

Times of Change: Greece and the Aegean during the 4th Millennium BC

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Abstract: This paper deals with the cultural development of the Greek mainland and the Aegean from the Chalcolithic (Attica-Kephala Culture, Athens North Slope phase) to the beginning of the Early Bronze Age (Pelos Culture). This period is visible in the landscape by an augmentation of sites in areas neither favourable to agriculture nor settled in earlier periods. This augmentation is seen in connection with the adoption of a new agricultural system and as the result of a higher frequency of relocation of settlements. The few architectural remains so far excavated show a delimitation of settlement area by walls and ditches. House plans point to a high variability in house architecture. The Chalcolithic also sees the emergence of new burial customs including extramural cemeteries. Throughout the Aegean, the pottery of this period has a quite homogeneous character from a technological point of view. Already during the Attica-Kephala Culture crusted ware and scoop-shaped vessels are distributed over a wide area. During the Athens North Slope phase so-called Heavy Burnished Ware with its characteristic shapes becomes frequent throughout the Aegean. The highly prestigious eating or drinking bowls of type Bratislava appear from the Balkans to central Greece and so-called 'cheese pots' are widespread throughout the Aegean. Such distribution of special purpose vessels points to similar technological developments over a wider geographical area. Concerning metallurgy, lead isotope analysis of copper objects indicates a close relation between Aegean metallurgy and that of the Balkans but also a growing importance of northern Greek sources. Copper is exploited in the central Cyclades on Kythnos and Seriphos as well as in Laurion in Attica; silver from Laurion and Siphnos also gains in importance. An intensification of exploitation of these sources probably led to the emergence of independent Early Bronze Age cultures in the Aegean. Ring pendants as known from the Balkans are produced and distributed as far as the southern Aegean. Axes and daggers are used from the beginning of the 4th millennium BC. Whereas axes lose ground in the central and southern Aegean, daggers soon become part of the attire and function as status symbol in warlike Early Bronze Age society.

Keywords: Greece, Aegean, Chalcolithic, Early Bronze Age, settlement patterns, pottery, metallurgy

The aim of this paper is to point out cultural developments present in the finds of the 4th millennium BC in central and southern Greece, as well as in the central and western Aegean. The time frame encompassing the 4th millennium includes the period that in Greek prehistory has been named the Final Neolithic.² Due to the increasing evidence of metal tool production during this period, German scholars prefer the term Chalcolithic.³ Accordingly, the last centuries of the 4th millennium are connected to the initial phase of Early Bronze Age I (Fig. 1).

Chalcolithic Chronology in Central and Southern Greece

According to the work conducted by Colin Renfrew and David French in southern Greece this Chalcolithic or Final Neolithic period should be separated into two stages, the Attica-Kephala Culture and the Athens North Slope phase.⁴ Research carried out by Joseph Maran shows that, in Thessaly, the Attica-Kephala Culture should be chronologically equated with the so-called Rachmani period, and the Athens-North Slope phase synchronised with a development found

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² Renfrew 1972, 68–80.

³ Dousougli 1992; Maran 2000, 179–184.

⁴ French 1972, 17–18; Renfrew 1972, 68–80.

Calibr. Data		Central and Southern Greece	Cyclades	Thessaly	North Eastern Aegean /Troad	Crete
2200						
2500	EH IIB EC IIB/III	Lerna IIIC–D Lefkandi I	Kastri-Group Agia Irini III	Pevkakia-Magula 6–7	Poliochni Giallo Poliochni Rosso	EM IIB
2700	EH IIA EC IIA	Lerna IIIA–B	Keros-Syros Agia Irini II	Pevkakia-Magula 1–5	Poliochni Verde	EM IIA
2900	EH I Late EC I Late	Talioti Eutresis IV Perachora Y–Z Tsepi	Kampos Group Markiani II	Argissa Magula I	Poliochni Azzurro Late	EM IB
			Plastiras Group			
3100	EH I EC I	Perachora X Eutresis III Tsepi	Zas III Pelos Group	Petromagula- Phase	Poliochni Azzurro Early	EM IA
3500	Younger Chalcolithic	Athens N. Slope Franchthi 5b	Zas IIB		Kumtepe B Poliochni Nero	Final Neolithic IV
4300	Chalcolithic	Attica-Kephala- Culture	Attica-Kephala- Culture	Rachmani- Culture		

Fig. 1 Chronological chart.

in Petromagula, Thessaly. The latter contains pottery connecting it with the Pelos Culture in the Cyclades, which is usually interpreted as part of Early Bronze Age I.⁵ However, tomb finds in the Cyclades,⁶ as well as settlement finds on Crete indicate⁷ that the mainland Athens North Slope phase, representing the latest component of the Chalcolithic period should not be equated with the Cycladic Pelos Culture, although both probably overlapped chronologically. Therefore, the phases discussed in this paper will be referred to as an earlier and a later Chalcolithic phase; the latter transitions into the Early Bronze Age of Greece.

These phases are traditionally characterised by pottery, the Attica-Kephala Culture by red ware with pattern burnishing, crusted ware and scoops which often have incised decoration.⁸ Contrary to earlier periods of Neolithic Greece, coarse pottery dominates over fine wares. During the later Chalcolithic phase, the dark so-called Heavy Burnished Ware appears; one of its characteristic shapes is the rolled rim bowl.⁹

Stratigraphic evidence for such a development is sparse, most likely due to settlement relocation. In southern Greece sequences are not evidenced from settlements but cave sites, such as the Franchthi Cave in the southern Argolid,¹⁰ the Skoteini Cave near Tharrounia on Euboea,¹¹ as well as the Zas Cave on Naxos.¹² A similar phenomenon is present in Thessaly where the site of Pevkakia Magula only produced Rachmani strata¹³ while cultural layers chronologically

⁵ Maran 1998, 135–139.

