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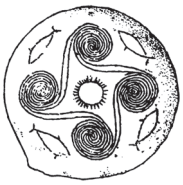

Of Odysseys and Oddities

Scales and modes of interaction between prehistoric Aegean societies and their neighbours

Paperback Edition: ISBN 978-1-78570-231-0
Digital Edition: ISBN 978-1-78570-232-7 (epub)

Edited by
Barry P.C. Molloy

OXBOW | books
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Oxford & Philadelphia
www.oxbowbooks.com

Published in the United Kingdom in 2016 by
OXBOW BOOKS
10 Hythe Bridge Street, Oxford OX1 2EW

and in the United States by
OXBOW BOOKS
1950 Lawrence Road, Havertown, PA 19083

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Paperback Edition: ISBN 978-1-78570-231-0
Digital Edition: ISBN 978-1-78570-232-7 (epub)

A CIP record for this book is available from the British Library

Library of Congress Cataloging-in-Publication Data

Names: Molloy, Barry.
Title: Of odysseys and oddities : scales and modes of interaction between prehistoric Aegean societies and their neighbours / edited by B.P.C. Molloy.
Description: Oxford ; Philadelphia : Oxbow Books, 2016. | Series: Sheffield studies in Aegean archaeology | Papers from the 2013 Sheffield Aegean Round Table. | Includes bibliographical references.
Identifiers: LCCN 2016007208 (print) | LCCN 2016008303 (ebook) | ISBN 9781785702310 (paperback) | ISBN 9781785702327 (digital) | ISBN 9781785702327 (epub) | ISBN 9781785702334 (mobi) | ISBN 9781785702341 (pdf)
Subjects: LCSH: Aegean Sea Region–Antiquities–Congresses. | Prehistoric peoples–Aegean Sea Region–Congresses. | Social interaction–Aegean Sea Region–History–To 1500–Congresses. | Intercultural communication–Aegean Sea Region–History–To 1500–Congresses. | Spatial behavior–Social aspects–Aegean Sea Region–History–To 1500–Congresses. | Material culture–Aegean Sea Region–History–To 1500–Congresses. | Aegean Sea Region–Relations–Congresses. | Neolithic period–Aegean Sea Region–Congresses. | Excavations (Archaeology)–Aegean Sea Region–Congresses. | Social archaeology–Aegean Sea Region–Congresses.
Classification: LCC GN776.22.A35 O34 2016 (print) | LCC GN776.22.A35 (ebook) | DDC 551.46/1388–dc23
LC record available at http://lccn.loc.gov/2016007208

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Front cover: The MBA village of Punta Milazzese on Panarea. Photograph by Helen Dawson.

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Acknowledgements

The 2013 Sheffield Aegean Round Table took place during a rather frigid January with snowfalls threatening to cut our plans short. Thankfully, we had a very fruitful meeting and a lively discussion over the course of three days. Most of those who engaged in the Round Table have been able to publish their papers in the volume, though the event was much enhanced by the oral contributions of John Bennet, Sue Sherratt, Sara Strack and Roger Doonan. We were also fortunate to have Kristian Kristiansen deliver a thought (and discussion) provoking keynote address and our meeting concluded with an eloquent final discussion by John Barrett.

The event took place during a Marie Curie Fellowship that the editor held at the University of Sheffield 2011–2013. I was very fortunate to work with and learn from Roger Doonan during this period. Along with acting as mentor for the fellowship, he co-organised the Round Table event with me and played a key role in designing the research agenda for the event and this publication. Thank you also to all of the student helpers who made the event run so smoothly. The Round Table is generously supported by the Institute for Aegean Prehistory, to whom we are most grateful.

The Sheffield Aegean Round Table is a type of event that is relatively rare these days, as it takes place in a relaxed atmosphere where people freely speak their minds. This is really made possible through the welcoming environment that is created by Debi Harlan, Valasia Isaakidou and John Bennet. The home baked fare that they so kindly made on the opening night (thanks also to Vuka Milić) set the guests up for a very comfortable and enjoyable event. Debi and John also hosted all of the guests at their home the next evening, making a very memorable climax to the convivial environment that makes the Round Tables such unique events.

The panel of reviewers, including many of the contributors, provided invaluable advice that was vital in bringing this volume to publication, for which we are grateful. I would finally wish to express my gratitude to the participants at the event and contributors to this volume who made the entire process so stimulating. It was indeed testimony to our aspiration to work across political and traditional boundaries that have influenced Aegean archaeology that we had participants representing eleven nationalities from institutions on three continents. A final note on behalf of the authors is that papers in this volume were submitted in 2013 and 2014, and as a consequence many will be missing citations to some important more recent publications.

Chapter 7

Aspects of Connectivity on the Centre of the Anatolian Aegean Coast in 7th Millennium BC

Barbara Horejs

Introduction

Any discussion of the scales and modes of interaction between prehistoric Aegean societies is of necessity based on the archaeological view of the Aegean as one broad cultural area, merely subdivided into different regions that are not homogeneous, either in time or in intensity (*e.g.* Renfrew 1972; Maran 1998: esp. 450–457; Broodbank 2000; Perlès 2001). The commonly invoked principle of *Aegean connectivity* forms one of the basic requirements for understanding Aegean archaeology.

The specific character of this basic connectivity and, moreover, its recognisability in prehistory call for an analysis of various phenomena, such as raw material networks, systems of trading and bartering in specific goods, social and political comparability and countless others. It is nonetheless difficult to reach complete or satisfactory results as a result of the sheer quantity of archaeological evidence available. Theories of archaeological connectivity offer at least a methodological tool to deal with these quantities and to model discrete networks.

Çukuriçi Höyük and the centre of the Anatolian Aegean coast

Çukuriçi Höyük on the centre of the Anatolian Aegean coast is located on the Küçük Menderes river delta opposite the island of Samos and is embedded in a sheltered basin that used to have direct access to the Aegean Sea in prehistoric times (Figure 7.1) (Brückner 1997; Kraft *et al.* 2001; Stock *et al.* 2013). The site is a tell with many phases of occupation spanning 7th to 3rd millennium BC, and its specific location at the Aegean coast as well as in one of the main river valleys in Western Anatolia highlights an important environmental feature for its enduring role in communities linking overlapping Aegean and Anatolian networks. The tell was settled during

different periods with six distinct settlement phases excavated so far (Figure 7.2), including Pottery Neolithic, Late Chalcolithic and Early Bronze Age periods (Horejs *et al.* 2011; Galik and Horejs 2011; Horejs *et al.* 2015). The surrounding basin of *c.* 10 sq km and adjacent hills provided open areas in prehistory for farming and livestock husbandry as well as wooded areas and sources of fresh water for man and beast alike. Botanical and zoological studies have revealed each of these aspects of subsistence strategies in all prehistoric periods, although chronological variations in faunal and floral species reveal diversity, and the varying numbers of each can

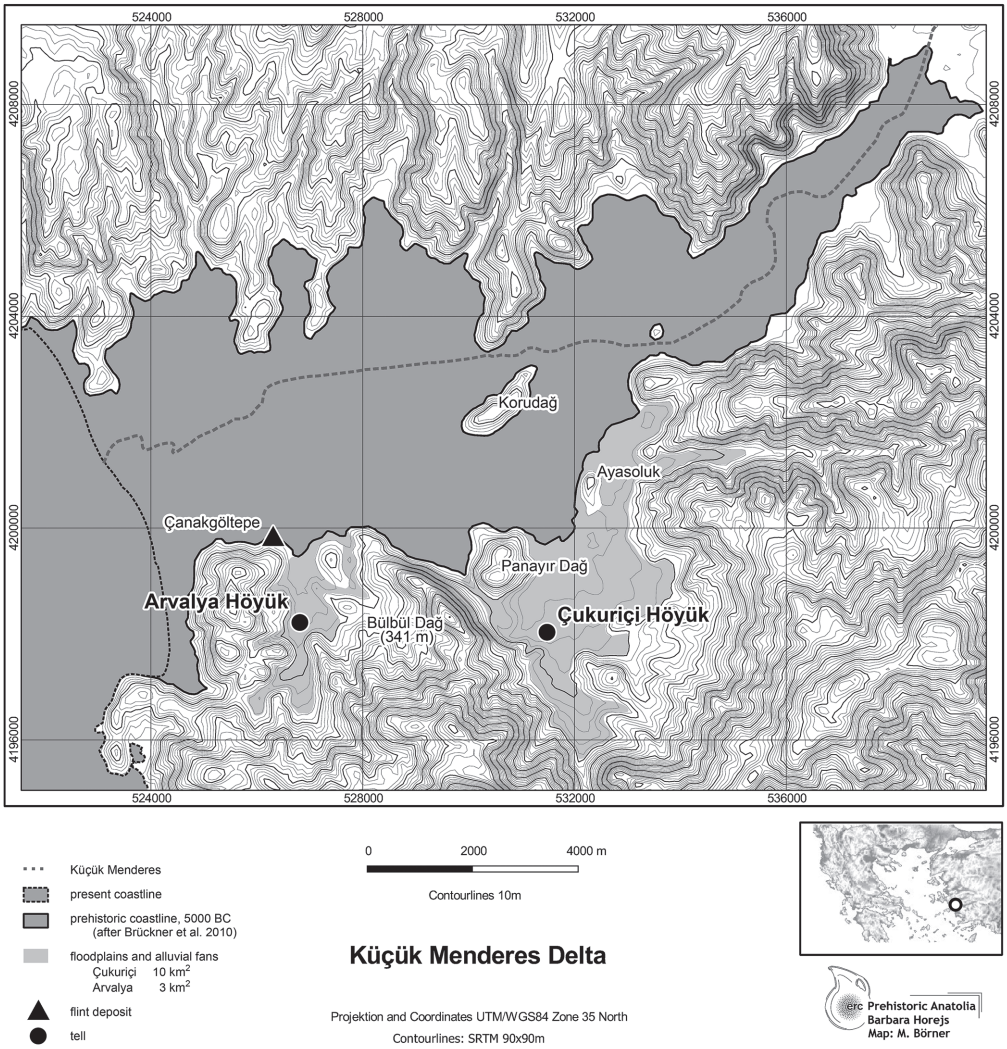

Figure 7.1: Reconstructed prehistoric environment around Çukuriçi Höyük (map by M. Börner/ERC Prehistoric Anatolia after Brückner 1997; Stock et al. 2013).

mainly be explained by cultural, climatic, and environmental changes over time. Alongside this, recent work has revealed the character of the latter two causes of change through pale geographical methods (Galik and Horejs 2011; Horejs *et al.* 2011: 50–60). Although changes in subsistence strategies and environmental conditions can be revealed clearly through various proxies, the point can be made that this micro-region offered all of the necessary scope for good living conditions and a high degree of self-sufficiency for prehistoric communities settled there.

