

# Early ceramic styles and technologies in the Aegean and the Balkans: retrospect and prospects

Lily Bonga

Institute for Aegean Prehistory, Study Center for East Crete, Pacheia Ammos, GR  
lilybonga@gmail.com

**ABSTRACT** – *Ceramics have always played a central role in defining the Neolithic period in south-eastern Europe. Early Neolithic ceramic assemblages, forming techniques, clay recipes, shapes, decoration, and vessel function have been traditionally used to establish the chronology and cultural groups of a region based on a handful of purported type-sites. This paper presents a critical review of the literature on Early Neolithic pottery in Greece, highlighting how preconceptions shaped the research and interpretation of the data of not only the ceramics themselves, but also how those interpretive conclusions were projected into other aspects of Early Neolithic life, such as the gender and status of potters and the socio-functional use of pottery. The recent reevaluation of old and new absolute dates through Bayesian analysis, statistical modelling, and stratigraphic considerations has also helped to provide a more nuanced use of relative pottery chronologies. New archaeological evidence from Northern Greece as well as reevaluations of Knossos and the Franchthi Cave are highlighted.*

**KEY WORDS** – *chronology; pottery; Impresso; Knossos; Franchthi; Greek Macedonia*

## **Zgodnji keramični stili in tehnologije na območju Egejskega morja in Balkana: pogled nazaj in naprej**

**IZVLEČEK** – *V jugovzhodni Evropi je imela keramika pri opredeljevanju neolitika vedno osrednjo vlogo. Na podlagi podatkov, pridobljenih na maloštevilnih domnevno tipičnih najdiščih, se je v tej regiji za vzpostavljane kronologije in kulturnih skupin tradicionalno uporabljalo zgodnje neolitske keramične zbirke, tehnike oblikovanja, lončarske recepte, oblike, okras in namembnost posod. V članku ponudimo kritično presojo literature o zgodnje neolitski lončenini v Grčiji, pri čemer izpostavljamo načine, kako so pristranski pogledi oblikovali raziskave in interpretacije različne vrste podatkov, ne samo same keramike, ampak tudi kako so s takšnimi zaključki interpretirali tudi druge vidike zgodnje neolitskega življenja kot sta spol in status lončarjev ter družbeno-funkcionalna raba lončenine. Za bolj raznoliko rabo relativnih kronologij, ki temeljijo na lončenini, si lahko pomagamo predvsem z nedavno predstavljenimi novimi ovrednotenji starih in novih absolutnih datumov, ki so bili izvedeni z Bayesovo analizo, ter s statističnim modeliranjem in ovrednotenjem stratigrafije. V članku predstavljamo tudi nove arheološke podatke iz severne Grčije ter ponovno ovrednotenje podatkov iz Knossosa na Kreti in jame Franchthi na Peloponezu.*

**KLJUČNE BESEDE** – *kronologija; lončenina; Impresso; Knossos; Franchthi; grška Makedonija*

## **Introduction**

The Neolithic period in Greece was traditionally believed to have begun around 7000 BC based on early absolute dates from the 1960s from a handful of sites, including Nea Nikomedia, Argissa, Sesklo, Achil-

leion, the Franchthi Cave, and Knossos on Crete (Fig. 1). This early date seemed to support the relative chronology and led to comparisons between the Near East, Anatolia, and southeastern Europe. It also

paved the way for pejorative descriptions of the pottery as primitive and simple, fitting presumed evolutionary paradigms of technological development. This fact is evident in the names (Frühkeramikum, Proto-Sesklo, Vor-Sesklo) and their definitions (early pottery, early painted, developed monochrome) of the first relative chronology for the Early Neolithic period for Thessaly. These sites have served as typesites for the Early Neolithic period in their respective regions ever since, but can no longer do so, as recent work in Northern Greece, Crete, the Cyclades, and Western Anatolia has expanded and enhanced the dataset.

### Traditional chronology of the Early Neolithic period in Greece

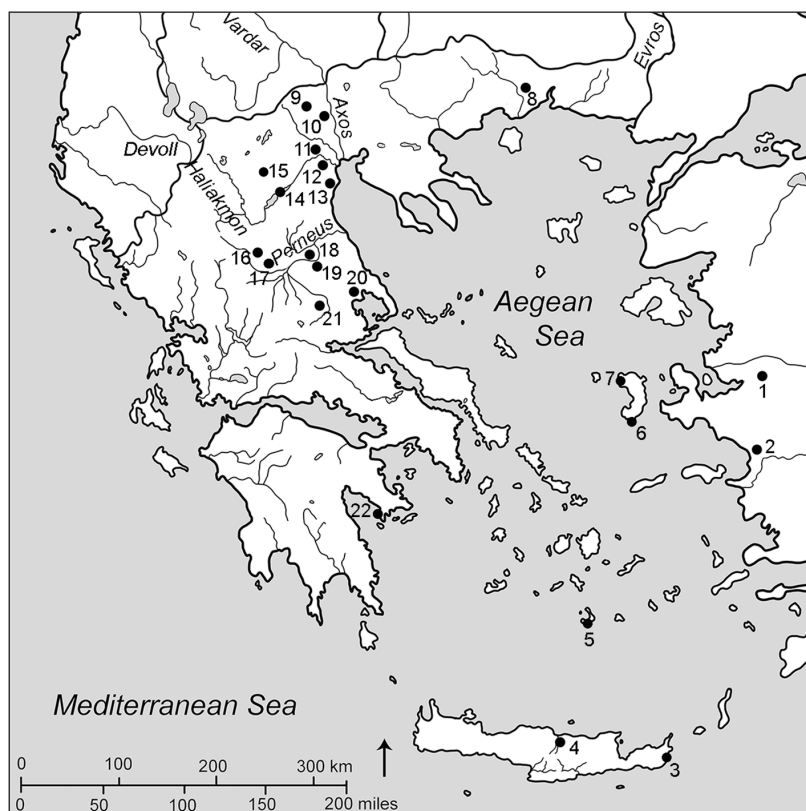
The traditional relative chronology of Neolithic Greece was primarily created in Thessaly due to early excavation and survey work in the area, and was based on surface treatment and decoration (Tsountas 1908; Wace, Thompson 1912). The relative chronology for Thessaly was established by Vladimir Milojević (1959) and it became canonical (Theocharis 1973). Scholars in Central and Southern Greece (e.g., Weinberg 1962; 1970) tried to correlate their ceramics to those of Thessaly as based on Milojević's system, but did not make chronological subdivisions based on decorated ceramics. Early Neolithic Greek Macedonia was unknown in Milojević's time.

