

Proto-Urbanisation without Urban Centres? A Model of Transformation for the Izmir Region in the 4th Millennium BC

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Abstract: The former absence of sites dating to the 4th millennium BC in western Anatolia represented an artificial lacuna produced by the lack of scientific research. This gap is gradually being filled with data from new annual excavations and surveys. Although we still have to get by with limited amounts of archaeological data, the Late Chalcolithic period has recently been presented in handbooks and wider studies as a crucial period of cultural development in Anatolia. Predating the relatively well-researched Early Bronze Age, with its organised central sites, the 4th millennium BC could be understood as a period during which the processes began that led to the developments that defined the Early Bronze Age. This contribution debates the multi-layered process of proto-urbanisation as a socio-cultural phenomenon in the context of *longue durée* development in the crucial period of the 4th millennium BC. Based on recent excavation results obtained from Çukuriçi Höyük and other sites, the paper examines different archaeological indicators to define the broad region of western Anatolia, and the centre of the Anatolian Aegean Coast in particular, before Troy. Based on Kemp's model for pre-dynastic Upper Egypt, this distinct region is considered from the perspectives of basic economy, functional diversity and specialisation. The results are discussed as cultural transformations and process of consolidation of communities and their functional differentiation in the use of land and resources. The paper concludes with a model of proto-urbanisation for the centre of the Anatolian Aegean Coast in the 4th millennium BC.

Keywords: Turkey, western Anatolia, Çukuriçi Höyük, Proto-Urbanisation, Late Chalcolithic, socio-cultural development, prehistoric economy, model of transformation

Western Anatolia is a well-integrated region between the inner Anatolian, Mesopotamian and Levantine world on the one hand and the Aegean, Balkans and the Black Sea on the other. Cultural interaction forms a conceptual backbone for understanding all of prehistory in western Anatolia. Examining general cultural developments from a broader perspective, we are dealing with the concept of connectivity from the earliest Pottery Neolithic up to the end of the Bronze Ages (and beyond). In this supra-regional cultural context, it appears significant to ask *why* it seems so difficult to connect western Anatolia, the region in our focus, with its cultural neighbours in the millennium before Troy and *how* we should understand the explosion of Early Bronze Age sites around the beginning of the 3rd millennium BC.

Excavation results from Çukuriçi Höyük reveal archaeological remains and materials dating to the 4th millennium BC or the Late Chalcolithic period that we can, for the first time, link with general processes that took place in other cultural areas. The intensive metallurgical production in the following Early Bronze Age at Çukuriçi² brings us back to the old debate of which role metals played for the development of social systems in the periods of early copper and arsenic bronze production. Since the late 1960s when C. Renfrew developed his model of a possible independent emergence of metallurgy in the Balkans and the Aegean-Anatolian world,³ the archaeological picture has changed several times, most recently because of the re-dating of the early Varna

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² Horejs et al. 2010; Horejs et al. 2011.

³ Renfrew 1969.



Fig. 1 Location of the site Çukuriçi Höyük in the alluvial basin, view from the west (photo: N. Gail; design F. Ostmann/ERC Prehistoric Anatolia).

Horizon,⁴ the access to other very early dates for Balkan and East Mediterranean metallurgy⁵ and new excavations at sites of the 5th and 4th millennium BC in the Aegean and Anatolia.

While the role of metals and their socio-cultural impact is discussed by E. Pernicka and M. Mehofer in this volume, the following contribution focuses on another general phenomenon usually summarised as the ‘process of urbanisation’ that can for the first time be observed in the 4th millennium BC in other cultural regions, but *not* in fact in western Anatolia. Although urban centres as nuclear parts of this phenomenon have not been identified from that time in the region of our focus, some social and cultural processes usually linked with urbanisation are observable. It is therefore possible to discuss western Turkey in the 4th millennium BC using a socio-cultural model, already developed and analysed in other regions, not least in modern social geography⁶ and cultural sociology.⁷

‘Proto-Urbanisation’ as a Useful Socio-Cultural Model for Prehistory?

Complex urban systems represent a final point in the long-term transformation of human ways of living,⁸ a multi-layered process of the *longue durée*⁹ and not necessarily linear and ‘successful’, which probably includes various stages and phases. Following different studies of social geography and demography, the phenomenon of urbanisation not only includes the development of urban centres and their expansion; the quantity, size and number of inhabitants increased in relation to the rural population.¹⁰ It also comprises the distribution and intensification of urban ways

⁴ Krauß et al. 2012 discusses the latest radiocarbon-dates in the context of different material analyses, archaeological and anthropological research at Varna.

⁵ Borić 2009; Radivojevic et al. 2010; Garfinkel et al. 2014.

⁶ E.g. Lichtenberger 1998.

⁷ For terminologies of towns and rural sociology as discussed in sociology see e.g. Sombart 1983.

⁸ Compare the basic essay of M. Weber about key definitions of an urban town and its variation through times and regions in the world (Weber 1920–1921) and more recently Lichtenberger 1998; s. also Düring 2011a, 253–254.

⁹ Braudel 1977.

¹⁰ Bähr 2011.

of life, economy and behaviour to integrate both dynamic processes and their social impact.¹¹ In this social and economic context, the simple dichotomy of urban and rural areas does not suffice to describe all ways of living; agricultural ways of living in modern cities or urban behaviours in agricultural communities in the country may be added.¹² The relation of a city and its subsistence base is, as M. Weber pointed out, not at all clear, illustrated by the variability documented from Classical antiquity until the Middle Ages in Europe.¹³ E. Lichtenberger created a model of changing urban-rural relations from the Feudal system until present times that also reflects changing social and economic structures of societies.¹⁴ Even though studies of present or classical societies can of course not be transferred directly to prehistory, the phenomenon of urbanisation and its complexity offer precious information for modelling prehistoric processes.¹⁵ Conversely, analyses of prehistoric data to reconstruct concepts of urbanisation could extend the range of sources to understand the principles of this phenomenon, add chronological depth and substantially expand the notion of urbanisation by contrasting and comparing different aspects.

As demonstrated, for example, by B. J. Kemp for pre-dynastic Upper Egypt, the transformation from egalitarian communities to agricultural towns in the 4th millennium BC formed the crucial basis of the first city states in the Old Kingdom.¹⁶ Based on landscape and archaeological data, he could differentiate stages of transformation from small egalitarian communities with low population density, farming villages and neighbouring zones of direct exploitation to the next level of agricultural towns with high population density, farming villages in the country (whilst other settlements were abandoned) and regular exchange with villages along the riverbank. Kemp's second stage model shows a structured territory with functionally differentiated villages of farming on the one hand and settlements for exploitation of river sources on the other, both dependent on each other and connected through regular contacts. This functional division forms the main basis of his third stage of incipient city states in early dynastic times with fortified towns of regional power, water channel systems for systematic land cultivation and organised ports at the riverbank. Kemp's convincing model of prehistoric Egypt demonstrates the necessary preconditions for the transition to urban centres that represent a crucial link between agricultural communities with simple subsistence economy and organised societies with urban regional power.¹⁷

Integrated in this context, the model of 'proto-urbanisation' is understood in this paper as a distinct phase of cultural transformation that is definable as a social process of consolidation of communities and their functional differentiation in the use of land and resources in western Turkey. Archaeological indicators to argue for this functional diversity can be traced at individual site studies by looking at exchange systems, craft specialisation, architectural diversification, infrastructure and the concentration of functional buildings as well as social interaction.¹⁸ In accordance with the urbanisation studies mentioned above, archaeological data about basic economy, including use and access to raw materials as well as agricultural supply of a site, could play an important role in defining the way of life of communities. Functional diversity of archaeological sites within a region could additionally represent a cultural transformation from egalitarian small farming villages to another level. Western Anatolia in the 4th millennium BC appears to reflect one stage in this transformation process that can, in my view, be integrated into a more general model and will therefore be discussed as *process of proto-urbanisation*, illustrated by the example of the region and landscape of the central Anatolian Aegean coast in the conclusion of this paper.

¹¹ Yakar 2011, esp. 330–338.

¹² Lichtenberger 1998, 65; Bähr 2011.

¹³ Weber 1920–1921, in particular 627–629.

¹⁴ Lichtenberger 1998, 63–65.

¹⁵ Cf. also Gogåltan 2010.

¹⁶ Kemp 1989.

¹⁷ See also Papadatos – Tomkins 2013.

¹⁸ Cf. e.g. the 'dynamic model of urbanisation' discussed for Manching in central Europe by Ellert et al. 2012.

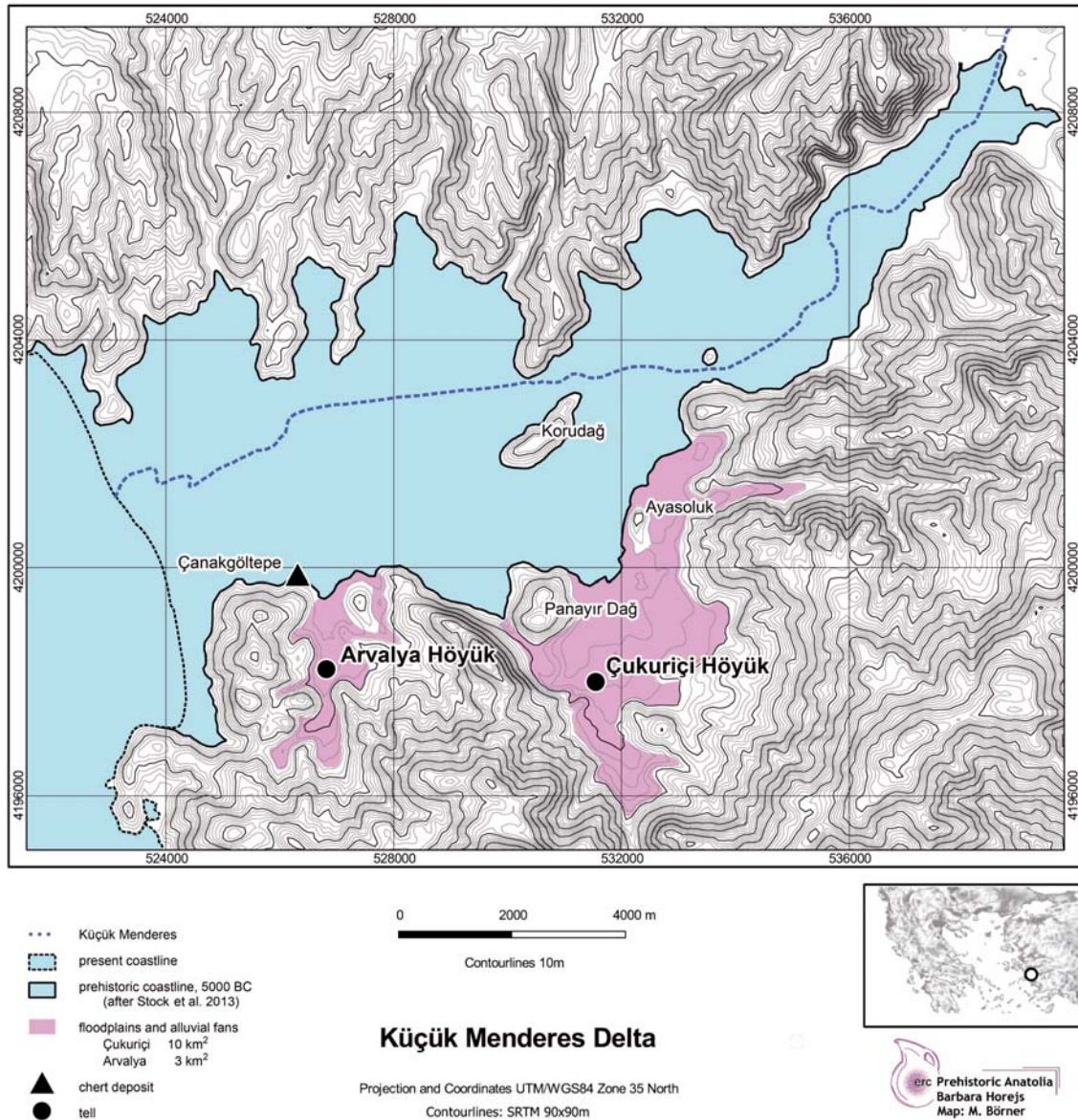


Fig. 2 Reconstructed prehistoric landscape with the archaeological sites Arvalya Höyük and Çukuriçi Höyük south of the Küçük Menderes Delta (M. Börner/ERC Prehistoric Anatolia).

