access' arguably represents the *primary* mechanism by which the obsidians of Melos were procured. However, the evidence does not suggest that each Aegean community was capable of undertaking an expedition to the sources themselves (Perlès 1990b; Carter & Ydo 1996, 168; Forsén *et al.* 2003, 188–90). Instead, it has been suggested variously (depending on time and place), that obsidian was either quarried by itinerant specialists who then knapped and traded the material (Perlès 1990b), or that procurement was the sole concern of the largest communities of the time, i.e. those who could organize and crew such long-distance voyages (cf. Broodbank 1989), whereby regional *entrepôts* acted as the starting point for the redistribution of much of the obsidian that we recover in the hinterlands (van Andel & Runnels 1988, 238–40; Carter & Ydo 1996, 168; Carter 2004). Thus it is quite possible to imagine a number of different modes of procurement occurring at any one time, including direct access, specialist intermediaries ('middlemen') and the redistribution of 'obsidian' from central places, albeit not in the form of market exchange.

It is too simplistic to argue that in periods when we have Cycladic material culture flowing out from the islands, such as the late EB I to early EB II and later MBA (Day *et al.* 1998; Broodbank 2000a, 279–83; Barber 1987, 154–7), that it should follow that there was an associated 'local' control of obsidian redistribution. The main point in this critique is that the specific temporal context has to be taken into account when considering the mechanisms by which obsidian was being accessed and moved, both within and beyond the islands, and that during certain periods it might be pertinent to argue for a more 'hands-on' role for those living in the Cyclades (or Melos specifically). Turning to the question of control, or influence over the quarries, it remains that we have no settlements dominating any of the major mineral resources of the islands, be that obsidian (Melos), copper (Kythnos), silver/lead (Siphnos) or emery (Naxos). The early Cyclades was

therefore clearly a quite different world to what we are used to, both in modern times and classical antiquity, as for example represented by the organized exploitation of the Lavrion silver mines by the Athenian Democracy, involving a dedicated workforce and controlling physical presence (Kakavoyannis 2001, 374–5). The absence of prehistoric settlements atop the Cycladic raw material sources could be explained through reference to these being inhospitable places to live, due to their poor soils, exposed locations, or because of some form of taboo that restricted access and made immediate habitation quite inappropriate (cf. Hampton 1999, 226–34). Alternatively, given that Sta Nychia and Dhemenegaki had been exploited for millennia prior to Melos being settled, it might have been the case that no one would have claimed direct control and ownership of these quarries, lest they risked a bloody nose the next time a mining expedition arrived from Sesklo or Knossos.

Turning finally, and briefly, to the notion of the 'supply zone' (Renfrew 1975, 46) we again need to be much more critical with regard to how we conceptualize, qualify and represent the distribution of obsidian. Because the idea of the 'supply zone' deals in relative terms (i.e. the percentage of obsidian in a site's chipped stone assemblage), rather than absolute terms (i.e. how much obsidian in relationship to site duration and size of community: cf. Cessford & Carter 2005) vast areas of the Aegean have been accorded a form of equality that simply never existed (Renfrew 1972, fig. 20.1). The Cyclades are a case in point, for one is left with the impression that each community had equal ease of access to Melian obsidian; this is extremely unlikely. Unfortunately quantified data are difficult to come by and we still await the detailed publication of our first obsidian assemblage from an EC settlement (for which I must take some blame). However one gains the *impression* that during EB I–II there were certain communities outside of the Cyclades, not least Poros-Katsambas, Mochlos, Aghios Kosmas, Manika and Lithares, that were procuring far larger amounts of obsidian than their contemporaries in, for example, the interiors of Naxos, Paros or Amorgos (Carter 1999, chap. 3). As with the mainland and Crete, one sees clear evidence for a handful of well-connected communities in the Cyclades (Broodbank 2000a, 305–9, fig. 99; Carter *in press a*) that undoubtedly represented the main points of entry into an island for a wide variety of non-local goods, obsidian included, that were procured via off-island traders, or accessed directly by a longboat propelled by the locals themselves. At this point one might start to consider the redistribution of 'obsidian' (preformed cores or end products) from these 'central places' to smaller settle-

ments in the interior, either down-the-line or moved through local networks of exchange underwritten by structures of kinship or trade-partnership. Such micro-regional fall-off patterns, commencing from coastal gateways (Moody 1987, 202–4, fig. 6.4, 298; Hayden *et al.* 1992, 339), or interior centres (van Andel & Runnels 1987, 90–91, map 17; Forsén *et al.* 2003, 188–90), have already been recognized in Cretan and mainland contexts (Carter 1994, 134–6, fig. 3), it remains to offer a more detailed breakdown of the Cycladic data.

The future requires us to be far more critical and nuanced in our conceptualization of the issues and how we discuss and present our material. There remains great potential to disentangle our masses of data and offer new interpretations of how Melian obsidians were procured, disseminated and used through time, through combining the insight of Bosanquet (1904) and the analytical rigor of Torrence (1986). By employing detailed typo-technological analyses, in combination with provenience studies, we can characterize and compare contemporary assemblages throughout the Aegean, to elucidate and plot distinct modes of consumption, not least technical practice and raw material choice. When one then considers the position of each assemblage in terms of the overall *chaîne opératoire* (as Perlès has been doing so successfully over the past two decades: cf. Perlès 1981; 1984; 1988; 1992 *inter alia*) then one can begin to map out inter-community

relations and further clarify the routes and directions through which obsidian was displaced throughout the prehistoric Aegean. In order to achieve this satisfactorily however, there is a responsibility on behalf of the (non-French trained) lithic specialists to stop writing ‘Appendix Z’ and become integrated members of our interpretative communities. First and foremost we have to consider ourselves Aegean prehistorians and engage with all aspects of the archaeological data and not let the ceramic supremacists continue to be perceived as those with the sole ability and responsibility to write the larger stories.

Acknowledgements

I thank Vasileios Lambrinoudakis for kindly allowing me to study the Aplomata obsidian, plus the staff of the 21st Ephorate of Prehistoric and Classical Antiquities for their continued and much appreciated help, specifically Marisa Marthari, Olga Philaniotou, Daphne Lalagianni and the guards of Naxos and Melos museums, to Nikos Efstratiou for access to unpublished data from Knossos, Colin Renfrew for inviting me to participate and the sponsors of the conference for paying for my flight from Stanford. The research referred to in the text was supported initially by a doctoral grant from the Science and Engineering Research Council (UK) and subsequently by the Institute for Aegean Prehistory. Iannis Sakellarakis is responsible for the term ‘necro-lithic’, a dreadful pun that I am extremely grateful for.