⁶ Rambach 2000b, 103–108, 431, 446, fig. 26.

⁷ Nowicki 2002, 53–54; Papadatos 2008, 260–262.

⁸ Alram-Stern 1996, 157–159; Alram-Stern 2007, 2–4; Nazou 2010, 8–9.

⁹ Vitelli 1999, 82–83, 98–99; Alram-Stern 2004, 154–155; Phelps 2004, 117–118.

¹⁰ Vitelli 1999, 15–21, 64–95.

¹¹ Sampson 1993, 21–198.

¹² Zachos 1999, 153–154.

¹³ Weißhaar 1989.

	Site	Material	Lab.-no.	¹⁴ C Age BP	Calibrated Date	Reference
Ch early	Pevkakia Magoula, lower Rachmani layer	charcoal	Pta 1405		3680 + 50 uncal	Weißhaar 1989, 139
	Pevkakia Magoula, middle Rachmani layer	charcoal, carbonized fruit	Pta 465		3560 + 65 uncal	Weißhaar 1989, 139
	Pevkakia Magoula, upper Rachmani layer	wood, bone	Pta 436		3570 + 80 uncal	Weißhaar 1989, 139
	Pevkakia Magoula, upper Rachmani layer	charcoal	Pta 435		3820 + 70 uncal	Weißhaar 1989, 139
	Spilaio Limnon, Kastria III	charcoal	DEM-270	5446±29	4348–4239	Phakorellis – Maniatis 1997, 530
	Spilaio Limnon, Kastria III	charcoal	DEM-271	5484±34	4446–4247	Phakorellis – Maniatis 1997, 530
	Spilaio Limnon, Kastria III	charcoal	DEM-344	5438±45	4355–4160	Phakorellis – Maniatis 1997, 530
	Spilaio Limnon, Kastria III	charcoal	DEM-550	5311±29	4234–4005	Phakorellis – Maniatis 1997, 530
	Spilaio Limnon, Kastria III	charcoal	DEM-549	5395±27	4333–4151	Phakorellis – Maniatis 1997, 530
	Spilaio Limnon, Kastria III	charcoal	DEM-394	5444±105	4466–4002	Phakorellis – Maniatis 1997, 530
	Spilaio Limnon, Kastria III	charcoal	DEM-395	5657±32	4545–4400	Phakorellis – Maniatis 1997, 530
	Alepotrypa Cave		DEM D94-3	5540±30	4456–4338	Zouridakis – Papathanassopoulos 1995, 18
	Alepotrypa Cave		DEM D94-4	5465±30	4354–4248	Zouridakis – Papathanassopoulos 1995, 18
	Alepotrypa Cave		DEM D94-9	5500±30	4440–4264	Zouridakis – Papathanassopoulos 1995, 18
	Agios Dimitrios Phase I	charcoal	HD-10020	5400±35	4338–4053	Zachos 1987, 305
	Agios Dimitrios Phase I	charcoal	HD-10163	5330±75	4330–3990	Zachos 1987, 305
	Franchthi Phase 5.1	charcoal	P-1660	5261±64	4310–3970	Vitelli 1999, 138
	Franchthi Phase 5.1		P-1659	5163±78	4230–3790	Vitelli 1999, 138
Ch late	Mikrothives		Dimokritos		3670–3380	Adrimi-Sismani 2007, 74
	Halieis	shell	P-1397	5102±72	4040–3710 3909–3367 (korr.)	Pullen 2000, 184
	Kephala / Keos	seeds	P-1280	4826±56	3710–3380	Coleman 1977, 110
	Tsougiza	charcoal	AA-10827	4499±53	3326–3102	Pullen 2011, 51
	Zas Cave IIb	shell	OxA-7470	4345±40	3100–2900	Manning 2008
	Skoteini-Höhle, Tharrounia 3	charcoal	DEM 93-104	4811±42	3675–3528	Sampson 1993, 285
EH I	Eutresis III–IV	charcoal	P-307	4442±64	3340–2920	Caskey – Caskey 1960, 164
	Eutresis III–IV	charcoal	P-306	4446±75	3340–2920	Caskey – Caskey 1960, 164
	Aghia Triada / Chalkis	shell	AAR-9668	4781±42	3080–2930	Heinemeier 2006
	Alepotrypa Cave		DEM D94-1	4180±30	2882–2620	Zouridakis – Papathansopoulos 1995, 18
	Alepotrypa Cave		DEM D94-2	4280±30	2918–2787	Zouridakis – Papathansopoulos 1995, 18
EC I	Zas Cave III	wood	OxA-7471	4425±40	3300–2900	Manning 2008
EC I late	Amorgos	bone	OxA-4003	4390±65	3100–2910	Renfrew – Housley – Manning 2006, 73f.
	Amorgos	bone	OxA-3297	4380±100	3110–2880	Renfrew – Housley – Manning 2006, 73f.
	Amorgos	bone	OxA-4004	4160±65	2820–2660	Renfrew – Housley – Manning 2006, 73f.

Fig. 2 Radiocarbon dates of the Chalcolithic and Early Bronze I from the area of Greece.

succeeding the Rachmani phase were observed at the single-phase sites of Petromagula¹⁴ and Mikrothiva.¹⁵ However, this picture may change with the publication of the results from sites like

¹⁴ Chatziangelakis 1984.

