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# A New Fixed Point in Minoan Relative Chronology?

**The Pottery Assemblage from the Ceramic Workshop at Zominthos and Its Implications for Neopalatial Chronology**

## Introduction

»Archaeology today rightly emphasizes the primary importance of the formulation of hypotheses or models to explain long term processes, stable states, advances in complexity and discontinuities in past societies.«[1]

Although expressed already almost 20 years ago by Peter Warren and Vrowny Hankey, this formulation of archaeology's goals and scientific meaning still has lost nothing of its importance and topicality. Today, more than ever, interest in questions on the ›way of ancient life‹ has taken the place of the admiration of magnificent artifacts of prehistoric cultures on both a scientific, and a public level. It is one of archaeology's main challenges to provide answers to these questions. The achievement of these tasks is necessarily linked to reliable chronological information in order to synchronize the archaeological finds with socio-political, cultural, and historical data, which may then ultimately lead to the reconstruction of a greater picture of past societies and their development. As Jörg Schäfer pointed out, the most important prerequisite to the historic understanding of the ancient Aegean is the placement of the visible remains and deducible events in a coherent chronological system[2].

Natural Sciences have been of paramount importance for the establishment of absolute dates in modern archaeology, but the development of relative sequences still largely depends upon pottery as »the archaeologist's most important tool«[3].

The sheer abundance of Minoan ceramic material and its tendency towards chronologically determined alterations promote pottery as the basis for all relative sequences in the Aegean Bronze Age[4]. Thus, the following paragraphs have been dedicated to the study of several questions concerning the Relative Chronology of Late Minoan Crete, the rôle pottery played in its design and how the material from Zominthos may contribute to the ongoing discussion.

## The Relative Chronology of Late Minoan Crete

A ›Relative Chronology‹ always seeks to create sequential periods of time in order to better understand developments and changes within a specific framework, for example a certain geographic region, regardless of absolute dates and the individual length of such periods. For prehistory, pottery, with its decorative as well as formative styles in particular, has proven to be the most reliable indicator for the passage of time, based on vertical stratigraphy and stylistic analysis. Time itself and the comprehension of time in archaeological research have mostly, but unjustifiably, been limited to a single, linear aspect of

**1** Warren – Hankey 1989, 1.
**2** Schäfer 1998, 53.
**3** Driessen – MacDonald 1997, 15.
**4** Dickinson 1994, 12.

chronological ordering. Only recently, based on earlier theoretical approaches towards the understanding of time, has this view been challenged and attention has been drawn towards the multiple facets of time. However, chronology often still represents a very particular view of time as a linear sequence[5]: a view that oversimplifies and neglects important variables when reasons for, and results of change, are observed and interpreted. »Consequently, it is argued that archaeological explanations of change should alter their focus from change per se to the rate of change – and even the changing rate of change«[6]. Such relevant aspects of time ought to be considered when chronological matters are discussed and especially when chronological schemes and sequences are proposed. As Stuart Piggott pointed out: »Any enquiry into the past which does not reckon with the dimension of time is obviously nonsense«[7].

The Cretan Relative Chronology is ultimately bound to Sir Arthur Evans and his discoveries at Knossos. Together with Duncan Mackenzie, Evans shaped the well-known tripartite chronological scheme that separated an Early, Middle, and Late Minoan Period, each one in itself subdivided in three phases, and firstly published only three years after the beginning of his excavations[8]. Working at the beginning of the 20th century, Evans and the interpretation of his finds were certainly influenced by various external circumstances and developments, but also by his »character and personal history«[9]. To him, the »triple division« was »in its very essence logical and scientific« being based on the evolutionist theory of rise, maturity and decay, as well as the correlation with the Egyptian chronological sequence of the Old, Middle and New Kingdom[10]. But this simplistic chronological scheme created a number of problems that still occupy Aegean archaeologists today[11].

Evans himself stressed that his »classification of the Minoan culture into nine successive Periods does not rest merely on theoretical deductions as to the evolution and succession of types« but »rests on a mass of stratigraphical evidence«[12]. However, this stratigraphical evidence, best illustrated by the section in the West Court, has been proven to be too schematic to produce secure results[13]. The calculations of Evans for the length of his periods as represented by geological strata were based on the assumption that the thickness of these strata correlated directly to a continuous amount of time. But a geological process, especially the accumulation of sediments is no continuous, ever similar event that can be captured by such a simple outline[14]. Nevertheless, the impact of Evans' sequence remained immense for a long period of archaeological research[15].

A second major problem in the scheme proposed by Evans is the equation of decorative pottery styles with periods of time. However, stylistic differences do not automatically relate to chronological differences[16]. This is especially important knowing that Evans' deposits used to identify different styles (and therefore periods) were highly selective and often problematic[17]. His nomenclature for these styles from Early Minoan I to Late Minoan III remains to be used today and its understanding has been inevitable for the decipherment of archaeological literature dealing with Cretan prehistoric pottery ever since[18]. But as the archaeological investigation of Minoan Crete proceeded and many more sites were unearthed, it became clear that the relative sequence of pottery styles at Knossos was far too static as to be compatible with actual historic events, such as destructions, not just in different geographic areas on the island, but even at Knossos itself. As John Pendlebury pointed out: »The real break between the Middle and the Late Bronze Age exemplified by the earthquake at Knossos actually comes within the borders of what has always been called M.M.IIIb. No doubt if the original excavators had been gifted with prophetic

**5** Lucas 2005, 27.
**6** Lucas 2005, 17.
**7** Piggott 1959, 51.
**8** Mackenzie 1903; Evans 1921; see also Mirié 1979, 14–17.
**9** Fitton 1995, 117.
**10** Evans 1921, 25; Schäfer 1998, 56 f.
**11** Before considering some of the major difficulties of his chronological sequence, it must be stated that Evans and Mackenzie did a remarkably good job in differentiating and ordering the pottery styles they encountered at Knossos, especially when taking into account what was then known about Cretan prehistory. Brown 1983, 18 f.; Driessen – MacDonald 1997, 16.
**12** Evans 1921, 28.
**13** Evans 1921, fig. 4.
**14** Schoch 1995, 51.
**15** Furumark 1941, 78.
**16** Niemeier 1980, 6.
**17** Driessen – MacDonald 1997, 16.
**18** Schäfer 1998, 59.

knowledge of what they were going to find, they would have labeled the post-seismic M.M.IIIb pottery L.M. Ia«[19].

The realization that Evans' chronological periods based on pottery styles did not correlate to the various destruction horizons at the palace of Knossos later caused Nikolaos Platon to criticize this scheme as follows: »L'inconvénient de ce système chronologique consistait dans le fait qu'il était basé exclusivement sur l'évolution de la céramique, dont les styles avaient servi pour départager les différentes périodes ou les phases d'après les grandes catastrophes qu'avaient nécessairement suivies les reconstructions des villes et des palais. Il est vrai toutefois que bien souvent le changement d'un style était l'indice d'une catastrophe, néanmoins un tel critère ne saurait être appliqué avec une rigueur absolue, compte tenu que, même après un grand bouleversement, le même style a pu substituer, et que, d'autre part, le style a pu changer sans l'intervention d'une catastrophe«[20].

In conclusion he proposed a different chronological framework based on the architectural phases of the palaces, marked by widespread destruction evidence. Platon established four broad periods of Minoan prehistory: a »Prepalatial« period, a »Protopalatial« period (Old Palace period), a »Neopalatial« period (New Palace period), and a »Postpalatial« period, the last three periods again subdivided into three phases[21]. This scheme was later also refined, adding a »Final Palatial« period[22]. By leaving the development of pottery styles aside, he created a wider frame for Cretan prehistory that resembled socio-historic events as turning points rather than changes in pottery ornamentation.

This admittedly rather broad outline may serve as a suitable frame for a combination of both systems: the analysis of pottery styles and the recognition of archaeologically visible historic events. A further step may then try to correlate individual site sequences on a wider regional scale and possibly throughout the entire island of Crete and beyond. A pioneering study trying to synchronize a wide geographic region has for example been presented by Hermann Parzinger, focusing on the Neolithic and Early Bronze Age periods[23]. He relied mainly on local horizons, based on intra-site stratigraphy to correlate the early cultures of eastern and southeastern Europe, covering an area including the Aegean and Anatolia[24].

Following his example, I tried to exemplary illustrate the Knossian relative sequence in a table that combines the chronological periods of socio-political continuity (Prepalatial, Protopalatial, Neopalatial, Final Palatial and Postpalatial), with feasible destruction horizons, decorative pottery styles, and deposits of each period (table 1). This table intentionally omits arbitrary divisions of pottery styles since it »is impossible in practice to decide the exact point where one period ends and another begins«[25]. Looking at this chart one must keep in mind that no complete stratigraphic sequence of successive deposits at Knossos exists and that the cited pottery groups were unearthed in different parts of the palace and settlement of Knossos[26]. Thus, although highly probable, it represents merely a patchwork-sequence of the complicated history of the Knossos palace and town, without the claim of completeness or final correctness.