Concerning the Early Neolithic, a tripartite system was established. It consists of the Frühke-

ramikum, a purely monochrome phase, the Proto-Sesklo with developed monochrome pottery and limited use of painting, and the Vor-Sesklo (Pre-Sesklo) in which painted pottery was more common than before. In this traditional scheme, the first painted pottery in Greece was conceived of as red-painted decoration, typically red or reddish or buff-coloured surfaces.

Milojević (1960) later argued for the existence of a Pre-Ceramic phase in Greece of chronological significance in the Balkans based on analogy with the Pre-Pottery Neolithic (PPN) of the Near East. Late, the 'Magoulitsa sub-phase' was added at the end of Vor-Sesklo based on the finds from Otzaki Magoula (Milojević-von Zumbusch 1971; Müller 1988; 1994; Reingruber 2011; 2015). The 'Magoulitsa phase or culture' was defined by the use of impressed, incised, and finger-pinched decoration, subdivided into an earlier ('barbotine') and a later ('cardium') phase (Milojević-von Zumbusch 1971.146–148; Reingruber et al. 2017.41–42). It was thought to be of Balkan influence (Milojević, Milojević-von Zumbusch 1971.82ff) and allowed for correlations between the two regions (Milojević 1959.10–11, 31–32) as this type of decoration was recognized since the beginning of the 20<sup>th</sup> century as an "independent cultural phenomenon in the northern Balkans" (e.g., 'nail-decorated horizon'; Childe 1929.75–76, 79; 'Na-

**Fig. 1. Neolithic sites mentioned in the text with absolute dates within 6600–5900 cal BC. Numbers 3, 6, 7 without absolute dates. 1 Ulucak Höyük; 2 Çukuriçi Höyük; 3 Pelekita Cave, Crete; 4 Knossos, Crete; 5 Akrotiri, Santorini; 6 Ayia Gala, Chios; 7 Emporio, Chios; 8 Dikili Tash; 9 Giannitsa B; 10 Axios A; 11 Nea Nikomedia; 12 Kolindros-Paliambela; 13 Revenia-Korinos; 14 Servia-Varytimidis; 15 Mavropigi-Filotsairi; 16 Theopetra Cave; 17 Prodomos; 18 Otzaki Magoula; 19 Argissa Magoula; 20 Sesklo; 21 Achilleion; 22 Franchthi Cave.**



gelgeritzte'; *Banner 1929; 1935.122–123; Raczky 2012.9*).

As the culture-history approach fell out of fashion, the tripartite chronology of Early Neolithic Thessaly was relabelled under the more neutral divisions of Early Neolithic 1, 2, and 3 (*Wijnen 1981*). Later, the 'Preceramic' was renamed 'Initial Neolithic' (*Perles 2001.43, n. 8*). Local regional differences in ceramics also began to be considered within Thessaly, such as the disappearance of painted pottery by the end of the Proto-Sesklo phase at some sites in and directly around the plain of Larisa, like Sesklo and Argissa Magoula. Yet in the Vor-Sesklo period, painted pottery, "at sites in or around the plain of Karditsa it does not vanish, but coexists with plastic decoration" (*Wijnen 1981.36*).

Lastly, what is significant about the relative chronology of Greece as established by Milošević (*1949a; 1949b; 1950/51; 1959*) is that his chronology was used as a template of cultural development for the whole of south-eastern Europe in the Neolithic (e.g., Starčevo in Serbia, Körös in Hungary, Criş in Romania) despite some objections (e.g., *Nandris 1970; Schubert 1999; 2005*) (Fig. 2). For instance, by analogy with Greece, a hypothetical monochrome phase was proposed for the definition of Proto-Starčevo phase (*Srejović 1973*) and Starčevo Ia (*Lazarović 1979*). Milošević's four-stage relative chronology for the Neolithic period was also subsequently modified in its application in other regions (e.g., *Arandjelović-Garašanin 1954; Grbić 1957; Dimitrijević 1969; 1974; Srejović 1971; Makkay 1965; 1969; 1987*).