Çukuriçi Höyük in the Late Chalcolithic Period

Çukuriçi Höyük is situated in a basin close to the delta of the Küçük Menderes River (Fig. 1), flanked by low mountains just outside the antique city of Ephesus. Thanks to decades of geographical work by the teams of H. Brückner, I. Kayan and C. Kraft, it became clear that the tell was originally situated approximately 1.5km from the Aegean coastline.¹⁹ The basin comprises about 10km² and offers very good conditions for agriculture and animal husbandry, including easy access to freshwater sources like springs and rivers (Fig. 2). The results of coring by F. Stock suggest that the tell was originally larger in size (c. 200 × 160m), although a shift of settlements

¹⁹ Stock et al. 2013.

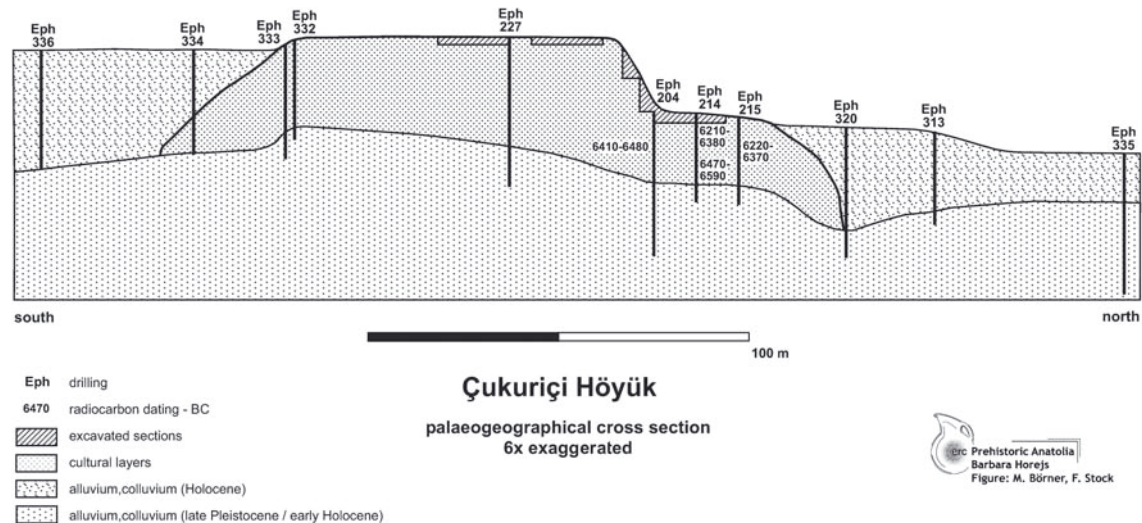


Fig. 3 Palaeogeographical cross-section of Çukuriçi Höyük, 6× exaggerated (M. Börner/ERC Prehistoric Anatolia after F. Stock 2013).

on the tell itself within an area of about 3.2ha in different periods cannot be excluded at the present state of research (Fig. 3).

Seven settlement phases dating to the Neolithic, Chalcolithic and Early Bronze Age have been excavated so far, of which only the earliest and latest periods have been recovered over larger areas. Remains of the 4th millennium BC have been mainly excavated in deep stepped profile trenches at the northern edge of the tell that offered a vertical sequence of the site. The stratigraphy illustrates that the 4th millennium levels (phase ÇuHö VII) directly cover the layers of phase ÇuHö VIII, dating to the Early Chalcolithic at c. 6000 BC. The 4th millennium BC levels include traces of architecture,²⁰ remains of buildings and corresponding horizons of use, including the skeleton of a child in a cist grave underneath a stamped clay floor dating to the second half of the 4th millennium BC (Fig. 4). The crouched infant body had been placed carefully on the right side in more or less east-west direction with the face to the north without any grave goods.

Other remains dating to the Late Chalcolithic period have been detected at the tell itself as well as in the northern plain, as intrusive interference in the Neolithic settlement. A ditch corresponding to the 4th millennium BC layers of the tell continues here, originally built when the northern area was still part of the hill, but later dug away by bulldozers. The ditch seems to encircle a settlement dating to the second half of the 4th millennium BC. The ditch was filled with only very fine-grained sediments during its use, typical settlement waste or other remnants of activity. These are only rarely presented in the oldest deposits, which could mean that the ditch had been cleared out regularly. The excavated part of the ditch is between 4 to 5m wide and around 2 to 2.5m deep (Fig. 5). Geophysical surveys from the top of the tell (ZAMG/Vienna) assume the continuation of a curvilinear structure underneath the partially excavated EBA 1 settlement (phase ÇuHö IV), which led us to reconstruct a roughly circular or egg-shaped enclosure. Further results of geomagnetic and georadar surveys by ZAMG allow reconstruction of the presumably contemporary architecture inside this continuing enclosure, including various buildings.

The enclosure apparently went out of use, as it was filled with an impressive number of stones, which seem to represent remains of original building materials of Late Chalcolithic architecture (Fig. 6). Thanks to the geological studies of D. Wolf and G. Borg, the stones can be attributed to local sources, as the size and shape of the stones are comparable to the material typically used for

²⁰ Horejs – Schwall, in print (figs. 4–5).

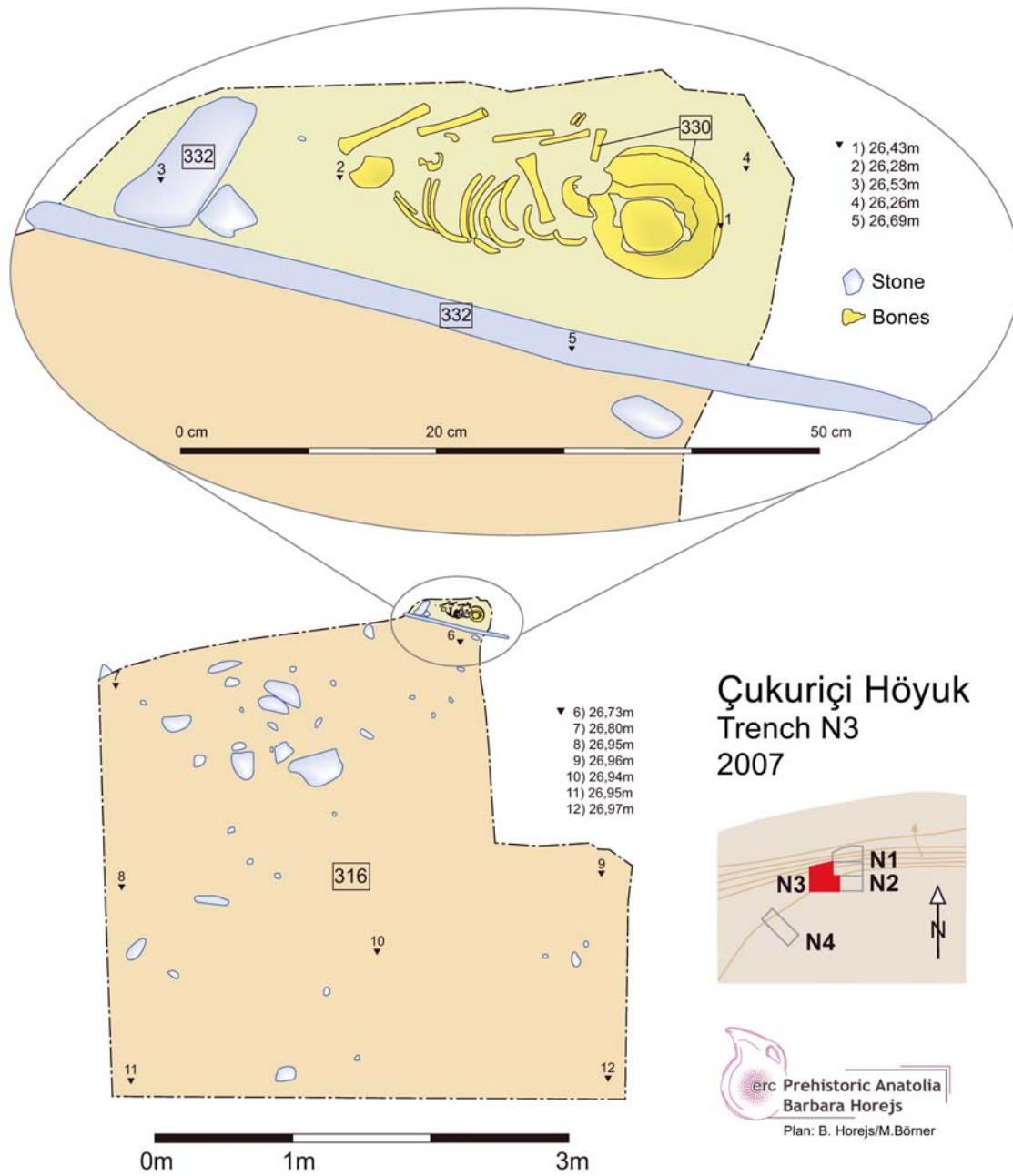


Fig. 4 Detail of trench N3 at Çukuriçi Höyük: cist grave with child burial (M. Börner and B. Horejs/ERC Prehistoric Anatolia).