The idea of combining socio-historic periods, architectural phases and stratigraphic data with pottery styles in order to create local sequences is not new and has been employed at various sites on Crete, including Knossos, Phaistos and Malia. However, these studies were often restricted to certain periods. At Knossos John Evans distinguished ten Neolithic strata in Area AC in the Central Court, covering the entire Neolithic period from EN (Early Neolithic) to LN (Late Neolithic)[27]. He simply numbered the encountered strata from I to X, creating a useful system of terminology that referred to different horizons as »Knossos I/II« (LN) – »Knossos X« (EN), providing a fine

**19** Pendlebury 1939, 180.
**20** Platon 1956, 510.
**21** Platon 1956, 512; see also Schoch 1995, 18.
**22** Schäfer 1998, 59.
**23** Parzinger 1993.
**24** Parzinger 1993, 184–189 suppl. 4.
**25** Hood 1999, 381.
**26** Niemeier 1994, 71 f.
**27** Evans 1964, 132–240.

| Socio-historic period | Destruction events at Knossos | Pottery styles | Knossos deposits | Zominthos |
|---|---|---|---|---|
| Postpalatial | | LM IIIB – LM IIIC | SEX Southern Half Group (LM IIIC)<br>MUM North Plattform Group (LM IIIB Late)<br>Makrithikhos ›Kitchen‹ Group (LM IIIB Early) | |
| Final Palatial | Destruction in LM IIIA2 | LM II – LM IIIA2 | MUM Pits 8, 10–11 Group (LM IIIA2)<br>Long Corridor Cist Group (LM IIIA1)<br>MUM South Sector Group (LM II) | |
| Neopalatial | Partial destruction | LM IB | SEX North House Group (LM IB) | Ceramic assemblage from Pottery workshop |
| | Earthquake destruction (VDL Akrotiri) | LM IA Mature | Gypsiades Well (Upper Deposit) Group (LM IA) | |
| | Earthquake destruction (SDL Akrotiri) | MM IIIB – LM IA | KS 178 Group (MM IIIB) | |
| | Construction New Palaces | MM IIIA – MM IIIB | | |
| Protopalatial | Destruction Old Palaces | MM IIIA | West and South Polychrome Deposits Group (MM IIIA) | |
| | | MM IIB | Trial KV Group (MM IIB) | |
| | | MM IIA | Royal Pottery Stores Group (MM IIA) | |
| | Construction Old Palaces | MM IB | Early Chamber beneath the West Court Group (MM IB) | |
| Prepalatial | | EM I – MM IA | House C/RRS Fill Group (MM IA)<br>Upper East Well Group (EM III Late)<br>SFH Foundation Trench Group (EM III Early)<br>South Front Group (EM IIB)<br>North-East Magazines Group (EM IIA Late)<br>West Court House Group (EM II Early)<br>EM I Well Group (EM I) | |

Table 1 Knossos Relative Sequence

subdivision for Arthur Evans' and Duncan Mackenzie's long Neolithic period[28]. For an example covering the Protopalatial Period, we can turn our attention to Phaistos where Doro Levi proposed three main phases of the Old Palace Period (I fase a, I fase b, II fase, III fase)[29]. These constructional phases were later restudied by Erica Fiandra who also tried to correlate these architectural pieces of evidence with Levi's original phases and Evans' chronology based on pottery styles[30]. Levi's last protopalatial phase, the »III fase protopalazziale«, has been shown to follow the destruction of the Old Palace and should thus better be referred to as the first Neopalatial phase at Phaistos[31]. Fiandra assigned two constructional phases to Levi's »I fase« (MM Ib and MM IIa), a third to »II fase« (MM IIb) following an earthquake destruction, and a fourth in »III fase« after a fire destruction (MM IIb – MM IIIa)[32]. This correlation itself is also very schematic but attests the attempt to synchronize the chronological schemes of two major Minoan sites and shows that decorative styles need not coincide with architectural phases.

Another Minoan palatial site, Malia on the northern shore of Central Crete, offers more information on both the Protopalatial as well as the Neopalatial periods. However, a single complete stratigraphic sequence does not exist at this site either[33]. The general socio-historic frame for Malia is characterized by the division of an »époque néolithique, prépalatiale, protopalatiale et néopalatiale«. The subdivision of the Neopalatial period comprises three phases called »Phase II«, »Phase IIIA« and »Phase IIIB« based on the excavation results from Quartier E[34]. »Phase II« being contemporary with Evans's MM III – LM IA, »Phase IIIA« with mature LM IA, and »Phase IIIB« with LM IB and LM II. New studies by Aleydis Van de Moortel and Paul Darcque carried out in the

**28** Evans 1964, fig. 4.
**29** Levi 1976.
**30** Fiandra 1961/1962, 125.
**31** Carinci 1989, 73–80; Niemeier 1994, 71.
**32** Fiandra 1961/1962, 125.
**33** Van de Moortel – Darcque 2006, 177.
**34** Pelon 1970.

»Abords Nord-Est« have shown the existence of three architectural sub-phases in the Neopalatial period in combination with four ceramic styles[35]. The first two architectural phases both belong to the period when Early LM IA pottery was in use, postdating Olivier Pelon's »Phase II«[36]. A third architectural modification was carried out in »very Late LM IA or Early LM IB« after a destruction in late LM IA and thus after Pelon's »Phase IIIA«. The »very Late LM IA« pottery seems to belong to a post-Theran LM IA horizon[37]. This situation is well comparable to that of other palatial centers, again proving that »architectural and ceramic phases do not necessarily coincide«[38]. A weakness of Van de Moortel's and Darcque's study certainly lies in the fact that they relied mostly on finds from fills and only few floor deposits[39].

These selected examples may illustrate the complexity of local relative sequences and the often limited value of pottery styles to define them. Instead of relying on decorative schemes, a combination of more than just pottery and its stylistic development must be employed to synchronize and correlate different sites within a broader frame of chronological periods and along certain detectable horizons. An important fact to be kept in mind at all times is the lack of complete relative sequences at any major Minoan site which means that we are always looking at a combination of different sequences from different areas of an archaeological site. These areas are sometimes very small, trenches of few meters length only, and cannot explain events that may have affected complete buildings, let alone entire settlements[40].

The lack of a wide chronological correlation of Cretan sites is certainly one of the main desiderata in Aegean Prehistory and can probably only be answered by carefully studied individual stratigraphies from large scale excavations, combined with a meticulous analysis of pottery development. The various authors of the Knossos Pottery Handbook (KPH) have collected a great number of contemporary deposits for each Knossian pottery group, which can be regarded as an excellent basis for a revised relative chronological sequence stretching beyond the area of Knossos and correlating all geographic regions of Crete. However, until such a detailed chart of island-wide synchronisms exists, it may be advisable to refer to wider chronological periods rather than to sub-phases of decorative pottery styles when matters of dating and correlating different sites are concerned.

## The Chronological Significance of Pottery and How to Date Pottery Assemblages

Before turning to the ceramic material itself, it is necessary to analyze a number of questions concerning the validity and limitations of chronological results that are based on pottery studies. These combine questions of a more general »Quellenkritik« and very specific aspects of contexts, find circumstances, and preservation as well as influences of post-depositional and taphonomic character[41].

So what is the chronological significance of pottery and how are we to date pottery finds? I will start by shortly commenting on contextual questions and what implications can be retrieved from them. A central question when chronological information is sought concerns the nature of the deposit. As archaeologists we are usually dealing with either primary or secondary deposits, the latter being of only limited chronological value since they may often contain mixed material from several periods, or are frequently disturbed by later building activities or sometimes illicit excavations. Thus, only the primary deposits ought to be used when chronological questions are discussed. A relatively

**35** Van de Moortel – Darcque 2006, 177; see also Baurain – Darcque 1993, 671–675.
**36** Van de Moortel – Darcque 2006, 181.
**37** For the post-Theran horizon see also Warren 1999, 894.
**38** Van de Moortel – Darcque 2006, 185.
**39** See note 38.
**40** Driessen – MacDonald 1997, 17.
**41** Eggers 2004, 256 f.

old but still appropriate definition of such a primary deposit was proposed by Oskar Montelius in 1903, forming a key argument in his typological method. A primary deposit, or a »geschlossener Fund«, is thus a deposit of things which have been discovered under circumstances that allow the assumption that all contents had been deposited at the same time, without later disturbances[42]. This does obviously only prove that such objects had been deposited at the same time, but does not mean that they all have the same age. Some may be considerably older than others and just have been deposited together, however, in most cases the contents of a primary deposit appears to consist of objects that are relatively contemporaneous. Exceptions to that rule exist of course and the question of the life span of things, or in our case pottery, will be of interest again a little further below. The tradition of archaeological deposits and finds, meaning the archaeological record, depends on several factors including all aspects of preservation, post-depositional interferences, and the value and possibility of recycling an artifact[43]. Accordingly, what we perceive then as archaeological finds may either be the result of an intentional or accidental deposition, and there may well be a difference between the original, systemic context and the archaeological one[44]. This has also a possible chronological implication since we cannot automatically assume that what we see is a solidified portrait of prehistoric reality[45]. Probably the best and chronologically most reliable situations producing primary deposits are those of destruction horizons, most desirably on a wide scale, sealing the complete contents of buildings and rooms, so well illustrated by the settlement of Akrotiri on Thera.

Closely connected to the question of primary deposits in general and the ceramic contents of sealed destruction horizons in particular, is another main factor of determining a local relative sequence: stratigraphy.

Vertical stratigraphy is based on the assumption that distinguishable strata or layers mark the passage of time, the upper stratum being younger than the one below. Ideally such strata ought to be undisturbed, sealed, and easily distinguishable from the neighboring strata. In reality this is hardly ever the case. But let us stick to this premise for these theoretical explanations. Pottery and other finds from sealed strata do thus possess significant chronological value since they represent the material that was in use at the time of their deposition. As already stated above, no complete stratigraphic sequence exists for any major Cretan site which is an important problem when trying to correlate different sites chronologically. Thus the establishment of intra-site stratigraphic sequences must be the first step in creating a basis for wider regional synchronizations[46]. These site-specific sequences will naturally vary from one another to a certain degree but this is where pottery comes into play and may help to correlate and synchronize local strata with those of other sites.

What makes pottery the most important class of material culture when chronological matters are concerned? »In view of the fact that potsherds occur in great abundance and exhibit many variables, it is not surprising that they should afford a primary means for setting up a relative chronology«[47]. Over the many years of archaeological pottery studies the medium of ceramics has proven to be the most indicative artifact for the passage of time. The development and change of pottery is assumed to happen gradually and fluently, however, one may have to differentiate between the different factors of pottery production. Changes in technical production procedures are hardly explicable by a gradual development but are usually triggered off by some invention or acquaintance of new knowledge, possibly by trial and error, and thus over a certain, limited period of time. Morphological changes may occur due to a gradual development of certain vessel-shapes but may equally reflect changes

**42** Montelius 1903; Eggers 2004, 91.
**43** Sommer 1991, 55.
**44** Lucas 2005, fig. 2, 1.
**45** Binford 1981, 195–208; Sommer 1991, 62.
**46** See e. g. Korfmann 2001, figs. 366–368. 372.
**47** Shepard 1985, 341 f.

in function or new requirements caused by altered considerations of utility or pleasure of form[48]. The stylistic modifications of ornamentation and decoration, however, seem to be the result of a fluent development. This becomes visible for example when comparing the styles of Neopalatial Cretan pottery, which often exhibit a clear continuation of motifs and decorative schemes. Since change in technical procedures occurs relatively rarely compared to alterations in shape and style, the latter two aspects of ceramic development have preferably been used for the establishment of chronological sequences. And although the general validity of the chronological data obtained from pottery studies is accepted and well established, some problems must be considered and kept in mind in order to refine and further elaborate these pieces of information. Some concern the body of evidence, in this case the pottery itself, others relate to the subjective criticism of the archaeologist, and still others are caused by the endorsed nomenclature and definitions used in the classification of pottery.