Furthermore, geo-archaeological investigations have revealed a range of raw material sources in the immediate vicinity, such as sources of stone for polished tools or artefacts (*e.g.* serpentine, basalt, marble, quartz) or for use as building materials (marble, cist, limestone *etc.*) as well as chert suitable for producing knapped tools (Figure 7.1) (Wolf *et al.* 2012a; Wolf *et al.* 2012b). All these sources would have been known and utilised by Çukuriçi settlers at least since the 7th millennium BC, again with distinct variations in their significance and degree of active exploitation over time. In addition, imported raw materials which were used for the production of the same kind of objects and tools served very similar functions in practical, everyday terms. This has made it possible to shed light on the value of specific raw materials and exchange systems operating within this society and how this was integrated into a broader network.

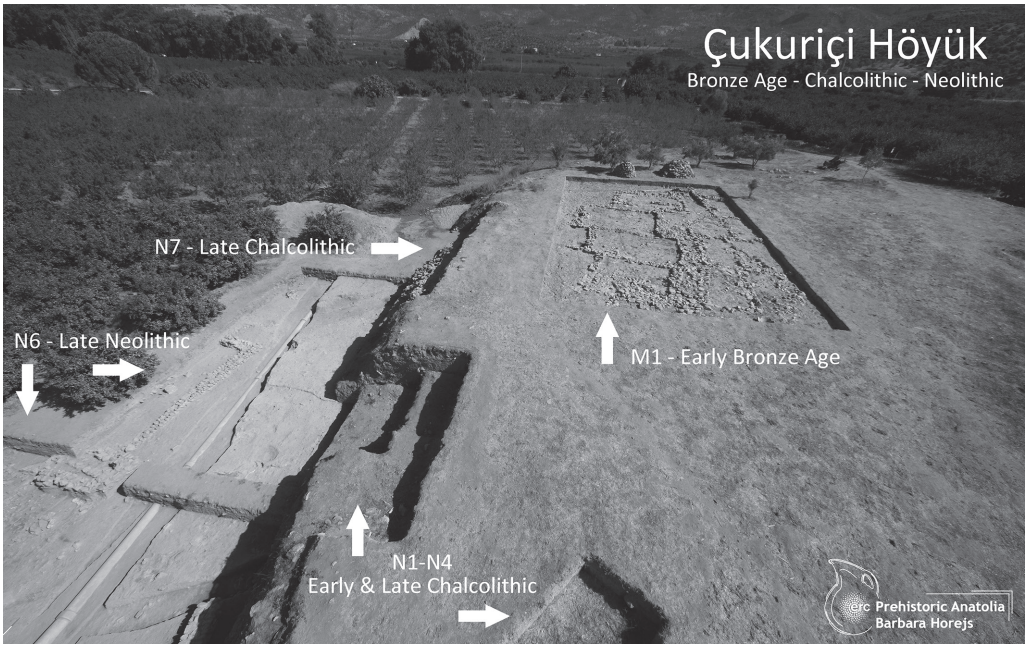

Figure 7.2: Overview of Çukuriçi Höyük excavation with settlement phases (photo by N. Gail; illustration by F. Ostmann/ERC Prehistoric Anatolia).

Aspects of regional connectivity

The Neolithic societies of Çukuriçi Höyük can be seen as having been well integrated into a regional network through the material culture and the basic schemes and strategies for living in an early farming community. With the focus of recent research on prehistory on the centre of the Anatolian Aegean coast around modern Izmir, it is feasible for the first time to engage not only with single sites, but with a group of excavated settlements that all have horizons dating to the 7th millennium BC (Figure 7.3). The Neolithic settlements of Dedeçik Heybelitepe, Ege Gübre, Ulucak, Yeşilova and Çukuriçi Höyük make up a regional cluster that share more things in common than differences in many respects. Because detailed chronological debate should not be our ultimate objective, comparable settlement phases of this date can be extrapolated (if in a preliminary and tentative manner), on the basis of relative chronologies of the sites obtained by pottery studies (Çilingiroğlu 2012: 85 with modifications; Horejs 2012) and on radiocarbon dates recently published from those other sites (and Çukuriçi Höyük), allowing synchronisation of settlement horizons at each site.

Generally, the 7th millennium BC covers the Pottery Neolithic period in Anatolian chronology and can partially and only in some Anatolian regions be subdiveded in early and late phases (*e.g.* Özdoğan *et al.* 2007). Based on early history of research and east Anatolian and upper Mesopotamian chronologies, the Chalcolithic period is defined to start around 6000 BC (*e.g.* Schoop 2005). Although a real Copper Age in cultural sense does not exist in most part of Anatolia in these early stages and certainly not in western Turkey, the traditional basic frame work is (still) widely accepted. The recently excavated sites and their settlement phases at the centre of Anatolian Aegean coast are divided with Roman numerals, except Dedecik-Heybelitepe defining an older phase A followed by younger phase B (Herling *et al.* 2008).

The sites at the centre of Anatolian Aegean coast can be clustered in two main chronological Neolithic phases in 7th millennium: early (6700–6500 BC) and late (6500–5900/5800 BC). Detail studies of relative chronological links between them are not published yet; a preliminary chronological division of the distinct millennium is nonetheless possible based on various published studies, radiocarbon dates and summarising reports. They are nevertheless only representing chronological clusters, which should not be understood as cultural horizons at the moment.

The so far earliest Neolithic phase known in our region appears in Ulucak VI and Çukuriçi Höyük XIII (site-phase abbreviation: ÇuHö XIII), eventually also in Yeşilova III.8. Ulucak VI does not reveal any pottery; various concise radiocarbon-dates of Ulucak VI allow its fixing between 6760 and 6600 cal BC (Çilingiroğlu *et al.* 2012: 153).[1] Chronologically comparable is the foundation level of Çukuriçi Höyük XIII (Horejs *et al.* 2015, 298-301 Fig. 4); so far three radiocarbon dates of seeds from the settlement phase ÇuHö X indicating a slightly later dating.[2] In contrast to Ulucak VI, the settlement phase ÇuHö XIII contains pottery (four sherds). The founding of Yeşilova III.8 is not cleared yet.[3]

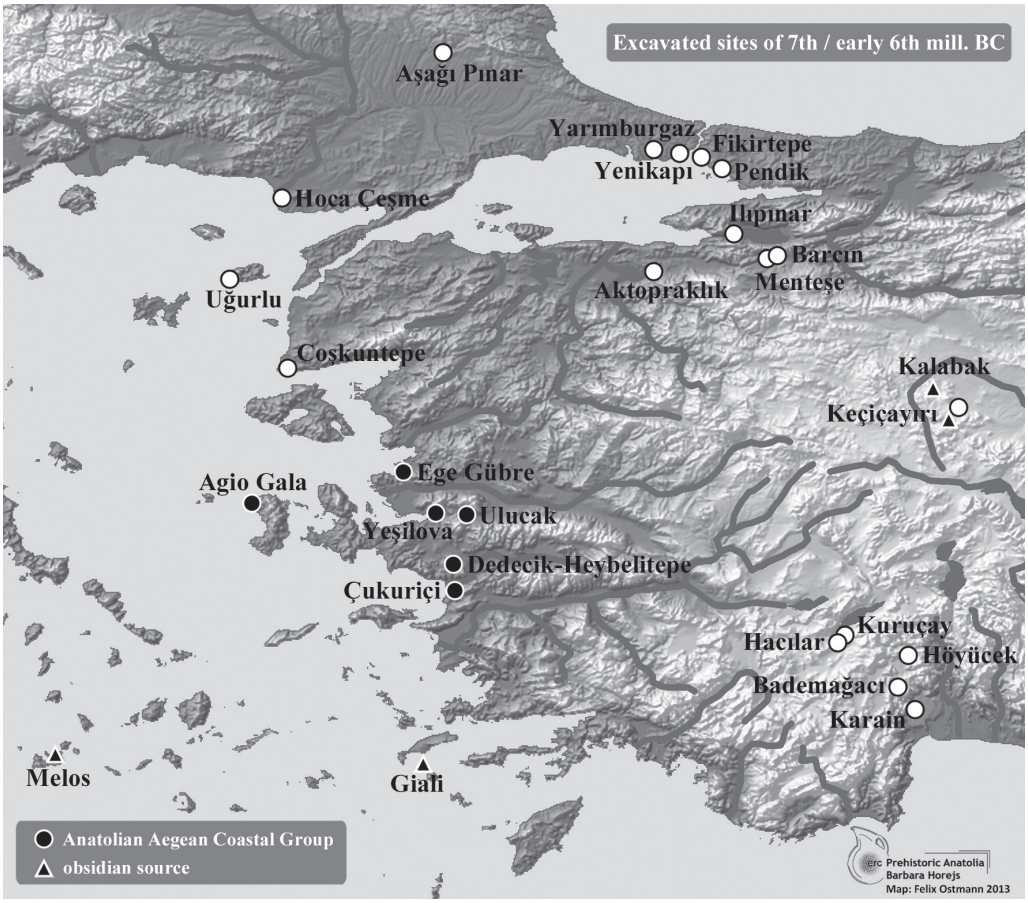

Figure 7.3: Excavated sites of 7th and early 6th millennium BC with highlighted group of Central Aegean coast (map F. Ostmann/ERC Prehistoric Anatolia).