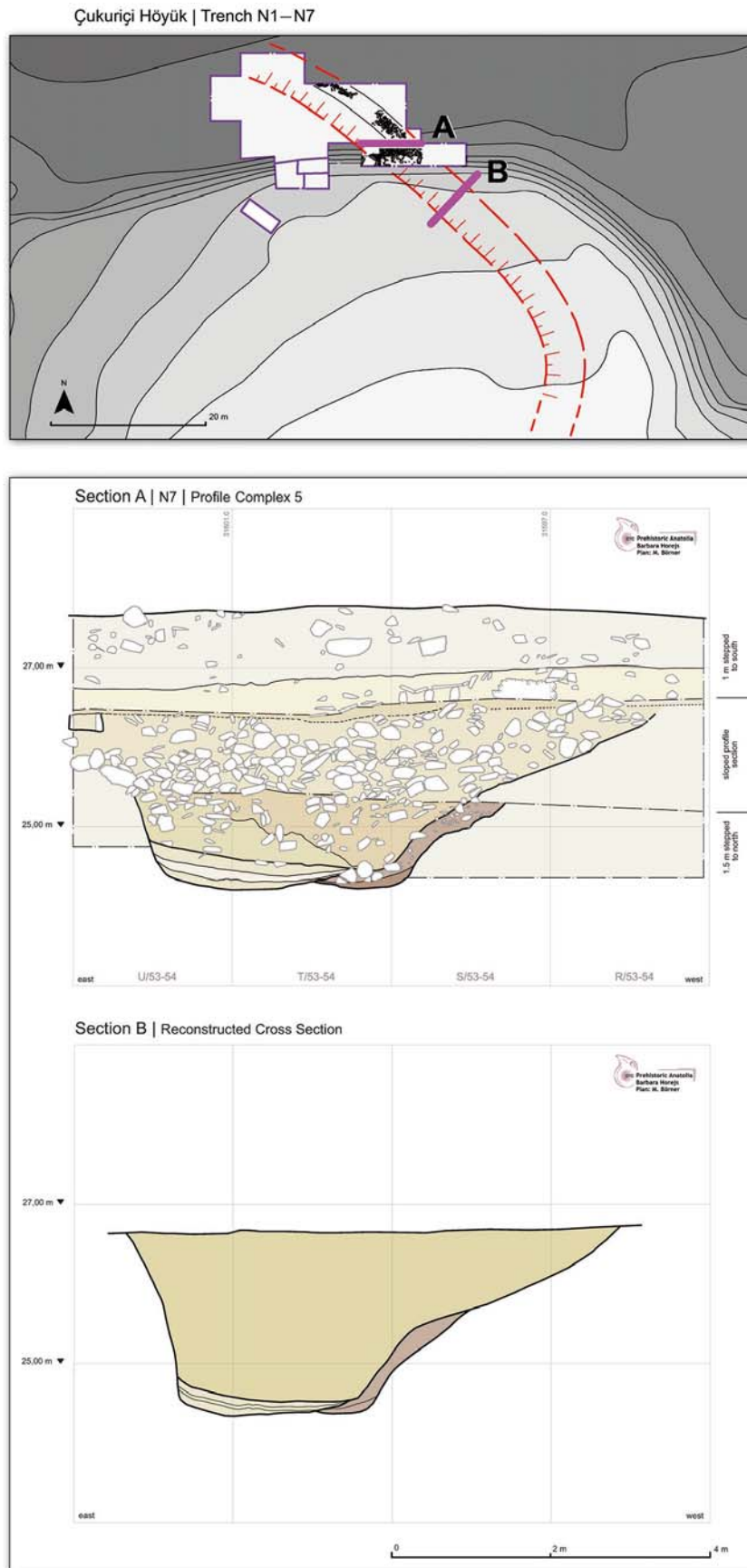


Fig. 5 Northern area of Çukuriçi Höyük with location of the ditch, profile of ditch-filling and its cross-section (M. Börner/ERC Prehistoric Anatolia).



Fig. 6 Ditch (complex 5) and its filling during excavation, view from northwest (photo: F. Ostmann/Prehistoric Anatolia).

architecture at the tell (in the Late Chalcolithic and Early Bronze Age period).²¹ The ditch filling process was concluded with the installation of a stone cist, comparable to a cist grave excavated further west, which included a child burial. In contrast to this, the cist concluding the ditch filling was empty. The whole filling was finally covered by levelling layers that enlarged the settlement area and covered with architecture of the following EBA 1 period.

The radiocarbon dates of short-lived samples from the excavated settlement date the remains of phase ÇuHö VII to the second half of the 4th millennium BC, between 3300 and 3100 calBC in particular.²² So far, only one sample of the ditch filling has been analysed and dates to 3085–2908 calBC (2 σ range),²³ representing the *terminus post quem* of its abandonment and corresponding to the results of the Early Bronze Age layers. The later settlement, also covering the filled ditch, date to the early 3rd millennium BC (period EBA 1: 2900–2750 calBC for both phases ÇuHö IV and III).²⁴

To sum it up, the excavated and geophysical survey areas, the material analyses of archaeological deposits and the radiocarbon dates indicate a settlement with an enclosure in the second half of the 4th millennium BC at Çukuriçi Höyük. Although neither its exact size nor its intra-site structure is known in detail as yet, the Late Chalcolithic settlement is obviously not just an ephemeral site but appears to be in use for a community living there permanently, as was the case in the preceding and later excavated settlement periods.

²¹ Wolf et al. 2012b.

²² Horejs – Weninger, in print.

²³ Ceralia ÇuHö no. 11/1206/11/1 with ¹⁴C age 4366 (Lab. no. MAMS 15267).

²⁴ Horejs – Weninger, in print.

Economy at Late Chalcolithic Çukuriçi Höyük

Although excavations of the deposits of the 4th millennium BC are limited, they offer important insights into the communities' economy and craft specialisation, as well as use and access to raw materials. Botanical studies by U. Thanheiser revealed barley, pulses and fruits, but hardly any wild plants²⁵ were present in the excavated Late Chalcolithic domestic area. Studies of zoological remains by A. Galik show a balanced and developed livestock management and intensive use of marine sources for nutrition.²⁶ Galik furthermore points out a distinct change of subsistence management from the Early Chalcolithic to the Late Chalcolithic period at Çukuriçi, demonstrated in a change in the age at which animals were slaughtered, and potentially indicating the secondary use of animal products. Livestock composition, use of marine sources and botany suggest a farming village with a community living at the tell on a permanent basis without indications for systematic seasonal transhumance as an economic basis.²⁷

The analyses of the lithic industry from the 4th millennium BC layers show a distinct dominance of obsidian in the raw materials, in addition to cherts, the latter presumably mainly of local sources. A potential local source of chert is located very close at Çanakgöltepe,²⁸ easily accessible from the village by crossing the Bülbüldağ Mountain or along the Aegean bay by boat (Fig. 2). M. Bergner noticed a relatively large amount of production waste, cores and core fragments of obsidian as well as of chert, which indicates that a knapping site must have been situated close to the settlement, but not in the excavated area (Fig. 7).²⁹ Bergner's studies based on Neutron Activation Analyses³⁰ further revealed that obsidian of phase ÇuHö VII was imported from Melos only, using both different sources there (Demenegaki and Adamas). The high proportion of imported obsidian in the lithic assemblage (72%) could be explained as statistical error due to the small size of the analysed assemblage, if it did not correspond to the large quantity of obsidian in the following EBA I period at the site, which was excavated over a much larger area and also revealed an emphasis on lithic industry.³¹ Detailed material exchange analyses by D. Knitter et alii demonstrated that the large quantity of Melian obsidian at Çukuriçi during the EBA is outstanding in comparison to contemporaneous sites in the region (and beyond),³² one reason amongst many that led us to conclude that the site was a potential gateway community for obsidian exchange in early 3rd millennium BC. Although the specific function of raw material exchange of the settlement can currently not be conclusively demonstrated for the Late Chalcolithic period, the 4th millennium BC assemblages with a dominance of obsidian as main resource indicate a comparable significance in these times.

Other crafts practiced in 4th millennium BC give further information about the community living at Çukuriçi. Textile production – presumably as normal household activity – is represented by heavy cylindrical loom weights (Fig. 8). Late Chalcolithic metal production was observed in a small excavated trench with remains of finished copper products and a possible metal working area.³³ A malachite ore fragment further demonstrates that raw metals were already being brought to the site in phase ÇuHö VII, presumably for further metal processing.

All these archaeological results together indicate a farming community with livestock management as main economic basis and access to local as well as non-local raw materials

²⁵ Thanheiser, in preparation.

²⁶ See also Galik, this volume 385–394.

²⁷ See Galik, this volume 385–394.

²⁸ Archaeometrical studies have not been conducted so far with this ore; therefore its use in lithic assemblages is just based on macroscopic expertise.

²⁹ Bergner, in preparation.

³⁰ Bergner et al. 2009; Bergner, in preparation.

³¹ Horejs et al. 2011.

³² Knitter et al. 2012; cp. for example with recent discussion in Carter 2008; Perlés et al. 2011; Milić 2014.

³³ Mehofer, this volume 463–490.

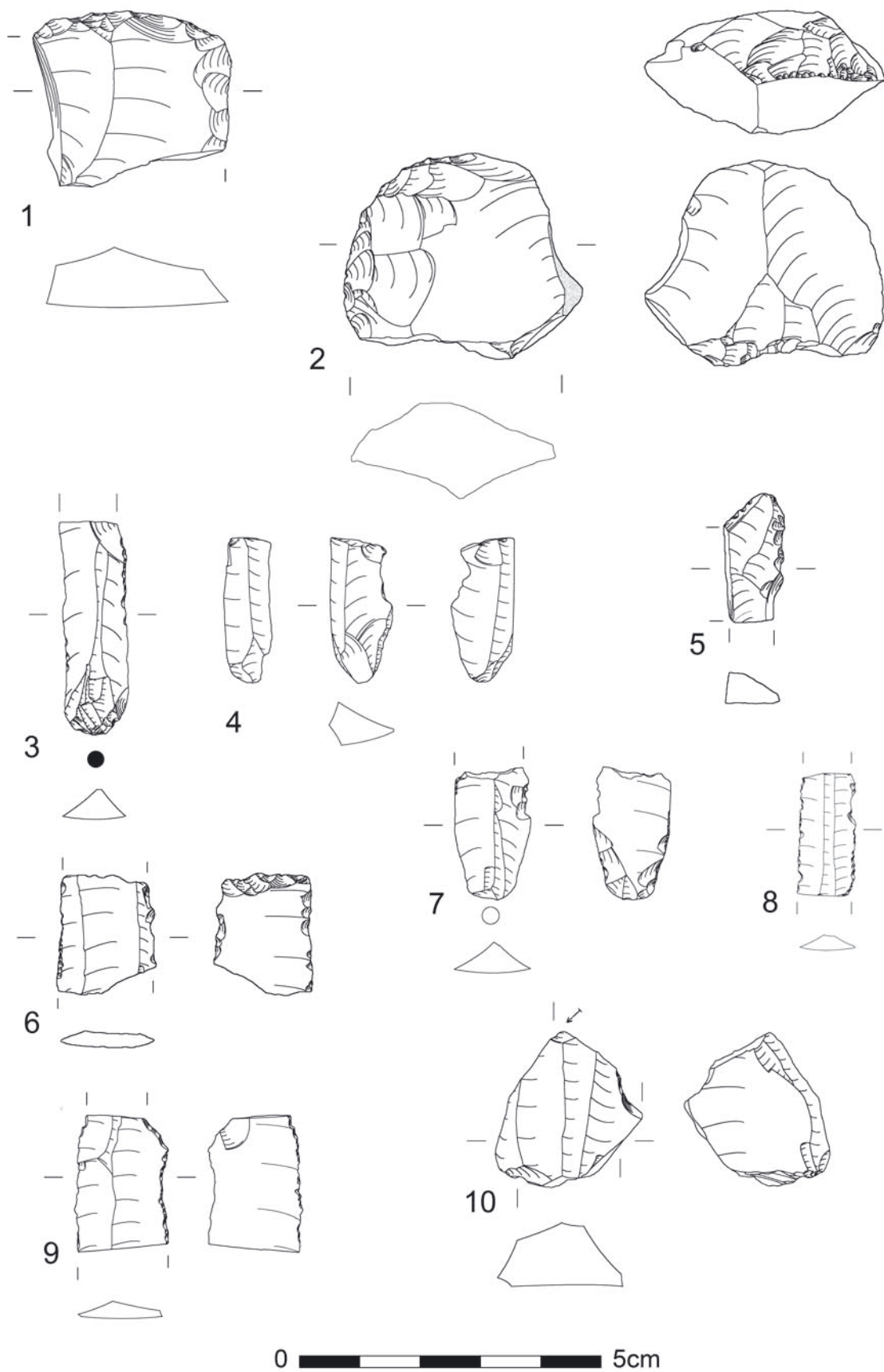


Fig. 7 Various knapped tools and fragments (modified and non-modified) from Late Chalcolithic settlement phase ÇuHö VII (Bergner/ERC Prehistoric Anatolia).