A major problem is terminology. Like in any other chronological period, the pottery of the time under consideration is characterized by certain decorative styles, motifs and elements. Such styles must not be confused with chronological periods. A style is not the same as a period. Styles exist within a period of time and do neither start, nor end abruptly, but usually overlap each other in time, sometimes for their entire duration. For example »Late Minoan IA as a style continues with little change until the end of the Late Minoan IB period«[49]. At least this is true for the so called ›Standard Tradition‹ which enhances motifs and elements of the LM IA style, but coincides chronologically with the LM IB style, so that »in most cases the development is so subtle the style cannot be distinguished from that of the earlier pottery«[50]. So, as Sinclair Hood noted, the arbitrary divisions separating archaeological periods cannot be based on pottery styles alone[51]. And consequently, one must acknowledge »the difference in character between the boundaries separating reigns of kings and dynasties as known from written sources, and those dividing archaeological periods defined in terms of variations that can be distinguished in pottery and other aspects of material culture«[52]. The conventional use of the term ›style‹ as descriptive of a period of time would not be too problematic if one accepted and kept in mind that styles cannot easily be put in relative chronological rows or schemata. Luca Girella describes this as follows: »As long as ceramic styles are equated with ceramic periods, the frustrating debate on MM III will continue to be misunderstood. Ceramic styles may continue for some time, but ceramic periods are identified by a restricted number of shapes and decorations that constitute the type fossils. Thus we can find MM IIIB as a style in the LM IA period, and vessels stylistically datable to MM IIIB that possibly were produced in LM IA«[53].

However, to »maintain that it does not matter whether we call a deposit, for example, MM IIIB or early LM IA is perhaps naïve, for whether one likes it or not, these labels have acquired a primarily chronological significance, […]«[54]. Therefore, instead of using phrases like ›a vessel dates to LM IA‹, a more suitable term would probably be something like ›a vessel is decorated in the LM IA style‹. This does imply a chronological position on the one hand, but leaves enough room to recognize and respect the insufficiencies of stylistic pottery analysis concerning the definition of a date on the other hand.

Another aspect concerning the value of pottery styles for relative chronology is the duration or life span of ceramic vessels and their decoration. We simply do not know how long a vessel was used, and the amount of time in which a pot functioned is merely based on estimations and guesswork since

**48** Shepard 1985, 344.
**49** Driessen – MacDonald 1997, 15.
**50** Betancourt 1985, 137.
**51** Hood 1999, 381 f.
**52** Hood 1999, 381.
**53** Girella 2007, 253.
**54** Momigliano 2007, 5.

particular vessels may easily survive two or more generations[55]. Although pottery, unlike metal or stone vessels, has a limited material value and tends to be readily discarded, it does not seem improbable that single vases may be used over a long period of time, presupposed they remained intact[56]. The uncertain life span of vases may often lead to ›out-of-time‹ contexts, meaning that seemingly older objects are found in younger contexts, creating further problems for chronology[57].

Another problem is the regional diversity of pottery styles, which had already been recognized by Arne Furumark but has only been sufficiently acknowledged over the last decades. »Pottery specialists working on the Greek mainland and in the Aegean tend to view Minoan pottery chronology as a monolithic sequence pretty much equivalent with Knossian pottery chronology. In reality, the landscape of Minoan pottery production is far more complex«[58]. The most prominent example of this regional diversity in Neopalatial pottery certainly is the decorative development of East Crete[59]. This rich and detailed style enhances motifs in both light-on-dark (l-o-d) and dark-on-light (d-o-l) at a time when the old l-o-d style had already gone out of use in Central Crete. As Mervyn Popham stated: »At Zakro, for instance, we find a reluctance to abandon the old technique and vases of excellent fabric occur there in both l-o-d and d-o-l depicting the same motives and evidently of contemporary manufacture«[60]. The reed or plant style of Central Crete however, is extremely rare in the East. Thus, an immediate correlation of deposits from Central and East Crete is very difficult. Fortunately, sites like Malia and Gournia link both regions geographically and allow several synchronizations. When places like Zominthos are concerned, located remotely in the mountains and relatively far away from the closest palatial center, one ought to keep in mind whether or not this geographic position may affect the development of decorative pottery styles as well. However, we should probably not expect a very long delay before new trends also reached the outskirts and hinterland of the larger administrative centers[61]. This regional diversity further strengthens the argument that ceramic evolution by itself can hardly describe historic events and changes[62].

Keeping these considerations in mind one needs to decide how to establish a date for the material under study. This decision can be based upon several factors and approaches, the usually most reliable of which depends on the principle of stratigraphy as just mentioned above. When clear-cut stratigraphies are lacking, as is quite often the case, there are basically two alternatives to establish a relative date for the material of these deposits:

The first one tries to define dates for each vessel according to stylistic features and developments and accepts that the seemingly youngest vase presents the final date for all finds from the deposit under study. Although this approach is theoretically correct, it is hampered by the problems of stylistic developments and the chronological implications obtained from them, especially when unequivocal pieces are missing, such as Marine Style pottery for example. This difficulty is also well illustrated by the situation at the Acropolis Houses at Knossos: »The Acropolis Houses deposits A to E are sequential, but the majority of potentially useful features runs right through them, coated, ribbed/ridged cups, Vapheio (or Keftiu) single-ribbed cups (rare), everted rim bowls with dipped or coated rim and tortoiseshell ripple decoration«[63]. Although taken out of its context, this quote nicely describes the fundamental problems of dating deposits according to selected features regardless of the character of the entire assemblage.

The second alternative, however, does not only regard single pieces but takes the contents of a deposit as a whole into account. This way, the overall

**55** Marinatos 1987, 286.
**56** See e. g. Shepard 1985, 347.
**57** Pomerance 1984, 9.
**58** Van de Moortel 2007, 201.
**59** Warren – Hankey 1989, 75–78.
**60** Popham 1967, 339.
**61** Walberg 1983, 6; Schoch 1995, 25.
**62** Warren – Hankey 1989, 1.
**63** Warren – Hankey 1989, 59 f.

appearance of an assemblage defines the date of its deposition rather than single vases. This is of course only applicable when definite chronological markers are absent and the chronological character of the assemblage is by no means clear. Additionally, this approach eliminates the influence of possibly intrusive elements or ›heirlooms‹ by focusing on more general features and statistics. For the material from Zominthos this latter approach has been chosen to establish the date of the destruction of the so called ›Central Building‹.

Having determined the relative dates of local deposits, the next logical step in order to set up a wider regional chronological sequence is the establishment of contemporaneity with different archaeological sites and their deposits[64]. Stratigraphy may be of help for this task as well, if common and apparently contemporaneous events such as large destruction horizons are detectable in different sites of a wider region. »When such sequences are repeated in whole or in part across a number of sites within a region, it is possible to build up broad regional sequences through the technique of cross-dating«[65]. For the Neopalatial period on Crete, such events may be the destruction of the Old Palaces at the beginning of the period, and the destruction of the New Palaces at its end. Another widespread horizon is that of severe destructions in a mature stage of LM IA that most probably relates to the ›Volcanic Destruction Level‹ (VDL) at Akrotiri on Thera.

Returning to pottery, the establishment of contemporaneity is based on the comparison of vessels from different sites. This approach accepts that a »general similarity of certain traits in pottery of different regions, a similarity that is construed as indicating spread of styles or techniques from a common source« exists and is clearly recognizable[66]. Of special interest are imports from one site deposited in another regional context, implying a chronological overlap or even contemporaneity between both deposits. However, such imports, especially of exotic or luxurious character, may sometimes appear to be rather misleading for chronological purposes since they could well be kept for a long period of time due to their specific character. Pottery however, especially of utilitarian character, is not necessarily a premium candidate for such luxury items during the Aegean Bronze Age and the sometimes large numbers of imported pots in individual Cretan sites clearly mirror its primarily functional meaning. Thus imported vessels can be of great value for the establishment of contemporaneity of different sites. So obviously, the attempt to create a pan-Cretan relative chronology must inevitably be based upon regional or even local sequences, evidenced by both stratigraphy and stylistic pottery analysis as described above.

## Putting Zominthos into Context

Minoan Zominthos is situated on a small highland plateau half way between modern Anogheia and the Idean Cave (fig. 1). At a height of 1187 m above sea level, the site lies on the northern slope of the Ida-Oros ca. 400 m above the altitudinal limit of modern habitation. The site did not only embrace a harmonious landscape with rich sources of water and pasture but lay at the cross-road of two Minoan routes leading to the Idean Cave from the east and northeast connecting Zominthos with the central areas of the Psiloritis Mountains and important sites such as Sklavokampos, Tylissos and eventually Knossos (fig. 2)[67]. The site was thus not as isolated as one might think at first, despite its remote geographic position, but rather well integrated in the Minoan road-network and ›villa-system‹.

**64** Shepard 1985, 347 f.
**65** Sinopoli 1991, 74.
**66** Shepard 1985, 347.
**67** Driessen – MacDonald 1997, 126; Sakellarakis – Panagiotopoulos 2006, 50.