From the mid of 7th millennium (6500–5900/5800 cal BC), these three tells are certainly settled. This late Neolithic phase is represented in Ulucak V–IV (Çilingiroğlu *et al.* 2012: esp. 153), Çukuriçi Höyük X-VIII[4] and Yeşilova III.7–6.3–5 (Derin 2012: 183). Although detailed studies of relative chronological links are a difficult endeavour particularly when excavations are ongoing, a distinction can be tentatively proposed at this juncture between these main chronological stages of Neolithic. Ulucak VI appears to be so far the earliest Neolithic phase, together with Çukuriçi Höyük XIII, dating around 6700 cal BC (Horejs *et al.* 2015, 298-301), cal BC, followed by phases XII and XI at Çukuriçi, where the occupation of the earliest Neolithic in Izmir region goes up to 6500 BC. Late Neolithic starts at around 6500 BC, when tells in Izmir region (Ulucak, Çukuriçi and Yeşilova) are certainly settled, and compiled by Ege Gübre IV (Sağlamtimur 2012: esp. 201–202) and Dedecik-Heybelitepe A (Herling *et al.* 2008; Lichter and Meriç 2012). Late Neolithic at Çukuriçi Höyük (ÇuHö

X-VIII) could be dated from 6500–5900/5800 BC. Even though the time after 6000 BC in chronological sense corresponds to the period of Early Chalcolithic (Schoop 2005), material culture of early 6th millennium at Çukuriçi Höyük seem to follow the Neolithic tradition until the 5900/5800 BC.

A strong intra-regional network between these communities can be postulated on the basis of the comparable assemblages of material, not only in stylistic, but also in technological and conceptual features. Especially the comparison of sites within the distinct chronological phases of early Neolithic (6700–6500) and late Neolithic (6500–5900/5800) let assume strong inter-regional links.

Ç. Çilingiroğlu's pottery studies have revealed strong similarities in classes, fabrics, shapes and principle concepts of pottery technologies, like the so-called Red Slipped Burnished (*RSB*) and Cream Slipped Burnished (*CSB*) wares, s-profile shaped jars, characteristic vertical tubular lugs, specific kind of ceramic temper *etc*. (Çilingiroğlu 2012: esp. 78–86) that are confirmed in recent publications of pottery from all relevant sites (Lichter and Meriç 2012; Derin 2012; Sağlamtimur 2012; Horejs 2012). These analogies in Neolithic pottery shapes, types, surface treatments, fabrics and classes represent a corresponding concept of pottery that can be defined as a strong marker for connectivity as well as characteristic 'regional style'.

Although our state of research does not offer a holistic picture of pottery in terms of 'provinces' at present, the region at the centre of the Anatolian Aegean coast obviously differs from other western Anatolian areas such as the Marmara Sea, where the so-called 'Fikirtepe horizon' has been proposed (*e.g*. Özdoğan 2006; Özdoğan 2013; Thissen 2001; Karul 2011). Late in the developmental sequence of Neolithic pottery, Impresso wares are recognizable at all sites in the last century of the 7th millennium and at the beginning of the 6th millennium BC (Çilingiroğlu 2010; Herling *et al*. 2008; Derin 2012; Horejs 2012; Sağlamtimur 2012). Although this phenomenon could have emerged as a result of a broader Mediterranean network, it is quite obvious that the whole region with each of its farming villages is caught up in this tangible manifestation of connectivity (Çilingiroğlu, in this volume).

The same can be said of the late Neolithic phases (mid- to end of the 7th mill. BC), when it came to polished stone axes, bone spatulae and bone tools, beads and other forms of portable artefact which seem to have correlations in the deployment of specific raw materials and in the suite of technological features employed in their manufacture and use. Although H. Sağlamtimur (2012: 201) describes the archaeological assemblage of Ege Gübre as 'quite distinctive from Ulucak', the so far published pottery and small finds seem to correspond very well with the other sites in the region and Ulucak IV particularly. Some differences could maybe be explained by chronological distinction, because most of the Pottery Neolithic phases at Ulucak (Ulucak Vf-c) are older than the horizons of Ege Gübre IV-III that seem contemporary with Ulucak Vb-a and IV.

For illustrating the regional material relations, the example of comparable sets of axes is salient. They are evident at all sites in the region being discussed and show strong analogies in size, shape, morphology and used raw materials. The axes appear

at the same time as small-size, high-quality and polished mainly serpentine and basalt tools (likely to be trapezoids or narrow and elongated shapes like chisels). Alongside these we find heavy, large-size roughly polished types made of different coarse stones. Those from Çukuriçi have been geochemically analysed by D. Wolf (Wolf, in preparation), while the artefacts of the other sites are illustrated in published photos or drawings (Çilingiroğlu *et al.* 2012: 165 fig. 16; Derin 2012: 101, fig. 9; Sağlamtimur 2012: 223, fig. 28; Herling *et al.* 2008: 26–28). The assemblage of axes occurs in same types, raw materials and stylistic details in all settlements and seems to reflect a kind of corresponding 'regional style', already observed for the concept of pottery.

Aside from these obvious analogies between technologies, style and types in everyday materials, such as pottery and tools, strong links between these early farming communities are also detectable in the designs of early weapons. While lithic arrowheads were a rare occurrence around the region in late Neolithic period (one piece mentioned *e.g.* by Derin 2012: 182; for earlier examples s. Horejs *et al.* 2015, 308-309 Fig. 8), sling missiles seemed to be frequently deployed as assault weapons (Korfmann *et al.* 2007: 42; Özdoğan 2002) and are known in large quantities from Ulucak and Çukuriçi (Figure 7.4). They had obviously been stored in piles or deposited in hoards at both settlements (Ulucak: Çilingiroğlu *et al.* 2012, 147: 166–167; Çukuriçi: Figure 7.4). Although detailed studies are not over yet, the remarkable hoarding of these weapons on-site as well as their variety of shape (bi-conical, conical and globular), material (stone or clay) and diversified technologies ranging from the simply collected pebbles gathered to highly polished sling-stones or well-fired clay missiles are indicative of their comparable value and utility.

As it has been convincingly argued by M. Özdoğan (2002), sling missiles seem to replace the common flint or obsidian arrow points in Pre-Pottery Neolithic periods in Central Anatolia. While there is an overlapping span of time, where both – missiles and arrow points – occur in early Pottery Neolithic period, sling missiles become frequent at least in Late Pottery Neolithic of late 7th millennium BC. His observation does not only indicate cultural transformation from PPN to Pottery Neolithic (with potential social dimension as argued by Özdoğan 2002: esp. 443); it offers also a good point for the use of sling missiles as weapons.

In contrast to the use of rounded clay or stone balls to transfer heat to food and possibly also to rooms as discussed for assemblages at Çatalhöyük (Atalay 2005), the deposits of stone and clay missiles at Çukuriçi Höyük do not show traces of burning or boiling. Their function as boiling or cooking stones appears not plausible for the Çukuriçi assemblages. On the other hand, there are some indicators for the function of pottery bi-conical objects as weapons at other Neolithic settlements, summarized recently by L. Clare and B. Weninger (Clare and Weninger, in press). They interpret sling missiles in shape of biconcial clay objects[5] (like the Çukuriçi ones) recovered along a massive defensive wall in Hoca Çeşme in Turkish Thrace and a major conflagration of the settlement as hints for violent conflicts. Also in Höyücek in the Lake District in Western Anatolia, a large number of sling missiles

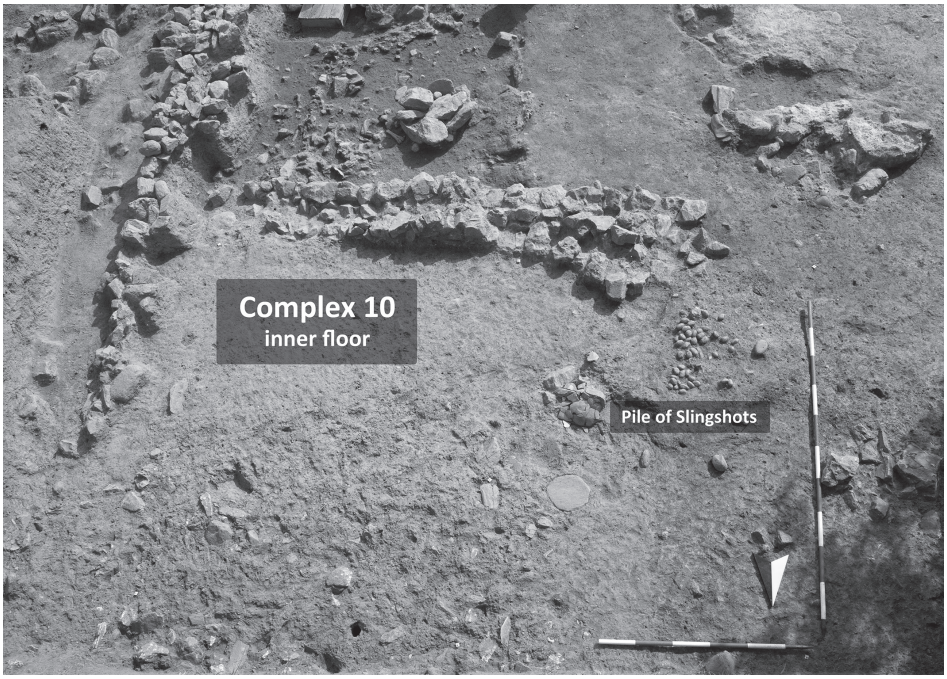

Figure 7.4: Building complex 10 of Çukuriçi Höyük during excavation with pile of slingshots deposited inside (photo M. Börner/ERC Prehistoric Anatolia).

on the floor of one destroyed building are seen as indicators for armed conflicts (Clare *et al.* 2008). And in the neighbouring site of Bademağacı in the Lake District, eight individuals including one with perimortem cranial trauma were found in burnt structures (Duru 2005; Erdal, Erdal 2012), taken as one argument in a broad discussion for general serious conflicts between 6600 and 6000 cal BC explained by economic and environmental stress (Clare *et al.* 2008). Taking these parallels of sling missiles in different contemporaneous contexts of destruction into account with the background of their potential replacement of lithic arrow points argued above as well as the absence of traces for domestic use at Çukuriçi like heating, their function as weapons appears most plausible at the moment.