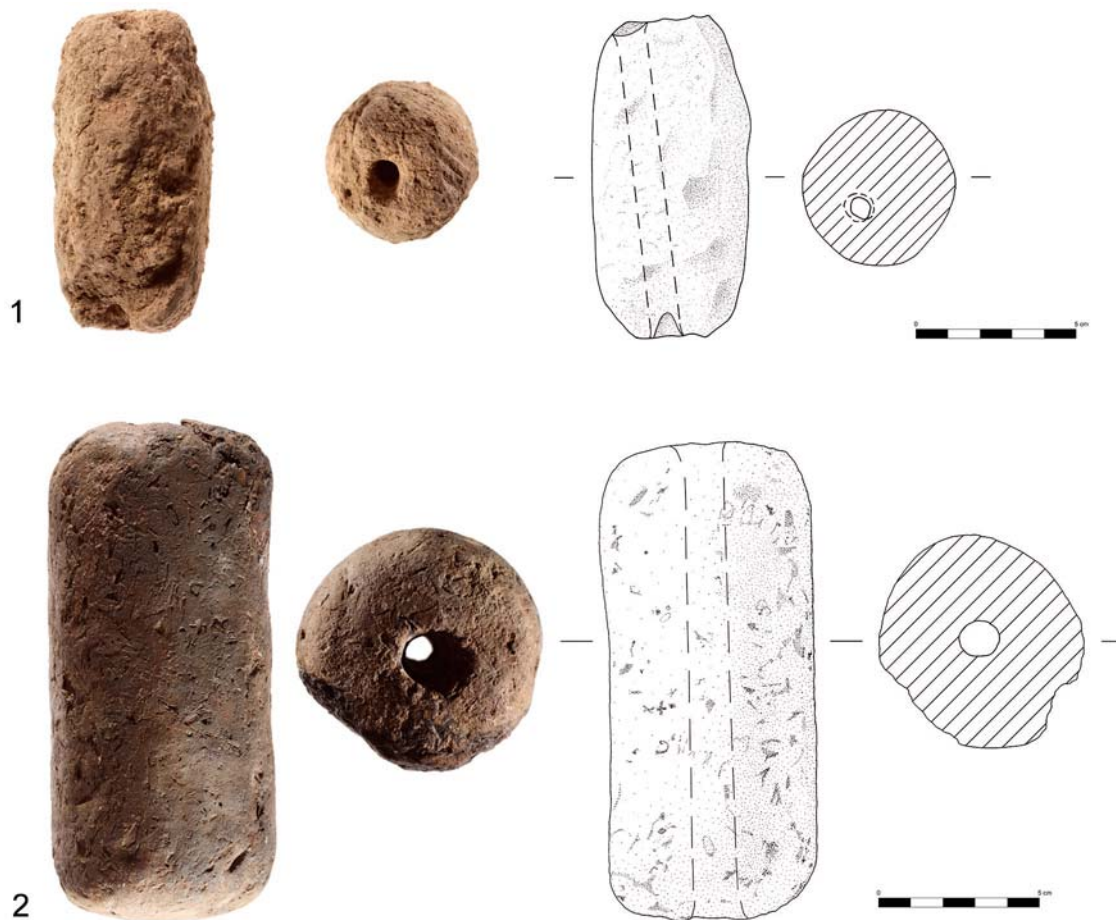


Fig. 8 Late Chalcolithic cylindrical loom weights (layout and design: M. Röcklinger/ERC Prehistoric Anatolia);
1. CuHö07/335/3/101; 2. CuHö09/883/3/001

(obsidian and metals³⁴). Additional specialised crafts can be assumed at least for metallurgical production, although they have so far rarely been found in excavations. The importance of textile production in the Late Chalcolithic period is not fully understood, but recent studies by U. Schoop suggest a potentially significant impact of textile production (and exchange?) for western Anatolia before the Early Bronze Age.³⁵

Regional and Interregional Material Patterns in the 4th Millennium BC

Studies of architecture and finds of the 4th millennium BC at Çukuriçi Höyük show some distinct local specifics, various regional characteristics as well as a few interregional features that demonstrate the scale of regional and interregional patterns in material cultural as indicators for the scale of connectivity. Domestic architecture indicates some principle common features in shape and function, as demonstrated by comparable built storage structures, rectangular houses and apsidal

³⁴ Although the metal sources are not yet fully analysed, currently it seems that metal ores are not located in direct vicinity of the site but within the wider region (Wolf et al. 2012a).

³⁵ S. Schoop, this volume 421–446.

buildings in both the east Aegean and west Anatolian regions.³⁶ Although the basis for assuming interregional connections between Late Chalcolithic communities is still very limited, some relations seem obvious from similarities in material culture and pottery production in particular.

The range of pottery found at Çukuriçi Höyük VII is composed mainly of open and some closed vessels (Fig. 9), including some characteristic regional and interregional types of the period. These are different types of bowls, of which the shallow bowls with different lips (Fig. 10, S1) and flat bowls with rolled rim or further variations of thickened lips at the inside (Fig. 10, F.H.K) are also characteristic for the Troad (Kumtepe IB, Hanaytepe B),³⁷ for the Izmir region,³⁸ for Demircihüyük³⁹ and Küllüoba 6⁴⁰ as well as for southwest Anatolia (Bademağaçı⁴¹). Rolled rim bowls in particular can be integrated in a wider interregional Late Chalcolithic stylistic picture from the Greek mainland, the Aegean islands and western Anatolia, as demonstrated by E. Alram-Stern in this volume.⁴² Cheese bowls or cheese pots found in Çukuriçi VII (Fig. 10, Chb) have a comparable wide distribution that represents another typical interregional pottery feature of the 4th millennium BC,⁴³ while cooking pots and different types of open vessels appear to represent more local styles or regional traditions.⁴⁴

The pottery technology and fabrics produced in Çukuriçi VII can be summarised in a similar way. In contrast to the previous periods at Çukuriçi (Neolithic and Early Chalcolithic in the 7th and 6th mill. BC), coarse wares occur frequently from phase ÇuHö VII onwards. Used as cooking pots and large closed jars, their surface is usually roughly burnished or smoothed and often covered with a self-slip.⁴⁵ Cheese bowls appear to be produced of a specific type of coarse ware with the addition of organic temper. The phase ÇuHö VII bowls, deep bowls and jugs are primarily medium or fine tempered with rough or finely burnished surfaces. Only a few pieces have a highly polished and shiny surface (black or beige), which may be decorated with white painted patterns. Apart from painted decoration, simple grooved (not fluted) and incised fragments exist, but altogether just in very small quantities.

The frequency and nature of the decorated ceramics most likely represents a regional characteristic. As the analysis of the occurrence of decorated pottery wares of the 4th millennium BC shows (Tab. 1), some differences between the regions in western Anatolia and the eastern Aegean can be observed. The number of known settlements of the Late Chalcolithic or the 4th millennium with published ceramic assemblages is nearly balanced⁴⁶ in the different regions and thus forms a good basis for comparison.

A unifying element is the presence of incised decoration in all six regions, which could be understood as an interregional characteristic. Grooved wares are likewise widespread, but do not seem to be a universal phenomenon. We observe pottery with grooved decoration in the regions of the Troad/Thrace, the Maeander Valley, the central Anatolian Aegean coast and as single

³⁶ For a detailed discussion of architectural features and their illustration, see Horejs – Schwall, in print.

³⁷ Kumtepe IB: Sperling 1976, 327–341; Korfmann et al. 1995, 253; Hanaytepe: Schachner 1999a, 13–15.

³⁸ Dedecik Heybelitepe: Herling et al. 2008, 25; Baklatepe: Erkanal – Özkan 1999, 135 and Şahoğlu – Tuncel, this volume 65–82; Cine-Tepecik: Günel, this volume 83–104.

³⁹ Seeher 1987; Seeher 2012.

⁴⁰ Efe – Ay 2000, 40–41, pls. 1, 9–10.

⁴¹ Umurtak 2005, esp. fig. 1.

⁴² See Alram-Stern, this volume 305–328, fig. 6.

⁴³ E.g. Sperling 1976; Seeher 1987; Alram-Stern 1996; Sampson 2006; see also the contribution of Alram-Stern (esp. fig. 7), Blum, this volume 125–155, Şahoğlu – Tuncel, this volume 65–82, and Günel, this volume 83–104.

⁴⁴ Few similarities can be seen in the Izmir region, see Şahoğlu – Tuncel, this volume 65–82.

⁴⁵ Comparable pottery technologies are e.g. observable in the Lake District and Elmalı Plain (Eslick 1992, 83), in the Troad (e.g. Sperling 1976) and the neighboring sites of the Izmir region (s. Tuncel – Şahoğlu, this volume 65–82 and Kouka, this volume 43–64).

⁴⁶ Tab. 1 lists only sites of the 4th millennium BC, which are dated securely by relative chronology or radiocarbon dating.

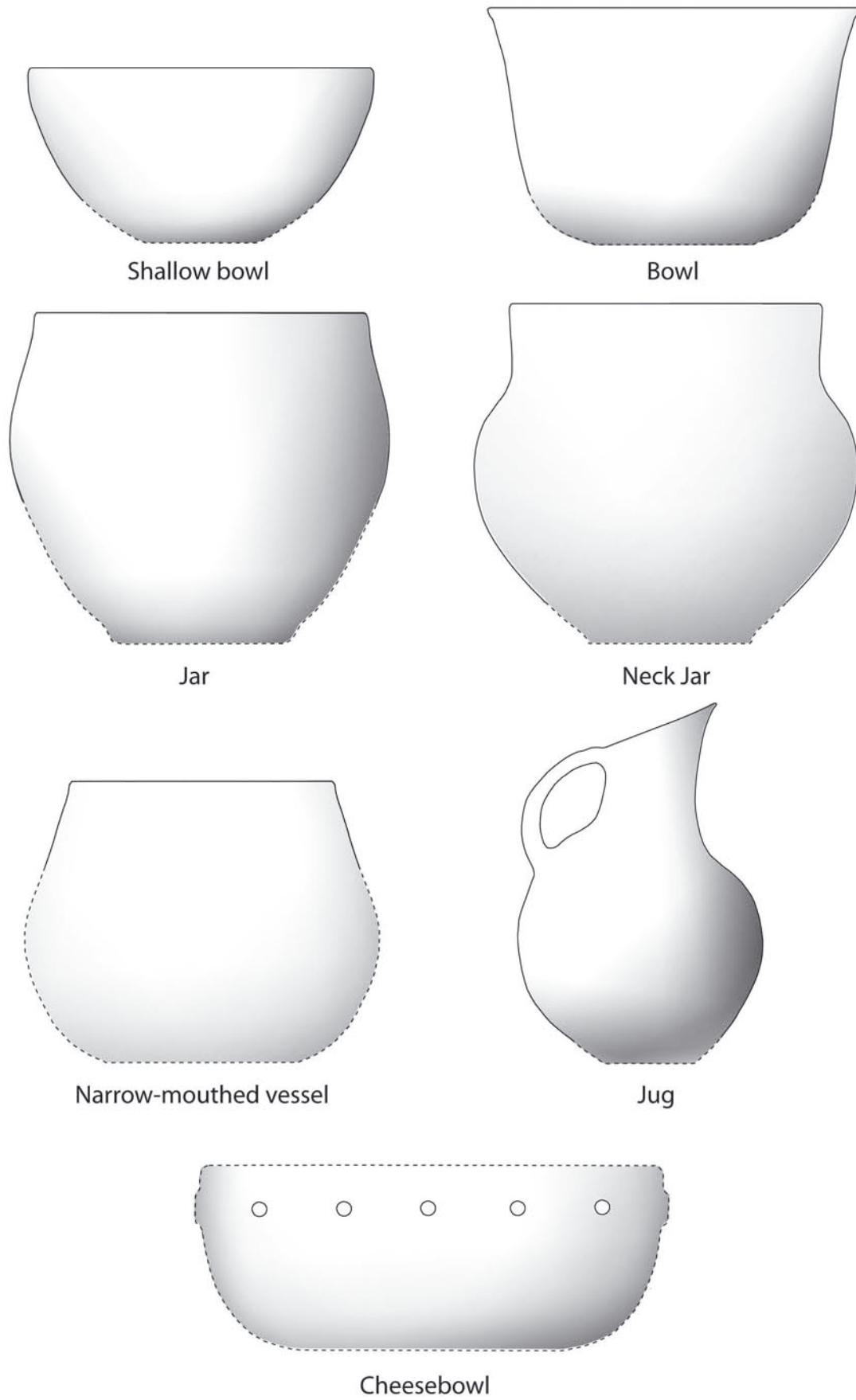


Fig. 9 Main pottery shapes at Late Chalcolithic Çukuriçi Höyük (layout and design: M. Röcklinger/ERC Prehistoric Anatolia).

