New Light on a Nebulous Period – Western Anatolia in the 4th Millennium BC: Architecture and Settlement Structures as Cultural Patterns?

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Abstract

The Late Chalcolithic period in Western Anatolia and the Eastern Aegean islands can be described as poorly investigated. In recent decades, however, the number of excavated sites dating to the 5th and 4th millennia BC has increased. Based on new excavation results from Çukuriçi Höyük, a site on the central Anatolian Aegean coast, in context with previously published studies of other sites, this contribution aims to shed new light on the Late Chalcolithic period in Western Anatolia. Our approach focuses on architectural remains and settlement structures which may point to cultural patterns in this region. It can be demonstrated that different construction techniques of Late Chalcolithic buildings are observable as local patterns. Stone socles and probably walls built entirely of stone are recorded in addition to walls built of mud bricks, or wattle-and-daub constructions. For the superstructure of these socles, walls of mud brick or of simple wattle-and-daub construction are known. From the architectural structures excavated so far, we categorize four principle types of domestic buildings in 4th millennium BC Western Anatolia: rectangular buildings, apsidal/elliptic buildings, circular structures and stone row structures. Solid building techniques with storage facilities as a general pattern in the Late Chalcolithic seem to indicate permanent settlements as the main living strategy. The closed character of the settlements – attested by enclosures or the villages' spatial organisation – reflects some complex social organisation, even if monumental buildings have thus far not been identified.

Introduction

The assumed Chalcolithic period discussed in this paper has been poorly investigated in Western Anatolia in general. Therefore, it must be stated at the start that the basic information of these millennia has not been clarified in many aspects and is still in discussion by the few scholars dealing with it. Following the most common meaning of chronological terms, the Copper Age covers the time span from the end of 7th until the late 4th millennium BC and can be subdivided into early, middle and late subperiods.[1] Intensively argued by U. Schoop after comparing stratigraphies, closed assemblages and radiocarbon dates of numerous Anatolian sites, the subperiods can be dated between 6100–5500 BC (early), 5500–4250 BC (middle) and 4250–3000 BC (late).[2] As Schoop also pointed out, especially the 5th and 4th millennia BC are hard to define due to the lack of good data, and the obvious great variety of pottery in different regions of Anatolia can be linked by typological developments only infrequently.[3] The difficulties in the comparison of local and regional pottery styles over long distances, for example, are well demonstrated by shifting stratigraphies and dates of some key Chalcolithic sites (for example, Beycesultan XL–XX and Kuruçay 6A–4).[4] Yet, it is clear that at least with the famous Early Bronze Age fortified centres on the Aegean coast (for example, Troy, Liman Tepe) and other sites in the hinterland, sustantial changes took place in the West and are visible in the archaeological record.[5] Although actual archaeological, chronological or cultural arguments for the end of the Chalcolithic or the beginning of the Early Bronze Age around 3000 BC in the region are rare, they seem to be one of the few fixed and common anchors in this debate.[6]

Being aware of this research background, we are using this chronological terminology as a framework to discuss architectural remains and settlement structures as possible cultural patterns. Including new excavation data in the debate, we discuss general settlement features in Chalcolithic Western Anatolia, basing on former and recently published studies.[7] Architectural remains are more frequently published than other materials and, therefore, can be used as possible sources of information concerning relations between sites or regions, which remain unclear in other features, such as pottery characteristics. The organization of settlements in a broader diachronic perspective could be analyzed as a possi-

[1] For example, chronological charts of Hauptmann/Özdoğan 2007, 28 and Karul 2012, 398.

[2] Schoop 2005, 17 Beilage 1; Schoop 2011.

[3] The problems of the pottery and chronology are discussed in Schoop 2005.

[4] For example, Seeher 1987c; Eslick 1992.

[5] For the general chronological definition and research background of Anatolian Neolithic and Bronze Age with older literature see Mellink 1965.

[6] For example, in the Troad with the beginning of Troy I (Kromer et al. 2003, 47–48) or in the plain of Elmalı in the south (Eslick 1992, 80–89).

[7] Schachner 1999b, 5–9; Düring 2011a, 200–256; Düring 2011b; Perello 2011, 145–146.

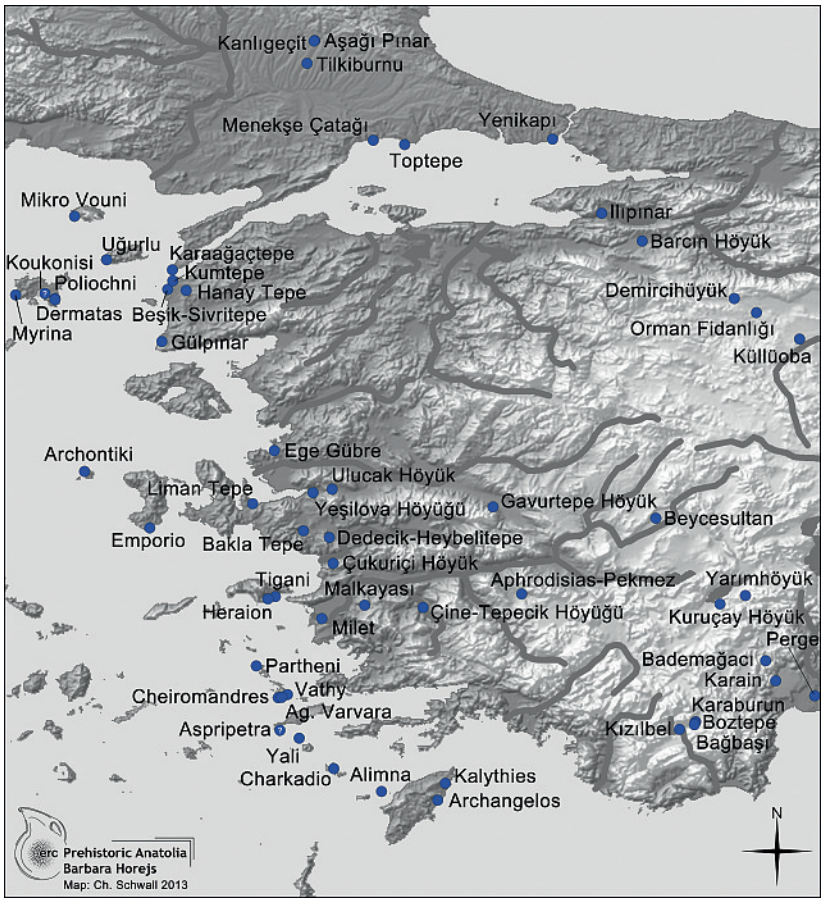

Fig. 1. Sites of the 5th and/or 4th millennia BC in Western Anatolia (without surface finds), literature cited in the text.

ble reflection of social and economical changes, as demonstrated by various studies including the Anatolian Copper Age as well.[8] Even though the current state of research does not allow any final conclusions, we shall attempt to shed some new light on the 4th millennium BC in Western Anatolia by discussing newly excavated data in the context of possible, recently interpreted patterns in settlement structures and architecture. Focusing on these topics, we begin this paper with an overview of all published and excavated sites with architectural remains dated to the 5th and 4th millennia BC and located in Western Anatolia, yet without repeating detailed chronological discussions already published by U. Schoop.[9] In the following, recently excavated Late Chalcolithic architecture in Çukuriçi Höyük will be presented and discussed in the context of architectural features and principal settlement structures in the whole region.