### Aspects related to the Impresso-style

Impressed, incised, and finger-pinched decoration of the 'Magoulița phase' is today referred to in the literature of Neolithization of Europe under the umbrella term of 'impresso', which encompasses all types of plastic surface decoration irrespective of the fabric, vessel shape, method of surface manipulation (finger or tool), stylistic

differences (dense *vs.* sparse, organized into motifs *vs.* random), or precise chronological correlations (*Vuković 2013.661–666*), and is cited as evidence of connectivity and mobility between vast geographic areas (e.g., Adriatic, Balkans, Anatolia, North Africa, the Near East, and the Black Sea) (*Çilingiroğlu 2010; 2016; Gaskevych 2010; 2011; Gündoğan 2010*).

The term 'impresso' was originally used to describe pottery decorated with incisions made with pointed tools and impressions of cockle shells (formerly classed as *Cardium edulis* but now classified as *Cerastoderma edule*) in the Early Neolithic period of the Adriatic; impressions of fingernails, fingertips, and finger-pinches were rarely used in this region. Conversely, in the Balkans, cockle shells were never used for impressions (*Coleman 1992.254*); instead 'pseudo-impresso' or 'comb-impressed' was used to describe impressions and incisions made with tools or fingers (*Vuković 2013.658*). The ceramic tradition in the central Balkans also remained distinct from that of the Adriatic coastline (both style and manufacturing techniques) (*Spataro 2009*).

The subcategory of 'barbotine' (barbotin) was thought to be a chronological marker for the Early Neolithic Balkan-Anatolian complex in the Central Balkans (e.g., proto-Starčevo) (*Vuković 2013.671*). Barbotine was defined as an additive decorative style in which wet clay slurry is added to create a lumpy, irregular surface, sometimes with ridges or rows in ornamental compositions (stepped, channelled, arched) (*Arandjelović-Garašanin 1954*); pseudo-bar-

Date cal. BC	Milošević and Milošević-von Zumbusch 1971	Wijnen 1981	Furness 1953, Evans 1964	Mantelli 1993	Tomkins 2007, 2014	Vitelli 1993	Garašanin 1979, 1982
7000	Präkeramikum (Preceramic)	---	Aceramic Stratum X	Aceramic Stratum X	Initial Neolithic Stratum X	Franchthi Initial Neolithic	---
6500	Frühkeramikum (Early Pottery / Early Monochrome)	Early Neolithic 1 (EN 1)	Early Neolithic I-II Strata IX-1	Early Neolithic I Strata IX-V	Early Neolithic Strata IX-VII	Franchthi Ceramic Phase 1	Early Neolithic
6300	Proto-Sesklo (Early Painted/ Developed Monochrome)	Early Neolithic 2 (EN 2)					(Proto-Starčevo-Starčevo)
6100	Magoulița Phase Vor-Sesklo	Early Neolithic 3 (EN 3)					Balkan-Carpathian Complex (Starčevo-Criş-Körös)
5900	Middle Neolithic	Middle Neolithic			Middle Neolithic Strata VII-VI, P	Franchthi Ceramic Phase 2	Middle Neolithic

**Fig. 2. Traditional chronology of Early Neolithic Greece, as based on Thessaly and in reference to the Balkans.**

botine is defined as a slurry surface and small clay granules (Vuković 2013.662). Several other descriptive terms or phrase have been applied (e.g., ‘wheat-grain’: Dimitrijević 1974.67; Sekereš 1974.192; ‘fir branches’: Benac 1979.380; “an endless flock of birds in flight”: Vetnić 1974.130). The distinction between ‘impresso’ and ‘barbotine’ found in the literature was believed to have chronological meaning, but this is no longer the case (Vuković 2013.660). Complicating the picture is the fact that the terms ‘impresso’ and ‘barbotine’ are used differently in Greece from the rest of the Balkans.

In Greece, the ‘impresso’ pottery associated with the ‘Magoulitsa phase or culture’ of the Vor-Sesklo period was subdivided into an early ‘barbotine’ phase consisting of finger pinches and nail impressions and a later ‘cardium’ phase, in which tools were used to create the impressions, excluding the use of cockle shells (Reingruber et al. 2017.41–42). These sub-phases were based on Otzaki Magoula (Müller 1988; 1994; Reingruber 2011) but were not grounded on stratigraphic reality (Reingruber et al. 2017.42), nor does the small amount of highly curated published material add much to support to this claim (Tsitrstoni 2009.45).

Furthermore, the ceramic sequence of the ‘Magoulitsa phase’ as found at Otzaki was not confirmed at Sesklo, where painted pottery disappeared before the end of the period, when parts of the settlement were destroyed by fire (Andreou et al. 1996.540; Wijnen 1981.11) and perhaps followed by a hiatus during Vor-Sesklo period (Wijnen 1981). It has also been suggested that the absence of the ‘Magoulitsa phase’ at Sesklo or other sites in eastern Thessaly is not chronological, but rather geographical, as impressed, incised, and finger-pinched pottery is documented in Thessaly both at the end of the Early Neolithic (e.g., Nessonis I, Gediki, Argissa Magoula, Otzaki Magoula) and in the beginning of the Middle Neolithic (e.g., Magoulitsa, Achilleion, Bardali, Koutroulou Magoula). Therefore, any distribution maps of Early Neolithic sites based on Gallis’ Atlas (Gallis 1992) should be seriously questioned because they were constructed using relatively dated sites based on the presence or absence of monochrome, painted, or impresso decoration of surface sherds (Reingruber 2011.297).