¹⁵ Adrymi-Sismani 2007.



Fig. 3 Important Chalcolithic settlement and cave sites.

Palioskala in Thessaly,¹⁶ Spata in Attica¹⁷ and Strophilas on Andros,¹⁸ which appear to have more than one settlement phase (Fig. 3).

Concerning absolute chronology, ¹⁴C dates are sparse. There are a number of dates for the Rachmani and Attica-Kephala cultures while dates for the subsequent phase are extremely rare. Nevertheless, the radiocarbon dates indicate that the Attica-Kephala Culture may commence at around 4300 BC (Fig. 3).¹⁹ On the other hand, the beginning of the Athens-North Slope phase and its northern equivalent are quite insecure. However, they must have developed before the middle of the 4th millennium, perhaps as early as 3800 BC or a little later (Fig. 2). Settlements like Palioskala and Strophilas possibly date to the onset of the later part of the Chalcolithic; unfortunately, these contexts are yet to be published. However, data from Zas Cave IIb and the

¹⁶ Toufexis 2009.

¹⁷ Steinhauer 2001; Steinhauer 2009, 216–218.

¹⁸ Televantou 2008, 43–46.

¹⁹ Coleman 1992, figs. 2, 4–5; Johnson 1999; Alram-Stern 2007, 2–4, 7–9, tab. 1.

Alepotrypa Cave are comparably young although their finds correspond with the Athens-North Slope phase. Additionally, the ¹⁴C date of Zas Cave III which is attributed to the Pelos Culture clearly overlaps Zas Cave IIb. Therefore, it is likely that the Athens North Slope phase as well as the Pelos Culture are part of a longer cultural sequence commencing before 3500 BC, perhaps as early as 3700 BC and continuing until 2900 BC. These dates also fit with a ¹⁴C date for the end of Cretan Final Neolithic and the start of EM I between 3360 and 3020 BC.²⁰

Settlement Evidence in Central and Southern Greece

Settlement evidence for the 4th millennium has always been described as meagre. However, according to our present knowledge I would argue to the contrary. If we look at the Peloponnese, a large number of sites are known. The same is true for the region of Attica.²¹ Most of the Peloponnesian sites are known from surveys, and their assignment to a phase is uncertain. However, from excavations we see that sites do not necessarily belong to the Attica-Kephala Culture, but many of them actually date to the later part of the Chalcolithic period. In any case, this frequency of sites is probably due to the relocation of settlements which is also observed at the excavated sites.²² Another interesting fact is the visibility of such often quite eroded sites in surveys.

Based on the distribution of Chalcolithic sites it becomes clear that a large number of sites are known from regions not favourable to agriculture and not settled in earlier periods. Therefore, the southern Argolid survey team argues²³ that such sites may be connected with a new agricultural system, which favours fruit requiring comparably little rainfall. This new system also included herding of sheep and goats. Although archaeozoological and archaeobotanical investigations to prove this assumption do not exist to date, an increase in wool production may be argued by the sudden increase of spindle whorls. This occurrence could also be due to other technological changes.²⁴

Architectural remains are presently known from the entire Chalcolithic sequence. Since many sites are only preliminarily published, it is difficult to assign them to a certain period. All in all, we may argue that settlements were often surrounded by circular walls which are at least partly to be interpreted as fortifications. They are known for the earlier phase in Attica at Kiapha Thiti,²⁵ perimeter walls probably dating to the later phase are found in Spata and Choumeza in Attica,²⁶ in Palioskala in Thessaly and at Strophilas on Andros. While the walls of Palioskala consist of an inner and outer perimeter,²⁷ the fortification of Strophilas is characterised by a bastion.²⁸ In any case, perimeter walls, as well as ditches are already known for Late Neolithic sites in Thessaly and Macedonia, and the Chalcolithic fortifications seem to be a tradition continuing from this time onwards.²⁹

Wells are known from the later part of the Chalcolithic period in the settlements of Spata and at Loutsas in Attica.³⁰ They remind us of the fact that Chalcolithic wells have already been argued

²⁰ Tomkins 2007, 44.

²¹ Alram-Stern 2001; Alram-Stern 2003.

²² Johnson 1996; Cavanagh 1999, 54–56; Alram-Stern 2003.

²³ Jameson et al. 1994, 347–352.

²⁴ Vitelli 1999, 105–110.

²⁵ Rozaki 1982.

²⁶ Steinhauer 2001; Kakavogianni – Douni 2009, 384; Steinhauer 2009, 216–218.

²⁷ Toufexis 2009, 56–57.

²⁸ Televantou 2008, 43–46.

²⁹ Aslanis 1990; Aslanis 2010, 48–49.

³⁰ Efstratiou et al. 2009, 221–223.

for in Athens.³¹ Therefore, we can be sure that wells within settlements were common during the Chalcolithic period. Since fortifications and wells are interpreted as communal works characteristic for a proto-urban society, these architectural features point to a start of such a development in the Aegean during the 4th millennium.