Excavated sites of the 5th and 4th millennia BC in Western Anatolia (Fig. 1)

First investigations at Chalcolithic sites in the West took place mainly on the Çanakkale peninsula, situated in the northwestern part of Turkey, which were initialized as a by-product of research undertaken in the wider surroundings of Troy. Therefore, research concerning the 5th and 4th millennia BC in Western Anatolia can be dated to the second half of the 19th century. Besides the Middle Chalcolithic (5th millennium BC) settlements of Beşik-Sivritepe,[10] Gülpınar[11] and Level IA in Kumtepe,[12] three excavated sites of the 4th millennium BC, Kumtepe IB, Hanay Tepe[13] and Karaağaçtepe (Gelibolu peninsula)[14], are known from the Troad and the direct vicinity (**Fig. 1**). The absolute chronology of the so-called Late Chalcolithic horizon at Kumtepe IB can be fixed by calibrated radiocarbon dates to the second half of the 4th millennium.[15] First excavations at Hanay Tepe were conducted by F. Calvert in 1857 and yielded finds from two strata: B and C.[16] A review of the material by A. Schachner led to a further subdivision of stratum B. The older part of this level shows strong connections to the finds of Kumtepe IB and could partially be seen as contemporary.[17] The four sites Poliochni,[18] Myrina,[19] Dermatas[20] and possibly Koukonisi[21] on the Aegean island of Lemnos, not far from the coast of the Çanakkale peninsula, belong to the 4th millennium BC.[22] Moreover, several settlements, which date to the 5th and/or 4th millennium BC, are known from the East Aegean islands Samothrace (Mikro

[8] For example, Schachner 1999b; Gogâltan 2010, 16–19.
[9] Schoop 2005.

[10] Schliemann 1881, 739–744; Lamb 1932; Korfmann 1985; Korfmann 1986; Korfmann 1989; Korfmann/Kromer 1993; Korfmann et al. 1995; Gabriel 2000; Gabriel 2001; Gabriel 2006.
[11] Seeher 1987a; Takaoğlu 2006; Takaoğlu 2006b; Takaoğlu/Özdemir 2013.
[12] Koşay/Sperling 1936; Sperling 1976; Korfmann et al. 1995; Gabriel 2000; Gabriel 2001; Gabriel 2006. J. Sperling divided the levels of Kumtepe into two periods: I and II, including three subperiods for Kumtepe I (Sperling 1976, 309; 360–361). The subperiods IA and IB represent the Chalcolithic layers, and IC and II the Bronze Age settlements (Korfmann et al. 1995, 238–241). Due to the fact that Kumtepe II was totally destroyed by agricultural activities in this area, Korfmann decided to change the terminology to Kumtepe A–C without period numbers (Korfmann et al. 1995, 243–244).
[13] Calvert 1859; Calvert 1881; Schachner 1999a; Aslan 2012, 154.
[14] Schliemann 1884, 286–295; Demangel 1926, 15–33; Özdoğan 1986, 54; Blum et al. 2011, 120.
[15] Korfmann et al. 1995, 260–261; Gabriel 2000, 235 Tab. 1; Kromer et al. 2003, 45–46; Schoop 2005, 262 Fig. 6.7. Concerning the discussion about the radiocarbon dates for the Kumtepe A period, cf. Schoop 2005, 262–263.
[16] Calvert 1881, 784
[17] Schachner 1999a, 22.
[18] Bernabò-Brea 1964; Doba 1997a; Kouka 2002, 34–45.
[19] Achilara 1997; Doba 1997a; Doba 1997b; Kouka 2002, 21–22; Doba 2003; Alram-Stern 2004, 928–930; Acheilara 2008.
[20] Bernabò-Brea 1964, 18; Bernabò-Brea 1976, 13 Pl. CCLIII,a; Kouka 2002, 25.
[21] Boulotis 1997; Kouka 2002, 23; Alram-Stern 2004, 931.
[22] The dating of Poliochni nero is supported by radiocarbon dates between 2910–2672 calBC for the following phase Poliochni azurro dated to EBA 1 and comparison with Troy I (Begemann et al. 1992, 220–221; Kouka 2002, 51).

Vouni[23]), Imbros (Uğurlu[24]), Chios (Emporio[25]), Psara (Archontiki[26]), Samos (Heraion[27], Kastro Tigani[28]), Leros (Partheni[29]), Kalymnos (Vathy Cave, Cheiromandres Cave, Agio Varvara Cave[30]), Kos (Aspripetra Cave[31]), Yali[32], Tilos (Charkadio Cave[33]), Alimnia[34] and Rhodes (Archangelos Cave[35], Kalythies Cave[36]). Especially the sites at Chios and Samos are situated close to the coastline and could be considered as an integral part of the central Western Anatolian contact sphere. Relations between these regions have been pointed out by R. Tuncel, based on the ceramic material for the 5th and 4th millennia BC, and by O. Kouka for the following Early Bronze Age.[37] Regarding this region itself, many investigations were undertaken during the past 20 years. These research projects led to the discovery and excavation of several new sites of the 5th and 4th millennium BC on the Çeşme peninsula (Bakla Tepe,[38] Liman Tepe[39]), to the north (Ege Gübre[40]), and the hinterland of İzmir (Ulucak Höyük,[41] Yeşilova Höyüğü[42]) down to the region of the lower Küçük Menderes (Çukuriçi Höyük,[43] Dedecik-Heybelitepe[44]) and Aydın (Malkayası Cave[45], Çine-Tepecik Höyüğü,[46] Milet[47]). A closer view of Western Anatolia reveals sites in the south/southeastern region (Aphrodisias-Pekmez[48], Bağbaşı[49], Bademağacı[50], Beycesultan[51], Boztepe[52], Gavurtepe Höyük[53], Karaburun[54], Karain Cave[55], Kızılbel[56], Kuruçay Höyük[57], Perge[58], Yarımhöyük[59]) as well as in the north/northeastern region (Aşağı Pınar,[60] Barcın Höyük,[61] Demircihüyük,[62] Ilıpınar,[63] Kanlıgeçit[64], Küllüoba[65], Menekşe Çatağı[66], Orman Fidanlığı[67], Tilkiburnu,[68] Toptepe,[69] Yenikapı[70]), which should be mentioned and added to the previously excavated sites in Western Anatolia and Turkish Thrace.

We can summarize by stating that the number of Late Chalcolithic sites is increasing, yet few have been excavated and even fewer have in fact been finally published. Therefore, only a small number of settlements like Beycesultan, Bakla Tepe, Küllüoba and Kuruçay Höyük were investigated on a large-scale and, thus, allow detailed analyses of architectural features and their changes, of economical sources and specialized craftsmen (that is, metalworking and textile production), of changes in settlement size, or of presumable social differentiation visible in the spatial division of settlement structure and organization.