A greater degree of ceramic variability is now recognized both at the intra site and regional levels (Kotsakis 1983; 2008) within the same chronological period (Gallis 1987; Coleman 1992), which sug-

gests that comparative conclusions from excavation sequences presumed to be typical (e.g., as Mottier 1981 does with Otzaki) should not be taken as representative of the wider region (Andreou et al. 1996.542).

### Current chronology of the Early Neolithic period in Greece

The main weakness in Milojević’s relative chronology was its complete lack of absolute dates, which were also absent from the rest of south-eastern Europe. Current absolute dates from Thessaly and Macedonia date the Early Neolithic period to c. 6500–5900 BC (Reingruber et al. 2017; Tsirtsoni 2016; Maniatis 2014; Perlès et al. 2013; Lespez et al. 2013; Douka et al. 2017; Perlès 2001.109–110), although some sites may begin as early as c. 6600 BC. These dates are comparable to new data from western Turkey (Anatolia).

Current absolute dating of the Pre-Ceramic phase prevents its definition of being contemporary with the PPN Pre-pottery Neolithic of the Near East of Cyprus (Reingruber 2015.153–154). This phase also remains to be securely documented anywhere in Greece, as its definition was primarily based on small areas of exposure in thin strata just above bedrock, or sterile soil and often with ‘intrusive’ sherds or other ceramic material such as figurines (Nandris 1970.196–201; Reingruber 2008; 2011; 2015; Reingruber, Thissen 2009; Bloedow 1992–1993; Nowicki 2014.48–60).

Similarly, neither a Pre-Ceramic nor an Early Monochrome (ger. *Frühkeramikum*) phase is found elsewhere in areas to the north (e.g., Republic of Northern Macedonia: Stojanovski et al. 2014; Naumov 2009.4); Albania (e.g., Vlush, Konispol Cave: personal comm.; Adoni 2018); Bulgaria (e.g., Krainitsi I, Koprivets I and Polyantsa-platato I: Krauß et al. 2014.52; Stefanova 1996; Krauß 2006.161–162; 2008.119–121; 2011); and probably Hungary and Romania (Biagi, Spataro 2005).

The existence of an Early Monochrome (*Frühkeramikum*) phase can also be questioned on the same contentious criteria as the Pre-ceramic deposits (e.g., limited exposure, thin deposits, small sample). Given the supposed rarity of early painted pottery in the Vor-Sesklo phase in general, and the fact that this early painted decoration was often applied only on a small part of the vessel (e.g., near rims), it cannot be convincingly argued that painted pottery was not

in use. A more accurate statement would be that painted pottery was not found in the lowest levels of small horizontal exposure, often in secondary refuse pits. Yet the use of painted pottery cannot be ruled out due to these small sample sizes and contexts (e.g., in pits).

Giving these individual site phases/levels chronological meaning beyond the site level by making them into regional phases of long temporal duration may be an artificial construction by modern archaeologists. For instance, Karen D. Vitelli (1993b:46, n. 18) has pointed out how excavation methodology affects the data; without the sherds recovered from sieving, the earliest levels at the Franchthi Cave were monochrome and the ceramic development appeared to conform to the Thessalian sequence, but when she added the sherds recovered from sieving, this development was invalidated. In contrast to the excavation procedures of the Franchthi Cave, where dry and wet sieving were employed, the material from Sesklo was not even dry sieved (Wijnen 1981: 17), which may have impacted its interpretation.

### New evidence from Greek Macedonia

New data from Northern Greece highlights the need to carefully integrate excavation stratigraphy with ceramics and absolute dates, as well as identify regional differences with the same period. For instance at Mavropigi-Filotsairi in Western Macedonia, the excavators identified three phases belonging to the Early Neolithic period; these phases seem supported by absolute date. These phases were primarily based on the stratigraphy of a central feature of the site (the central *origma*), which was interpreted as a semi-subterranean house that eventually became a ground-level structure (Karamitrou-Mentessidi et al. 2016:51–53).

On its own, a simple presentation of the stratigraphy and ceramics from the central *origma* would also appear to follow the Thessalian sequence, with the lowest levels above sterile soil devoid of ceramics but containing other cultural remains, followed by thin levels with monochrome pottery, and later levels that included painted, impressed, and incised pottery (Bonga 2017). Yet upon close inspection of

the sherds (e.g., a few joins between Phase I and the first passes of Phase II and the nature of the sherds themselves: small, abraded, reused, use of red-slip), the lack of complete vessels, and the rarity of complete profiles suggests that these pieces were discarded material that may or may not date to one temporal moment. Similar depositional practices were suggested at the Franchthi Cave, where most deposits were determined to be secondary and suggestive of periodic cleaning of areas rather than containing material from a specific activity (Vitelli 1993b:31).

When other deposits at Mavropigi-Filotsairi are taken into account, other complications arise. The use of red-painted pottery on a white slip made of a calcareous material, though rare, is documented in the Vor-Sesklo phase both at Paliambela (Saridaki et al. 2019) and at Mavropigi-Filotsairi (Bonga 2017:378); this type of decoration is characteristic of the Middle Neolithic in Thessaly. The distinction between the use of painted decoration on a slip, white slip, or unburnished surface may be related to regional differences and/or chronological ones.<sup>1</sup> For example, white-on-red painted pottery in the traditional relative chronology was characteristic of the Middle Neolithic in Thessaly. Yet this type of decoration in the Vor-Sesklo period appears in Central Macedonia at Nea Nikomedia (Yiouni 1996), Axos A (Chrysostomou 1996), and Yiannitsa B (Chrysostomou 1997), together with *impresso*. These sites date to c. 6300/6200 BC (Maniatis 2014:Fig. 2; Maniatis et al. 2015: Fig. 4).