Fig. 1 Zominthos, plateau with ›Central Building‹, from South

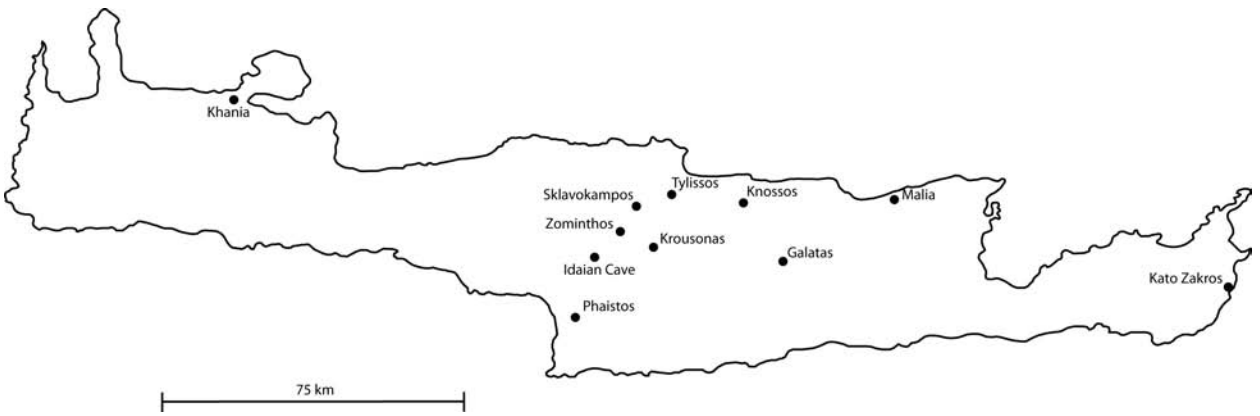
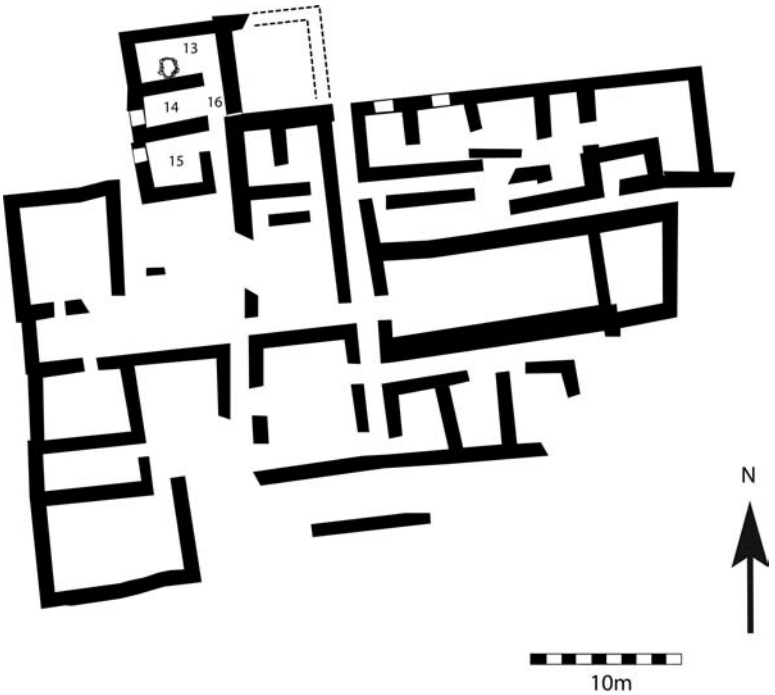



Fig. 2 Map of Crete, location of Zominthos

The Minoan site of Zominthos owes its discovery to the resumption of the works in the Idean Cave by Iannis Sakellarakis[68]. The location of the site and its pre-hellenic name ending in ›-nthos‹ had already been known, however the archaeological remains had only been recognized during a survey in 1982[69]. Between 1983 and 1990 five small-scale excavations (1983, 1986, 1988–1990) directed by Sakellarakis gradually revealed the remains of a rural villa and its surrounding settlement[70]. The ›Central Building‹ of Zominthos was largely untouched by modern looters, except for a small area in the centre of the building where, according to information provided by the inhabitants of nearby Anogheia, illicit excavations had taken place in the 1960s producing several finds. The area of the workshop to which we shall turn later, however remained undisturbed by these lootings. In 2004 a new interdisciplinary project under the auspices of the Archaeological Society of Athens in collaboration with the University of Heidelberg entitled »Zominthos 2004–2008. Reconstructing a Minoan Landscape« directed by Iannis Sakellarakis and Diamantis Panagiotopoulos resumed the work at the site. Since 2007 the excavations have continued under the auspices of the Archaeological Society at Athens directed by Iannis Sakellarakis and his wife Efi Sapouna-Sakellarakis.

The ›Central Building‹ of Zominthos is exceptionally well preserved. The structure covers an area of roughly 1600 m$^2$ with more than 40 rooms in the ground floor alone which makes it the largest example of the so called ›Rural

**68** Sakellarakis 1996, 205.
**69** Marinatos 1956/1957, 241; Sakellarakis 1983, 443.
**70** Sakellarakis 1983, 488–498; Sakellarakis – Panagiotopoulos 2006, 49.




Zominthos, ›Central Building‹

Fig. 3 Plan. Pottery workshop in room 13 (scale 1 : 500)

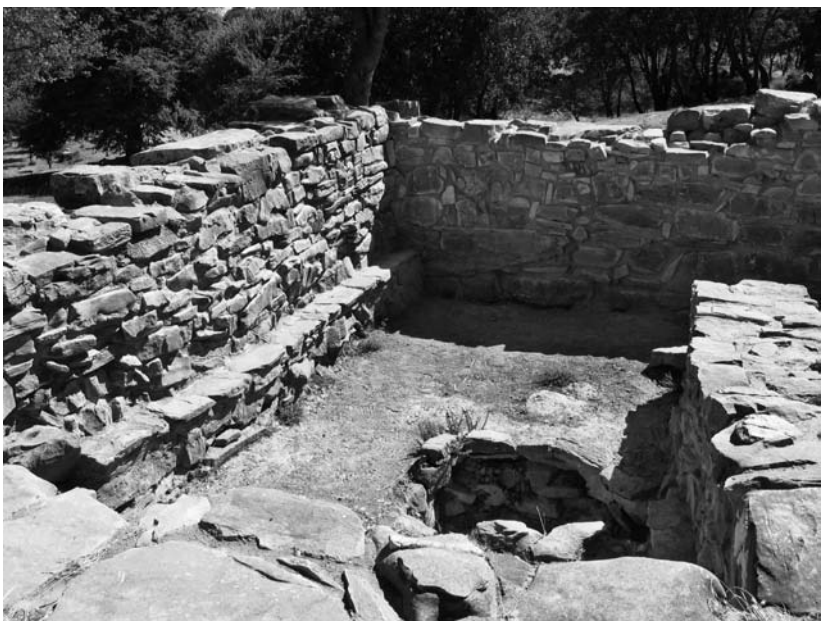


Fig. 4 Pottery workshop with built installations, from West

Villas‹ known so far in Crete (fig. 3)[71]. Its impressive northern façade is one of the best preserved architectural remains of Minoan Crete and in some areas the walls of the building stand up to 2.5 m.

The ›Central Building‹ also incorporates the remains of a pottery workshop located in the northwestern annex to the main structure (fig. 4)[72]. This workshop certainly was the most important find of the early campaigns at Zominthos. Its unusually well preserved architecture with built installations as well as its contents and finds allowed a secure identification as the atelier of a potter. It is located in an annex to the main structure of the ›Central Building‹ at its northeast corner. This annex is made up by three adjacent rooms

**71** Panagiotopoulos 2007, 20; Traunmüller 2009, 13 figs. 9. 10.
**72** Traunmüller 2009, 36–39.

connected via a narrow corridor west of them. The northernmost room seems to have been the main room of the workshop. It covers an area of roughly 10 m². The walls of the room are preserved to a height of ca. 1.5 m and consist of roughly hewn limestone blocks. The floor level is indicated by a limestone threshold and an earthen floor. Built benches run along the northern and southern walls on which numerous vases had been found in situ. The most significant installation however, is a built basin that was lowered into the floor of the room in order to cleanse and clarify the clay raw material. Its diameter is ca. 0.8 m, the walls consist of small and medium limestones, and its floor was paved with limestone slabs. Pure, strained clay was still found on its floor at the time of its excavation[73]. The find of the potter's wheel and parts of the potter's toolkit in the western part of the room further added to its identification as a workshop. Almost all of the pottery under consideration in this study was found in this area and appears to belong to the final series of pottery production at the site.

The following paragraph attempts to determine the chronological position of the ›Central Building‹ at Zominthos in the Cretan relative sequence. Since Zominthos appears to have been a single-phase site during the Neopalatial period (a second occupational phase is attested for LM III), stratigraphy is of limited value for the establishment of local chronological dates, and I will thus rely mostly on the analysis of the diagnostic elements of the pottery and the comparison of the finds with those of other Cretan Neopalatial sites[74].

The very broad limits of the material from Zominthos are characterized by two important factors. The first one being the complete absence of l-o-d decorated pottery, the second one the complete absence of pottery decorated in the ›Special Palatial Tradition‹ style[75]. This fact can leave little doubt on the general attribution of the material to an advanced stage of the Neopalatial period when l-o-d painted pottery had already gone out of use in North-Central Crete. But what is the exact chronological position of the Zominthian material and to what wider horizon can it be related? Which decorative pottery styles are present in the assemblage and what date does the holistic analysis of the vessels suggest? Before trying to answer these questions I will shortly summarize the character of the Zominthian context and underline the possible importance of the material for Minoan relative chronology.

## Why is Zominthos important?

The ceramic assemblage found in the area of the pottery workshop in Zominthos can be of paramount chronological importance due to a number of reasons. First, the excellent state of preservation of the entire building, including the workshop area in the Northwest annex, is almost unparalleled in Crete and offers valuable information on both architectural features of such a workshop and pottery production procedures[76]. The ›Central Building‹ seems to have been destroyed at one seismic event, the destruction horizon sealing the complete contents of the workshop. This includes the finished products as well as an array of tools. The thick destruction layer containing the finds remained undisturbed until the beginning of the archaeological investigations at the site during the 1980s. Thus the ceramic material under study comes from a sealed deposit par excellence and what we see may be regarded as an unbiased glance through time, not unlike the situation at Akrotiri on Thera. Additionally, the pottery probably belongs to the final production series of the local potter, defining a very exact point of time. Since all different vessel shapes

**73** See note 72.
**74** Sakellarakis – Panagiotopoulos 2006, 55.
**75** Betancourt 1985, 140.
**76** Sakellarakis – Panagiotopoulos 2006, 70.

were uncovered in the same destruction deposit, it is legitimate to assume that they were all common, and in use at the time of the catastrophe. Therefore the array of shapes and decorations at Zominthos represents a chronologically fixed point for the types of pottery here encountered. This fixed point of time may be of great use for other Minoan sites with comparable material and may eventually contribute to a refined relative chronological sequence for Central Crete or even larger areas of the island. To sum up the aspects just mentioned:

Zominthos is a single-phase site during the Neopalatial period.