As suggested by Ç. Çilingiroğlu (Çilingiroğlu *et al.* 2012) recently for Ulucak, hoarding of sling missiles inside the village may also suggest inter-regional tensions or even internecine conflicts that necessitated the storage of such in large numbers. With the comparable phenomenon of storing sling-stones en masse recently uncovered at Çukuriçi, there might be a counter part that supports this view on intra-regional conflicts, although hunting was another historically attested use for sling-stones that cannot be excluded and may also be a reason for their collection and storage on site. Deposits of obvious polished and prepared stone sling shots in context with ceramic-made ones and ordinary rounded pebbles at Çukuriçi indicates

a comparable use for the latter, which are also known as single finds from other sites, like Dedecik-Heybelitepe (Herling *et al.* 2008). Also in Yeşilova there were 10 potential sling missiles recovered, but all except one are just rounded stones (Derin *et al.* 2009: fig. 31).[6]

Therefore it seems possible that these attacking weapons were also common in other sites in the region and have been preserved preferentially at Ulucak and Çukuriçi and in such numbers due to deposition conditions and a lack of later disturbance or taphonomic change. Even so, this category of weapon illustrates another trapping of the connectedness of practices and possessions between sites around the region.

Including the observations discussed above, an archaeological *Central Anatolian Aegean Coastal Group* is slowly taking shape for the 7th millennium BC. Strongly linked concepts of production, function, use and technology are not only detectable in pottery, tools and weapon practices, but also in subsistence strategies and rituals (see below). The proposed identification of a Neolithic archaeological Group in the region needs further investigation of detail relations between the single sites in the future, when details studies of partially ongoing excavations are published.

Regional diversities at the central Anatolian Aegean coast

At first sight, architectural details and settlement structures both reflect a general diversity rather than similarity in the important, permanent villages of what formed the proposed Central Anatolian Aegean Coastal Group. House structures with presumably held diverse, but core-meanings and values for first permanent settlements of the region (*e.g.* Samson 1990; Schachner 1999), and so this very marked diversity in the material conditions of inhabitation appears particularly noteworthy. The choice of technology used to build a house intended for permanent dwelling and use could be linked to experience, raw materials available, the communities' needs, climatic and environmental conditions as well as the community's local tradition, beliefs and social structure (Souvatzi 2008).

Looking at late Neolithic sites on the centre of the Anatolian Aegean coast (*c.* 6500–5900/5800 BC), their architecture is built using different technologies, although the environmental conditions seem comparable from the sources obtainable, such as wood and stone. The existence of both raw materials is indicated, first, by archaeological remains as postholes for wooden poles at all site sand, second, by reconstruction of woodland by faunal remains of game, at least at Ulucak and Çukuriçi (Çilingiroğlu *et al.* 2004: 3–8; Çakırlar 2012; Galik and Horejs 2011; Horejs *et al.* 2011) and first palynological results in the Küçük Menderes delta region.[7] Stone is also accessible throughout the region from neighbouring mountains as well as rivers and is an overt and obvious source of building material for houses. It was not used *en masse* and in bulk in earlier phases, but it was by the late Neolithic period around 6000 BC. As comparable access to building materials as well as similar climatic conditions can be assumed for the

whole region, other aspects such as tradition and origin, experience, beliefs, social structures and necessity are therefore potential reasons for architectural diversity.

A look to the other side of the Aegean let us recognize a comparable phenomenon at the Neolithic Greek mainland. Convincingly analysed by S.G. Souvatzi, the relative uniform Neolithic culture with lots of shared key elements is contrasted by a high variability in households (Souvatzi 2008). The household in general forms the key unit in social structuring, but vary in morphology, ideology and social expression. Following Souvatzi's arguments for mainland Greece, this distinct diversity in households can also be seen as an expression how Neolithic communities and their households were structured and integrated. The variety moreover could reflect social identities on a local level. Projecting these results to the Anatolian Aegean coastal Group, its households diversities and differing spatial organization can be seen as regional expression of different local identities, perhaps originated in differing traditions? Anyhow, it is remarkable that this local variability seems to disappear at the end of the Neolithic period in the last centuries of 7th millennium.

Houses at Ulucak V (levels a.b.c.e.f) are built mainly using a wattle-and-daub technique with posts inserted without any stone foundations (Çilingiroğlu *et al.* 2012: 145–146), whilst contemporaneous buildings at Çukuriçi X-VIII are constructed with massive stone socles, partially with posts at regular intervals on top of the plinth for stabilizing the stamped mud walls (Figure 7.5: complex 3), a building method ostensibly comparable with the architecture of Yeşilova (Derin 2012: 180–181). This obvious technological diversity changes at the end of the Neolithic in the late 7th millennium when stone socles also become a regular feature at Ulucak IVk: maybe because of their better stability and resistance to damp and wet weather conditions?

Aside from different building technologies in the late Neolithic period (*c.* 6500–5900/5800 BC), potential local identities seem detectable in settlement organisation when it came to production, cooking, storage and living areas. Food production and cooking routinely used to be pursued inside and outside houses where hearths are located inside buildings as well as in courtyards or open areas in Çukuriçi phases IX and X (Figure 7.5 featuring complex 8 including red-marked hearths and different handcraft activities, pits and platforms). A contrasting scheme is observable tentatively at Yeşilova (Derin 2012: 181) and certainly at Ulucak V where various storage facilities, different kinds of production and cooking also including ovens and hearths are frequently situated *inside* the structures (Çilingiroğlu *et al.* 2012: 145). Although there are hitherto no detailed space-and-function analyses of those sites for the purposes of comparison, the main organizational scheme of domestic life and productive endeavour at the present stage of research appears diverse. Spatial analyses are also required for understanding the potential functional differentiation between agglutinated houses (*e.g.* Ulucak Va) and freestanding buildings with open courtyards, as observable at Çukuriçi IX and X as well as at Yeşilova. As argued above, the different systems of spatial organization reflect the local social organization of households with their preferences and identities. Aside from these general contrastive features, other more detailed characteristics of the Pottery Neolithic period are common, such as

stone paving or lime-plastered floors and walls for example, (see Figure 7.5 with the lime-plastered area of an adjacent courtyard outside house complex 6).

To sum up, Ulucak, Yeşilova and Çukuriçi differ in some respects in terms of their building technology and the spatial organization within and around houses and areas of activity, what let us recognize differing social traditions and identities. They have in common the concept of rectangularity, not of necessity an obvious choice, which leads us finally to the special case of Ege Gübre. Rectangular buildings and circular structures (with stone socles as well as wattle and daub walls) are simultaneously used and grouped around one central courtyard for the settlement that had impressive dimensions. Hearth installations and facilities have been retrieved inside rectangular houses and from the courtyard. This area was partially used for cooking and tool production, but mainly as a 'refuse tip' as described by the excavator (Sağlamtimur 2012: 198–199). The huge courtyard as a village centre reflects not only a possible functional differentiation between diverse production zones as part of the villages' social and spatial organisation. It may also have served as an area for ritual activities, as indicated by a limestone stele (Sağlamtimur 2012: 210, fig. 8) and by the fact that the remains of game animals such as deer, boar and wild cattle were retrieved from that area only. Nonetheless, the courtyard dates back to late Neolithic, no earlier

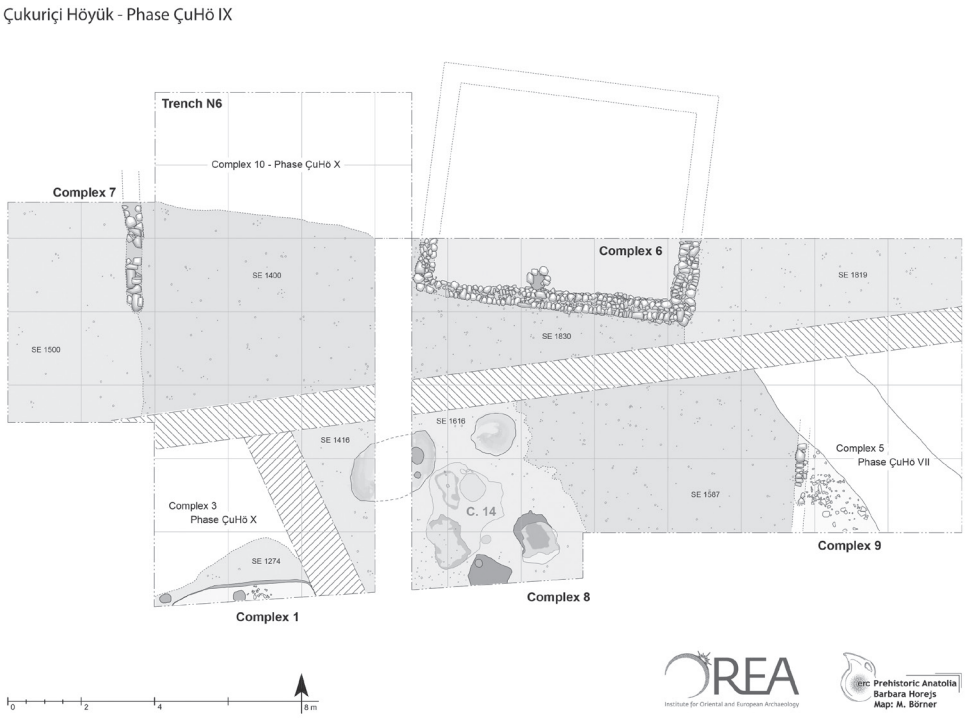

Figure 7.5: Architecture and activity zones of settlement phase IX at Çukuriçi Höyük with different complexes (C). Note Complex 8 including hearths marked in red and areas of different craft activities, pits and platforms (plan M. Börner/ERC Prehistoric Anatolia)

than 6200 cal BC, and cannot be fitted into the regional tradition developed over the preceding centuries, as has been described for Ulucak V, Yeşilova III.7–3 and Çukuriçi X-IX. Although an autochthonous or independent initiative to erect round-plan structures cannot be ruled out for the Ege Gübre's community, their uniqueness also offers several signs of supra-regional contacts.