White-on-red painted pottery from Mavropigi-Filotsairi was found in pit 106 and assigned to Phase II by the excavators. The precise date of the appearance of this type of pottery is unclear as the pit was used over time, but the absolute date c. 6200 BC based on charred seeds (OxA-31863, 6222±83 BC) may be an indicator. The central *origma* in Phase II did not contain white-painted pottery. What is interesting at Mavropigi-Filotsairi is the fact that the technology (red slip, white paint) to produce white-on-red decoration was known since the Proto-Sesklo phase, as the characteristic pottery of Mavropigi-Filotsairi includes polychrome-painted pottery consisting of broad areas of motifs painted in red on a tan back-

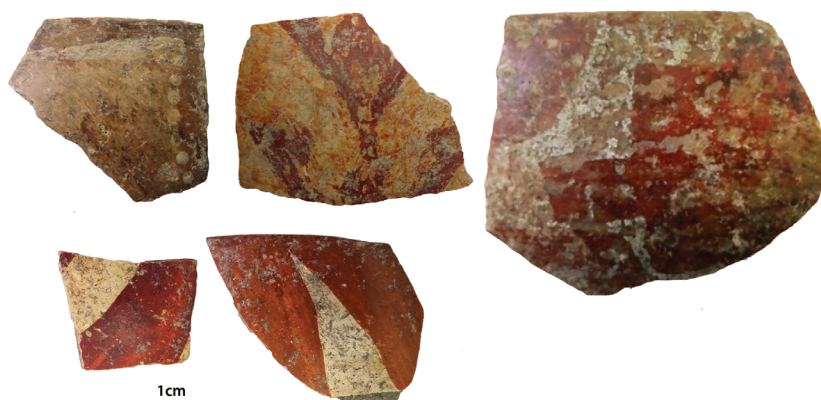
<sup>1</sup> Creating a distinction on the use of slips in general and as a background for painted pottery requires more investigation than is possible based on small assemblages or applying one site (e.g., Sesklo) as a paradigm, even within a region. While a limited use of slips is documented at Sesklo in all phases and areas of the settlement, slips of various composition were used at sites in the plain of Larisa (e.g., Argissa, Otzaki, Soufli, and Melissochori Magoula) and slips were regularly used at Achilleion (Dimoula 2017: 211, 213, 215). A similar variability in the use of slips is seen in Central Macedonia at Revenia, where slips were rare while at Paliambela slips were common, including the use of white slip (calcareous material) (Saridaki et al. 2019).

ground and outlined in white paint (Fig. 3). Polychrome and red-painted pottery was preferred over white-on-red.

The impressed, incised, and finger-pinched pottery at Mavropigi-Filotsairi dates 100–200 years earlier than that of ‘Magoulitsa phase’ c. 6400/6300 BC (e.g., pit A, DEM-1680; *western origina* DEM-2697/MAMS-21104; burial 3, in the *central origina*, OxA-V02365-54/S-EVA 10096). Many different types of surface treatments were used (Fig. 4) and this type of decoration was used alongside monochrome and painted pottery. Similarly, while few in number within a small area and sample size, decorated pottery consisting of both red-painted and finger-pinched decoration was documented in two pits (629, 630) with early dates at Paliambela (*Papadakou 2011; Papadakou et al. 2015*).<sup>2</sup> These sites show the development of decorated pottery at some sites in Central and Macedonia does not match the traditional Thessalian sequence in terms of development or date.

### Recent re-evaluations of the Franchthi Cave in the Argolid (Peloponnese)

At the Franchthi Cave, Vitelli (*1993a.37*) defined deposits below pottery-bearing levels as Ceramic Phase Zero and the Ceramic Interphase 0/1 as units in each sequence located between lower deposits that contained no pottery (FCP 0) and upper deposits that contained all of the Franchthi Ceramic Phase 1 varieties. Ceramic Phase Zero is called Initial Neolithic by other scholars who conducted secondary research,



**Fig. 3. Early Neolithic polychrome, white-on-red, and red-on-white painted pottery from Phase II, pit 106 at Mavropigi-Filotsairi.**

but not primary analysis of the ceramic assemblage itself (e.g., *Perlès 2001; Perlès et al. 2013; Reingruber, Thissen 2009; 2016*).