[23] Matsas 1987, 499–503, 546; Nêmejcová-Pavúková 1993, 247; Alram-Stern 1996, 448.
[24] Erdoğu 2011a; Erdoğu 2011b; Erdoğu 2012.
[25] Hood 1981.
[26] Touchais 1984, 812; Alram-Stern 1996, 480; Alram-Stern 2004, 943.
[27] DAI 2012.
[28] Felsch 1988.
[29] Sampson 1987; Sampson 2006, 230–231; Georgiadis 2012, 12.
[30] Maiuri 1928, 104–117; Hope Simpson/Lazenby 1973, 170; Benzi 1997, 383; Alram-Stern 2004, 948; Benzi 2008.
[31] Jacopich 1928; Levi 1929, 277–310; Buchholz 1982, 50–52; Alram-Stern 2004, 946.
[32] Sampson 1988a; Sampson 2006, 234–237; Georgiadis 2012, 12.
[33] Bachmayer et al. 1976, 139–142; Sampson 1987, 115; Melas 1988, 293; Alram-Stern 1996, 488; Alram-Stern 2004, 950.
[34] Sampson 1987; Sampson 2006, 231–233; Georgiadis 2012, 12.
[35] Sampson 1979; Sampson 1987; Sampson 1988b, 13–15; Sampson 2006, 220–230.
[36] Sampson 1987; Sampson 1988b, 11–13; Sampson 2006, 220–230.
[37] Tuncel (in press); Kouka 2002, 299–302.
[38] In summary: Erkanal/Özkan 1999; Erkanal 2008a; Şahoğlu 2008; Erkanal/Şahoğlu 2012a, 92–93; Tuncel (in press).
[39] In summary: Erkanal 2008b; Şahoğlu 2008; Erkanal/Şahoğlu 2012b, 221; Tuncel (in press).
[40] Sağlamtimur 2012, 197; Sağlamtimur/Ozan 2012, 228–229, 240.
[41] Çilingiroğlu et al. 2004; Çilingiroğlu/Çilingiroğlu 2007, 363; Çilingiroğlu et al. 2012, 159–160.
[42] Derin 2008, 219–220; Derin et al. 2009, 8–9, 16–17; Derin 2010, 69; Derin 2011; Derin 2012a; Derin 2012b, 178–179; Derin 2012c, 179.
[43] Galik/Horejs 2011, 86; Horejs 2008b, 97–98; Horejs 2011, 159; Horejs et al. 2011, 40.
[44] Herling et al. 2008.
[45] Gerber 2003, 84; Peschlow-Bindokat/Gerber 2004, 204–205; Peschlow-Bindokat/Gerber 2012, 74–75.
[46] Günel 2006; Günel 2007; Günel 2008a; Günel 2008b, 137; Günel 2012.
[47] Voigtländer 1983; Parzinger 1989; Niemeier 2000, 125–127; Niemeier 2007, 6–7.
[48] Sharp Joukowsky 1986.
[49] Eslick 1992.
[50] Umurtak 2005.
[51] Lloyd/Mellaart 1962.
[52] Eslick 1992.
[53] Meriç 1994, 423; Meriç 2009, 124.
[54] Eslick 1992.
[55] Kökten 1955; Seeher 1987b; Kartal/Yalçınkaya 2012, 28–29.
[56] Eslick 1992.
[57] Duru 1996; Duru 2008, 122–144.
[58] Martini 2003, 56–57; Abbasoğlu 2004, 46; Abbasoğlu 2009, 62; Martini 2010, 14–15.
[59] Ekinci/Öztürk 1999.
[60] Özdoğan/Parzinger 2000, 84; Karul et al. 2003; Parzinger/Schwarzberg 2005.
[61] Gerritsen et al. 2010.
[62] Korfmann 1983; Seeher 1987c; Seeher 2012, 118–119.
[63] Roodenberg 1995; Roodenberg 2001; Roodenberg/Thissen 2001; Roodenberg 2008; Roodenberg/Alpaslan Roodenberg 2008.
[64] Özdoğan 2000c, 71–72; Özdoğan 2004, 25; Özdoğan et al. 2012, 46.
[65] Efe/Ay 2000; Efe/Ay-Efe 2001; Fidan 2012, 6–9.
[66] Erim-Özdoğan/Işın 2002.
[67] Efe 1990; Efe 2000; Efe 2001.
[68] Özdoğan 1982; Özdoğan 1991b, 220, 223; Özdoğan 2000b.
[69] Özdoğan 1991a, 351–357; Özdoğan et al. 1991, 75–81; Özdoğan 2000c; Özdoğan 2004, 25.
[70] Perinçek 2010; Dönmez 2011, 23–24.

Late Chalcolithic remains at Çukuriçi Höyuk – current state of research

Çukuriçi Höyuk is a tell site situated near the ancient city of Ephesos in the Küçük Menderes river delta, close to the Aegean coast.[71] The first investigations on the tell started in 1995 as short rescue excavations, conducted by the Efes Müzesi (Selçuk).[72] In the following years large parts of the tell were destroyed through reducing its size and levelling the hilltop in order to enlarge the surrounding areas for agricultural use.

New research was initiated by trial excavations at the site in 2006. These excavations led to a research project funded by the Austrian Science Fund (FWF) in 2007[73] and are currently part of a project supported by the European Research Council (ERC) since 2011.[74] Thus far, the investigations during these years have yielded six settlements that date to the Late Neolithic, Early Chalcolithic, Late Chalcolithic and Early Bronze Age periods.[75] The Early Chalcolithic settlement dates to ca. 6000 calBC;[76] it seems to be followed by a hiatus of a minimum of 1500 years and resettlement at least in the second half of the 4th millennium BC.[77] These Late Chalcolithic levels were excavated in small deep trenches; they were only briefly presented in one excavation report and are currently in preparation as part of an interdisciplinary publication. The main results of the analyses of the Late Chalcolithic material provide an insight into the domestic architecture and assemblages of the Late Chalcolithic period at Çukuriçi Höyük, which can be summarized as follows:

Distinct Late Chalcolithic levels have been excavated in two trenches and are stratigraphically defined as settlement phases ÇuHö VII and VI. These phases could be dated relatively by pottery assemblages and fixed chronologically by radiocarbon dates in the second half of 4th millennium BC.

Trench N4 (excavated in 2009, **Fig. 2–3**) contains a sequence of Late Chalcolithic layers that represent numerous overlapping, closed contexts. Due to the destruction of the tell site after 1995, the Early Bronze Age layers were dug away in the western and northwestern parts of the hill. Therefore, a Late Chalcolithic use horizon covered by debris could be excavated in trench N4 directly beneath the mixed layers of the surface. This floor covers an older use horizon, which was founded on a levelled layer underneath. Both use horizons contained typical domestic assemblages, like pottery for cooking and consumption, fragments of pithoi, lithic tools, loom weights, metal objects and grinding stones, which are associated with clay floors.[78] Although no architectural features were present that correspond with these layers due to the small excavated area, it seems clear that we are dealing with a domestic quarter of a settlement.

[71] Horejs et al. 2011, 36 Fig. 3.
[72] Evren/İçten 1997.
[73] FWF-Project no. P 19859-G02 (2007–2010); FWF-Project no. Y 528 (2010–2016).
[74] ERC-Project no. 263339.
[75] For more detailed information about the settlement phases see Horejs 2008b, 98 Fig. 8. The Late Neolithic settlement Phase IX was recently discovered during the excavations in 2011.
[76] Galik/Horejs 2011.
[77] Horejs et al. 2011, 41–42; Horejs 2014; Horejs/Weninger (in press). Analysis of the radiocarbon samples of ÇuHö IX are still in progress.

[78] The publication of radiocarbon dates (B. Weninger), architecture and pottery (B. Horejs) and grinding stones (Ch. Schwall) is in preparation.

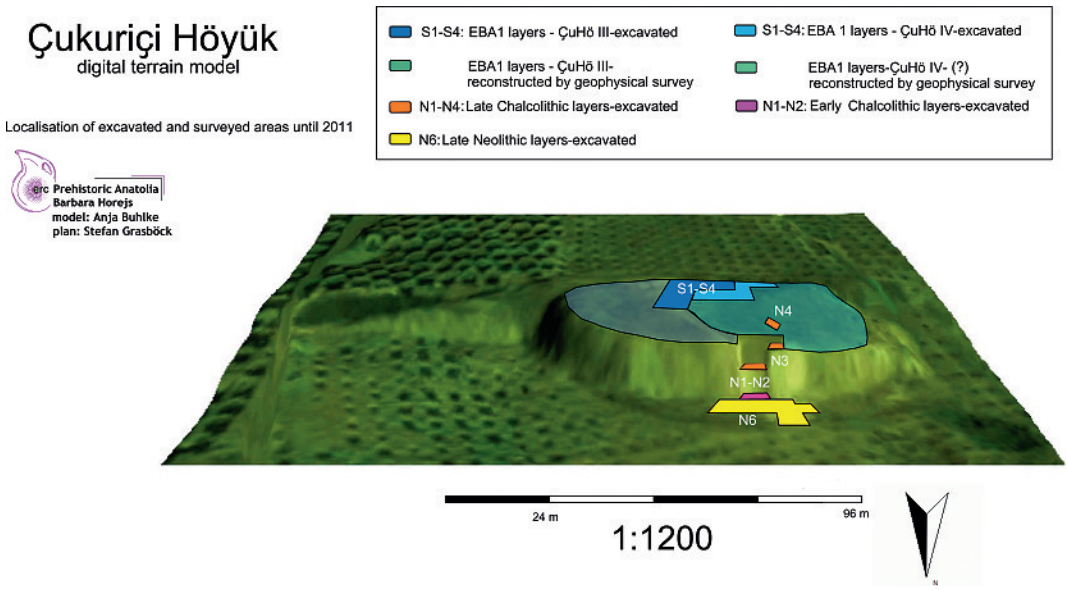

Fig. 2. Digital model of Çukuriçi Höyük with areas that were excavated and surveyed until 2011 marked (model by A. Buhlke; plan by St. Grasböck).