It should be pointed out that round or circular house structures are absent in the Aegean as well as in West and Central Anatolia. Therefore a foreign influence from Neolithic Cyprus through maritime interaction had already been suggested (Özdoğan 2011; Sağlamtimur 2012: 201). Combining these circular structures with the pottery impresso wares at the same time period, both together can be seen as indicators of a sphere of maritime interaction stretching at least from the Eastern Mediterranean to the Aegean at the end of the 7th millennium BC. Ç. Çilingiroğlu even proposes an interaction sphere from the Levant to Iberian Peninsula (Çilingiroğlu 2010 and in this volume). This speculative maritime network seems to have already been well-established by the late stages of a very dynamic and mobile part of the Neolithic period (*e.g.* Brami and Heyd 2011; Horejs *et al.* 2015), as suggested by other categories of evidence for Aegean connectivity.

Aegean connectivity in the Neolithic Age

Another important aspect of the subsistence strategies of farming communities was animal husbandry, which again exhibits a possible regional homogeneity, although this is currently based only on data from studies of two sites. Without pursuing specific details of Ç. Çakırlar's and A. Galik's analyses, the numbers of livestock at Çukuriçi and Ulucak obviously *do* reflect similar subsistence strategies in both communities predicated more on livestock and less on hunting (Çakırlar 2012; Galik and Horejs 2011; Horejs *et al.* 2011). Stock farming dominates the mammalian assemblage in both communities.

Simple quantification of domesticates and game remains may hamper the reconstruction of Neolithic consumption pattern (Halstead and Isaakidou 2011a; Halstead and Isaakidou 2011b; Isaakidou 2011) by various taphonomical as well as procedural uncertainties. At these two sites were high methodological excavation standards applied and the archaeozoological remains indicate domination in exploitation of sheep and goat and less intensity in the use of cattle and especially in pig not only by simple NISP based statistics but also by more sophisticated reflections in terms of bone weight and body part representation.

Beyond our confinement here to the regional level of the centre of the Anatolian Aegean coast, comparable volumes of livestock, interestingly enough, abound in other areas of the Aegean, particularly on mainland Greece and on Crete at the early to middle Neolithic sites of Nea Nikomedia, Knossos, Argissa Magoula, Agios Petros and Achilleion go to show, where sheep, goat and cattle can be observed in slightly fluctuating amounts with clearly dominating sheep and goat (Reingruber 2008: 514,

tab. 5.6). In relation to the centre of the Anatolian Aegean coast, the subsistence strategies around Marmara Sea appear different as the archaeozoological results of Fikirtepe, Menteşe, Ilıpınar and Barcın Höyük suggest and illustrate moreover some intra-regional diversity (Boessneck, v.d. Driesch 1979; Buitenhuis 1994; Buitenhuis 2008; Gourichon and Helmer 2008; Würtenberger 2012).

Although there is a great need for detailed studies by specialists of modern faunal data, it can be stated that the Central Anatolian Aegean Coastal Group and the Greek mainland show some similarities in general life stock strategies in 7th millennium, whilst early villages around the Marmara Sea appear different. Thus, if animal husbandry is perceived as a key-element in the subsistence strategies of communities, then these cross-Aegean similarities might well be linked to cross-Aegean relations, even though the direct spread of subsistence strategies from East to West or vice versa cannot really be postulated at this juncture.

Yet from the particular perspective of Çukuriçi, its Neolithic communities exhibit clear signs of active use of the Aegean Sea and regular seafaring for a range of different reasons. Whilst a migration from inland areas of small groups during the first occupation of Ulucak has been plausibly argued by Ç. Çilingiroğlu (Çilingiroğlu 2011: 75; Çilingiroğlu and Çakırlar 2013), the coastal site of Çukuriçi Höyük may also have been settled by groups arriving via sea routes, as suggested by the procurement of raw materials and seafood consumed (Horejs *et al.* 2015). Both pursuits are detectable at least from the early–7th millennium BC and seem to play an important role in shaping local identities until the abandonment of the tell in the Early Bronze Age (Bergner *et al.* 2008; Horejs *et al.* 2011: 54–60). This specific local tradition was rooted back in the early occupation phases and, in my view, cannot really be ascribed to or linked with early farming communities originating from inland Anatolia.

When we look to the lithic industry of Neolithic Çukuriçi, then technology and morphology are the ways and means of fitting this into the scheme of regional characteristics. The presence of all categories from different stages of the production process is likely to support the theory of knapping tools on-the-spot, rather than importing pre-fabricated products, although a specific knapping workshop has not been identifiable hitherto (Horejs and Milić 2013). Blades were the favoured type of tool produced. Continuing technological studies might be able to demonstrate that the pressure technique was mainly used for blade production (on conical and semi-conical cores leading to the bullet cores) as would be typical to the general hallmarks of Neolithic lithic industries in the region.

The dominant use of bullet cores is frequently observable in this part of the centre of the Anatolian Aegean coast (Herling *et al.* 2008; Çilingiroğlu *et al.* 2012: 148; Derin 2012: 192–193; Sağlamtimur 2012: 200). From this perspective, it appears all the more extraordinary that the raw materials used for lithic production at Çukuriçi appear to be radically different from other sites. As mentioned above, local sources of chert were available, but used only in very small amounts, whereas obsidian was being imported and used on a much larger scale.

Obsidian clearly dominates the lithic assemblages of Çukuriçi totalling more than 80% at Neolithic occupation levels, whilst cherts were seldom used for chipped stones. Neutron Activated Analyses has been employed to determine the provenance of the obsidian, and the samples analysed thus far reveal that the Aegean island of Melos was the only obsidian source used for the products recovered.[8] Cappadocian sources known from later periods of the tell (4th and 3rd mill. BC) do not seem to have been imported in the Neolithic period (Bergner *et al.* 2008).

Turning to the amounts and varieties at other sites, not only in the region, but also throughout Western Anatolia, the high amount of Melian obsidian suggests a special impact of this specific raw material on the Çukuriçi's communities. They preferentially used this Aegean source instead of locally available flints. Even though significant quantities lithic raw materials remain unpublished for many sites, what we know so far indicates that they appear in what are fundamentally different relative proportions; obsidian usually occurs as a minority component in the assemblages of Ulucak, Yeşilova and Ege Gübre, where good-quality cherts and flints are numerically dominant (Çilingiroğlu *et al.* 2012: 148; Sağlamtimur 2012: 200; Lichter and Meriç 2012; Derin 2012: 182 – distinctive differing obsidian amounts for Yeşilova are mapped by M. Milić 2014). Other scientific obsidian analyses at Ulucak seem to show up even just small quantities of Melian obsidian in 7th millennium BC lithics assemblages (Çilingiroğlu *et al.* 2012: 148). New analyses by M. Milić by pXRF characterisation could show a huge predominance of Melian obsidian in Ulucak, Ege Gübre and Yeşilova with only a very few pieces of Anatolian types (Milić 2014 and this volume). As Milić correctly pointed out, the smaller amount of analysed artefacts at Çukuriçi with NAA could likely miss potential minor sources like the central Anatolian ones.[9]

When we take account of the amounts of obsidian that occur on the centre of the Anatolian Aegean coast as well as the strong regional Neolithic network argued for above, then a special role for the coastal site Çukuriçi is implicated in this exchange system, specifically in relation to obsidian from Melos. Material from the later periods (Early Bronze Age 1: early 3rd millennium BC) (Knitter *et al.* in print), maybe taken as comparative evidence for speculating that Çukuriçi's communities were quite active in procuring obsidian directly from the quarry sites. This would have been to provide raw material for regional exchange systems and could, besides, permit us to describe Çukuriçi as a 'gateway community' for obsidian in a broader Aegean context, at least in early EBA times (Knitter *et al.* in print). The rise and role of gateway communities in late 4th and early 3rd millennium BC have been recently discussed for coastal sites in Crete (Papadatos and Tomkins 2013). The authors could clearly demonstrate the specific dynamic and process linked with the system of gateway communities in the Aegean that cannot be transferred to former periods.

Whilst the agents and members of these distinct Early Bronze Age networks speculatively included various mediators between the sources of Adamas and Demenegaki on Melos (*e.g.* Broodbank 2000) and Çukuriçi, the Aegean islands

between source and site were not feasible as possible agents of obsidian trade in the 7th millennium BC (cp. distribution in M. Milić 2014: 288, fig. 2, without Emporio and Tigani that seem to be not settled in that period, *e.g.* Hood 1981). Quite interesting for examining potential obsidian exchange networks in Neolithic are the results of the work of L. Herling in Dedecik-Heybelitepe farther inland (Herling *et al.* 2008), where around two thirds of the late 7th mill. BC assemblage was composed of obsidian. They suggested the importing of already prepared cores based on technological analyses in a 'down-the-line' system. Moreover, exhausted cores and complete exploitation of the material there was taken to indicate a scarcity of obsidian (Lichter and Meriç 2012: 134) in contrast to Çukuriçi datasets. This may encourage us to think of Çukuriçi's specific role in the exchange system of the centre of the Anatolian Aegean coast region.

Another particular feature of Neolithic Çukuriçi that can offer some clues to the potential principle agents in the supply of raw materials is indicated by patterns visible in their consumption of sea food. Although fish remains from Neolithic occupation phases have not been comprehensively analysed at the present stage of research, A. Galik's initial results give us clear evidence for fishing being a common activity that contributed to the communities' dietary practices. Over and above the predictable small and medium-size varieties of fish, there is also evidence of tuna (*Thunnusthynnus*) being caught, a fish that lives in open-seas, presumably being caught along its spawning routes that pass some distance from or along the coast (Stratouli 1996).