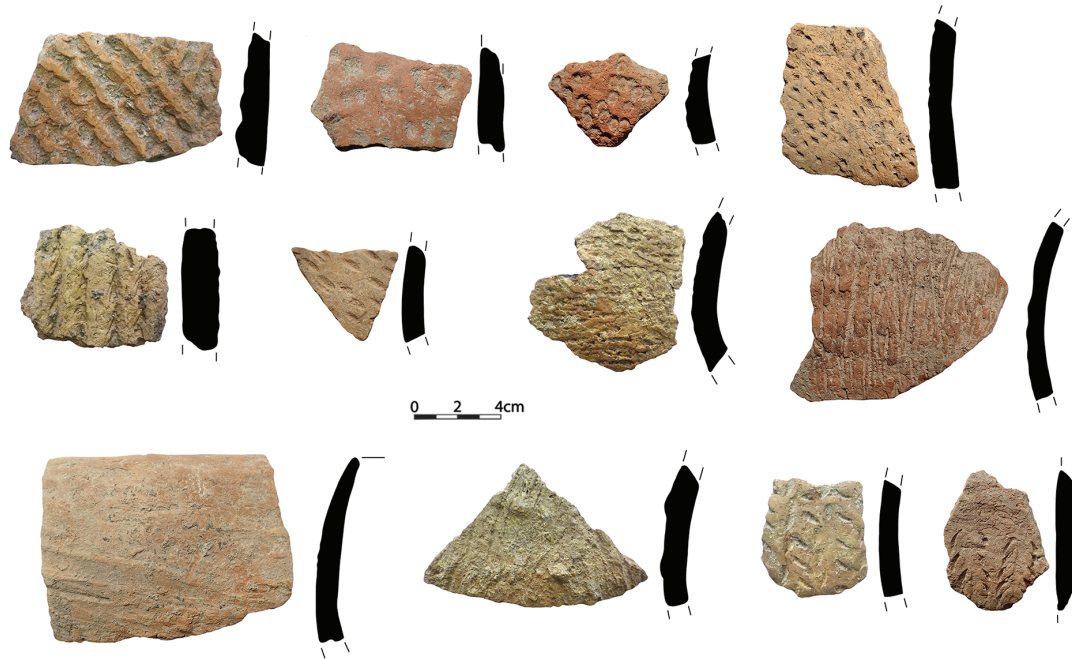
An examination of the absolute dates and contexts from the Franchthi Cave revealed the Final Mesolithic layers (Franchthi Lithic Phase X) overlap with the dates for Initial Neolithic layers (c. 6700–6400 BC; *Reingruber, Thissen 2016; Perlès et al. 2013*), and this was followed by a gap in dates of at least 500 years (up to 700 years; *Reingruber, Thissen 2009.758*) when the cave was re-occupied around or after 5900 BC based on these dates and ceramic parallels.<sup>3</sup> These gaps were perceptible in the ceramics, but were dismissed by Vitelli (*1993b.26*).<sup>4</sup>

It is also worth noting that the Franchthi Cave is perhaps better described as rock shelter or abri with a small open-air site adjacent (Paralia). It is not a dark, damp, cavernous cave like those used in later periods of the Neolithic (e.g., Skoteino, Alepotrypa, Ayia Triada); nor is it an open-air settlement, and these differences of context must be taken into account. The Franchthi Cave is also located on the coast, un-

<sup>2</sup> The interpretive situation at Palaiambela is based on absolute dates from burned animal bones (unspecified species) found in two Early Neolithic pits (629, 631) that have been interpreted as semi-subterranean pit-dwellings (*Maniatis et al. 2015.151*). Pit 629 yielded one date (DEM-2462/MAMS-12513) of c. 6400–6200 BC (another date DEM-2461/MAMS-12512) is listed as coming from over rather than within the pit itself). Pit 629 was 2.48 x 2.10m in size (*Maniatis et al. 2015.151*) and contained 8.12 kilograms of pottery, consisting of 439 sherds, only one of which was red-painted without the use of a white slip (*Papadakou 2011.93*). Pit 629 does not seem to be a totally closed deposit, however, as historical pit 606 cuts into its southern part and because the two dates (DEM-2464/MAMS-12515, DEM-2465/MAMS12516) from pit 627 antedate pit 629, even though pit 629 is depicted on the plan (*Maniatis et al. 2015.Fig. 1; Papadakou 2011.237, Fig. 2*) as later than pit 627 (pit 627 is also cut into by historical pit 607 in the northern part). Pit 630 yielded three dates (DEM-2458/MAMS-12509, DEM-2459/MAMS12510, DEM-2460/MAMS12511) falling around 6600–6400 BC (*Maniatis et al. 2015.Fig. 1*). The pit was approx. 1.7 x 1.07m in size and contained 1.32 kilos of pottery, consisting of 187 sherds, six of which were decorated with finger and nail pinching (*Papadakou 2011.90*).

<sup>3</sup> Other gaps in the stratigraphy are also confirmed by the absolute dates, such as before Franchthi Ceramic Phase 4 (c. 5200 BC) in the beginning of the Late Neolithic (*Reingruber 2008.23, Tab. 1.6; 2017; Reingruber, Thissen 2016*).

<sup>4</sup> Similar reevaluations of key Neolithic sites in later periods throughout Greece (e.g., Skoteini, Sarakenos, Cyclops, and Franchthi Caves, Dikili Tash, Sitagroi, and Servia) have also demonstrated that previous observations about the continuity of stratigraphy and ceramics cannot be substantiated (*Coleman 2011.17–19; Coleman, Facorellis 2018; Nowicki 2014; Tsitroni 2016; 2017; Reingruber, Thissen 2009*).



**Fig. 4. Early Neolithic impressed, incised, and finger-pinched pottery from Phase II in the central origma at Mavropigi-Filotsairi.**

like most caves, and this location (also next to freshwater springs) is probably related to the function of the cave. Yet like other caves in Greece, it was never used for permanent habitation but rather for short stays for various reasons (e.g., illness, ritual, herding, and refuge from inclement weather).