House remains were mainly found in Thessaly in Rachmani itself, in Pevkakia, Palioskala, Mikrothiva and Petromagula,³² in Strofilas on Andros as well as in Attica in Merenta Markopoulou, Spata-Zagani³³ and Choumeza. Thessaly and Attica remain the best investigated areas for this period (Fig. 3).³⁴ The longhouse, with rectangular or apsidal plan, traditionally separated from other longhouses by alleys, is a characteristic house type of this period. For the Rachmani period, longhouses are known from Pevkakia³⁵ and an apsidal house was documented at Rachmani.³⁶ An apsidal house was also found in Strophilas on Andros.³⁷ For the later Chalcolithic period, a house with an oval layout has been reported for Choumeza in Attica.³⁸ Mikrothiva also exhibits longhouses, one of them with three rooms.³⁹ Free-standing, single-room houses have been discovered in the centre of Palioskala⁴⁰ and at Lambrika/Koropi.⁴¹ Subterranean rooms cut into the earth are only reported from Attica at Merenta Markopoulou as well as from the health centre excavations at Koropi.⁴²

Cemeteries

The Chalcolithic period seems to be the starting point of peripheral cemeteries consisting of built tombs with individual burials in southern Greece and the Cyclades. The best known examples date to the Attica-Kephala Culture from Kephala on Kea⁴³ and another, possibly synchronous cemetery in Tharrounia on Euboea.⁴⁴ The later Chalcolithic phase seems to introduce similar cemeteries in Attica, present at Tsepi near Marathon,⁴⁵ but also in the Peloponnese in Delpriza/Kranidi⁴⁶ and ancient Elis.⁴⁷ Moreover, these tombs may already be synchronous with the earliest tombs of the Pelos phase (Fig. 4).⁴⁸

These tombs also trace the emergence of the tradition of incorporating certain grave goods, like pyxides and small jars. Furthermore, by this time the deposition of jewellery, as well as objects related to the processing and use of pigments, including palettes and pestles for grinding pigments appear.⁴⁹ These objects suggest the beginning of body adornment during this period, a custom that seems to have been prevalent throughout the entire Aegean.

³¹ Sapouna-Sakellarakis 1985.

³² Chatziangelakis 1984, 76–78.

³³ Steinhauer 2001; Kakavogianni – Douni 2009, 384; Steinhauer 2009, 216–218.

³⁴ Aslanis 2010.

³⁵ Weißhaar 1989, 11–12.

³⁶ Wace – Thompson 1912, 37–40.

³⁷ Televantou 2008, 45–46.

³⁸ Kakavogianni – Douni 2009, 384.

³⁹ Adrymi-Sismani 2007, 73–74.

⁴⁰ Toufexis 2009.

⁴¹ Kakavogianni 2009, 239–241.

⁴² Kakavogianni et al. 2009, 161–169.

⁴³ Coleman 1977, 44–97.

⁴⁴ Sampson 1993, 233–240.

⁴⁵ Pantelidou Gofa 2005, 324–326.

⁴⁶ Kossyva 2010.

⁴⁷ Rambach 2007.

⁴⁸ Dumas 1977, 49–53.

⁴⁹ Cyclades: Rambach 2000a, 107–108; Tsepi: Pantelidou Gofa 2005, 320–323; Elis: Rambach 2007, 66–68.



Fig. 4 Cemeteries of the Attica-Kephala Culture, the Late Chalcolithic period and the Pelos Culture.

Figurines

Human stone and clay figurines are known from the earlier phase of the Chalcolithic period from settlement contexts or ritual depositions in settlement areas and in burial grounds,⁵⁰ but they are not recovered directly from the graves. Furthermore, there is no evidence for figurines in later Chalcolithic contexts, although they appear again during Early Bronze I.⁵¹

Pottery

As aforementioned, the ceramic data indicate two distinguishable phases for the Chalcolithic. During the earlier phase, decorated pottery is characterised by crusted decoration mainly found on bowls. This trait occurs abundantly in Thessaly as well as southern Greece.⁵² Pattern burnish-

⁵⁰ E.g. Kephala on Kea: Coleman 1977, 8–9; Kolonna on Aegina: Felten – Hiller 1996, 67.

⁵¹ Przytula-Wojczyk 2010.

⁵² E.g. Pevkakia: Weißhaar 1989, 21–22; Franchthi: Vitelli 1999, 68–70, 73–74; Ayios Dimitrios: Zachos 2008, 17; Lerna: Vitelli 2007, 354–355, fig. 85.