Freshwater fishing, surprisingly, does not appear to have been practiced. Diving for marine shells that lived in stony habitats appears to have been quite common, as shown, for example, by the large numbers of spondylus and arcanoae shells (Galik and Horejs 2011; Horejs *et al.* 2011). These same species are also known in higher amounts at the sites of Yeşilova and Ege Gübre in the late Neolithic period (Derin 2012: 181; Sağlamtimur 2012: 201). We can nonetheless suggest that Neolithic societies actively harnessed the Aegean Sea as a source of food using both fishing and diving techniques, and detailed analyses of species, rates and fishing techniques being studied by A. Galik will reveal more specific nuances on these traditions.

Fishermen can consequently be associated with shipping and seafaring. While there is no clear evidence of boats at Çukuriçi, many items from around the Mediterranean provide indirect and circumstantial evidence that have often been cited as proxies that support the existence of early shipping (*e.g.* Perlès 2001; Broodbank 2006). What is obvious is that mobile and peripatetic groups used to practise an early form of cabotage, travelling along the coast around the Aegean and also across the Sea, speculatively from island to island and from the coast in the Cyclades (*cf.* discussion by Çilingiroğlu, in this volume). As it is known so far, the islands as stopover were not settled in the 7th millennium, at least not permanently (Broodbank 2000). The relative abundance of sea-fauna at Çukuriçi points to a Neolithic society that frequently used the Aegean Sea for food supply and its members have been continuously moving

within the Aegean Sea, most probably even voyaging into the open sea as far as the Cyclades, particularly the island of Melos.

The putative suppliers of obsidian to the centre of the Aegean coast of Western Anatolia can be tentatively identified within this fishing community, as indicated by the extremely high volumes of obsidian that appear to have played an exceptional part in forging local identities up until abandonment of the site in the 3rd millennium BC. Thus, Çukuriçi Höyük in the 7th millennium can also be viewed as a gateway for the supply of this raw material to the local and regional networks in Western Anatolia.

Interregional ritual connectivity

The striking mobility of Neolithic communities has often been referred to in supra-regional analogies that incorporate Anatolia, the Levant and the Aegean as taking part incomparable symbolic traditions, such as distinct types of figurines and pendants, clay stamps or red-plastered floors that have already been frequently discussed in these terms (*e.g.* Özdoğan 2007; Lichter 2005; Lichter 2011; Çilingiroğlu 2010; Perlès 2001; Hansen 2007; Hauptmann, Özdoğan 2007). These analogies reflect not only a high scale of mobility, but presumably also a kind of common perception of some specific ritual activities or an understanding of symbolism, such as the red plaster floors or sealing/marking/decorating objects with similar stamps. Returning to the Anatolian Aegean Coastal Group, its integration into these supra-regional networks has been discussed by C. Lichter (2006; 2011) and Ç. Çilingiroğlu (2009; 2010; 2012) in terms of red plaster, figurines, impresso wares or clay stamps. Also H. Sağlamtimur's (2012) interpretation of round structures at Ege Gübre as an Eastern Mediterranean architectural influence might possibly be included in those networks, if convincing and cogent analogies can be speculatively argued.

Recent results at Yeşilova and Çukuriçi offer another insight into inter-regional symbolic connectivity in the guise of the special ritual of leopard hunting. A femur fragment with *fossa patellaris* and *epicondylusmedialis* of a leopard (*panthera pardus*) was deposited in a late 7th millennium pit at Çukuriçi phase VIII (Galik *et al.* 2012). The assemblage deposited together with this bone includes pottery, obsidian blades, fragments of a spoon and a polished stone axe and a clay sling missile as well as domestic animal bones and seeds. The special preparation of the pit, its arrangement with flat stones on the pit-ground and its partially lime-plastered inner surface constitutes the special repository of the whole deposition.[10] The character of deposited objects and jars in context with burnt food remains (for details of the botanical and zoological analyses s. Galik *et al.* 2012) have been interpreted as the refuse from a feasting ritual. The combination with a leopard's femur let us assume a potential specific ritual role of the beast. It has to be pointed out that the very frequent depictions of leopards, in Neolithic Anatolia and Levant in particular, are in stark contrast with the very few animal remains recovered.[11] As argued convincingly by I. Hodder for Çatalhöyük (Hodder 2006), illustrations of leopards reflect a Neolithic

society's conscious reference to a potentially dangerous - and possibly taboo -animal. The concept of Neolithic symbolism of wild leopards in relation to later objects, text sources and the results of ethnoarchaeological studies are discussed elsewhere (Galik *et al.* 2012), an here note that the beast seemed to play a distinct ritual role in Neolithic early farming communities. Especially, its expression as symbol of the wild dangerous sphere outside the protected and domesticated sphere inside the village is remarkable for Neolithic times.

A this point we can say that leopards appear to have been hunted at Çukuriçi Höyük and in one preserved case also deposited in a pit with special treatment and remains of a feasting ritual. In context of the symbolic meaning of the beast in Çatalhöyük and other Neolithic sites, we state a specific ritual connected to the hunting and feasting process. This femur bone demonstrates that leopards were not only brought to the region as fur, a potential consistent assumption due to one piece of a metatarsal found in Ulucak V (Çakırlar 2012: 22, tab. 3). A recently excavated jar with a depiction of a leopard in a relief in Yeşilova (Derin 2013) obviously shows that the beast was also known in reality and alive. It seems that the leopard was understood as symbolic expression in the Anatolian Aegean Coastal Group, too, although its manifestation differs from the Neolithic core zones in the east and southeast.

Conclusions

A rich variety of categories of evidence demonstrate that connectivity in the centre of the Anatolian Aegean coast in 7th millennium BC took the form of complex networks on regional as well as on interregional levels.

The clustering of more or less contemporary sites in one region shows strong linkages in terms of technology, style, morphology and use of material culture (in a broad sense). In addition, the way that sources of supply were used allows in my view a tentative, initial modelling of a regional group in Pottery Neolithic period. Strong regional relationships have been argued for, not only from direct comparison of material objects, but also by exploring overlapping ideas about subsistence strategies within these early farming and livestock communities. The use and design of weapons also indicate comparable policies about dealing with conflicts and/or hunting. On a broader scale, the uniformity of the discussed Neolithic sites in their material culture and ways of life is striking and let assume an Anatolian Aegean Coastal Group in 7th millennium BC.

Integrating the regional results into broader Aegean networks provides a strong basis to develop our understanding of the regional trading and bartering systems, as well. As proposed for the system of obsidian supply, the coastal site of Çukuriçi Höyük can be seen as a community with extensive regional exchange of this distinct raw material. That is why this community, which also appears to have participated regularly in fishing, presumably not only onshore, is identifiable in the region as one of the potential agents harnessing sources of supply. The integration of the Anatolian

Aegean Coastal Group into widespread Neolithic symbolic systems from the Levant, inner Anatolia and Mesopotamia links this part of the Aegean into this interregional network. We can also suggest, at the very least, that with the adaptation of Neolithic symbolism in a regional context with red-plastered floors, sealing systems and others, also the ritual role of leopards have been adopted and transformed by the local communities.

This regional homogeneity of cultural norms is striking in many respects, though this is set against an interesting contrast in the diversity noted at each site - mainly in terms of architectural technology on the level of households and the spatial organisation of settlements. These can hardly be explained by external factors or circumstances, such as differences in environment or access to necessary resources, but seems to reflect local traditions and identities as well as local social patterns. To attain a better understanding of the manner of connectivity in the region, further studies into their distinct diversity promise new answers about what may be the communities' different needs, traditions, beliefs, identities and maybe their origins, as well.

Acknowledgements

I would like to thank the organizers of the Sheffield Round Table for an inspiring workshop and Barry Molloy in particular for his great patience to written contribution. Moreover, I thank Mehmet Özdoğan, Çiler Çilingiroğlu and Raiko Krauß for fruitful discussions in the last years concerning Neolithization processes. Finally, my thanks go to the whole ERC project team and Bogdana Milić as well as Felix Ostmann particularly for their work with the Neolithic stratigraphy and chronology of Çukuriçi Höyük. I would also like to thank the European Research Council (ERC) for funding the project 'Prehistoric Anatolia' (263339) and the Austrian Science Fund (FWF) for financial support.

Notes

1. The summarily chronological tables and former reports suggested a dating of Ulucak VI up to 7000 BC in using two dates of charcoals (*e.g.* Özdoğan *et al.* 2012: 238; Çakırlar 2012); the excavators recently argued convincingly with five new short-lived samples that the earliest settlement was founded between 6760 and 6600 cal BC (Çilingiroğlu *et al.* 2012: 152–153).
2. MAMS 18320: ÇuHö12/1554/10/1: 2σ-range 6766–6592 cal BC; MAMS 18319: ÇuHö11/1362/10/3: 2σ-range 6682–6509 cal BC; MAMS 15270: ÇuHö 11/1398/11/1: 2σ-range 7020–6641cal BC.
3. The excavator Z. Derin published "*...the first result obtained from level III.7 is (one sigma) 6490 cal BC (7505 +/- 37 BP) and the finds from level III.8 suggest that it could go back a further 200 years*" (Derin 2012, 183).
4. One seed sample from house complex 6 (MAMS 18744: ÇuHö12/1637/10/1: 2σ-range 6437–6264 cal BC) is also proven by various samples from drilling cores corresponding to phase ÇuHö IX in height within a range of 6480 to 6210 cal BC.
5. Illustrated *e.g.* by Özdoğan 2002: 442, fig. 6.
6. My sincere thanks to Ç. Çilingiroğlu, who called my attention to these finds at Yeşilova.

7. Preliminary results have been presented by Maria Knipping (University Hohenheim) at the Geoarchaeological Workshop Ephesos at the Austrian Archaeological Institute (18.5.2013).
8. The former relatively small NAA programme of obsidians at Çukuriçi in the Curt Engelhorn Centre for Archaeometry in Mannheim, Germany, conducted by E. Pernicka has recently been integrated into a broader project of lithic raw materials as part of the ITN Marie Curie BEAN project-funding of the lithic studies of B. Milić starting in 2012.
9. I would like to thank M. Milić for this personal comment that will hopefully lead to further analyses of Çukuriçi assemblages in the near future.
10. For a detail description of the "leopard's pit" and its assemblage s. Galik *et al.* 2012, esp. fig. 2–9.
11. S. distribution map of excavated leopard bones from Paleolithic to End of Bronze Age in Galik *et al.* 2012: 274 fig. 11.