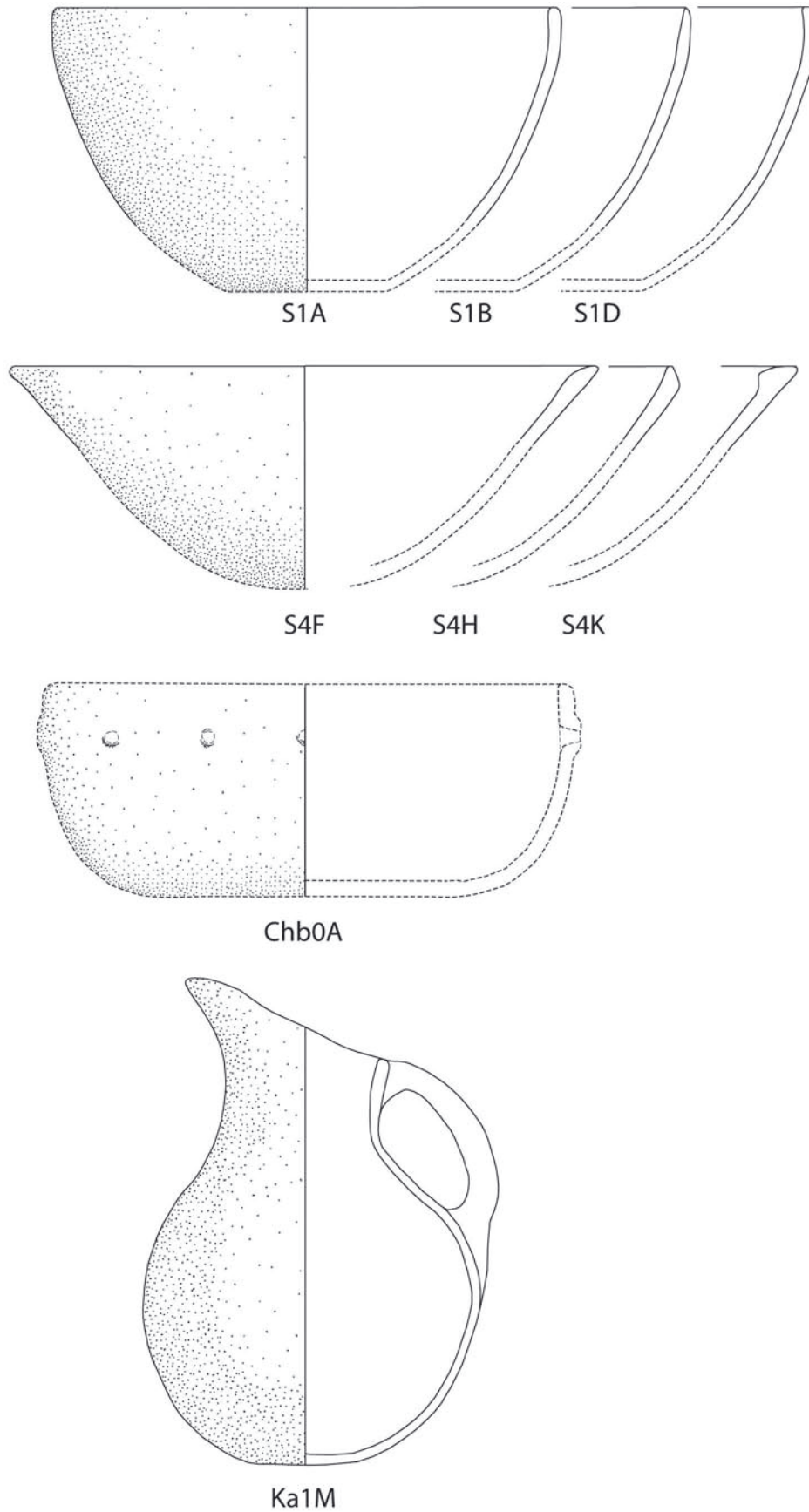


Fig. 10 Characteristic pottery types at Late Chalcolithic Çukuriçi Höyük mentioned in the text (layout and design: M. Röcklinger/ERC Prehistoric Anatolia).

4th millennium BC sites: Decorated Pottery Wares				
SITES in regional order	Pattern burnished	Grooved	White painted	Incised
Troad/Thrace				
Kumtepe IB	–	–	x	x
Hanaytepe B	–	x	–	x
Karaağaçtepe (Protesilas)	–	x	–	x
Tilkiburnu	–	x	–	x
Southeast Marmara/ Eskişehir				
Ilıpınar IV	–	–	–	x
Barcın Höyük	–	–	–	–
Demircihöyük	–	–	x	x
Küllüoba 6–3	(x)	–	x	–
Elmalı Plain/Lake District				
Kuruçay 6A–3	–	x	x	x
Yarımhöyük	–	–	–	x
Bağbaşı	x (1)	–	–	–
Bademağaçı	–	–	–	–
Maeander Valley				
Beycesultan XL–XX	x	x	x	x
Aphrodisias LC2–4	x	x	x	x
Çine MC (–LC?)	x	x	x	–
Milet I	x (?)	–	x	x
Centre of Anatolian Aegean Coast with backland				
Çukuriçi Höyük	–	x	x	x
Liman Tepe “LC later phase”	–	–	x	x
Bakla Tepe “LC later phase”	–	–	x	x
Gavurtepe Höyük	n.c.	n.c.	n.c.	n.c.
Dedecik Heybelitepe	–	x	–	–
Yeşilova	?	–	–	–
East Aegean islands				
Koukonisi	n.c.	n.c.	n.c.	n.c.
Poliochni	–	–	x	–
Dermatas	n.c.	n.c.	n.c.	n.c.
Myrina 1–2	–	–	x	x
Archontiki	n.c.	n.c.	n.c.	n.c.
Heraion/Samos	–	–	–	x
Archangelos/Kalythies	x	–	x	x
x: ware is present; –: ware is not present; n.c.: unpublished or not clear				

Tab. 1 Absence/presence table of different decorated pottery wares in 4th millennium BC in regional order (s. Appendix and Fig. 11).

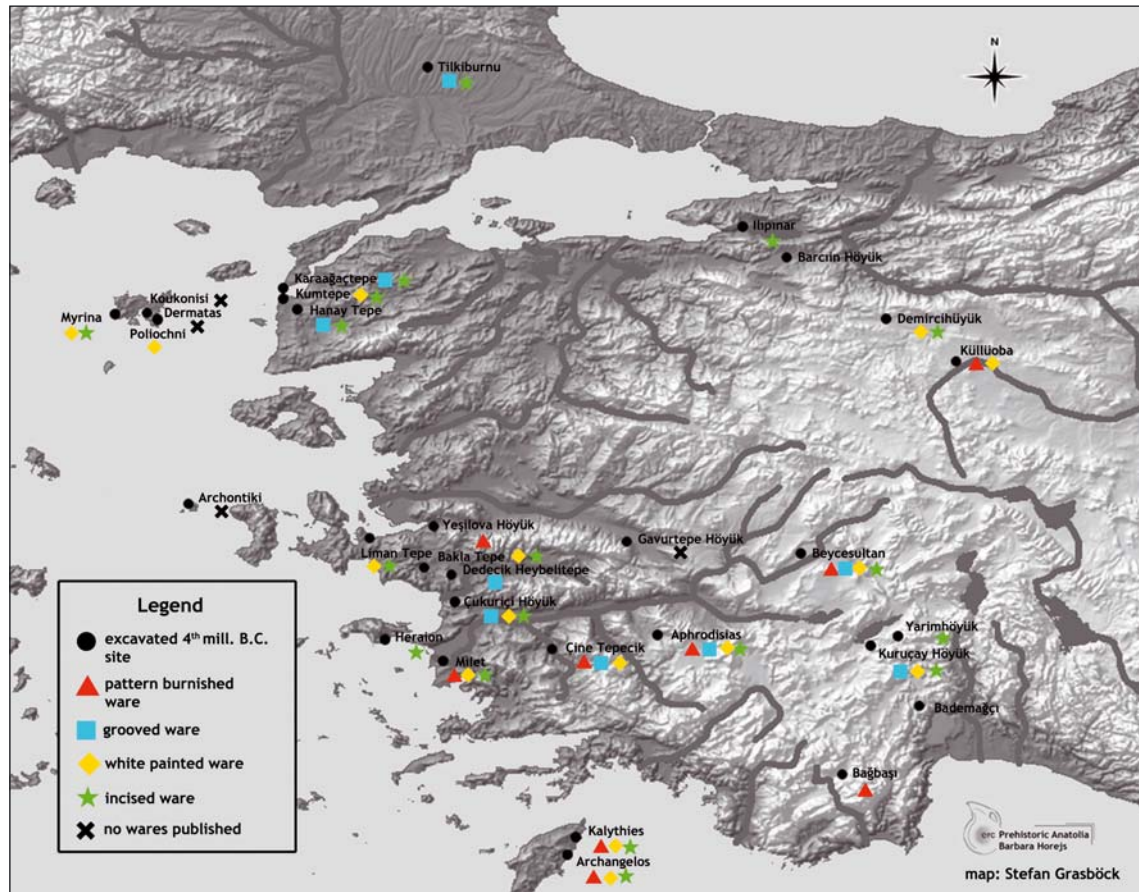


Fig. 11 Distribution of different decorated pottery wares in 4th millennium BC, s. Tab. 1 with appendix (map: St. Grasböck/ERC Prehistoric Anatolia).

finds in the Emalı Plain/Lake District (Tab. 1). On the eastern Aegean islands and south of the Marmara Sea grooved wares have so far not been found. Several studies have already concluded that ceramics with pattern burnished decoration are typical for the preceding 5th millennium BC in our study area.⁴⁷ Nevertheless, pattern burnished vessels are found in the region of the Maeander Valley in the 4th millennium BC as well,⁴⁸ which is not the case in the other five regions of the wider area. Perhaps we can observe the survival of an older tradition here, whilst it was already abandoned elsewhere.