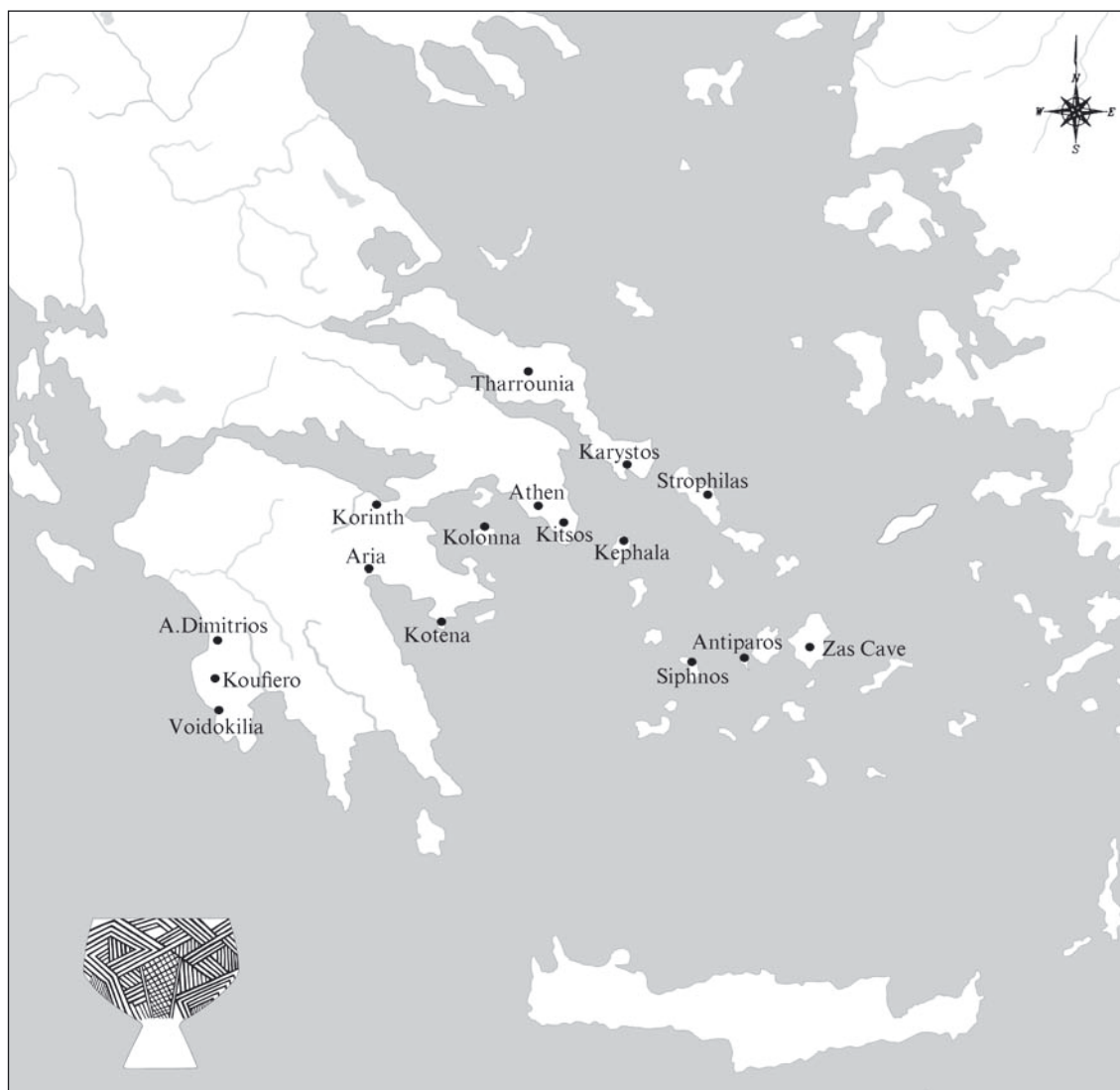


Fig. 5 Pattern burnished pottery of the Attica-Kephala Culture.

ing covering the entire vessel frequently appears in central and southern Greece and the Aegean,⁵³ but is uncommon in Thessaly. Typically, this decoration is mainly restricted to bowls that quite often display so-called elephant lugs. Pattern burnishing is also known from the eastern Aegean, but differs in style (Fig. 5).⁵⁴ Scoops with perforated and incised basket handles – high-swung perforated strap handles, quite often also decorated with incised lines – and incised decoration are typical for this period and may have been used for ritual purposes. They are known from Thessaly to southern Greece and the Aegean islands. The shape of the scoop shows a longer development going back to the Late Neolithic period.⁵⁵

As has been mentioned above, on the Greek mainland as well as in the Aegean, the later Chalcolithic period is characterised by the so-called Heavy Burnished Ware. Shapes of this phase from

⁵³ Coleman 1977, 11–12; Zachos 1987, 699, fig. 9; Mari 1993, 136–152, figs. 135–149; Zachos 2008, 17.

⁵⁴ Alram-Stern 1996, 147–148.

⁵⁵ Misch 1992, 27–28; e.g. Sesklo: Papathanassopoulos 1996, 263–264, fig. 116; Kephala: Coleman 1977, 62, 87, pls. 36.173; 36.102.

the Franchthi Cave include collared jars, carinated bowls and collared bowls which often have horizontal tubular lugs.⁵⁶ One of the most characteristic shapes is the bowl with a rolled rim. It is abundant at most sites throughout Greece, e.g. at Lerna in the Argolid, Tharrounia on Euboea, in Petromagula in Thessaly, as well as in the Zas Cave on Naxos.⁵⁷ Such bowls are also well-known from northwestern Anatolia in Kumtepe B⁵⁸ and Poliochni Nero⁵⁹ and considered characteristic of this horizon.⁶⁰ Their wide distribution is also evidenced by their appearance on Crete. Within this context, rolled rim bowls should be connected with a phase, which Peter Tomkins has defined as Final Neolithic IV.⁶¹ Rolled rim bowls continue to be used on the Cyclades during the EC Pelos phase, as well as throughout the Kampos phase, however, their use ceases with the Keros-Syros Culture (Fig. 6).⁶²

Another widely distributed shape that expands into the eastern Balkans to Macedonia and to the Peloponnese is a small jar with with fluted (channelled) decoration on the body.⁶³ This shape has clear connections to the horizon of Cernavoda III – Boleraz and should, therefore, help to synchronise our Late Chalcolithic period with the earliest Balkan Early Bronze Age.⁶⁴

A shallow, rounded bottom bowl with an incised central motif, often of spiralled design, also connects the Balkans and even central Europe with the Aegean. Joseph Maran who was the first to observe this feature has called it bowl of type Bratislava.⁶⁵ It has a distribution pattern that extends from central Europe to northern Greece, Thessaly and Attica. The large number of pieces from Mikrothiva demonstrates that this shape was quite common in certain places and must have been part of an eating and drinking set which was used from the northern Balkans to central Greece.⁶⁶ Moreover, in Mikrothiva and Petromagula, this shape was used in addition to rolled rim bowls.⁶⁷