The following distinct architectural remains underneath these layers provide additional support for this interpretation. The architecture is represented by three sections of walls (**Fig. 4**). Two of them are 0.7 m in width, forming a corner in northeast direction, and presumably belong to a rectangular building complex. No indications of a foundation or superstructures could be recognized during the excavations. Furthermore, no destruction layer of stones or mud bricks was found that accorded with the walls and might have specified their kind of construction. Likewise, a corresponding floor has not been identified so far, but the covering levelled layer contained several domestic finds that seem to have been associated with this building originally.

Trench N2–N3 (excavated in 2006 and 2007, **Fig. 2–3**) yielded different remains of the Late Chalcolithic Period. The excavated area is situated close to the northern edge of the site. A huge part of the settlement had been dug away in northerly direction during the destructive agricultural activities mentioned above. Therefore, the stratigraphy of the upper layers of these trenches is comparable with the situation in trench N4. Below recently disturbed layers Chalcolithic remains could be recovered, two of which should be described summarily. In trench N2, the architectural remains are represented by six parallel rows of single stones without any foundation (**Fig. 5**). Due to the shallow depth of this structure below the surface, no details about the superstructure of these remains are preserved. The stone rows are situated parallel on the same horizontal level and are embedded in a layer of burnt clay. Although no clear floor or closed context that corresponds to these stone rows are preserved due to recent destruction and pits, we nevertheless interpret them as the remains of an architectural context. Directly at the northern edge of trench N3 the intramural burial of a child without grave gifts was discovered in a stone slab cist (N3, **Fig. 6**).[79] The northern and eastern stone slabs were not present, but the burial itself was fully conserved. The child had been placed in East–West direction in a slightly contracted position with the face to the North.

To conclude the presentation of Late Chalcolithic remains at Çukuriçi Höyük, we would point out the main results about the proposed approach as follows: The tell was re-settled at least in the 4th millennium BC, and all architecture and assemblages could be interpreted as mainly for domestic use. The whole Late Chalcolithic settlement was surrounded by a ditch, which was attested at the north of tell. The technique of building houses with a stone socle can be traced

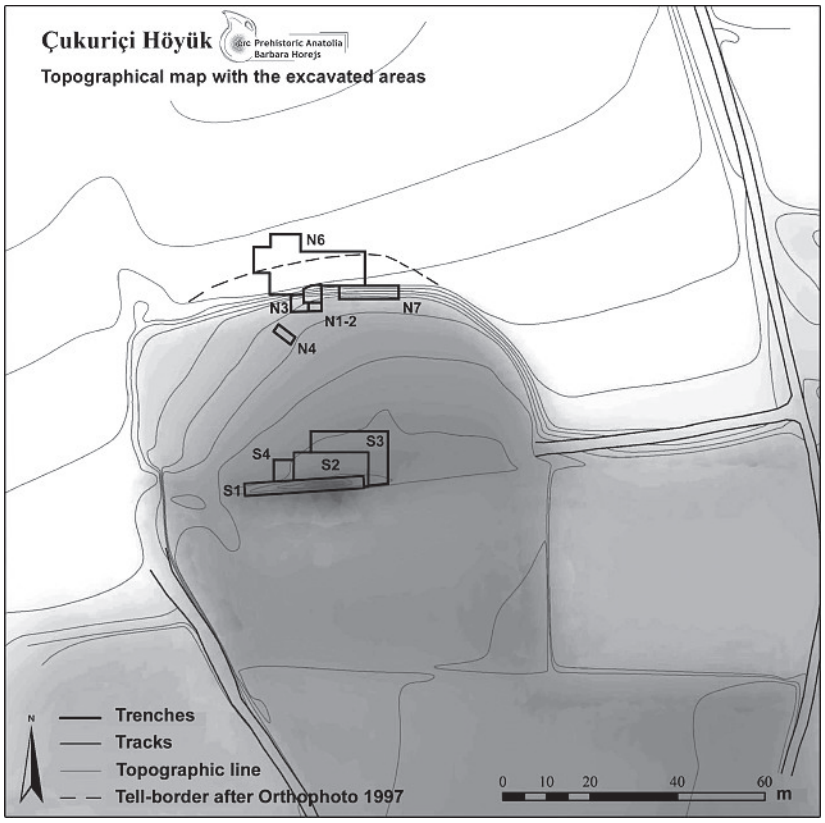

Fig. 3. Topographical map of the tell site Çukuriçi Höyuk with trenches excavated in 2006–2011 and reconstructed settlement size (cartography by Ch. Kurtze; plan by M. Börner).

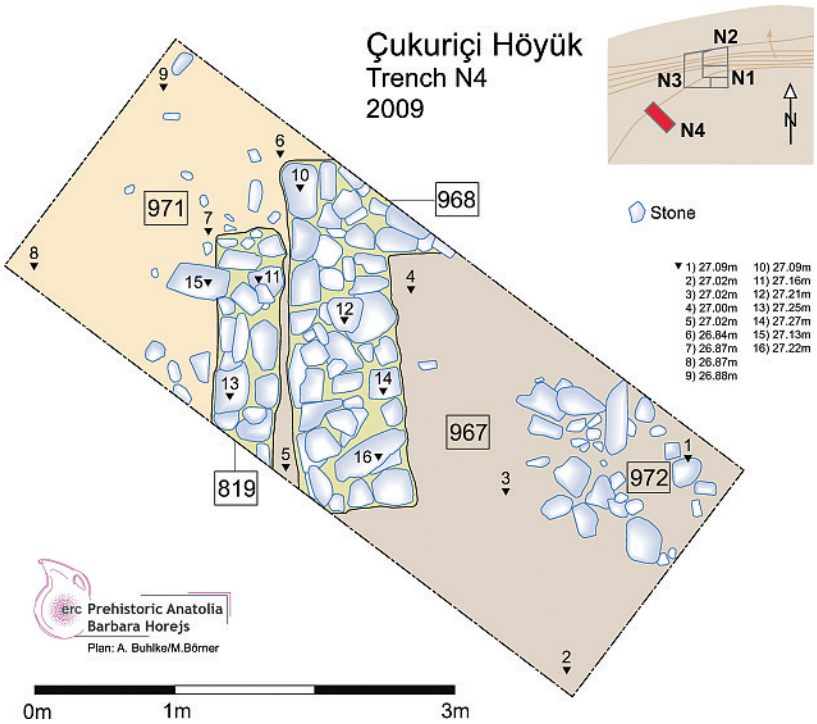

Fig. 4. Architectural remains in trench N4 (plan by M. Börner/A. Buhlke).

[79] Horejs 2008a; Horejs 2014, 20 Fig. 4.