1. The pottery workshop is excellently preserved, including its contents.
2. The material under study comes from an undisturbed, sealed destruction horizon.
3. The pottery seems to belong to the final production series of the local potter and offers thus a very definite chronological fixed point.
4. All vessels were in use at the same time.

Although these factors ought to facilitate an exact dating, the material from Zominthos is naturally not completely unproblematic. So far only a small area of the ›Central Building‹, limited to the northern and northwestern parts, has been excavated. Thus it cannot be automatically taken for granted that what we observe is a representative ceramic assemblage, neither can be excluded that additional ceramic material may alter the assumptions and conclusions uttered in this article. The fact that most of the vessels under consideration were found in the pottery atelier suggests a rather precise date of their manufacture on the one hand, while on the other hand the composition of this assortment of vases, or production series, may well depend on very particular odds, such as the will of the potter, a specific order of needed vases, or local preferences of certain shapes. Seemingly older pieces from the workshop may have served as models or patterns and were possibly not produced at the same time as the other vessels. The uncertain life span of specific shapes and styles may also obscure our picture. Whether or not the remote geographic location of the Zominthian workshop and regional or even local diversity in pottery production also affected the character of the assemblage must remain open as well.

However, since archaeology is by its very nature laden with uncertainties and imperfection, we are usually dealing with questions of probability when trying to reconstruct past events and developments. Therefore, and from what is known from Zominthos so far, the chronologically relevant aspects mentioned above must be regarded as valid and correct. This assumption forms the basis for the following investigations of the pottery and the conclusions drawn from it.

## The Final Destruction of the ›Central Building‹ at Zominthos

Establishing the precise date of the destruction of the ›Central Building‹ at Zominthos was one of the main goals of my Ph.D. dissertation[77]. Due to the circumstances at the site, meaning the excellent state of preservation, the virtually untouched remains of the settlement, and the character of the material from the workshop, it appeared to be possible to gain very exact and reliable chronological results from the analysis of the pottery assemblage.

This ceramic assemblage from the pottery workshop at Zominthos is characterized by several general features. Starting with the painted decoration the observer notices immediately that the range of decorative elements is, just as the range of vessel shapes, rather limited. Of the 161 recorded complete or almost complete vessels, only a small minority, ca. 10 per cent, exhibit

**77** Traunmüller 2009.

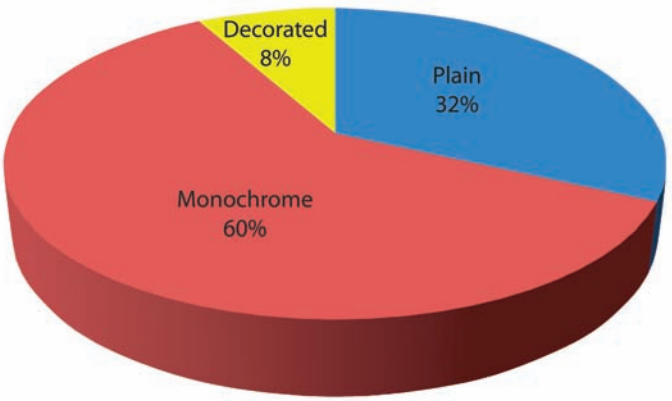



Fig. 5 Zominthos, surface treatment of ceramic assemblage

painted decoration at all. The vast majority, more than 60 per cent, is coated with a monochrome dark reddish brown to black paint, usually on both the interior and exterior, or on the exterior only. The remaining material is left plain with a buff surface (fig. 5). These numbers closely resemble the situation encountered at the kiln at Kommos, where ca. 2/3 of the vases show a dark monochrome coating[78]. But this kind of surface treatment does not necessarily have chronological implications since it also occurs on later cups, for example from Mochlos[79]. Unfortunately the preservation of the paint on the Zominthian vessels is often poor and not all vases can be assigned to one of the above categories with absolute certainty. Nevertheless, the overall picture and percentage does not seem to be altered by this. The painted decoration is carried out exclusively in the d-o-l technique. Not a single piece with l-o-d decoration has so far been discovered at Zominthos. The decoration includes a variety of spirals, tortoise shell ripple pattern, reed or grass pattern, trickle pattern, splashes and solid bands among few other motifs (figs. 6. 7). All of the applied decorative elements can securely be attributed to the LM IA style or the so called ›Standard Tradition‹ contemporary with LM IB style pottery. However, no typical LM IB ›Special Palatial Tradition‹ pottery has yet been found. Regarding several comparisons for each decorated piece from Zominthos it becomes quite clear that the stylistic analysis of the pottery offers little more than a very broad chronological date for the assemblage. In fact had all the decorated pieces been found by themselves and out of context, they would probably have been dated within a range from MM III to LM IB for stylistic reasons, covering almost the entire Neopalatial period on Crete. But since they come from the same undisturbed horizon we must assume that they were all in use at the time of the destruction of the ›Central Building‹. However, regarding the overall character of the decorated vases, it also becomes clear that the best parallels for the vessels from Zominthos come from contexts that have convincingly been dated to a period of the advanced and mature phases of the LM IA style. The most significant decorative motifs seem to be the solid-center spirals and the reed pattern varieties. This does not exclude the survival of seemingly older MM III elements, like tortoise shell ripple pattern, within the same deposits since the styles of MM III may well have overlapped the new LM I schemes of decoration. However, the existence of numerous later features and the overall appearance of the deposit clearly point towards a date when the LM IA style was in full bloom.

Much of what has been said for the painted decoration and its limitations concerning chronology also seems to apply to the development of certain vessel shapes. Changes in older traditional shapes occurred, new shapes devel-

**78** Van de Moortel 2001, 66. 97 fig. 46.
**79** Barnard – Brogan 2003, figs. 4. 5.

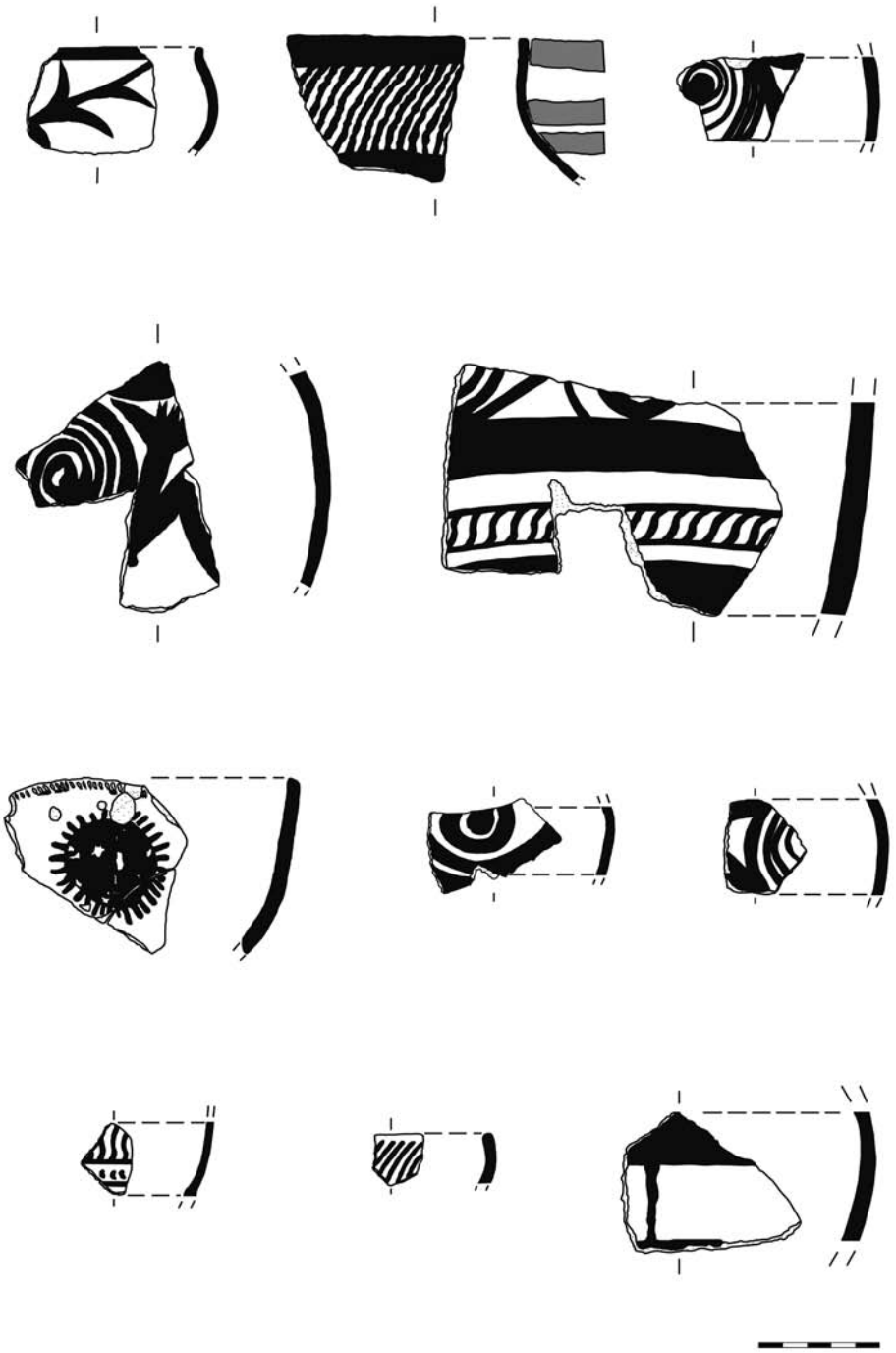


Fig. 6 Zominthos, decorative schemes on Minoan vessels, LM IA (scale 1 : 3)
Top to bottom row, left to right: Inv. Unit 70, 1988, 15; Unit 76, 1988; Unit 70, 1988, 2; Unit 76, 1988, 2; Unit 12, 1988; Unit 70, 1988, 20; Unit 70, 1988, 8; Unit 115, 1988; Unit 115, 1988, 2; Unit 70, 1988, 12; Unit 70, 1988, 6

oped while others went out of use and disappeared from the archaeological record. The question is in what way and to what extent such morphological alterations may help to establish relative dates and sequences. The vessel shapes in the Zominthian assemblage are also rather limited and represent typical Neopalatial vases. The vast majority consists of various cup shapes, others are kalathoi, jugs, and a number of other, more specialized shapes. Most were made of fine fabrics and only relatively few fragments in the deposit belonged to coarse-ware storage and cooking vessels (fig. 8).