A bowl on a high conical stand is another form to be mentioned. This shape does not seem to be common during the earlier part of the Chalcolithic period. The earliest examples were recovered from a pit in the cemetery of Tsepi, from a pit in Kolonna/Egina as well as from a cemetery at Delpriza.⁶⁸ As such, this shape seems to be highly connected with some sort of ritual, mainly taking place in cemeteries. Interestingly, good parallels for chalices of this period come from Poliochni Nero and point to certain relations to the eastern Aegean.⁶⁹ Therefore, we see that shape and decoration of eating and drinking sets of the earlier Chalcolithic period are confined to the Aegean while eating and drinking vessels of the later Chalcolithic period show connections to the Balkans and to northwestern Anatolia.

Far reaching connections are also demonstrated by the presence of coarse wares. A very characteristic shape of the Chalcolithic period is the so-called ‘cheese pot’. This name is used to describe vessels with a row of perforations under the rim. Most unique are low rim pans with a coarse outer side and burnished interior. The function of this shape is uncertain. In fact, these ves-

⁵⁶ Vitelli 1999, 82–83, 98–99.

⁵⁷ Chatziangelakis 1984, 80, fig. 3.13–14; Zachos 1987, 699, fig. 10; Sampson 1993, 161–162, fig. 121.9–12; Vitelli 2007, 350–351, fig. 83; Zachos 2008, 35, 120, fig. 34; Papathanassopoulos 2011, 177–178, no. 124; Koukounaries: Katsarou-Tzeveleki – Schilardi 2008, 69–70; Poros-Katsambas: Wilson et al. 2008, 263, fig. 26.2.

⁵⁸ Gabriel 2000.

⁵⁹ Manning 1995, 74–76.

⁶⁰ Alram-Stern 2007, 5.

⁶¹ Nowicki 2002, 53–54; Papadatos 2008, 260–262.

⁶² Karantzali 1996, 120; Rambach 2000b, 417–418.

⁶³ Sitagroi: Sherratt 1986a, 434–435; Eutresis: Caskey – Caskey 1960, pl. 47.III, 10; Lerna: Vitelli 2007, 342–345, figs. 79e–f, h; 80e, g–h; Alepotrypa Cave: Papathanassopoulos 2011, 169–170, no. 117.

⁶⁴ Alram-Stern 2001.

⁶⁵ Maran 1998, 40–41, 344–346, tabs. I–IV; Coleman 2011; Zachos – Douzougli forthcoming.

⁶⁶ Adrymi-Sismani 2007, 76.

⁶⁷ Chatziangelakis 1984, 81; Adrymi-Sismani 2007, 76.

⁶⁸ Tsepi: Pantelidou Gofa 2008, 284–285, fig. 28.11, 13; Kolonna: Felten et al. 2011; Delpriza: Kossyva 2010.

⁶⁹ Tinè 1997, 37–38.