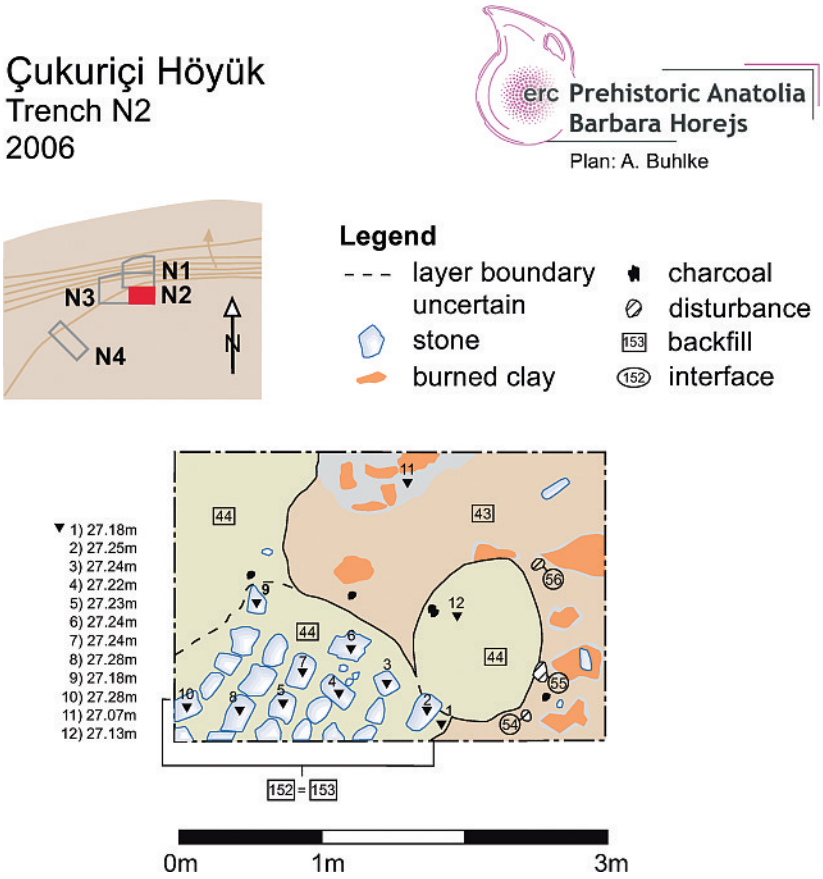

Fig. 5. Architectural remains in trench N2 (plan by A. Buhlke).

to a local tradition of solid architecture, which was much better known in the subsequent Early Bronze Age layers.[80] The same could be concluded for the burial of a child in the settlement context, a phenomenon also detectable in the later Early Bronze Age 1 phase in Çukuriçi Höyük.[81]

In the search for possible analogies in Western Anatolia during the Late Chalcolithic, the phenomenon of intramural burials of children should be mentioned, too. Common in many periods and regions, inhumations of children within the context of settlements, mainly in living quarters, are known from Bakla Tepe,[82] Barcın Höyük,[83] Dedecik-Heybelitepe,[84] Kuruçay Höyük[85] and Beycesultan.[86] Aside from this specific intramural burial practice, children and infants were also buried in regular graveyards as demonstrated in the Late Chalcolithic necropolis of Ilıpınar.[87]

[80] Horejs et al. 2011, 40–41.
[81] Horejs 2010, 168–169, 175 Fig. 7.
[82] Erkanal/Özkan 1999, 134, 197 Fig. 36; Erkanal/Şahoğlu 2012a, 93.
[83] Gerritsen et al. 2010, 201–202.
[84] Herling et al. 2008, 17–20 Fig. 2–3.
[85] Duru 1996, 24 Pl. 49–52.
[86] Lloyd/Mellaart 1962, 22 Fig. 5; 23–25 Pl. IIIb–c.
[87] Roodenberg 2008 (burials UR and UZ).

Domestic architecture and building techniques in Western Anatolia

Certainly, the choice of raw materials was primarily dependent upon direct access to natural resources in the neighbourhood and only secondarily a reflection of local traditions and techniques.[88] As recently discussed by B. Düring, the use of different building techniques in Chalcolithic sites possibly also reflects the intensity of settling in general. Within the context of probable seasonally occupied sites like Ilıpınar 5B (Marmara region) and Bağbaşı (Elmalı plain), Düring propounds the model of pastoralist nomadism also for 5th millennium Troad sites and other shallow settlements with wattle-and-daub structures.[89] According to Düring, this mobile way of life would additionally explain the difficulty in detecting Chalcolithic sites in large parts of Asia Minor.[90] Following his arguments, it seems necessary to focus on building techniques and the raw materials used in Late Chalcolithic domestic architecture in general in order to continue this discussion. While Central and Eastern Anatolia have been analyzed comprehensively in their principle architectural features of the Copper Age,[91] the western part of Turkey still lacks such an overview. In analyzing the few excavated architectural structures that have been published, we would categorize four principal types of domestic buildings present in the 4th millennium BC (**Fig. 7**): rectangular buildings (type 1), apsidal/elliptic buildings (type 2), circular structures (type 3) and stone row structures (type 4).

Rectangular buildings (type 1), as exemplified by the single house-corner in trench N4 at Çukuriçi Höyük, seem to be the most common type of domestic architecture during the 4th millennium BC in the region,[92] and show a great variety in building techniques and materials obtained (**Tab. 1**). The walls of rectangular houses can be built entirely of mud brick (Aphrodisias-Pekmez,[93] Barcın Höyük,[94] Beycesultan,[95] Demircihüyük?[96]), of simple mud and/or wood structures (Bağbaşı,[97] Tilkiburnu[98]) or perhaps, due to

[88] Convincingly analyzed by A. Schachner (1999b, 23–24, 52–63) for other regions in Anatolia, from the Neolithic to Bronze Age periods.
[89] Düring 2011a, 254–255.
[90] Düring 2011a, 254.
[91] Schachner 1999b.
[92] Especially at Kuruçay Höyük, R. Duru describes the rectangular buildings as standard for the Late Chalcolithic settlement (Duru 1996, 12).
[93] Sharp Joukowsky 1986, 65–72.
[94] Gerritsen et al. 2010, 200.
[95] Lloyd/Mellaart 1962, 17–26.
[96] Only a part of a wall was detected. It is not possible to state whether it belongs to a rectangular building or not (Korfmann 1983, 27; Seeher 2012, 118).
[97] Eslick 1992, 15–16.
[98] Özdoğan 1982, 4–5.

state of preservation, built completely with stones. Regarding the stone walls of rectangular and other building types, it can hardly be distinguished whether the walls were built solely of stone or whether they have a stone socket with rising mud brick walls or wattle-and-daub constructions above a foundation as in Bakla Tepe (wattle-and-daub),[99] Dedecik-Heybelitepe (unclear),[100] Karaağaçtepe (unclear),[101] Kumtepe (mud bricks?),[102] Küllüoba (mud bricks),[103] Kuruçay Höyük (mud bricks),[104] and Poliochni (wattle-and-daub?).[105] Kuruçay Höyük in the Lake District of southwestern Anatolia represents one of the best preserved architectural remains of the 4th millennium BC with around 23 houses in level 6A, in which mud bricks represent the major building material.[106]

Besides the dominant rectangular buildings, so far apsidal or elliptical houses (type 2) are also known from a few sites on the central Aegean coast and neighbouring Aegean islands, like on Lemnos (Poliochni,[107] Myrina[108]), Yali[109] as well as in Liman Tepe[110] and Bakla Tepe[111]. The third category in domestic architecture (type 3) can be summarized as circular structures with a stone foundation and floors partially paved with stones, also detected in Chalcolithic Myrina (layers II and III),[112] Poliochni nero[113] and Bakla Tepe[114]. Both of our building types 2 and 3 have been interpreted as granaries or storage rooms.[115] Especially the finds of grindings stones and mortars, presumably used for food preparation, in