A regional differentiation can be recognised, at least as a trend, for the White Painted Ware of the 4th millennium BC. On a small scale, it belongs to the typical range of ceramics in the regions of Eskişehir, the Maeander Valley, the centre of the Anatolian Aegean coast and the east Aegean islands. In the Troad and the Emalı Plain/Lake District white painted jars appear only at individual sites (Kumtepe IB and Kuruçay 6A–3). The absence of these characteristic finds in the Emalı Plain seems to reflect a regional production style, since at the same time there are numerous similarities in the range of vessels and ceramic technologies to western Anatolia in general and

⁴⁷ E.g. Seeher 1987, 58–64; Eslick 1992, 86; Tuncel, in print; see also Alram, this volume 305–328, and Kouka, this volume 43–64.

⁴⁸ While Beycesultan XL–XX and Aphrodisias LC2-4 can be securely dated to the 4th millennium BC (cf. Schoop 2005), the dating of Çine-Tepecik will have to be clarified by further studies (see Günel, this volume 83–104). The single instance at Miletus I is based on the description by Parzinger (1989, 419, no. 8), where he describes an ‘einpoliertes Muster’.

the Maeander Valley in particular.⁴⁹ The rare White Painted Ware in the Troad can probably be associated with contacts to the northeastern Aegean Islands.

No ceramic provinces can be clearly distinguished in the 4th millennium BC, as C. Eslick has aptly shown.⁵⁰ Rather, we see a far reaching western Anatolian ceramic tradition that is continuously developing and has many common features. As Eslick further worked out convincingly, the similarities hardly ever completely overlap and detailed analyses show clear local characteristics.⁵¹ A spatial analysis of the decorated pottery wares complements and concretises this picture (Tab. 1; Fig. 11). From the perspective of the ceramic analysis we see a common ceramic tradition in the greater region of the eastern Aegean and western Anatolia, which ranges to the limits of the Anatolian plateau. The common elements of this ceramic horizon include manufacturing techniques and the repertoire of types such as the characteristic cheese pots or rolled rim bowls. They also include incised decoration of vessels, which occurs throughout the greater region in all six areas. Further, local and regional differences emerge that reflect stylistic preferences and independent productions at the various sites of the 4th millennium BC. White Painted Ware, for example, does not play a big role in northern Anatolia apart from the Eskişehir region with two sites. The individual pieces from Kumtepe IB could perhaps be explained by contacts to the northeastern Aegean islands (Poliochni Nero, Myrina 1–2) and may therefore be amongst the first of many to be expected from the Troad. On the eastern Aegean islands, in the region at the centre of the Anatolian Aegean coast and in the remote Maeander Valley there seems to be at least one common horizon of White Painted Ware in the ceramics production.

Against this background, the results of Çukuriçi Höyük are very well embedded in a regional ceramic horizon, which in turn can be anchored in a larger cultural tradition in the eastern Aegean and western Anatolia. The comparable or at least similar material culture underpinning the area at the macro scale speaks for a continuous exchange of concepts and ideas between the various regions, which are implemented in local (or regional ?) production. The distribution of White Painted Ware reveals a corridor of intensive contacts for the regions of the islands and along the western Anatolian coast of the Aegean, which O. Kouka has named the *Aegean Koiné*.⁵² Although at present there are no comparable regional archaeometric ceramic analyses for the 4th millennium BC, a local and regional ceramic production can largely be assumed. The traditional local and regional characteristics at least hint at this tentative conclusion. The interregional parallels and similarities described above therefore probably reflect the mobility and communication of communities that may have been more intense in the eastern Aegean and western Anatolian coastal zone around Izmir up to the hinterland of the Maeander Valley.

Functional Diversity of Archaeological Sites at the Central Anatolian Aegean Coast

The question of possible functional differences of sites within a larger settlement area are essential to commenting on social transformation processes in the context of proto-urbanisation, as explained in the introduction. Even if no urban centres existed in the 4th millennium BC in western Anatolia,⁵³ functional differentiation still most likely occurred between the individual settlements and activity areas. The region at the central Anatolian Aegean coast gives us at least some evidence of this diversity. In this period at the latest we observe a denser settlement pattern and use of the landscape, which now also encompasses the side valleys of the great river basins running from east to west as well as increasingly remote areas and areas of higher altitude for

⁴⁹ Eslick 1992, 78–79.

⁵⁰ Eslick 1992, esp. 81–89; see also Lloyd – Mellaart 1962, 103–110 with less data.

⁵¹ Eslick 1992, 86–87.

⁵² Kouka 2002; Kouka, this volume 43–64.

⁵³ Compare e.g. Yakar 2011, 289–298.

settlements. Settlement structures also play a large role in the most recent research, as publications by Yakar and Düring on prehistoric Anatolia demonstrate.⁵⁴

Düring's differentiation of Late Chalcolithic settlement types in Anatolia shows that there are mainly ephemeral sites in the west, defined by a different kind of huts, which are possibly only used seasonally.⁵⁵ Only few permanent villages in Beycesultan, Kuruçay and Kumtepe are characterised as farming settlements with well-built structures. Complex villages with public buildings, communal infrastructure and defensive installations are only found in central and east Anatolia in the Chalcolithic period.⁵⁶ The recently excavated sites at the central Anatolian Aegean coast are not integrated in Düring's recent publication, probably due to a lack of published material. The present volume with numerous contributions about this region should now fill this research gap.

It is undisputable that permanently used settlements existed in western Anatolia, of which Kuruçay in the Lake District represents an important basis for comparative studies with other sites.⁵⁷ This village with well-built houses in compact order has been excavated at a large scale and the preservation conditions for architectural features are exceptional.⁵⁸

Current studies of Chalcolithic settlements in western Anatolia by C. Schwall reveal that the ordinary rectangular house can generally be understood as the main type of domestic architecture.⁵⁹ Although the excavated areas on other sites are limited, architectural structures comparable to those at Kuruçay were, for instance, observed at Beycesultan, Aphrodisias, Kumtepe IB and Poliochni Nero, even if only a few remains were preserved or excavated.⁶⁰ Circular buildings, sometimes in larger dimension, appear to have mainly been characteristic for storage, a possible hint of communal organisation in permanent settlements. They are known from Myrina, Bakla Tepe and Poliochni and can be seen as communal storage areas, at least at these three sites.⁶¹ Much less common are the 'grill-plan houses', known from Bakla Tepe and Çamlıbel Tarlası, probably also from Çukuriçi Höyük as badly preserved remains.⁶² Their principle function (e.g. storage? food production? workshop?) is not yet clear; at least at Bakla Tepe, the dimensions of the "grill-plan houses" indicate they were built for the benefit of a larger group than just the nuclear family. With all due caution, these types of buildings suggest the construction of communal buildings in the 4th millennium BC, at least at Bakla Tepe.⁶³

Finally, the ditch enclosure at late Chalcolithic Çukuriçi Höyük is indisputably a public structure. The 4th millennium BC ditch does not stand alone and can be compared to the contemporary enclosure of Barcın Höyük, which is interpreted as a symbolic settlement boundary by the excavators.⁶⁴ Regardless of whether the enclosures of both sites are of symbolic or of more practical and defensive function, they nevertheless represent a monumental structure built by a society with some sort of communal organisation. Çukuriçi's ditch moreover shows not only an organised construction, but also collective decision making leading to the process of filling the ditch after its use to enlarge the settlement area at the beginning of the Early Bronze Age. Comparing the villages' sizes to recognise potential differentiation is only possible to limited extent due to the current state of research, but seems to indicate that we are dealing with small to medium-sized villages in Late Chalcolithic western Anatolia after Düring's definition.⁶⁵

⁵⁴ Düring 2011a; Düring 2011b; Yakar 2011.

⁵⁵ Düring 2011b, 799–781.

⁵⁶ Düring 2011b, 803–806.

⁵⁷ Duru 1996; Duru 2008.

⁵⁸ For a critical discussion of the excavation results see Schachner 1999b, and Schoop 2005.

⁵⁹ For a typology of Late Chalcolithic houses see Schachner 1999b, and Horejs – Schwall, in print fig. 7.

⁶⁰ Summarised with illustrations by Yakar 2011, 289–294.

⁶¹ Bernabò Brea 1964; Achilara 1997; Kouka 2002; Erkanal 2008.

⁶² Şahoğlu 2008; Schoop 2010; Horejs – Schwall, in print.

⁶³ Tuncel, in print.

⁶⁴ Gerritsen et al. 2010.

⁶⁵ Düring 2011a, 254–255.

A model of Proto-Urbanisation for the central Anatolian Aegean Coast



Illustration: F. Ostmann 2013



Fig. 12 A model of proto-urbanisation for the central Anatolian Aegean coast (illustration: F. Ostmann/ERC Prehistoric Anatolia).

Coming back to Düring's differentiation of settlement types, the research gap at the central Anatolian Aegean coast can now be filled with permanent villages of small and medium size. At least some of them show social and public organisation indicated by enclosures and granaries, potentially also by "grill-plan houses" of so far unknown function. Finally, in addition to normal settlements with or without enclosures, attention has to be paid to the presence of specialised workshops. T. Takaoğlu investigated a marble workshop at Kulaksızlar,⁶⁶ in which both marble vessels and figurines were produced. Following J. Seeher's studies, the produced figurines belong to the Kiliya group, which is characteristic for the Chalcolithic period in western Anatolia, in particular in the 5th and 4th millennium BC.⁶⁷ The frequent occurrence of Kiliya figurines in various settlements of our region (Çukuriçi Höyük, Aphrodisias, Malkayası, Gavurtepe and Çine-Tepecik)⁶⁸ suggests a connection to this specialised marble workshop. Even if archaeometric analyses of provenience are still missing, it may be assumed that the figurines do indeed come from the workshop at Kulaksızlar. This represents a further indication of the process of diversification – both in the use of space in the landscape and in society.

A Model of Transformation for the 4th Millennium Central Anatolian Aegean Coast

Complex urban systems represent the end point of a process of long-term transformations and multi layered developments over the *longue durée*, as discussed in the introduction. Kemp's model for pre-dynastic and dynastic Egypt is based on one of the best studied archaeological regions worldwide (see above). His second stage in the transformation to early dynastic city states consists of structured territory with functional differentiation between farming villages and settlements for the exploitation of Nile sources. These sites are dependent on each other and are connected through regular contacts. This kind of functional differentiation of land use can also be suggested for the central Anatolian Aegean coast in the 4th millennium BC (Fig. 12). For the first time, an expansion of permanent settlement into the hinterland can be seen in this period, for which side valleys and basins along the wide rivers are now also utilised. Design, construction and continuity of these settlements speak for a permanent rather than seasonal use, which, although only indirectly, infers the cultivation of the surrounding areas.

The evidence of stockpiling in *pithoi* and storage buildings points to a surplus production that suggests collaborative and strategic action. The extent to which the differentially exploited food resources of the coastal zone and the hinterland were regularly exchanged, or whether these areas were independent, as in Early Dynastic Egypt,⁶⁹ is still to be clarified. The exchange system for imported raw materials such as obsidian, which probably passes through the coastal zone into the hinterland, is unambiguously in place. Copper of Çukuriçi Höyük would also have circulated in the regional networks of the 4th millennium BC,⁷⁰ either as raw ore or finished products. At the current state of research it remains unclear to what extent metal-producing and metal-consuming settlements in this region were differentiated. At this point I would argue, however, that the pronounced specialisation in metallurgy at Çukuriçi Höyük in the 3rd millennium BC is already rooted in the Late Chalcolithic. Functional diversification through specialised workshops in other crafts areas is, after all, apparent from the 4th millennium BC at the latest. The marble workshop in Kulaksızlar, for example, produced objects (e.g. Kiliya figurines) whose recipients are found in a larger regional or possibly supra-regional circuit. The specialists who operated in this workshop remain unknown, as matching cemeteries or settlements still have not been

⁶⁶ Takaoğlu 2005.