References

Atalay, S.
2005 Domesticating Clay: The Role of Clay Balls, Mini Balls and Geometric Objects in Daily Life at Catalhöyük. In I. Hodder (ed.), *Changing materialities at Catalhöyük: reports from the 1995–1999 seasons*(Catalhöyük Research Project Volume 5, BIAA Monograph 39): 139–168. Cambridge.

Bergner, M., B Horejs and E. Pernicka
2008 Zur Herkunft der Obsidianartefakte vom Çukuriçi Höyük. *Studia Troica 18*: 251–273.

Boessneck, J. and A. v. d. Driesch
1979 Die Tierknochenfunde aus der neolithischen Siedlung auf dem Fikirtepe bei Kadiköy am Marmarameer. Dissertation, University of Munich.

Brami, M. and V. Heyd
2011 The origins of Europe's first farmers: The role of Hacılar and Western Anatolia, fifty years on. *Prähistorische Zeitschrift* 86: 165–206.

Broodbank, C.
2000 *An island archaeology of the Early Cyclades*. Cambridge: Cambridge University Press.
2006 The Origins and Early Development of Mediterranean Maritime Activity. *Journal of Mediterranean Archaeology* 19: 199–230.

Brückner, H.
1997 Geoarchäologische Forschungen in der Westtürkei – das Beispiel Ephesos. In T. Breuer (ed.), *Geographische Forschungen im Mittelmeerraum und in der Neuen Welt. Festschrift für Klaus Rother* (Passauer Schriften zur Geographie 15): 39–51. Passau: Passauer Schriften zur Geographie.

Buitenhuis, H.
1994 Note on archaeozoological research around the Sea of Marmara. *Anatolica* 20: 41–144.
2008 Faunal remains from the late Neolithic and Early Chalkolithic levels. In J. Roddenberg and S. Alpaslan-Roddenberg (eds.), Life and Death in a Prehistioric Settlement in the Northwest Anatolia. *The İlıpınar Excavations* II: 205–218.

Çakırlar, C.
2012 The evolution of animal husbandry in Neolithic central-west Anatolia: the zooarchaeological record from Ulucak Höyük (*c.* 7040–5660 cal. BC, Izmir, Turkey). *Anatolian Studies* 62: 1–33.

Çilingiroğlu, Ç.
2009 Of stamps, loom weights and spindle whorls: Contextual evidence on the function(s) of stamps from Ulucak, İzmir, Turkey. *Journal of Mediterranean Archaeology* 22(1): 3–27.
2010 The Appearance of Impressed Pottery in the Neolithic Aegean and its Implications for Maritime networks in the Eastern Mediterranean. *Türkiye Bilimler Akademisi Arkeoloji Dergisi* 13: 9–22.
2011 The Current State of Neolithic Research at Ulucak, Izmir, in: R. Krauß (ed.) *Beginnings – New Research in the Appearance of the Neolithic between Northwest Anatolia and the Carpathian Basin. Papers of the International Workshop 8th-9th April 2009, Istanbul* (Menschen – Kulturen – Traditionen. Studien aus den Forschungsclustern des Deutschen Archäologischen Instituts 1): 67–76. Rahden/ Westfahlen: Menschen – Kulturen – Traditionen. Studien aus den Forschungsclustern des Deutschen Archäologischen Instituts.
2012 *The Neolithic Pottery of Ulucak in Aegean Turkey. Organization of production, interregional comparisons and relative chronology* (BAR International Series 2426). Oxford: British Archaeological Reports.

Çilingiroğlu, Ç. and Çakırlar, C.
2013 Towards configuring the neolitisation of Aegean Turkey. *Documenta Praehistorica 40*. doi:10.4312/ dp.40.3.

Çilingiroğlu, A., Ö. Çevik and Ç. Çilingiroğlu
2012 Ulucak Höyük. Towards Understanding the Early farmings Communities of Middle West Anatolia: Contribution of Ulucak. In M. Özdoğan, N. Basgelen and P. Kuniholm (eds.), *The Neolithic in Turkey. New Excavations and New Research* (Western Turkey 4): 139–175. Istanbul: Western Turkey.

Çilingiroğlu, A., Z. Derin, E. Abay, H. Sağlamtimur and İ. Kayan
2004 Ulucak Höyük. Excavations Conducted Between 1995 and 2002. *Ancient Near East Studies Supplement Series* 15.

Clare, L., E. J. Rohling, B. Weninger and J. Hilpert 2008
Warfare in Late Neolithic/Early Chalcolithic Pisidia, southwestern Turkey. Climate induced social unrest in the late 7th millennium calBC. *Documenta Praehistorica* 35: 65–92.

Derin, Z.
2012 Yeşilova Höyük. In M. Özdoğan, N. Basgelen and P. Kuniholm (eds.), *The Neolithic in Turkey. New Excavations and New Research* (Western Turkey 4): 177–195. Istanbul: Western Turkey.
2013 En yaşlı Anadolu Parsı. In *Kent Dergisi Bornova*, Mart 2013, Sayı 3: 22–27.

Derin, Z., F. Ay and T. Caymaz
2009 İzmir'inprehistorikyerleşimi, Yeşilova Höyüğü 2005–2006 yılıçalışmaları. *Arkeoloji Dergisi* 13: 1–52.

Duru, R.
2005 Bademğacı Kazıları 2002 ve 2003 yılları çalişma raporu. Belleten 68: 549–594.

Erdal, E.
2012 Organized violence in Anatolia: A retrospective research on the injuries from the Neolithic to Early Bronze Age. *International Journal of Paleopathology* (in print).

Galik, A. and B. Horejs
2011 Çukuriçi Höyük – Various Aspects of its Earliest Settlement. In R. Krauß (ed.), *Beginnings – New Research in the Appearance of the Neolithic between Northwest Anatolia and the Carpathian Basin. Papers of the International Workshop 8th-9th April 2009, Istanbul* (Menschen – Kulturen – Traditionen. Studien aus den Forschungsclustern des Deutschen Archäologischen Instituts 1): 83–94. Rahden/ Westfahlen: Menschen – Kulturen – Traditionen. Studien aus den Forschungsclustern des Deutschen Archäologischen Instituts.

Galik, A., B. Horejs and B. Nessel
2012 Der nächtliche Jäger als Beute – Zur prähistorischen Leopardenjagd. *Prähistorische Zeitschrift* 87(2): 261–307.

Gourichon, L. and D. Helmer
2008 Etude de la Faune Neolithique de Menteşe. In J. Roddenberg and S. Alpaslan Roddenberg (eds.), Life and Death in a Prehistioric Settlement in the Northwest Anatolia.*The Ilıpınar Excavations* II: 435–446.

Halstead, P. and V. Isaakidou
2011a A pig fed by hand is worth two in the bush: Ethnoarchaeology of pig husbandry in Greece and its archaeological implications. In T. Wilkinson, S. Sherratt, J. Bennet (eds.) *Interweaving Worlds: Systemic Interactions in Eurasia, 7th to 1st Millennia BC*(Oxbow Books): 160–174. Oxford: Oxbow Books.
2011b Revolutionary Secondary Products: the Development and Significance of Milking, Animal-Traction and Wool-Gathering in Later Prehistoric Europe and the Near East. In T. Wilkinson, S. Sherratt and J. Bennet, (eds.) *Interweaving Worlds: Systemic Interactions in Eurasia, 7th to 1st Millennia BC* (Oxbow Books): 61–76. Oxford: Oxbow Books.

Hansen, S.
2007 *Bilder vom Menschen der Steinzeit. Untersuchungen zur anthropomorphen Plastik der Jungsteinzeit und Kupferzeit in Südosteuropa.* Berlin: Archäologie in Eurasien 20. Philipp von Zabern Verlag

Hauptmann, H. and M. Özdoğan
2007 Die Neolithische Revolution in Anatolien. In *Die ältesten Monumente der Menschheit. Ausstellungskatalog Karlsruhe*: 26–36.

Herling, L., K. Kasper, C. Lichter and R. Meriç
2008 Im Westen nichts Neues? Ergebnisse der Grabungen 2003 und 2004. *Istanbuler Mitteilungen* 58: 13–65.

Hodder, I.
2006 *Çatal Höyük. The Leopard's Tale, revealing the mysteries of Çatalhöyük.* London: Thames and Hudson.

Hood, S.
1981 *Excavations in Chios 1938–1955. Prehistoric Emporio and Ayio Gala.* London: British school of Archaeology in Athens Supplement Volume 15.

Horejs, B.
2012 Çukuriçi Höyük. A Neolithic and Bronze Age Settlement in the Region of Ephesos. In M. Özdoğan, N. Basgelen and P. Kuniholm (eds.), *The Neolithic in Turkey. New Excavations & New Research*. (Western Turkey 4): 117–131. Istanbul: Western Turkey.

Horejs, B., A. Galik, U. Thanheiser, and S. Wiesinger
2011 Aktivitäten und Subsistenz in den Siedlungen des Çukuriçi Höyük. Der Forschungsstand nach den Ausgrabungen 2006–2009. *Prähistorische Zeitschrift* 86: 31–66.

Horejs, B. and B. Milić
2013 *A 7th millennium BC house complex of Çukuriçi Höyük in the light of the lithic assemblage*. Poster presentation at the International Symposium on Chert and other Knappable Materials, Iaşi, Rumania, 20.-24.08.2013.

Horejs, B., B. Milić, F. Ostmann, U. Thanheiser, B. Weninger and A. Galik
2015 The Aegean in the Early 7th Millennium BC: Maritime Networks and Colonization, *Journal of World Prehistory* 28(4): 289–230.

Isaakidou, V.
2011 Farming regimes in Neolithic Europe: gardening with cows and other models. In T. Wilkinson, S. Sherratt, J. Bennet (eds.) *Interweaving Worlds: Systemic Interactions in Eurasia, 7th to 1st Millennia BC* (Oxbow Books): 90–112. Oxford: Oxbow Books.