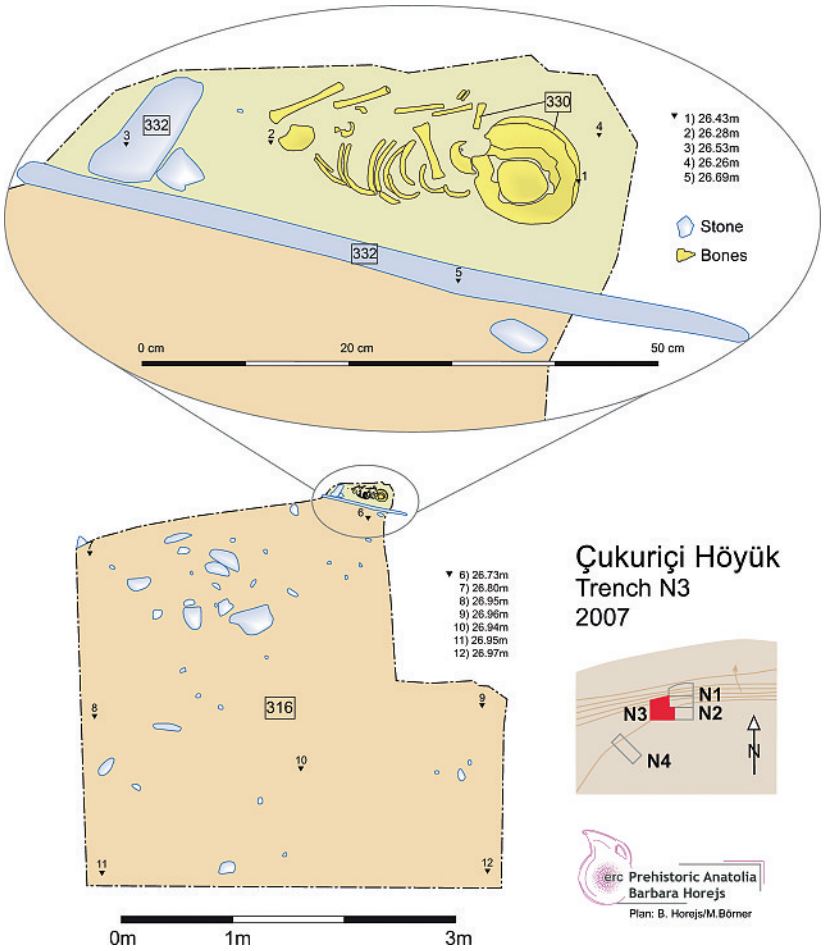

Fig. 6. Child's burial in a stone slab cist in trench N3 (plan by B. Horejs/A. Buhkle).

Location	1	2	3	4	5
Bakla Tepe		■	■	■	■
Çukuriçi Höyük	■			■	■
Liman Tepe		■			■
Poliochni		■	■		■
Myrina	■	■	■		
Kumtepe	■				■
Dedecik-Heybelitepe	▒	▒			
Aphrodisias-Pekmez	▒	▒			
Barcın Höyük	▒	▒			■
Beycesultan	■				■
Bağbaşı	■				▒
Kuruçay Höyük	■				■
Küllüoba	■				
Yali		■			

Table 1. Categories of 4th millennium domestic architecture in Western Anatolia and the East Aegean. 1 Rectangular buildings; 2 Apsidal/elliptical buildings; 3 Circular structures; 4 stone row structures; 5 Cultivation of grain (black: attested; grey: possible; white: not attested).

[99] Erkanal/Özkan 1999, 132; Erkanal 2008a, 168; Erkanal/Şahoğlu 2012a, 92; Tuncel (in press).
[100] Herling et al. 2008, 16–20.
[101] Demangel 1926, 16.
[102] In Level IB J. Sperling mentioned a layer of brown earth, which he views as possible remains of mud bricks (Sperling 1976, 327, 330–331, 342). M. Korfmann also recognized a layer of yellow clay, which he interprets as the remains of mud brick walls (Korfmann et al. 1995, 246–247).
[103] Efe/Ay 2000, 7; Fidan 2012, 7.
[104] Duru 1996, 5.
[105] Kouka 2002, 37 footnote 191.
[106] Duru 1996, 12; Duru 2008, 123; Düring 2011a, 226–229; Düring 2011b, 802.
[107] Bernabò-Brea 1964, 45–57; 73–103; Kouka 2002, 34–41 Plan 2.
[108] Doba 1997b, 284–292 Fig 2α; Kouka 2002, 22; 39.
[109] Sampson 2006, 237 Fig. 233. For the discussion of dating see Georgiadis 2012, 12.
[110] Kouka 2009, 143; Tuncel (in press). The walls of the building found at Limantepe were made of "wattle and daub" constructions (Kouka 2009, 143; Erkanal/Şahoğlu 2012b, 221).
[111] Erkanal/Özkan 1999, 130–134; 196 Fig. 34–35; Erkanal 2008a, 168; 176 Fig. 14; 177 Fig. 15; Tuncel (in press); Erkanal/Şahoğlu 2012a, 92; Şahoğlu/Tuncel 2014, 68–71.
[112] Doba 1997b, 284–292 Fig. 2γ,3; Kouka 2002, 22; 39.
[113] Bernabò-Brea 1964, 45–57, 73–103; Kouka 2002, 34–41 Plan 2.
[114] Erkanal/Özkan 1999, 133; Erkanal 2008, 168; 177 Fig. 16; Erkanal/Şahoğlu 2012a, 92; Tuncel (in press).
[115] Doba 1997b, 290–292; Erkanal/Özkan 1999, 133; Kouka 2002, 40; Erkanal 2008, 168; Erkanal/Şahoğlu 2012a, 92.