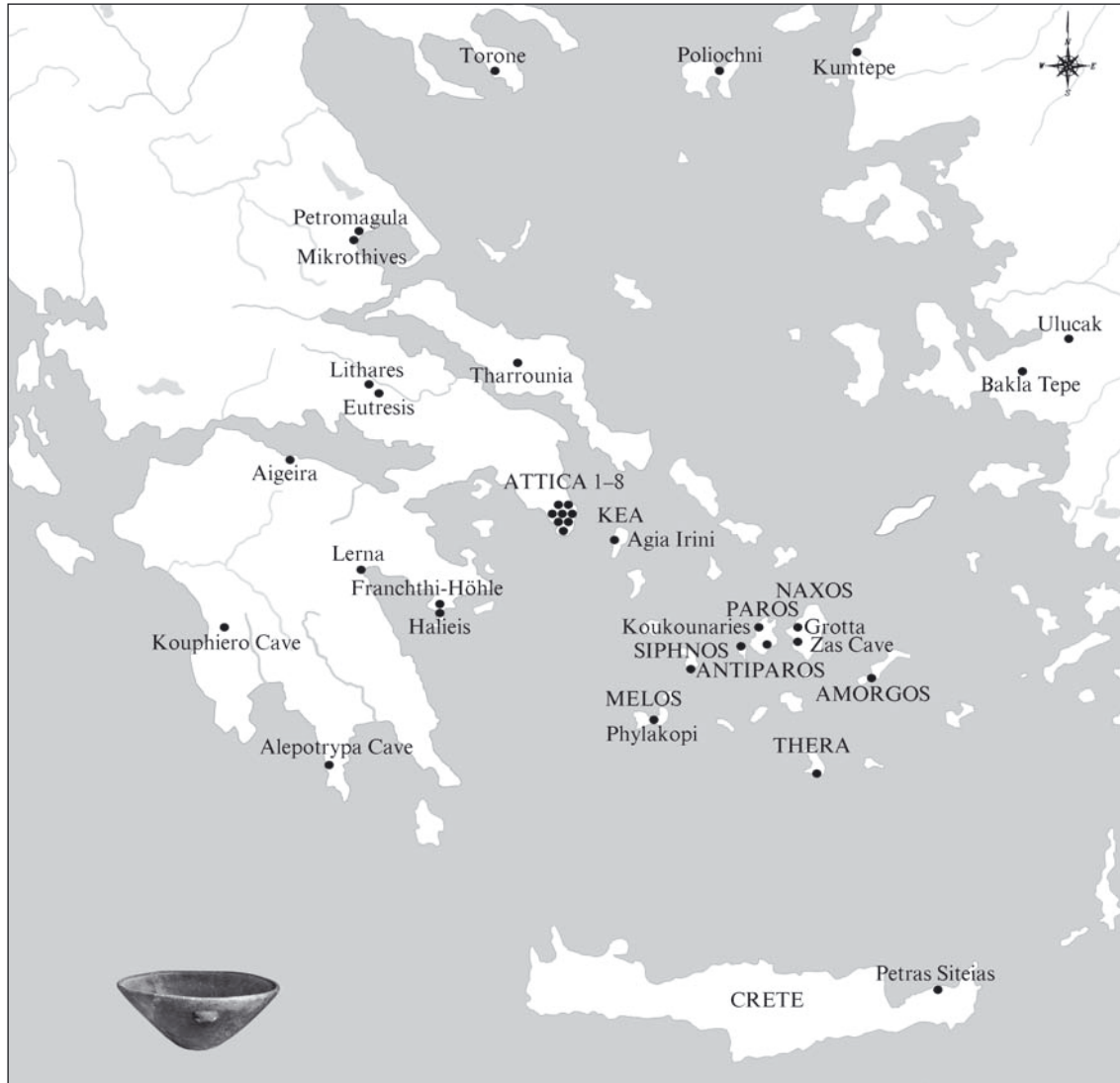


Fig. 6 Rolled rim bowls and their distribution during the Late Chalcolithic period (1–8: Athens, Kitsos Cave, Koropi Health Centre, Laurion, Leontari Cave/Hymettos, Merenda Markopoulou, Tsepi, Zagani) according to selected published finds (Alram-Stern 2004 with additions; see also this volume).

sels could have been used to process milk,⁷⁰ but it is also possible that they were used for cooking. This idea is supported by the coarse clay, which is especially resistant to heat. The production of cheese pots may have taken place during the 5th millennium, but their widest distribution dates to the later Chalcolithic period.⁷¹ During this period, they were used in the Cyclades, on the Greek mainland, but also in the southeastern Aegean and in coastal settlements of Crete. Therefore, these forms document an intensive interaction sphere within the entire Aegean including its northern as well as its southern region, i.e. the Dodecanese and Crete (Fig. 7).

⁷⁰ Cavanagh 2007, 116.

⁷¹ 5th millennium: Ftelia: Sampson 2002, 61–70; 4th millennium: Tharrounia: Sampson 1993, 182–183, figs. 187–188; Katsarou-Tzeveleki – Schilardi 2008, 70; Crete: Nowicki 2002, 54, 59, 62–63, figs. 32–33; Dodecanese: Sampson 1987, 89–90.



Fig. 7 So called cheese pots, distribution according to published finds (after Nowicki 2002; Alram-Stern 2004, for further additions see this volume).

Coarse fabrics are also used for storage vessels, which are produced in the entire Aegean in large quantities from the Late Neolithic period onwards.⁷² The production of large vessels can be viewed as a technical achievement. Furthermore, storage vessels may have been favoured over other storage facilities. In any case, the storage of food was of eminent importance to people living in areas with unstable crop yields.

⁷² E.g. Lerna: Vitelli 2007, 358–367 figs. 87–90; Alepotrypa Cave: Papathanassopoulos 2011, 157–163, nos. 104–110.



Fig. 8 Chalcolithic copper finds in Greece and the Aegean (after Zachos 2010, figs. 6–4).

Metallurgy

Finally, one of the most important fields of study of the Chalcolithic period is metallurgy. However, in this paper it is only possible to provide a brief outline of the most recent research results.⁷³ In Greece, it is during the Chalcolithic that we see evidence for the earliest local extraction and production of metal objects (Fig. 8).⁷⁴

⁷³ See the two latest conferences on metallurgy: Day – Doonan 2007; Tsachili 2008.

⁷⁴ Zachos 2007.



Fig. 9 Ring pendants and straps of gold, ring pendants of silver and other material (after Zachos 2010, figs. 6–4).

According to lead isotope analysis, objects from Sitagroi in Macedonia and an axe from Dimini probably were made of copper from the Black Sea area. Conversely, Aegean sources on the islands of Kythnos and Seriphos and in Laurion/Attica were probably exploited during the late 5th and early 4th millennia. Analyses show that the copper axe from Sesklo and an axe from Alepotrypa Cave had lead isotopes similar to Laurion. In any case, copper was melted in Plakari, in Kephala/Kea and on Phtelia/Mykonos.⁷⁵ Additionally, new research from northern Greece points

⁷⁵ McGeehan-Liritzis – Gale 1988, 207, 211–213; McGeehan-Liritzis 1996; Stos-Gale – Gale 2003, 87–88; Gale – Stos-Gale 2008, 399–400, tab. 37.7; Gale et al. 2008, 102.

to the possibility that copper was produced from the ores on Thasos and the Chalcidice peninsula.⁷⁶

Recent evidence for mining and smelting of copper dating to the Late Chalcolithic comes from Attica. Copper slags from a salvage excavation were recovered in the area of the Health Centre of Koropi.⁷⁷ The slags indicate that copper was mined in the area around Lavrio during this time. Furthermore, smelting in crucibles is also present at the same site.⁷⁸