The most common of all Minoan vessel shapes, the handleless cup, has often been discussed, also concerning its value as a chronological marker.

Fig. 7 Zominthos, decorative schemes on Minoan vessels, LM IA (scale 1 : 4)
Top to bottom row, left to right: Inv. A 159; A 134; A 170; A 273; A 73; A 121; A 33; A 117

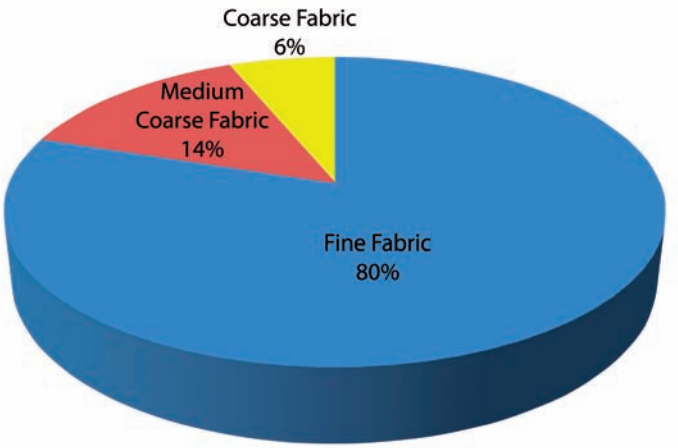



Fig. 8 Zominthos, fabrics of ceramic assemblage

Several intra-site typologies have been proposed, the most comprehensive of which certainly is that by Aleydis Van de Moortel for the cups from the western Mesara plain, especially those found at Kommos for the MM II through LM IB periods[80]. She stressed the chronological significance of conical cups and tried to develop her »conical cup typology as a dating tool«[81]. For MM III Van de Moortel distinguished eleven types of conical cups (Types A, B, C, D, E, F, J, L, M, N, V) which »differ from those of the preceding and following phases by their larger sizes, thicker walls and poorly raised bases« and were often made of medium-coarse fabric[82]. The Type A cup, low and with convex or ogival profile and truly everted, thick rim, was proposed as the type fossil of MM III. This cup type has close similarities with Type 4 handleless cups from Zominthos[83]. The Early LM IA stage had seven types of cups (B, D, E, J, P, V, W) that »in general […] are smaller and lighter than those of MM III, and fine fabrics become the rule«[84]. Advanced LM IA in Kommos was then characterized by nine types (C, D, E, F, I, J, N, P, V) and Final LM IA by ten types (C, D, E, F, H, I, J, P, Q, V). As can easily be seen, most types overlap several periods and appear to be distinguished by »subtle morphological changes« only[85]. Nevertheless, Van de Moortel argued that sufficient changes and evidence existed for the establishment of these chronologically significant types. However, the classification does not seem to be entirely convincing and little more than rather general features can be ascertained. A classification as such is always a highly subjective enterprise and it is quite probable that a second researcher studying the material from Kommos would have reached at least slightly different results. This is of course also true for the typology proposed for the Zominthian material. Consequently, I find it difficult to accept more than a limited chronological value of handleless cups due to rather general changes in the development of the vessel shape. At least this is true for the local assemblage at Zominthos.

If the handleless cups are indeed of relatively modest chronological value, other vase shapes may or may not be of greater significance. The semiglobular, or hemispherical cups are a shape typical for the entire Neopalatial period starting in MM III with a peak in popularity in LM IA. Especially the type of cup with straight sides and rim seems to be typical for the LM IA style. These are then followed by the ogival variant so characteristic for the LM IB pottery[86]. However, a clear-cut morphological differentiation between the two is often hardly possible and depends strongly on the eye of the beholder[87]. The large straight-sided cups with monochrome dark coating from Zominthos (fig. 9)

**80** Van de Moortel 1997, 32–81; Girella 2007, fig. 5.
**81** Van de Moortel 1997, 32.
**82** Van de Moortel 1997, 38.
**83** For the typology of conical cups from Zominthos see Traunmüller 2009, 75–81.
**84** Van de Moortel 1997, 50.
**85** Van de Moortel 1997, 33. 70.
**86** Barnard – Brogan 2003, figs. 4. 5.
**87** Warren 1999, 898; Hatzaki 2007, 178.

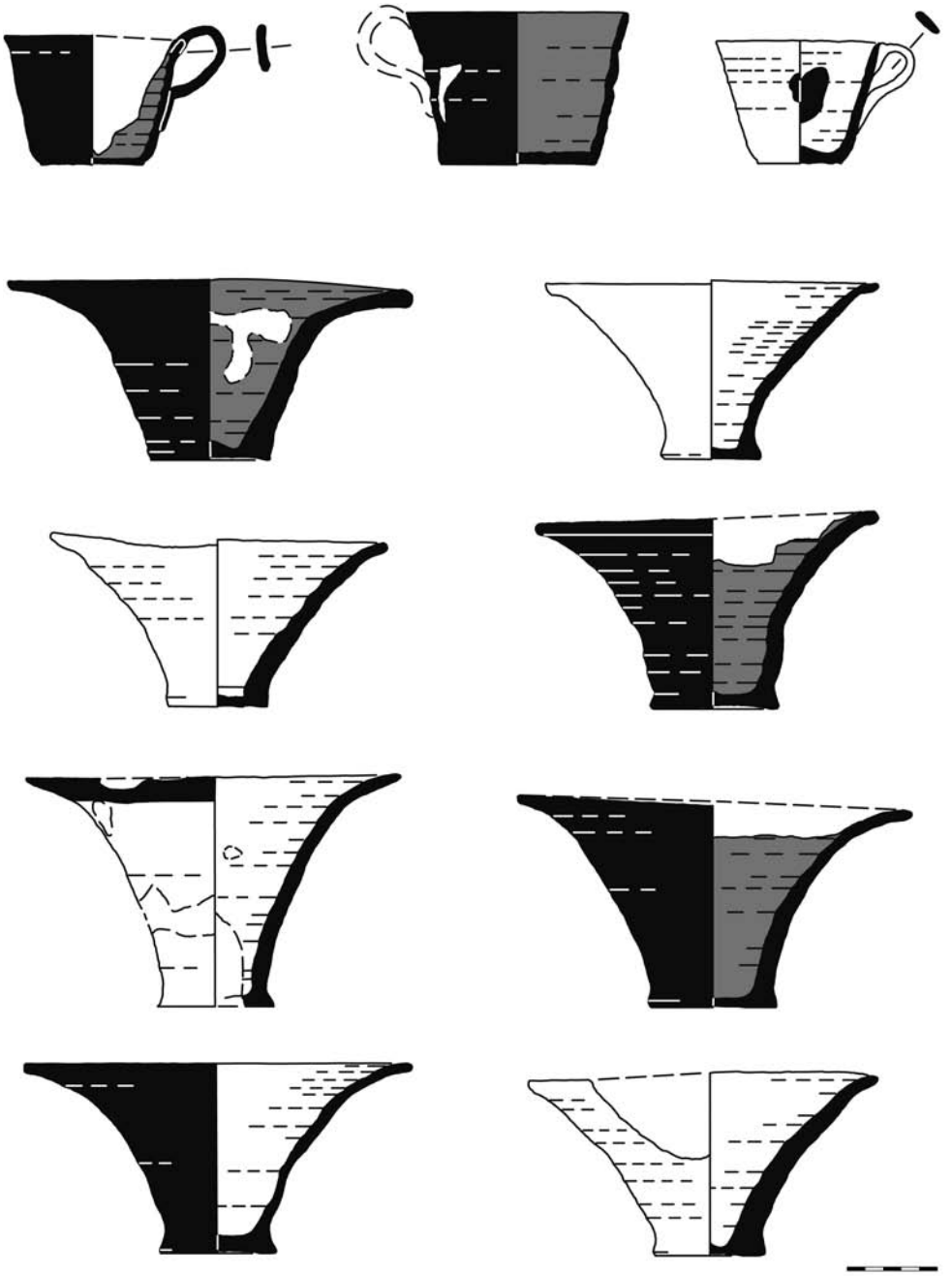


Fig. 9 Zominthos, straight-sided cups and kalathoi, LM IA (scale 1 : 4)
Top to bottom row, left to right: Inv. A 292; A 279; A 201; A 304; A 104; A 103; A 16; A 186i; A 57; A 3; A 2

can best be compared to MM IIIA examples of this shape, for example from Knossos[88]. Still they were also found in the sealed deposit of Room 12 together with vessels that clearly belong to a later phase. Other well comparable pieces were found outside Crete in Akrotiri and ascribed to the phase MM IIIA[89]. These Minoan imports do however exhibit white dots on the monochrome coating unlike the ones from Zominthos. The kalathos or flaring bowl, both in its tall and small variety seems to be a typical LM IA shape (fig. 9). All taller shapes, including beaked jugs and jars, follow the general trend towards tall, elongated shapes, usually with a high maximum diameter – a development beginning in MM III pottery and existing throughout the Neopalatial period as a whole. Rather specialized shapes, such as the brazier lid or the karpodochos