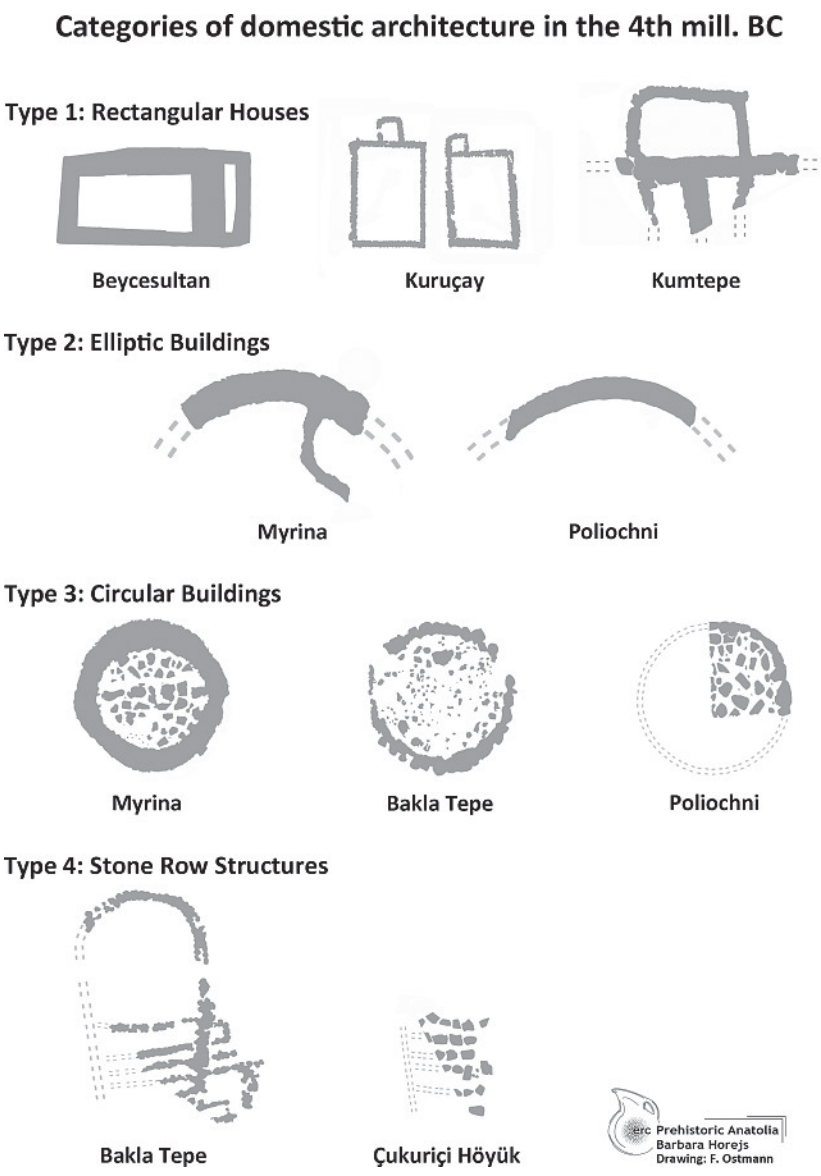

Fig. 7. Schematic figure of different domestic building types in Western Anatolia. 1 Rectangular building; 2 Apsidal/elliptical building; 3 Circular structure; 4 Stone row structure (different scale; design by F. Ostmann).

the context of these buildings in Poliochni nero support this interpretation. The close analogies between rounded and circular buildings at sites on Lemnos and those on the central Anatolian coast have already been pointed out by O. Kouka,[116] which she further interprets in the cultural sense of close contacts and relations within one cultural Aegean-Anatolian zone.

Finally, we would add a fourth type of domestic buildings, designated as stone row structures, which are surprising for the region as well as for this specific period. This kind of architecture is well known from buildings in Eastern Anatolia, mainly dating to the Pre-Pottery Neolithic periods (for example, Çayönü[117]). They are characterized by a rectangular shape, often of monumental size and subdivided by several parallel walls in the interior, which led to the term "grill-plan houses". Comparable structures have been detected in Bakla Tepe,[118] where they are designated with this specific terminology. The walls of these houses are made of wattle-and-daub that found upon a stone socle. None of the buildings has been excavated completely; only one structure in trench H 14–15 shows a distinct apsidal end. This building apparently measures at least 10 m in length and around 5 m in width.[119] Except for the apsidal part, several rows of stones subdivide the interior of the structures. Excavations in this trench (H 13–15) revealed altogether three free-standing buildings, all displaying similar monumental dimensions. They are situated to the east of a stone-paved structure, which is interpreted by the excavators as a road.[120] Based on these excavation results, it seems clear that all three buildings were part of a much larger settlement.[121]

A kind of parallel for this building type was found at Çamlıbel Tarlası,[122] probably a seasonally inhabited site in Central Anatolia.[123] The excavator U. Schoop interpreted the structures as storage facilities for grain, because of the stone single rows that created space possibly for raised and, therefore, dry floors.[124] This interpretation obviously derives from later structures, already mentioned by O. Kouka at Thermi I–III and Emporio III.[125] Although the architecture found at Çukuriçi Höyük has been excavated only partly, the structure described there with parallel rows of stones could be explained as the remains of this kind of stone row structure (type 4), much better preserved in the neighbouring Bakla Tepe.

Function, agriculture and storage

Due to the state of preservation and research, our simplified four types of domestic structures in Western Anatolia settlements do not allow the creation of a more detailed picture, as for instance was drawn for Central and Eastern regions by A. Schachner. His studies on Central

[116] Kouka 2002, 39; Kouka 2014, 46.
[117] Aurenche 2006, 62; Erim-Özdoğan 2011, esp. 194–201 Fig. 8; 11; 14–15; 17.
[118] Erkanal/Özkan 1999, 130–134; Erkanal 2008a, 168, 176 Fig. 14, 177 Fig. 15; Şahoğlu 2008, 484–485; 497 Fig. 5; Tuncel (in press).
[119] Cf. Erkanal 2008a, 176 Fig. 14.
[120] Erkanal/Özkan 1999, 132.
[121] About settlement size see Erkanal 2008a, 171 Fig. 2.
[122] Schoop 2010.
[123] Schoop 2010, 200–201.
[124] Schoop 2010, 192, 193 Fig. 49; 194 Fig. 51.
[125] Kouka 2002, 40 footnote 225. She suggests that these buildings represent normal houses, whose apsides were partly used for different functions, like storage (Kouka 2002, 40). Although R. Tuncel does not define the specific character of the houses, he proposes that the level of these buildings was raised "[…] due to the high water table in the region […]" (Tuncel in press).

Anatolia during our specific period also include Pisidia (Kuruçay and Beycesultan); they revealed some results that are of importance for the western regions concerning the functions of buildings and various activities.[126] Based on these two sites Schachner reconstructs standardized dwellings as rectangular buildings, mainly single-room houses with a central hearth, a further separate oven and independent storage rooms. Houses are grouped around open spaces and streets, and apparently were also used communal granaries. In view of their principally small size ranging between 20 and 40 m^2, the houses presumably belonged to one family. Our building type 1 in different sites in the West could represent such standardized dwellings, probably not only rectangular, but also apsidal or elliptical shaped (see above and **Fig. 7**). Additionally, we emphasize the variety of different types of storage buildings in the East Aegean/West Anatolia, which also offer some insight in agriculture and social organization in settlements.

Storage of food could be integrated in a household, detectable in the form of small annexes in dwellings, which demonstrates the combination of a living–working area and storage in one house-complex. Examples with traces of grain in such annexes are preserved in Beycesultan SC3;[127] M. Korfmann also interpreted an annex in Kumtepe IB[128] as a storage room. Both buildings show separate storage rooms and differ only in their building technique.[129] Household-independent granaries are represented by building type 3 (see above) in Poliochni nero, Myrina and Bakla Tepe. Although not all of the aforementioned sites have yielded clear traces of food production with cereals and production equipment (grinding stones, mortars), nonetheless agricultural processes and/or storage of grain are evidenced in Beycesultan,[130] Barcın Höyük,[131] Kumtepe[132], Kuruçay Höyük[133], Liman Tepe[134] Bağbaşı[135] (probably) and Çukuriçi Höyük (**Tab. 1**).[136]

[126] Schachner 1999b, 59–62.
[127] Lloyd/Mellart 1962, 24 Fig. 6, 25.
[128] Korfmann et al. 1995, 249; 252 Fig. 17.
[129] In Beycesultan walls are made of mud brick, while in Kumtepe IB the mud brick superstructures are possibly built upon stone socles (see above).
[130] Lloyd/Mellaart 1962, 25.
[131] Gerritsen et al. 2010, 210.
[132] A small rectangular room was interpreted as a storage room by M. Korfmann (Korfmann et al. 1995, 249). For archaeobotanical studies see Riehl/Marinova 2008.
[133] Nesbitt 1996.
[134] Oybak/Doğan 2008; Kouka 2002, 143.
[135] Eslick 1992, 49.
[136] Moreover, rectangular silos (Küllüoba: Efe/Ay 2000, 3; Efe/Ay-Efe 2001, 46) and a storage pit (Milet: Niemeier 2000, 125, 126 Fig. 2) were detected at other Late Chalcolithic sites.