⁶⁷ Seeher 1992.

⁶⁸ See Günel, this volume 83–104.

⁶⁹ Cf. Galik, this volume 385–394, about marine sources and domestic life stock at different sites in western Anatolia.

⁷⁰ Mehofer, this volume 463–490.

found. Further conclusions as to their social status within their community can therefore not (yet) be drawn. Textile production is another area that intensifies in the late 5th millennium BC, as U. Schoop has conclusively argued in his analysis.⁷¹ Apart from the underlying technological and practical implications, textiles represent indirect economic indicators, which allow a community to accumulate economic wealth.

All these technological and economic developments of the 4th millennium BC must have had consequences for the socio-cultural development of societies.⁷² The larger, supra-regional context provides further details on these formative processes. In the Late Chalcolithic cemetery of Ilıpınar, for instance, metal objects seem to have been deposited both as personal and individual tools and jewellery objects (knives, needles) and as symbols of social status within the community (dagger, possibly axe).⁷³ The analysis of grave goods by J. Roodenberg reveals different concepts of how the nearly 40 burials were equipped; with all due caution, the analysis demonstrates social differences within society.⁷⁴ Three graves are clearly set apart from the rest in terms of the range of grave goods: they are characterised by an oversupply of vessels in combination with tools (awls, knives) and weapons.⁷⁵ A single adult male, an adult male/female couple and an adult and a child together were most likely buried in these three special graves.⁷⁶ In addition to their putative specific social role, the objects reflect the importance of copper weapons in the early 4th millennium BC: The only dagger of the necropolis has been added to the grave of a male individual buried separately within the group of exceptional graves. The beginnings of social differentiation seem imminent. The dynamics of the late Chalcolithic period can be captured by the technological and economic developments, a structural differentiation of the landscape, including cultivation of new areas, as well as the emergence of specialised workshops and crafts. The settlement expansion into the hinterland at the centre of the Anatolian Aegean Coast likely reflects this development at a spatial level. This process is particularly evident when it is contrasted with the spatial and functional structure of older periods. Our knowledge of the 6th and 5th millennia is still very poor, but the 7th millennium BC Neolithic period is now much better explored; for this reason, it was selected for comparison (Fig. 12). In my opinion, the factors discussed here represent a phase in the long-term socio-cultural process of development, which I would like to describe as proto-urbanisation. The Late Chalcolithic in western Anatolia can be compared to the second stage level of Kemp's model; this necessary pre-phase on the way to urban centres represents a crucial link between egalitarian agricultural communities with simple subsistence economies and organised societies with urban regional power. In the settlements of the 4th millennium BC we can detect a phase of this process, which from around 2700 BC results in the concrete proto-urban forms of settlements of later central places such as Troy II and Limantepe.

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⁷¹ Schoop, this volume 421–446.

⁷² Hansen, this volume 243–260.

⁷³ Roodenberg 2008.

⁷⁴ Roodenberg 2008, esp. 321, tab. 1.

⁷⁵ Roodenberg 2008, 321, tab. 1: Single grave W12/UH with more than seven vessels, dagger, knife and awl; double burial W12/UO+UP with eight vessels, an axe and a knife; double burial V13/UP+UQ with nine vessels, two axes, two knives and one awl.

⁷⁶ The osteological analysis is still not complete, see Roodenberg 2008, 317.

References

Achilara 1997

L. Achilara, Μυθίνα: οι μνημειακές εγκαταστάσεις του οικόπεδου Ευτ. Καζόλη, in: C. Doumas – V. La Rosa (eds.), Η Πολιόχνη και η Πρώιμη Εποχή του Χαλκού στο Βόρειο Αιγαίο / Poliochni e l'antica età del bronzo nell'Egeo Settentrionale (Athens 1997) 298–310.

Alram-Stern 1996

E. Alram-Stern, Die ägäische Frühzeit. Das Neolithikum in Griechenland mit Ausnahme von Kreta und Zypern. Veröffentlichungen der mykenischen Kommission 16 (Vienna 1996).

Bähr 2011

J. Bähr, Einführung in die Urbanisierung, in: Das Online-Handbuch Demografie des Berlin-Instituts <<http://www.berlin-institut.org/online-handbuchdemografie.html>> (last access 15.12.2013).

Bergner et al. 2009

M. Bergner – B. Horejs – E. Pernicka, Zur Herkunft der Obsidianartefakte vom Çukuriçi Höyük, *Studia Troica* 18, 2009, 251–273.

Bergner, in preparation

M. Bergner, Silices im späten Chalkolithikum, in: B. Horejs (ed.), Çukuriçi Höyük 1. Erste Ergebnisse zum frühen und späten Chalkolithikum (in preparation).

Bernabò Brea 1964

L. Bernabò Brea, Poliochni. Città preistorica nell'isola di Lemnos I (Rome 1964).

Borić 2009

D. Borić, Absolute dating of metallurgical innovations in the Vinča Culture of the Balkans, in: T. L. Kienlin – B. Roberts (eds.), *Metals and Societies. Studies in Honour of Barbara S. Ottoway* (Bonn 2009) 191–245.

Braudel 1977

F. Braudel, Geschichte und Sozialwissenschaften. Die longue durée, in: M. Bloch – F. Braudel – L. Febvre (eds.), *Schrift und Materie der Geschichte. Vorschläge zu einer systematischen Aneignung historischer Prozesse* (Frankfurt am Main 1977) 47–85.

Carter 2008

T. Carter, The consumption of obsidian in the early Bronze Age Cyclades, in: N. Brodie – J. Doole – G. Gavalas – C. Renfrew (eds.), *Horizon – Ορίζων: A Colloquium on the Prehistory of the Cyclades*, Cambridge, 25th–28th March 2004 (Cambridge 2008) 225–235.

Demangel 1926

R. Demangel, Le tumulus dit de Protésilas, *Fouilles du Corps d'occupation français de Constantiople* 1 (Paris 1926).

Derin 2011

Z. Derin, Yeşilova Höyük, 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 (Rahden 2011) 95–106.

Doba 1997

A. Doba, Μύθινα Λήμνου: οι αρχαιότερες άσεις του προϊστορικού οικισμού, in: C. Doumas – V. La Rosa (eds.), Η Πολιόχνη και η Πρώιμη Εποχή του Χαλκού στο Βόρειο Αιγαίο / Poliochni e l'antica età del bronzo nell'Egeo Settentrionale (Athens 1997) 282–297.

Doba 2003

A. Doba, Οι φάσεις εξέλιξης του προϊστορικού οικισμού στη Μύθινα Λήμνου, in: A. Vlachopoulos – K. Birtacha (eds.), *ΑΡΓΟΝΑΥΤΗΣ: Τιμητικός τόμος για του καθηγητή Χρίστο Ντούμα* (Athens 2003) 101–125.

Düring 2011a

B. S. Düring, *The Prehistory of Asia Minor. From Complex Hunter-Gatherers to Early Urban Societies* (Cambridge 2011).

Düring 2011b

B. S. Düring, Characterizing Chalcolithic Asia Minor, in: S. R. Steadman – G. McMahon (eds.), *The Oxford Handbook of Ancient Anatolia (10,000–323 BCE)* (Oxford 2011) 798–812.

Duru 1996

R. Duru, Kuruçay Höyük II. 1978–1988 kazılarını sonuçları. Geç Kalkolitik ve ilk Tunç Çağı yerleşmeleri / Kurucay Höyük I. Results of the excavations 1978–1988. The Late Chalcolithic and Early Bronze settlements (Ankara 1996).

Duru 2008

R. Duru, Burdur – Antalya Bölgesi'nin Altıbin Yılı. MÖ 8000'den MÖ 2000'e (Antalya 2008).

Efe – Ay 2000

T. Efe – D. Ş. M. Ay, Early Bronze Age I pottery from Küllüoba near Seyitgazi, Eskişehir, *Anatolica Antiqua* 8, 2000, 1–87.

Ekinci – Öztürk 1999

H. A. Ekinci – İ. Öztürk, Yarımhöyük Kurtarma Kazısı 1997, Müze Kurtarma Kazıları Semineri 9, 1999, 41–62.

Ellert et al. 2012

M. Ellert – S. Sievers – H. Wendling – K. Winger, Zentralisierung und Urbanisierung – Manchings Entwicklung zur späteltischen Stadt, in: S. Sievers – M. Schönfelder (eds.), *Die Frage der Protourbanisation in der Eisenzeit – La question de la proto-urbanisation à l'âge du Fer. Actes des 34. internationalen Kolloquiums der AFEAF vom 13.–16. Mai 2010 in Aschaffenburg, Kolloquien zur Vor- und Frühgeschichte* 16 (Bonn 2012) 303–318.

Erkanal 2008

H. Erkanal, Die neuen Forschungen in Bakla Tepe bei İzmir, in: H. Erkanal – H. Hauptmann – V. Şahoğlu – R. Tuncel (eds.), *Proceedings of the International Symposium The Aegean in the Neolithic, Chalcolithic and the Early Bronze Age* (Ankara 2008) 165–177.

Erkanal – Özkan 1999

H. Erkanal – T. Özkan, Bakla Tepe Kazıları/Excavations at Bakla Tepe, in: H. Erkanal – T. Özkan (eds.), *Tahtalı Barajı Kurtarma Kazısı Projesi/Tahtalı Dam Salvage Excavations Project* (Izmir 1999) 12–42, 108–138.

Eslick 1992

Ch. Eslick, Elmalı-Karataş I. The Neolithic and Chalcolithic Periods. Bağbaşı and Other Sites (Bryn Mawr, Pennsylvania 1992).

Garfinkel et al. 2014

Y. Garfinkel – F. Klimscha – S. Shalev – D. Rosenberg, The beginning of metallurgy in the southern Levant. A late 6th millennium calBC copper awl from Tel Tsaf, Israel, *PLoS ONE* 9, 3, 2014, 1–6.

Gerritsen et al. 2010

F. Gerritsen – R. Özbal – L. Thissen – H. Özbal – A. Galik, The Late Chalcolithic settlement of Barcın Höyük, *Anatolica* 36, 2010, 197–225.

Gogâltan 2010

F. Gogâltan, Die Tells und der Urbanisierungsprozess, in: B. Horejs – T. L. Kienlin (eds.), *Siedlung und Handwerk. Studien zu sozialen Kontexten in der Bronzezeit. Beiträge zu den Sitzungen der Arbeitsgemeinschaft Bronzezeit 2007 und 2008, Universitätsforschungen zur Prähistorischen Archäologie* 194 (Bonn 2010) 13–46.

Herling et al. 2008

L. Herling – K. Kasper – C. Lichter – R. Meriç, Im Westen nichts Neues? Ergebnisse der Grabungen 2003 und 2004 in Dedecik-Heybelitepe, *Istanbuler Mitteilungen* 58, 2008, 15–65.

Horejs et al. 2010

B. Horejs – M. Mehofer – E. Pernicka, Metallhandwerker im frühen 3. Jt. v. Chr. – Neue Ergebnisse vom Çukuriçi Höyük, *Istanbuler Mitteilungen* 60, 7–37.

Horejs et al. 2011

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

Horejs – Schwall, in print

B. Horejs – C. Schwall, Little new light on a nebulous period – Western Anatolia in the 4th millennium BC: Architecture and settlement structures as cultural patterns?, in: S. Hansen – P. Raczky (eds.), Proceedings of the Workshop Chronologies, Lithics and Metals. Late Neolithic and Copper Age in the Eastern Part of the Carpathian Basin and in the Balkans, Budapest, March 30–1 April, 2012 (in print).