**88** Catling et al. 1979, figs. 16. 18.
**89** Knappett – Nikolakopoulou 2008, figs. 6. 11. 12.

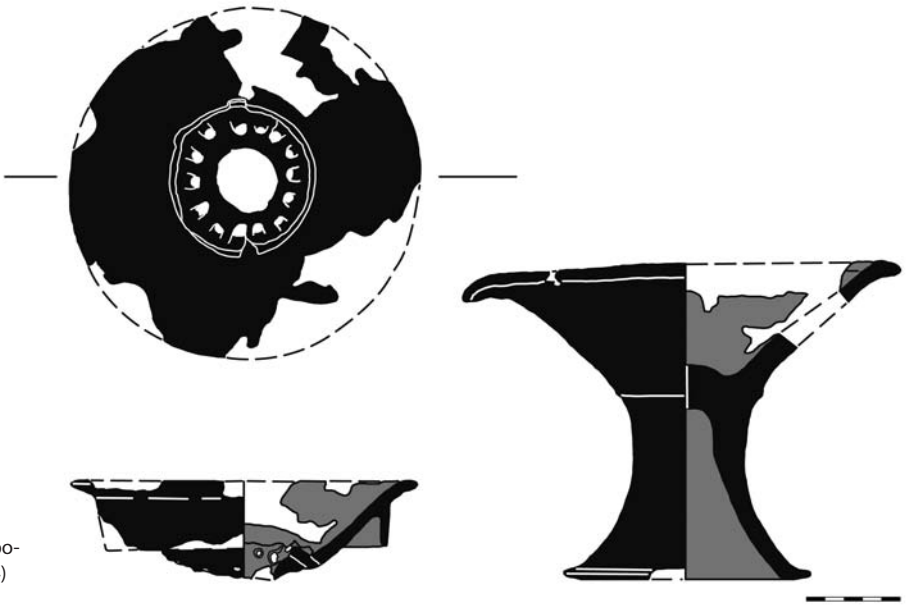


Fig. 10 Zominthos, brazier lid and karpodochos, LM IA (Inv. A 91; A 11. Scale 1 : 4)

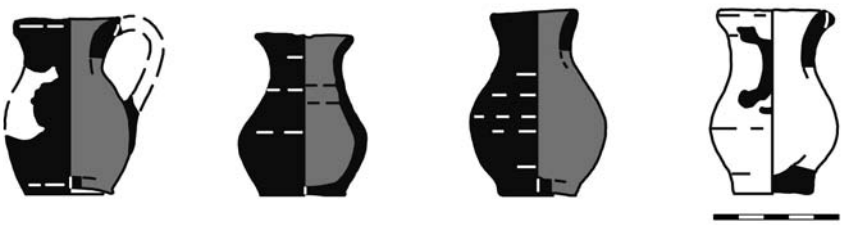


Fig. 11 Zominthos, miniature jugs, LM IA (scale 1 : 3)
Left to right: Inv. A 227; A 110; A 149; A 4

for example, are of no great help either (fig. 10). The brazier from Zominthos compares well to a number of vessels from other places that cover a chronological span from MM III to LM IB and in single cases even LM II. However, these very late parallels (LM II) come from unstratified contexts, tombs, and possibly secondary deposits and may therefore be omitted from the chronological range under consideration here. The conical rhyton from Zominthos clearly belongs to the most common type of LM IA, as does the type of potters' wheel. The so called ›milk jugs‹, which also occur at Zominthos (fig. 11), have been regarded as a type fossil of LM IA by Popham, but it is clear that the shape also existed already in MM III and continued later in LM IB[90].

Taken all the characteristics of the decoration, array of shapes and aspects of fabrics and surface treatment into account, it becomes rather certain that the assemblage from Zominthos is best comparable to those deposits that have been claimed to be contemporaneous with the Knossian Gypsadhes Well Upper Deposit Group[91].

The pottery of this group is characterized by several specific features that mostly apply to the Zominthian assemblage as well. Elaborate decorative schemes are increasingly used, such as reed pattern and retorted spirals. The l-o-d decoration is basically absent from this group at Knossos and is also totally obsolete at Zominthos, while d-o-l decorated vessels are usually of a high quality. Both monochrome and plain wares exist at Knossos and Zominthos, however the large amount of dark monochrome vessels at Zominthos is rather unusual and may be due to a local tradition. However this finds a good par-

**90** Popham 1984, 163; Mountjoy 2003, 76; Hatzaki 2007, 178.
**91** Hatzaki 2007, 172–175.

allel in the material from the kiln at Kommos, a deposit that is also presumed to be contemporaneous with this group. Also, the general array of shapes is more or less identical at Knossos and Zominthos. The LM IA handleless cups from Knossos show »that here is considerable variation in size and quality of manufacture« – a statement that is also true for the material from Zominthos[92]. Consequently, the deposition of the Zominthian material is most likely to be contemporaneous with this group.

Very little comparable material from West Crete has so far been published. The excavations at Khania yielded several LM I deposits but few pottery has been illustrated[93]. The material from the ›primo edificio‹ at Nerokourou has some common features with the assemblage from Zominthos such as a relatively large percentage of monochrome coated cups but appears to be more at home in the LM IB style[94]. However, the fragments of a jug that have been dated to LM IB and compared to vessels from Gournia and Palaikastro could also be ascribed to the LM IA style, especially since the piece from Palaikastro exhibits added white paint, a trait that is rather typical for LM IA style pottery[95]. The general character of the assemblage from Nerokourou actually shows a number of similarities with Central Cretan LM IA pottery and could possibly belong to that ceramic phase as well.

North-Central Crete with the predominant center at Knossos naturally offers the most and best parallels for the Zominthian pottery. The group of Knossian deposits just described (Gypsadhes Well Upper Deposit Group) clearly shows the close relation of the material from both sites. Nevertheless, other deposits offer good parallels for some vases from Zominthos as well, the best example probably being the straight-sided cups from the Acropolis Houses Deposit B[96]. The South House also provided some examples that were stylistically well comparable to single pieces from Zominthos, although most finds from it were unstratified. Other sites in this region also yielded deposits that seem to be contemporary with the Knossian and Zominthian assemblages. One of these sites is Amnisos on the north coast. The ›Villa of the Lilies‹ was finally destroyed by a seismic event at the end of LM IA, most probably the same event that is so well attested throughout the entire island[97]. Unfortunately relatively few vessels have been published but the LM IA style is securely attested. Another deposit of LM IA style pottery was unearthed in Archanes-Phourni, Building 4. Among some other finds an assortment of handleless cups has been published that seems to belong to the LM IA style[98]. The excavator also mentioned more LM I pottery fragments, however without commenting on a subdivision of the style in LM IA and LM IB[99]. A little further south of Archanes lies the site of Vathypetro where a rural villa of the Neopalatial period was unearthed by Spyridon Marinatos in the middle of the 20th century[100]. The photographs published in 1950 and 1952 clearly show a variety of LM IA vases, including handleless cups, hemispherical and straight sided cups, and kalathoi with spiral, reed and ripple pattern decoration[101]. These shapes and motifs are all well attested at Zominthos too.

The South-Central part of Crete during the Minoan period has been dominated by the important archaeological sites in the western Mesara plain, namely Phaistos, Aghia Triada and Kommos. While Aghia Triada gained its importance rather late compared to the other two sites, Phaistos and Kommos both show similarities with Zominthos in their material culture and especially pottery. While the palace at Phaistos yielded almost no evidence of the LM IA phase, the excavation in the town area in the immediate vicinity did turn up several vessels of the pottery style in question. A deposit of LM IA vessels was unearthed underneath a floor of geometric date in trench CC, including

**92** Hatzaki 2007, 178.
**93** Hallager – Tzedakis 1987, 13–18.
**94** Kanta – Rocchetti 1989.
**95** Sackett – Popham 1970, 218 fig. 11, NP 60.
**96** Catling et al. 1979, figs. 18. 19.
**97** Schäfer 1992, 66–68. 148 f. pls. 41, 3; 42, 2.
**98** Sakellarakis 1974, pl. 154.
**99** Sakellarakis 1974, 212.
**100** See also Cadogan 1992.
**101** Marinatos 1950, figs. 7. 10. 11; Marinatos 1952, figs. 8. 11–15.

hemispherical cups with spiral, reed and again tortoise shell ripple pattern decoration[102]. Far more examples of the pottery under consideration here were found at the harbor site of Kommos on the western shore of the Mesara plain. As already mentioned, the Late Minoan kiln and kiln dump deposits at Kommos seem to correlate very precisely to the deposit at Zominthos. The kiln was built in LM IA within the ›South Stoa‹ of the civic building T south of the so called ›Central Court‹[103]. The date of the kiln's operation has been assigned to »[…] parts of the advanced and final stages of LM IA at Kommos, roughly corresponding to the end of the ›Transitional MM IIIB/LM IA‹ stage and part of the mature LM IA stage elsewhere on Crete. Viewed in a broader context, production at the kiln appears to have ended either not long before, or at about the same time as, the volcanic eruption of Thera«[104].

This places the deposit in the same chronological horizon as the Gypsadhes Well Upper Deposit Group at Knossos although some connections to the preceding KS 178 Group seem to exist as well. The strong relation to the Zominthian assemblage in terms of vessel shapes and surface treatment has already been stated above[105]. The southern area of the Kommos site produced a large number of pottery groups also assignable to the advanced stages of the Neopalatial period including an early phase of LM IB (groups 15–40)[106]. Several of these groups are mixed deposits and the stylistic division of the subphases of LM IA and early LM IB appear to be rather subtle. Therefore I presume that these groups may either still be contemporary with the Gypsadhes Well Upper Deposit Group at Knossos, and thus with the Theran eruption before the end of LM IA, or the LM IA style continued for a longer period together with the younger LM IB style at the site. The correlation of Kommos and the Mesara in general with the North-Central Cretan sites is still somewhat problematic as illustrated for example by the construction of the Siphakis House at Seli, which is placed in LM IA by Eleni Hatzaki in the KPH, while Shaw placed it in LM IB Early[107]. The settlement on the hilltop and the central hillside at Kommos also yielded some deposits of Neopalatial date that have been published by Vance Watrous[108]. However, LM IA »is least represented in the excavations at Kommos and only one small deposit was ›pure LM IA‹« (Deposit 1)[109]. The new material from the southern area now adds more LM IA vessels to this scarce amount of pottery. Staying in the Mesara, another site is of interest concerning the period of time under consideration: Seli. Two houses, the Volakakis and the Siphakis Houses were unearthed at the site in the vicinity of Phaistos[110]. The first building, the Volakakis House seems to have been destroyed and abandoned in an advanced stage of LM IA, while the second house, the Siphakis House was then constructed. It was destroyed at the end of LM IB. Thus the destruction deposit of the first building fits well into the horizon of catastrophes feasible throughout the island to which also Zominthos seems to belong. The pottery shapes and decorations from Seli do not contradict this conclusion at all. On the contrary, several elements of the assemblage compare rather well with that of the ›Central Building‹ at Zominthos[111].