These facts change how Franchthi Cave was traditionally interpreted in terms not only of its date, use, and duration, but also affect the interpretation of the artefacts, such as the ceramics. For instance, it was interpreted that only a limited amount of pottery (c. 12 or 13 pots a year) was produced (Vitelli 1993b.210) by female specialists, and was thus highly valuable and used in symbolic rituals rather than for daily food-related activities (e.g., storage, processing, cooking) (Vitelli 1993a.254–255; 1999.188, 191–192, 196). These hypotheses were turned into theory by a series of archaeometric studies of sites in Thessaly (e.g., Wijnen 1981; Bjork 1995; Gardner 1978) and Central Macedonia (e.g., Yiouni 1996), and subsequently accepted as fact (e.g., Perlès 2009).

Some of these statements, however, are not applicable to other sites because of the dissonance between them either due to differences in dating or type of site (cave *vs.* open air settlement). For instance, a higher rate of vessel production was proposed at Nea Nikomedia (c. 25 to 90 per year) using a different methodology (Yiouni 2004.4; 1996.186), which is more in line with the quantity of ceramic production and use at open-air Early Neolithic sites (Yiouni

2004.10, nn. 38, 39). Similarly, the technological simplicity (e.g., use of temper, surface treatment, method of firing) of past interpretations must be questioned as new evidence from the early Middle Neolithic period (e.g., Magoula Imvrou Pigadi (Kyparissi-Apostolika 2012), Magoula Rizava (Krahtopoulou et al. 2018), and Kouphovouno (Ballut et al. 2017) suggests that kiln use was well established and probably began in the Early Neolithic period.

#### **Crete: traditional chronology and terminology**

Crete is often left out discussions of Neolithic Greece in general due to its peculiar traditional chronology and terminology. The relative chronology was almost exclusively defined in a small area within the Central Court of the Palace of Minos at Knossos excavated in the late 1950s and early 1960s (Evans 1964), and by another team in 1997 (Efstratiou et al. 2013); other areas were excavated or explored in soundings and used to fill-in or check the Central Court sequence.

The chronology of Knossos was established by Furness (1953) and built upon by John D. Evans (1964). This relative sequence used its own periodization terminology that did not match that of mainland Greece (or Anatolia), despite the existence of absolute dates from Evan's excavations since the late 1950s to help do so (nor did his subsequent experience in the Cyclades at Saliagos change his views). As a result, the levels and material labelled as Early

Neolithic in fact correspond with the Early, Middle, and Late Neolithic periods on the mainland in terms of absolute dates (Evans 1964). The lowest level at Knossos was labelled 'Aceramic' as a parallel to the Near East and mainland Greece. The ceramics used to create the relative chronology (Furness 1953; Evans 1964; Tomkins 2007) was based primarily on decorated sherds, as undiagnostic and undecorated sherds were discarded. Much of the material was also identified as secondary refuse from exterior spaces or dumped from levelling the surface of the site. The ceramics from 1997 excavation remain unpublished.

The incongruous terminology and periodization was partially rectified by Peter D. Tomkins (2007.12; 2008), who tried to correlate the pottery groups from Knossos "on the basis of imports, exports, stylistic parallels and, wherever possible, radiocarbon dates to other Neolithic assemblages from elsewhere in Crete" to be more in line with dates and assemblages from mainland Greece, the Aegean islands and the Anatolian-Aegean coast. It should be noted that Tomkins himself did not apply his chronology and phases in his doctoral dissertation (Tomkins 2001) or any of his publications before 2007 (Tomkins, Day 2001; Tomkins et al. 2004), and that any articles that refer to these phases are outdated. Similarly, the Early Neolithic Houses of Sir Arthur Evans (Evans 1921) in the Central Court in fact really date to the Early Minoan period.

Furthermore, this new phasing and dating has not been universally adopted. Even as a co-editor of the volume on Neolithic Crete, which includes Tomkins' (2008) detailing of the historiography of ceramic studies at Knossos and the reasoning for his (2007) changes, few of the articles in the volume actually adopted his changes; others adhered to the old chronology (e.g., Galanidou, Manteli 2008, Strasser 2008; and the other co-editor, Isaakidou 2008) or

followed their own systems (e.g., Todaro, Di Tonto 2008, Nowicki 2008). This failure of acceptance by other scholars is perhaps in part due to the fact that Tomkins (2007) did not publish any new material and even reused Evan's 1964 illustrations. Lastly, some of the parallels made by Tomkins (2007) are not all correctly dated, a fact which he may address in the future, as indicated in a footnote in which the Neolithic phase-names are changed and/or combined, and different absolute dates given but without further explanation (Tomkins 2018.129, n. 1).<sup>5</sup>

### The Early Neolithic on Crete revised: Knossos central court strata X, IX and levels 38, 39

The reevaluation of absolute dates, stratigraphy, and ceramics at Knossos mirrors that of the Franchthi Cave. First, what initially appeared to be early dates of c. 7000 BC for Stratum X (Reingruber 2015.151; Reingruber, Thissen 2016b) are likely mistaken because the first occupation of Knossos should date closer to 6610 BC (Reingruber, Thissen 2009.758–760; Douka et al. 2017), which is in accordance with dates from site both the southern Aegean (e.g., Franchthi, Çukuriçi Höyük, and Ulucak) and northern Greece (e.g., Paliambela, Mavropigi-Filotsairi), and integrates Knossos into the earliest stage of the Early Neolithic in the wider Aegean.<sup>6</sup>