Copper weapons found in the Aegean are confined to axes and daggers. Their use provides evidence from the time of the earlier Chalcolithic period onwards to the later Chalcolithic. In contrast to the Balkans, the use of daggers never ceased, but continued throughout the Early Bronze Age and became one of the status symbols of the Early Bronze Age Aegean.⁷⁹

Apart from copper, gold and silver were used for the production of objects such as jewellery. Gold is found in rivers of northern Greece⁸⁰ but is absent in the entire Aegean. Therefore, gold was most likely imported to the Aegean and its presence should be associated with middle to far distance exchange systems. Moreover, these gold objects, gold sheets and so-called ring idols, which are now distributed in the Aegean, can be connected with the Balkans.⁸¹ Most gold objects from closed contexts were connected with Early Chalcolithic contexts,⁸² but gold straps were also found in a grave of the Late Chalcolithic cemetery of Tsepi at Marathon.⁸³

These ring pendants seem to be a symbolic marker, as can be seen by their representation on Thessalian and southern Greek pottery and in a rock carving in Strophilas on Andros.⁸⁴ Ring pendants were also produced from other materials, e.g. stone or silver.⁸⁵ Most of these artifacts come from settlement contexts, but they are also found in caves.

This brings us to the exploitation of Aegean silver sources during the Chalcolithic period in the area of Laurion and at Siphnos. The exploitation of Siphnos during the period of the Attica-Kephala Culture is confirmed by pottery finds in the mines.⁸⁶ In the meantime, research in the small galleries of Laurion has provided evidence for mining during this period.⁸⁷ For the later part of the Chalcolithic period, the cupellation of silver is also acknowledged by the recovery of a bowl-shaped litharge at the site of Merenda Markopoulou.⁸⁸ The presence of litharge is indicative of cupellation in bowl-shaped hollows and is also observed in Late Chalcolithic contexts in Lambrika in Attica. Such finds also exist in Limenaria on Thasos⁸⁹ and Habuba Kabira in Syria.⁹⁰ Two silver ring pendants can be dated to the 5th millennium by their contexts,⁹¹ all the other finds were out of context. The ring pendant from Alepotrypa Cave, which was produced from Laurion

⁷⁶ Papadopoulos 2008, 66; Morris 2009/2010, 5–8.

⁷⁷ Kakavogianni et al. 2008.

⁷⁸ Amzallag 2009.

⁷⁹ Zachos-Douzougli 1999, 966–967; Adrymi-Sismani 2007, 77; Zachos 2007, 173; Zachos 2010, 87. For the evidence of the later Early Bronze Age I on Crete and in the Cyclades see Sherratt 2007, 249–250. For a new find of an axe at Palioskala: Toufexis 2009, 59, fig. 11.

⁸⁰ For Chalkidike: Morris 2009/2010, fig. 6.

⁸¹ Zachos 2010, 80–84.

⁸² Distribution of objects of gold in Greece: Zachos 2010, 82–83, figs. 6–4; for ring pendants of gold see Demakopoulou 1998, 51–58, 62–63, nos. 3–35, 56–58.

⁸³ Pantelidou Gofa 2005, 91–97, 319.

⁸⁴ Representation on pottery: Demakopoulou 1998, 68, figs. 75–76; Vitelli 1999, fig. 64; Strophilas: Televantou 2008, 49–50, figs. 6, 10; Nazou 2010, 9.

⁸⁵ Ring pendants of stone: Demakopoulou 1998, 66–67, nos. 67–74; ring pendants of silver: Demakopoulou 1998, 64–65, nos. 62–64 (Salamis, Amnisos Cave, Alepotrypa Cave).

⁸⁶ Gropengiesser 1987.

⁸⁷ Gale et al. 2008.

⁸⁸ Kakavogianni et al. 2008, 49–50.

⁸⁹ Papadopoulos 2008, 64–65.

⁹⁰ Kakavogianni et al. 2008, 47–48.

⁹¹ Zachos 2010, 88.



Fig. 10 Extraction and objects of silver of the Chalcolithic period.

silver, has unfortunately been published without context.⁹² However, Chalcolithic pottery from Alepotrypa Cave points to the later phase of the Chalcolithic period. A silver bead necklace was recovered from the same cave and compares with necklaces of later Early Bronze I from Louros on Naxos and Gournes on Crete. Such associations could, therefore, point to a later Chalcolithic date.⁹³ Grave 12 of Tsepi also contained silver decorations, which can be dated to the Late Chalcolithic.⁹⁴

⁹² Maran 2000, 187; Papathanassopoulos 2011, 216, 163.

⁹³ Rambach 2000b, 217; Galanaki 2006, 229–232.

⁹⁴ Pantelidou Gofa 2005, 91–97, 319.

Conclusion

Early Chalcolithic traditions incorporate Late Neolithic traditions often influenced by the Balkan, for example, fortifications from Thessaly, metallurgy, metal tools (e.g. daggers and axes) and ring idols. However, pottery indicates that an Aegean network, which connected raw material sources like silver and copper mines and obsidian outcrops with the mainland, was already established. Moreover, this network distributed prestige objects such as daggers and ring idols. Such a network could be responsible for the spread of fortifications in the Aegean.

During the Late Chalcolithic, new influences are seen in pottery forms and in the disappearance of symbolic items, such as ring pendants and human figurines. However, in settlement architecture fortifications and wells are present, which suggests an expansion in social organisation. This social continuity is also seen in the continual use of daggers as weapons. It seems as if the use of local metal sources intensified. This development ultimately points to the increasing importance of the Aegean during the Early Bronze Age.

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