Moving further east from Knossos along the northern coast, House E at Malia offers more material that can be compared to the pottery from Zominthos. The vases of level IIIA at the site, mostly from ›couche 6‹, strongly resemble the LM IA style of Knossos and other main Minoan settlements of the time. Cup shapes dominate the deposit and the spiral and floral motifs are the most common decorative designs[112]. The following phase IIIB also has some similarities with the Zominthian assemblage but generally appears to be a little later due to marked differences in shapes and decoration[113]. This stage is characterized rather by the LM IB style in Knossian terms.

**102** Levi 1976, 471 fig. 720.
**103** Shaw 2001, figs. 1. 2.
**104** Shaw et al. 2001, 135.
**105** Van de Moortel 2001, 66. 97 fig. 46.
**106** Rutter – Van de Moortel 2006, 413–477.
**107** Shaw – Shaw 2006, pl. 5, 1; Hatzaki 2007, figs. 5. 8.
**108** Watrous 1992; see also Shaw 1992, figs. 18, 4. 5.
**109** Watrous 1992, 111 pl. 1.
**110** La Rosa – Cucuzza 2001.
**111** Traunmüller 2009, 122.
**112** Pelon 1970, 77–95 pls. 15, 4. 5; 16, 1–3; 20, 1–5; 41, 8–11.
**113** Pelon 1970, 96. 111–114.

Many more sites have been identified in East Crete, a lot of them with LM I levels. Beginning in the Mirabello area, some pieces from Gournia have been quoted above in order to illustrate connections of the Central-Cretan pottery with the ceramics of this region. Gournia is also of special interest when trying to link Akrotiri on Thera with Crete[114]. The pottery of the ›Town Style‹, especially of the early and advanced stages, clearly represents the LM IA style of Central Crete[115]. The deposits that yielded most of the LM IA material are House Cm, room 58 and House D, room 29 on the east slope of Gournia. The pottery of Gournia exhibits a popularity of added white paint and floral motifs so typical of the East Cretan styles. These rather local and regional traits can only partly be observed in the Zominthian assemblage where no added white paint has yet been encountered. Floral motifs, however, do occur. For example there is a fragment with spirals with interlinked crocuses, which finds a good parallel in Gournia[116]. The settlement at Mochlos yielded only few LM IA pottery compared to the large amounts of LM IB style vases. Some diagnostic pieces were found in House C1 beneath a layer of Theran ash and tephra, probably from the »Minoan Eruption«[117]. The comparison with the vessels from Zominthos has shown that there is a marked difference between both assemblages, most probably due to regional variations in shapes and decoration. However, few examples from the LM IB style pottery from Mochlos do somehow compare to single pieces from Zominthos, for example a conical cup with trickle pattern, but this may merely serve to demonstrate that this kind of decoration continued into the LM IB style as well[118]. A built tomb west of the settlement at Myrtos Pyrgos contained 1069 LM I vessels that seem to belong to the latest burials in the tomb during the Pyrgos IV period[119]. The cups illustrated by Gerald Cadogan clearly belong to the LM IA style. On the east coast, the extensive settlement at Palaikastro also yielded much evidence for the LM IA period. Some rather typical assemblages have been published by Karl Knappett and Tim Cunningham, re-discussing an earlier publication by Lara Bernini[120]. The excavations at the site have shown that the previously hardly definable MM IIIB period had also been brought to an end by a major seismic event, just as seen by many sites in the central part of the island. A deposit in Building 2, Room 2, belongs to a stage after this event and has been ascribed to the LM IA phase[121]. This deposit consisted mainly of conical cups but also yielded some decorated pieces that allow an attribution to that stage. However, the same deposit had previously been ascribed to the MM IIIB style by Bernini, which illustrates the difficulties in differentiating the two stages stylistically[122]. Generally, both stages, MM IIIB and LM IA at Palaikastro show good comparanda for the material from Zominthos, a fact that does not facilitate an exact dating of that assemblage. I would like to follow Knappett and Cunningham's interpretation here, but need to remark that their date was mainly established by an analysis of the conical cups, a vessel type that is not unproblematic when dating purposes are concerned.

A destruction horizon possibly associable with earthquakes related to the Theran eruption was also encountered at Priniatikos Pyrgos, a settlement on the northern shore of East Crete[123]. The pottery from this horizon compares well the just mentioned Palaikastro deposits underneath the widespread LM IB destruction of the site and the pits at Zakros further to the east. The assemblage from Pyrgos contains a number of cups with floral decoration in both d-o-l and l-o-d and some tortoise shell ripple as well. The shapes and decoration fit well within the array of LM IA pottery in Eastern Crete also including the continuation of l-o-d schemes[124]. The same is also true for the pottery from the Zakros pits[125]. Additional material from Zakros was discovered in and around the pal-

**114** See Niemeier 1980.
**115** Boyd Hawes et al. 1908, 39–44 pls. 6, 35; 7, 25–41; 8; 19, F. G.
**116** Traunmüller 2009, 126.
**117** Soles – Davaras 1992, 434–438.
**118** Barnard – Brogan 2003, figs. 1, IB; 1, 5.
**119** Cadogan 1972, 630 pl. 589 b; Hankey 1986, 135–137.
**120** Bernini 1995; Knappett – Cunningham 2003.
**121** Knappett – Cunningham 2003, 169–173.
**122** Bernini 1995, pl. 1.
**123** Betancourt 1978, 381.
**124** Betancourt 1978, figs. 1. 2.
**125** Hogarth 1901; Hogarth 1902; Dawkins 1903, figs. 1–19.

ace which all hints at a major destruction of the site when LM IA pottery was in use. The vessels from the pits probably belong to the debris of an older structure underneath the palace, which was itself destroyed at the end of LM IB[126]. But again, the East Cretan LM IA style does not deliver the best comparisons to the Zominthian material, especially concerning the painted decoration, but still proves to be rather contemporaneous. It is due to the nature of the fluent development of pottery styles that many more comparisons could still be drawn to the Zominthian assemblage even with deposits that rather clearly postdate our material, but I will end this overview of selected depositions throughout the island at this point, presuming that the point I tried to make has become clear.

## Conclusions

All of the here mentioned deposits from across the island share the common aspect that they are more or less contemporary and »probably the result of earthquake destructions chronologically close to the LM IA eruption of Thera«[127]. Their correlation and synchronization is mainly based upon the comparison of their pottery assemblages. I have stated above that the excellent state of preservation and the almost ideal taphonomic situation of the Zominthian material enable us to establish a rather fixed date for the final destruction of the ›Central Building‹ and thus the deposition of the ceramic vessels at the site.

The complete absence of l-o-d decorated vases at the lower and ›Special Palatial Tradition‹ vessels at the upper end of the stylistic chronological scheme leave little doubt that this final destruction must have taken place within an advanced stage of the Neopalatial period on Crete[128]. However, several pieces of the material assemblage from Zominthos incorporate designs that are common in MM III styles as well as the LM IB ›Standard Tradition‹. But since these elements occurred in one and the same undisturbed, sealed destruction deposit, we must accept that the decoration of the vases is not as chronologically indicative as previously assumed, especially if we are in fact dealing with one series of production at Zominthos. This does of course not mean that pottery lost its value as the most important chronological tool of the archaeologist but I am reluctant to accept that prehistoric vessels can be dated with very accurate precision rather than distinguished in wider chronological margins.

Consequently, in order to retrieve reliable chronological information from pottery finds, we must concentrate on the analysis of primary deposits, and also take into account that regional traditions and local variations in style may blur and even alter our perception considerably. Since several decorative elements have been shown to exist throughout various pottery phases, the date of a ceramic assemblage ought to be established by judging the general characteristics of the group of vases rather than single specific designs or shapes[129].

In this article I have tried to shortly summarize the results of the analysis of the pottery assemblage from Zominthos and utter thoughts on how to establish chronological dates based upon such examinations. Continuing this train of thoughts a reliable pan-Cretan relative chronology ought to be constructed by synchronizing local, site-specific sequences that are based upon primary deposits of large dimensions. The system recently published for Neopalatial Knossos by Hatzaki makes the desirable effort to combine groups of comparable deposits with historic events and presents such a local relative sequence[130]: An effort that ought to be continued while more and more sites are being unearthed.

**126** Platon 1999, 679.
**127** Hatzaki 2007, 183.
**128** Traunmüller 2009, 270–275.
**129** Traunmüller 2009, 67–140.
**130** Hatzaki 2007.

**Abstract**

Sebastian Traunmüller, A New Fixed Point in Minoan Relative Chronology? The Pottery Assemblage from the Ceramic Workshop at Zominthos and Its Implications for Neopalatial Chronology

The small number of securely datable pottery deposits on Minoan Crete poses one of the crucial problems of Neopalatial chronology. Zominthos, however, seems to be the exception to that rule. The ceramic assemblage found in the area of the pottery workshop derives from a sealed deposit par excellence and is thus of paramount chronological significance. All, or at least most of the vases under consideration probably belong to the final series of pottery production at Zominthos, which facilitates the exact dating of the destruction of the ›Central Building‹ and may offer a chronologically fixed point for the use of LM I style pottery.

The studies on the material raised theoretical questions on how to date pottery in general, and Neopalatial vases in particular, taking into account taphonomic conditions, the character of decorative styles and vessel shapes, and their chronological significance. This article tries to formulate and discuss these questions by establishing a relative date for the destruction of the ›Central Building‹ and underline its chronological significance for Neopalatial Crete.

**Keywords**
Zominthos • Minoan Crete • relative chronology • Neopalatial • Minoan pottery

**Sources of illustrations**
Fig. 1: after Panagiotopoulos 2007, fig. 1. Photo by A. Smaragdis • Fig. 3: Drawing by S. Traunmüller after I. Sakellarakis, Ανασκαφή Ζωμίνθου, Prakt 2008, 95 fig. 1
All other figs. by S. Traunmüller

**Abbreviations**

| | |
|---|---|
| d-o-l | dark-on-light |
| EM | Early Minoan |
| LM | Late Minoan |
| l-o-d | light-on-dark |
| MM | Middle Minoan |
| MUM | Minoan Unexplored Mansion |
| SEX | Stratigraphical Museum Excavation Site |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