Second, there are neither dates for Stratum IX, which was previously believed to date to the Early Neolithic period, nor dates from the Middle Neolithic period. The next group of absolute dates from Knossos occur after 5300 BC (Reingruber, Thissen 2016; Douka et al. 2017.315) "an estimate that is not in conflict with the material culture of the surrounding areas", in terms of shapes and ornaments, particularly the Aegean islands (e.g., Tigani on Samos, Agia Gala on Chios, Akrotiri on Santorini) and western Anatolia (Reingruber, Thissen 2009.760–761).<sup>7</sup>

5 On numerous occasions Tomkins promises future clarification of such statements in publications which remain to appear, including (2008.27) a "completed re-evaluation of spatial (and thus demographic) development at Knossos (Tomkins in prep. with no further information)" and full publication "of Neolithic material from the British School excavations (e.g., ceramics, chipped stone, ground stone axes, faunal remains)" using with new chronology (e.g., Tomkins, in preparation as "Neolithic Knossos: Early, Middle and Late Ceramics and Stratigraphy" and "Neolithic Knossos: Final Neolithic-IV Ceramics and Stratigraphy"). (Tomkins 2007.12). A "new typology of EN forms" to be presented elsewhere (Tomkins et al. 2004.57 with no further information) and a "new set of RC dates from Knossos in preparation (personal communication Peter Tomkins, 30 May 2015)" (Reingruber 2015.151) also awaits publication.

6 The Theopetra Cave could be another similar case in which early Neolithic absolute dates are followed by a gap of occupation followed by reuse of the cave within the middle of the Early Neolithic period) and in which the Mesolithic-Neolithic is not a contiguous transition, although the cave stratigraphy is known to be disturbed by both natural and anthropogenic processes and full publication of the stratigraphy and pottery is not yet available (Kyparissi-Apostolika 2000a; 2000b; 2012; Facorellis, Maniatis 2000; Facorellis et al. 2001).

7 Recent re-excavation of the Pelekita Cave near Katos Zakros, Crete as also yielded similar Late Neolithic pottery, which according to Knossos would be dated to the Early and Middle Neolithic based on Tomkins' (2007) chronology (Bonga 2019).



Due to the fact that Knossos was abandoned for 1000–1500 years (*Douka et al. 2017.317; Reingruber et al. 2017.150; Reingruber 2015.154*), continuing to use the 7000 BC date (or limit?) for Stratum X (e.g., 7000–6600 BC: *Tomkins 2007*; 7000–6500/6400 BC: *Tomkins 2014*; 7000–6500: *Tomkins 2018*; 7030–6780 BC: *Facorellis, Maniatis 2013.199*) is in error (*Reingruber, Thissen 2016*), as is maintaining that “*from the IN [Initial Neolithic] onwards habitation at Knossos seems to have been continuous and permanent*” with “*no obvious breaks in the stratigraphical and cultural sequences*” (*Tomkins 2008.21, 30; Tomkins 2007.9, 21*; following *Evans 1968.275*). Once again, “*the relative chronological system of Knossos has to be re-evaluated in a general Aegean perspective*” (*Reingruber, Thissen 2016*).

Regarding the often discussed nature of the lowest levels (Stratum X, Levels 38 and 39) at Knossos (especially *Reingruber 2011; 2015; Reingruber, Thissen 2009; 2016; Evans 1964; 1971; Efstratiou et al. 2013; Tomkins 2007; Winder 1991; Bloedow 1991; Nowicki 2014*), it seems increasingly unlikely that these levels represent an ‘Aceramic’ phase, as mudbrick and ceramic figurines were found in these levels and based on analogies with sites on the mainland formerly considered to as Aceramic or Pre-ceramic pre-ceramic as based on parallels with the PPN Pre-pottery period of the Near East or Cyprus.

## Conclusion

Absolute dates from Western and Central Macedonia have pushed back the beginning of ‘impresso’ and painted pottery. In Southern Greece new dates on old samples and the application of Bayesian statistical analysis have demonstrated the lack of Early Neolithic occupation at both the Franchthi Cave and

Knossos, aside from brief visitations at the very beginning of the period. Gaps in occupation at sites are also increasingly being recognized based on these refined dates, re-examination of stratigraphy, and ceramic analysis.

Current studies of early ceramics are also beginning to overturn the old simplistic narratives of decorative and technological evolution. It is now demonstrated that early ceramics were a fully developed technology, although not standardized as in later periods of the Neolithic (e.g., *Dimoula 2017; Pentedeka, Dimoula 2009*). More complex and nuanced approaches to understanding depositional processes and cultural choice are necessary in approaching the dating and nature of Early Neolithic Greece as a socially embedded process located in a particular place and time within a certain social space (*Kotsakis 2003*).

The recent work on re-evaluating absolute dates through Bayesian statistical analysis and modelling is a useful way to move forward on refining chronologies at the region level and enables the accurate comparison of sites across wider geographical regions, within and outside of modern Greece. By focusing on smaller regions, perhaps patterns within these smaller areas can be better understood, with the individual site stratigraphy more accurately correlated with contemporaneous neighbouring sites. Of course, the excavation of broader areas of horizontal exposure of early sites and larger sample sizes are also necessary before constructing arguments or plugging-in data to fit preconceived expectations. Site and regional schemes, however, must take caution to not falsely be integrated into the wider world of Neolithic Greece (e.g., Franchthi Cave) or isolated from it (e.g., Knossos and Crete).

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[back to contents](#)