Karul, N.
2011 The Emergence of Neolithic Life in South and East Marmara Region. In R. Krauß (ed.), *Beginnings – New Research in the Appearance of the Neolithic between Northwest Anatolia and the Carpathian Basin. Papers of the International Workshop 8th–9th April 2009, Istanbul* (Menschen – Kulturen – Traditionen. Studien aus den Forschungsclustern des Deutschen Archäologischen Instituts 1): 57–66. Rahden/Westfahlen: Menschen – Kulturen – Traditionen. Studien aus den Forschungsclustern des Deutschen Archäologischen Instituts.

Knitter, D., B. Horejs, M. Bergner, B. Schütt and M. Meyer
In print *The importance of location in terms of Early Bronze Age 1 obsidian exchange in western Anatolia*.

Korfmann, M., F. Dedeoğlu and M. Erdalkıran
2007 Ulucak Höyük Neolitik Dönem Sapan Taneleri. In G. Umurtak, Ş. Dönmez, A. Yurtsever (eds.), *Refik Duru'ya Armağan*: 41–50. Istanbul: Zero Books.

Kraft, J.C., İ. Kayan and H. Brückner
2001 The Geological and Paleographical Environs of the Artemision. In U. Muss (ed.), *Der Kosmos der Artemis von Ephesos* (Sonderschriften des Österreichischen Archäologischen Institutes 37): 123–133. Wien: Sonderschriften des Österreichischen Archäologischen Institutes.

Krauß, R.
2011 *Beginnings – New Research in the Appearance of the Neolithic between Northwest Anatolia and the Carpathian Basin. Papers of the International Workshop 8th–9th April 2009, Istanbul* (Menschen – Kulturen – Traditionen. Studien aus den Forschungsclustern des Deutschen Archäologischen Instituts 1). Rahden/Westfahlen: Menschen – Kulturen – Traditionen. Studien aus den Forschungsclustern des Deutschen Archäologischen Instituts.

Lichter, C.
2006 Zum Forschungsstand des Neolithikums und frühen Chalkolithikums in Westanatolien. In I. Gatsov and H. Schwarzberg (eds.), *Aegean – Marmara – Black Sea. The present state of research on the Early Neolithic. Proceedings held at EAA 8th Ann. Meeting at Thessaloniki, 28th Sept. 2002* (Schriften des Zentrums für Archäologie und Kulturgeschichte des Schwarzmeerraumes, 5): 29–46. Langenweissbach: Schriften des Zentrums für Archäologie und Kulturgeschichte des Schwarzmeerraumes.
2011 Neolithic Stamps and the Neolithization Process. A Fresh Look at an Old Issue. In R. Krauß (ed.) *Beginnings – New Research in the Appearance of the Neolithic between Northwest Anatolia and the Carpathian Basin. Papers of the International Workshop 8th-9th April 2009, Istanbul* (Menschen – Kulturen – Traditionen. Studien aus den Forschungsclustern des Deutschen Archäologischen Instituts 1): 35–44. Rahden/Westfahlen: Menschen – Kulturen – Traditionen. Studien aus den Forschungsclustern des Deutschen Archäologischen Instituts.

Lichter, C. (ed.)
2005 *How Did Farming Reach Europe? Anatolian–European relations from the second half of the 7th through the first half of the 6th Millennium Cal BC. Proceedings of the International Workshop Istanbul, 20–22 May 2004*. Istanbul: Byzas 2.

Lichter, C. and R. Meriç
2012 Dedecik-Heybelitepe. Excavations of a Neolithic Settlement in the Torbalı Plain. In M. Özdoğan 2012 (eds.), *International Earth Science Colloquium on the Aegean Region, IESCA-2012 1st -5th October 2012, İzmir, Turkey* (Abstracts Book): 308.

Maran, J.
1998 *Kulturwandel auf dem griechischen Festland und den Kykladen im späten 3. Jahrtausend v. Chr. Studien zu den kulturellen Verhältnissen in Südosteuropa und dem zentralen sowie östlichen Mittelmeerraum in der späten Kupfer- und frühen Bronzezeit*. Bonn: Universitätsforschungen zur Prähistorischen Archäologie 53.

Milić, M.
2014 PXRF characterisation of obsidian from central Anatolia, the Aegean and central Europe.*Journal of Archaeological Science* 41: 285–296.

Özdoğan, M.
2002 On Arrows and Sling Missiles: What Happened to the Arrows?In Aslan, R. (ed.), *Mauerschau. Festschrift für Manfred Korfmann*: 437–444. Verlag Bernhard Albert Greiner.
2006 Neolithic cultures at the contact zone between Anatolia and the Balkans. In I. Gatsov and H. Schwarzberg (eds.), *Aegean – Marmara – Black Sea: The present state of research on the Early Neolithic. Proceedings held at EAA 8th Ann. Meeting at Thessaloniki, 28th Sept. 2002* (Schriften des Zentrums für Archäologie und Kulturgeschichte des Schwarzmeerraumes ZAKS e.V. Band 5): 21–28. Halle (Saale): Zentrum für Archäologie und Kulturgeschichte des Schwarzmeerraumes e.V.
2007 Amidst Mesopotamia-centric and Euro-centric approaches: the changing role of the Anatolian peninsula between the East and the West. *Anatolian Studies* 57: 17–24.
2011 Archaeological Evidence on the Westward Expansion of Farming Communities from Eastern Anatolia to the Aegean and the Balkans.*Current Anthropology* 52 supplement 4: 415–430.
2013 Neolithic Sites in the Marmara Region. In M. Özdoğan *et al.* (eds.),*The Neolithic in Turkey. New Excavations and New Research*. Band 5: Northwestern Turkey and Istanbul: 167–269. Istanbul: Arkeoloji Ve Sanat Yayınları.

Özdoğan, M. and N. Başgelen (eds.)
2007 *Türkiye'de Neolitik Dönem. Yeni kazılar, yeni bulgular*. Istanbul: Arkeoloji ve Sanat Yayınları.

Özdoğan, M., N. Başgelen and P. Kuniholm (eds.)
2012 *The Neolithic in Turkey. New Excavations and New Research*. Band 4: Western Turkey. Istanbul: Arkeoloji ve Sanat Yayınları.
2013 *The Neolithic in Turkey. New Excavations and New Research*. Band 5: Northwestern Turkey and Istanbul. Istanbul: Arkeoloji Ve Sanat Yayınları.

Papadatos, Y. and P. Tomkins
2013 Tradings, the Longboat, and Cultural Interaction in the Aegean During the Late Fourth Millenium B.C.E.: The View from Kephala Petras, East Crete. *AJA* 117: 353–381.

Perlès, C.
2001 *Early Neolithic in Greece*. Cambridge: Cambridge University Press.

Renfrew, C.
1972 *The Emergence of Civilisation. The Cyclades and the Aegean in the Third Millennium B.C.* London: Methuen and Co. Ltd.

Reingruber, A.
2008 *Die Argissa-Magula II. Das frühe und das beginnende mittlere Neolithikum im Lichte transägäischer Beziehungen*. Bonn: Beiträge zur ur- und frühgeschichtlichen Archäologie des Mittelmeer-Kulturraumes 35.

Sağlamtimur, H.
2012 The Neolithic Settlement of Ege Gübre. In M. Özdoğan *et al.* (eds.), *The Neolithic in Turkey. New Excavations and New Research*. Band 4: Western Turkey: 197–225. Istanbul: Arkeoloji ve Sanat Yayınları.

Samson, R. (ed.)
1990 *The Social Archaeology of Houses*: Edinburgh: Edinburgh University Press.

Schachner, A.
1999 *Von der Rundhütte zum Kaufmannshaus. Kulturhistorische Untersuchungen zur Entwicklung prähistorischer Wohnhäuser in Zentral-, Ost- und Südostanatolien (BAR International Series 807)*. Oxford: British Archaeological Reports.

Schoop, U.-D.
2005 *Das anatolische Chalkolithikum. Eine chronologische Untersuchung zur vorbronzezeitlichen Kultursequenz im nördlichen Zentralanatolien und den angrenzenden Gebieten*. Großschönau: Urgeschichtliche Studien 1.

Souvatzi, S.G.
2008 *A social archaeology of Neolithic households in Greece: An anthropological approach*. Cambridge: Cambridge University Press

Stock, F., A. Pint, B. Horejs, S. Ladstätter and H. Brückner
2013 In search for the harbours: New evidence of Late Roman and Byzantine harbours of Ephesus. *Quaternary International* 312: 57–69.

Stratouli, G.
1996 Die Fischerei in der Ägäis während des Neolithikums. Zur Technik und zum potentiellen Ertrag. *Prähistorische Zeitschrift* 71(1): 1–27.

Thissen, L.
2001 The Pottery of Ilıpınar, Phases X to VA. In J.J. Roodenberg and L.C. Thissen (eds.), The Ilıpınar Excavations II: 3–154.

Wolf, D., G. Borg and B. Horejs
2012a Geoarchäologische Untersuchungen zu den Erzvorkommen in Westanatolien. In F. Schlütter, S. Greiff and M. Prange (eds.), *Archäometrie und Denkmalpflege 2012* (Metalla Sonderheft 5): 143–144. Bochum: Metalla Sonderheft.
2012b Settlement walls of Çukuriçi Höyük – What stones could tell about prehistoric craftsman. In Ç. Helvacı *et al.* 2012 (eds.), *International Earth Science Colloquium on the Aegean Region, IESCA-2012 1st -5th October 2012, İzmir, Turkey* (Abstracts Book): 308.

Wolf, D.
in press Studien zur Geologie im Kaystros- und Kaikostal. Zur Nutzung von Lagerstätten und Rohstoffen in der Urgeschichte. PhD dissertation, Martin-Luther-University of Halle-Wittenberg.

Würtenberger, D.
2012 Archäozoologische Analysen am Fundmaterial des Barçın Höyüks im Vergleich mit ausgewählten Fundstellen Nordwest- und Westanatoliens des 7./6. Jahrtausends. Master´s thesis, Universiy of Vienna.