Horejs – Weninger, in print

B. Horejs – B. Weninger, Early Troy and its significance for the Early Bronze Age in Western Anatolia, in: S. Blum (ed.), Early Bronze Age Troy. Chronology, Cultural Development and Interregional Contacts. Proceedings of the Conference at the University of Tübingen, 8th–10th May 2009 (in print).

Horejs, in preparation

B. Horejs (ed.), Çukuriçi Höyük 1. Erste Ergebnisse zum frühen und späten Chalkolithikum (Vienna, in preparation).

Joukowsky 1986

M. S. Joukowsky, Prehistoric Aphrodisias. An Account of the Excavations and Artifact Studies I. Excavations and Studies (Providence 1986).

Kemp 1989

B. J. Kemp, Ancient Egypt. Anatomy of a Civilization (London 1989).

Knitter et al. 2012

D. Knitter – M. Bergner – B. Horejs – B. Schütt – M. Meyer, Concepts of centrality and models of exchange in prehistoric western Anatolia, in: W. Bebermeier – R. Hebenstreit – E. Kaiser – J. Krause (eds.), Landscape Archaeology. Proceedings of the International Conference Held in Berlin, 6th–8th June 2012, Topoi. Journal for Ancient Studies. Special Volume 3, 2012, 361–368. <<http://journal.topoi.org/index.php/etopoi/article/view/135/160>> (last access 20.12.2013).

Korfmann et al. 1995

M. Korfmann – Ç. Girgin – Ç. Morçöl – S. Kılıç, Kumtepe 1993. Bericht über die Rettungsgrabung, Studia Troica 5, 1995, 237–289.

Kouka 2002

O. Kouka, Siedlungsorganisation in der Nord- und Ostägäis während der Frühbronzezeit (3. Jt. v. Chr.), Internationale Archäologie 58 (Rahden 2002).

Krauß et al. 2012

R. Krauß – V. Leusch – S. Zäuner, Zur frühesten Metallurgie in Europa – Untersuchungen des kupferzeitlichen Gräberfeldes von Varna, Bulgarien-Jahrbuch 2012, 64–82.

Lichtenberger 1998

E. Lichtenberger, Stadtgeographie. Begriffe, Konzepte, Modelle, Prozesse (Stuttgart 1998).

Lloyd – Mellaart 1962

S. Lloyd – J. Mellaart, Beycesultan I. The Chalcolithic and Early Bronze Age Levels (London 1962).

Meriç 2009

R. Meriç, Das Hinterland von Ephesos. Archäologisch-topographische Forschungen im Kaystros-Tal, Ergänzungshefte zu den Jahresheften des Österreichischen Archäologischen Institutes in Wien 12 (Vienna 2009).

Milić 2014

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

Özdoğan 1982

M. Özdoğan, Tilikburun. A Late Chalcolithic site in eastern Thrace, Anatolica 9, 1982, 1–26.

Özdoğan 1986

M. Özdoğan, Prehistoric sites in the Gelibolu Peninsula, Anadolu Araştırmaları 10, 1986, 51–66.

Papadatos – Tomkins 2013

Y. Papadatos – P. Tomkins, Tradings, the longboat, and cultural interaction in the Aegean during the late fourth millennium B.C.E. The view from Kephala Petras, east Crete, American Journal of Archaeology 117, 2013, 353–381.

Parzinger 1989

H. Parzinger, Zur frühesten Besiedlung Milets, *Istanbuler Mitteilungen* 39, 1989, 415–431.

Perlés et al. 2011

C. Perlés – T. Takaoğlu – B. Gratuze, Melian obsidian in NW Turkey. Evidence for early Neolithic trade, *Journal of Field Archaeology* 36, 2011, 42–49.

Radivojević et al. 2010

M. Radivojević – T. Rehren – E. Pernicka – D. Slijivar – M. Brauns – D. Borić, On the origins of extractive metallurgy. New evidence from Europe, *Journal of Archaeological Science* 37, 2010, 2775–2787.

Renfrew 1969

C. Renfrew, The autonomy of the south-east European Copper Age, *Proceedings of the Prehistoric Society* 35, 1969, 12–47.

Roodenberg 2008

J. J. Roodenberg, The Late Chalcolithic cemetery, in: J. J. Roodenberg – S. Alpaslan Roodenberg (eds.), *Life and Death in a Prehistoric Settlement in Northwest Anatolia. The Ilıpınar Excavations III. With Contributions on Hacilar Tepe and Menteşe* (Leiden 2008) 315–333.

Sampson 1987

A. Sampson, *Η Νεολιθική περίοδος στα Δωδεκνήσια. Έκδοση του Ταμείου Αρχαιολογικών Πόρων και Απαλλοτριώσεων* (Athens 1987)

Sampson 2006

A. Sampson, *Η ΠΡΟΪΣΤΟΡΙΑ ΤΟΥ ΑΙΓΑΙΟΥ. Παλαιολιθική – Μεσολιθική – Νεολιθική* (Athens 2006).

Schachner 1999a

A. Schachner, Der Hanay Tepe und seine Bedeutung für die bronzezeitliche Topographie der Troas. Die prähistorischen Funde der Grabungen von Frank Calvert im Berliner Museum für Vor- und Frühgeschichte, *Acta Praehistorica et Archaeologica* 31, 1999, 7–47.

Schachner 1999b

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

Schoop 2005

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

Schoop 2010

U.-D. Schoop, Ausgrabungen in Çamlıbel Tarlası 2009, in: A. Schachner, *Die Ausgrabungen in Boğazköy-Hattuša 2009*, *Archäologischer Anzeiger* 2010, 1, 191–201.

Seeher 1987

J. Seeher, Demircihüyük III.1. Die Keramik 1. A. Die neolithische und chalkolithische Keramik. B. Die Frühbronzezeitliche Keramik der älteren Phasen (bis Phase G) (Mainz 1987).

Seeher 1992

J. Seeher, Die kleinasiatischen Marmorstatuetten vom Typ Kiliya, *Archäologischer Anzeiger* 1992, 2, 153–170.

Seeher 2012

J. Seeher, Ilıpınar, Barcın Höyük and Demircihüyük. Some remarks on the Late Chalcolithic period in north-western Anatolia, *Anatolica* 37, 2012, 117–127.

Sombart 1983

W. Sombart, Städtische Siedlung, Stadt, in: K. Schmals, (ed.), *Stadt und Gesellschaft* (Munich 1983) 279–289.

Sperling 1976

J. Sperling, Kumtepe in the Troad. Trial excavations 1934, *Hesperia. Journal of the American School of Classical Studies at Athens* 45, 1976, 305–364.

Stock et al. 2013

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

Şahoğlu 2008

V. Şahoğlu, Liman Tepe and Bakla Tepe. New evidence for the relations between the Izmir region, the Cyclades and the Greek Mainland during the late fourth and third millennia BC, in: H. Erkanal – H. Hauptmann – V. Şahoğlu – R. Tuncel (eds.), *The Aegean in the Neolithic, Chalcolithic and the Early Bronze Age. Proceedings of the International Symposium in Urla – İzmir (Turkey), October 13th–19th 1997 (Ankara 2008)* 483–501.

Takaoğlu 2005

T. Takaoğlu, A Chalcolithic Marble Workshop at Kulaksızlar in Western Anatolia. An Analysis of Production and Craft Specialization, *British Archaeological Reports, International Series 1358* (Oxford 2005).

Thanheiser, in preparation

U. Thanheiser, The botanical remains, in: B. Horejs (ed.), *Çukuriçi Höyük 1. Erste Ergebnisse zum frühen und späten Chalkolithikum* (in preparation).

Tuncel, in print

R. Tuncel, The Late Chalcolithic period in the Izmir region, in: C. Doumas – A. Giannikouri – O. Kouka (eds.), *The Aegean Early Bronze Age. New Evidence. International Conference, Athens, April 11th–14th (Athens, in print)*.

Umurtak 2005

G. Umurtak, A study on the dating of new groups of pottery from Bademağacı Höyük and some reflections on the Late Chalcolithic cultures of southwestern Anatolia, *Anatolia Antiqua* 13, 2005, 53–69.

Weber 1920–1921

M. Weber, Die Stadt, *Archiv für Sozialwissenschaft und Sozialpolitik* 47, 3, 1920–1921, 621–772.

Wolf et al. 2012a

D. Wolf – G. Borg – B. Horejs, Geoarchäologische Untersuchungen zu den Erzvorkommen in Westanatolien, in: F. Schlütter – S. Greiff – M. Prange (eds.), *Archäometrie und Denkmalpflege 2012, Metalla Sonderheft 5, 2012*, 143–144.

Wolf et al. 2012b

D. Wolf – G. Borg – B. Horejs, Settlement walls of Çukuriçi Höyük – What stones could tell about prehistoric craftsman, in: Ç. Helvacı – C. Akal – E. Yalçın Ersoy – Ü. Özbaş – N. Akyol – D. Dondurur – E. Timur (eds.), *International Earth Science Colloquium on the Aegean Region, IESCA 2012, 1st–5th October 2012, İzmir, Turkey, Abstracts Book (Izmir 2012)* 308.

Yakar 2011

J. Yakar, Reflections of Ancient Anatolian Society in Archaeology. From Neolithic Village Communities to EBA Towns and Politics (Istanbul 2011).

Appendix to Table 1

- Kumtepe IB: Sperling 1976, 327–341.
 Hanaytepe: Schachner 1999a, esp. 17–19.
 Karaağaçtepe (Protesilas): Demangel 1926, 15–18; cat. nos. 7–8, figs. 20–21; Özdoğan 1986.
 Tilkiburnu: Özdoğan 1982.
 Ilıpınar IV: Roodenberg 2008, 315–333.
 Barcın Höyük: Gerritsen et al. 2010.
 Demircihöyük: Seeher 1987 (Ware F and G).
 Külliöba 6–3 (including Late Chalcolithic and so-called transitional period): Efe – Ay 2000, esp. 17.
 Kuruçay 6A–3: Duru 1996, 45; Duru 2008, 138.
 Yarımhöyük: Ekinci – Öztürk 1999, drawing 3.
 Bağbaşı: Eslick 1992, 17–19, 25, 78–79.
 Bademağaçı: Umurtak 2005.
 Beycesultan: Chronology of LX–XX after Lloyd – Mellaart 1962, 71–115; Schoop 2005, 188–189.
 Aphrodisias LC2–3: Joukowsky 1986, 351–355.
 Çine MC (–LC?): Günel, this volume.
 Milet I: Parzinger 1989, 419 cat. no. 8; Kouka, this volume.
 Çukuriçi Höyük: this contribution
 Liman Tepe LC: Tuncel, in print.
 Bakla Tepe LC: Erkanal – Özkan 1999, 135; Tuncel, in print.
 Gavurtepe Höyük: Meriç 2009, 124.
 Dedecik Heybelitepe: Herling et al. 2008, 21–26.
 Poliochni: Bernabò Brea 1964, 112–114, tab. 1.
 Dermatas: Bernabò Brea 1964; Kouka 2002, 25.
 Myrina 1–2: Achilara 1997; Doba 1997; Doba 2003, 101–108.
 Heraion/Samos: Kouka, this volume.
 Archangelos/Kalythies: Sampson 1987, 31–32, 36–37, figs. 51–63, pls. 7, 12–18.
 Yeşilova: Derin 2011, 103–104, fig. 13.2.