Permanent settlements, raw materials and mobility

Following B. Düring, "complex villages" are described as settlements, which are mainly supplied by agriculture and include different craft activities as well as the existence of "monumental non-domestic building" and "possibly also defensive structures".[137] Hints with reference to this definition of settlement structure are present at only a few sites in Western Anatolia, and this is probably not solely due to the restricted size of excavated areas. Similar results have already been presented by A. Schachner for Central Anatolia, where he defined a simple and middle-ranged complexity of settlements (villages) in contrast to eastern and southeastern Anatolia with a more developed complexity in settlement structure.[138] The aforementioned settlement at Kuruçay Höyük encompasses open areas with groups of houses. Düring interprets these clusters as "closely associated households" in the settlement.[139] The closed character of the settlement – even without a distinct enclosure – is obvious in the spatial organization of buildings, streets and entrances, especially in the southeast area.[140] The general existence of this closed settlement character is attested by a few other enclosures like ditches or walls in Western Anatolia. These settlement features can be traced in the Middle (for example, Aşağı Pınar,[141] Emporio[142]) and Late Chalcolithic periods (Barcın Höyük,[143] Çukuriçi Höyük), although clear indications of monumental public buildings are lacking. Regardless whether or not this is due to the limited excavations, the question still arises as to whether the presence of "monumental non-domestic" buildings are strictly required for this classification. Instead of monumentality, public granaries or storage rooms as well as partially detected enclosures could be reflective of some sort of organization in these societies.

In Çukuriçi Höyük farming and craft activities like metalworking and textile production (attested by loom weights[144]) have been confirmed. Although metal production in general is still represented by only few sites and assem-

[137] Düring 2011b, 803–806; 808–809. B. Düring divided the settlements into three different types: "Ephemeral Settlements", "Villages and Hamlets" and "Complex Villages" (Düring 2011b).
[138] Schachner 1999b, 90–96 Fig. 21.
[139] Düring 2011b, 802–803.
[140] Duru 1996 Pl. 35. Different interpretation by A. Schachner (1999b, 158).
[141] Karul 2003, 110–112 Fig. 50.
[142] Hood 1981, 94–104.
[143] Gerritsen et al. 2010, 199.
[144] Late Chalcolithic loom weights are also attested at, for example, Bakla Tepe (Erkanal/Özkan 1999, 136; 198 Fig. 39) and Beycesultan (Lloyd/Mellaart 1962, 268, Fig. F.2,22, 275).

blages of the 4th millennium BC in Western Anatolia, it is nevertheless evident and presumably played an important role,[145] as indicated no less by heavy copper tools and weapons in the necropolis at Ilıpınar.[146] B. Düring could detect a specific "mobile way of life" in Chalcolithic Anatolia and suggests a parallel model of pastoralist nomadism (see above), which would also be supported by long-distance trade in raw materials, as visible in obsidian exchange networks.[147] Without doubt specific volcanic material had been exchanged over long distances and represents a non-local raw material in most of the settlements. Due to the state of publications, thus far the distribution of obsidian and indications of its sources can hardly be researched for Western Anatolia in 4th millennium BC.[148]

Results from Çukuriçi Höyük offer some new data for this discussion. More than 60 % of the Late Chalcolithic lithic assemblages is made of obsidian, which was imported from the Aegean island of Melos, as identified by Neutron Activation Analysis (NAA).[149] Production debris and semi-finished objects further indicate that tool production took place at Çukuriçi Höyük, and that obsidian presumably came in the form of raw nodules to the settlement. The great quantity of obsidian is not restricted to Late Chalcolithic phases at the site, but seems to have been a continuous phenomenon from the 7th to the 3rd millennium BC: apparently obsidian was processed in all settlements at Çukuriçi Höyük.[150] At least in the Early Bronze Age 1 phases at Çukuriçi Höyük (2900–2750 calBC), the quantity and composition in relation to other sites have led us to create a model of a 'gateway community' for the site, in order to reconstruct possible obsidian exchange systems.[151] Evidence of obsidian in all settlement phases demonstrates a kind of continuity and a tradition of known sources from the Neolithic to the Bronze Age, which certainly is supported by mobile groups that not only characteristic for the Copper Age in particular.

[145] Zimmermann 2011; Mehofer 2014.
[146] Roodenberg 2008; Zimmermann 2011.
[147] B. Düring (2011, 254–255) unfortunately argues without any statistically based analyses of the distribution of obsidian in these millennia, neither concerning its source nor its quantification.
[148] Clear data about lithic raw materials are only available from Aphrodisias, where obsidian was imported from Melos as well as from Central Anatolia in Late Chalcolithic 1–2 (4360–3150 calBC), restricted to Melos in the following phase Late Chalcolithic 3 (3135–2909 calBC) after Sharp Joukowsky 1986. Obsidian is sometimes mentioned in the reports for other sites, without statistical or analytical data.
[149] Bergner et al. 2009.
[150] Bergner et al. 2009; Horejs et al. 2011, 48–49 (for 3rd millennium obsidian); Galik/Horejs 2011, 88–89 (for 7th millennium obsidian).
[151] Knitter et al. 2012 (extended abstract).

Conclusions

This contribution focuses mainly on architecture and settlement structures as possible cultural patterns during the 4th millennium BC in Western Anatolia and on the eastern Aegean islands. In addition, new excavation results from Çukuriçi Höyük, a site on the central Aegean coast of Turkey, are discussed. Our evaluation of published settlements revealed different construction techniques of Late Chalcolithic buildings. Besides walls built entirely of mud bricks, mud and/or wooden structures are also attested. Furthermore, stone socles and probably walls completely built with stone can be added. For the superstructure of these socles, walls of mud brick or of simple wattle-and-daub construction are known in Western Anatolia. In addition to the different way of building walls, four general types of domestic buildings dating to the Late Chalcolithic period can be differentiated.

The rectangular single room-building (type 1) as standard domestic dwelling in Western Anatolia can be supplemented by apsidal/elliptical houses (type 2), especially on the coast and offshore Aegean islands. This region further shows a diversity in the way of food-storage in form of agglutinated annexes, integrated in living areas or as independent circular granaries (type 3), possibly used by several households. The current state of research does not allow a definition of the function of so-called stone row structures (type 4), which are evidenced at Bakla Tepe and perhaps at Çukuriçi Höyük, too. Also, the possible combination of stone row structures with rectangular or apsidal/elliptical houses cannot be proven at the moment. However, the appearance of these different types additionally illustrates at least the variety of architecture in the central coastal region of Western Anatolia in particular.

The Late Copper Age settlements in the region under study can be characterized as villages with a kind of public organization reflected in probable "public" storage rooms and partially detected enclosures. In contrast to Central Anatolia, for example, the spectrum of domestic architecture shows more diversification in shape and building techniques, which can be interpreted as a kind of cultural pattern for the region, supplemented by the common ritual of intramural burials of children in most of the sites. In our opinion, the general design of the villages discussed here, their solid building-technique and their agriculturally-based economy are good indicators for permanent settlements. In continuing, recently re-discussed models of pastoralism and a nomadic way of life in Chalcolithic Anatolia, we would emphasize permanent settling in farming villages as an additional (and the main?) way of living, probably as a parallel phenomenon

to nomadism. The exchange of raw materials over long distances as denoted by obsidian distribution in Western Anatolia is certainly a strong indicator of mobile groups, but it is not restricted to this specific period. Moreover, the exploitation of different obsidian sources and the further exchange of this material seem to have changed throughout time and need further research to answer these specific questions. A principle conclusion considering the range of complexity of 4th millennium sites can hardly be summarized; but hints of metal production, different craft activities presumably conducted by specialists, exchange of raw materials and the few indicators of social organization allow us to presuppose societies with some sort of differentiation during the Late Chalcolithic period in 4th millennium BC in Western Anatolia. To obtain better archaeological arguments for these results, further excavations at Late Chalcolithic sites are essential in the future.

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