BICHROME POTTERY IN THE MBA–LBA CENTRAL AEGEAN*

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1. THE DEFINITION OF MBA AND LBA BICHROME POTTERY

The parallel exploration of ceramic data in various areas of the Greek Mainland and the Cycladic Islands has led to a proliferation of different terminologies for Middle and Late Bronze Age (henceforth MBA and LBA) pottery. The labels and grouping methods used are, however, only useful tools as long as everybody understands what is actually covered by the terms. Many vessels manufactured in different areas of the Aegean, especially during the initial phases of the LBA, were decorated with more than one colour. Vessels of either a dark or light surfaced fabric could be decorated with contrasting dark (black, red, purple) and/or light (white, yellow) patterns. Dark or light paints were frequently also employed as solid coatings onto which one or several more or less contrasting colours were employed for pattern decoration. In this chapter we describe several kinds of MBA–LBA pottery essentially decorated with two colours, normally black and red, on a light unpainted or slipped ground. These varieties have been variously termed in previous studies. The use of different labels should, however, not disguise the basic observation that all vessels display a bold and usually attractive contrasting effect of black and red decoration on a light ground. Some vessels, but certainly not all, also show limited additional decoration in the form of auxiliary lines or dots of a superimposed, fugitive and often semi-transparent white paint. This infrequent, subordinate and often hard to spot addition of white paint is probably the reason why some scholars have chosen the term “polychrome” rather than “bichrome” for describing their decoration. For sake of convenience and consistency, we use the latter term for all varieties of dark-on-light pottery described below.

There are several kinds of Aegean pottery decorated with more than one colour which are not included below. We have limited our analysis to pottery produced on the Cycladic islands and the Southern and Central Greek Mainland (henceforth the Central Aegean) in the second millennium BC. These limitations may appear arbitrary to the reader. The justification for this selected coverage is mainly twofold: (i) bichrome decorated vessels from these areas are well represented in ceramic assemblages recently analysed by one or several of the authors at Kolonna on the island of Aegina and at Lerna in the Peloponnese and (ii) the Aegean dark-on-light varieties described here are also more likely than others to be confused with bichrome decorated vessels from other regions in the Eastern Mediterranean. Polychrome decorated vessels from Thessaly (e.g. MARAN 1992A, 162–169) are thus excluded, as are also different classes attested on contemporaneous Crete (e.g. MACDONALD and KNAPPETT 2007, 35, Classes A.6–7) and in the Dodecanese (e.g. MOMIGLIANO 2007; VITALE 2007, 76–193). Finally, no references are made to the NE Peloponnesian pottery variously known as “White on Burnished Dark” (DIETZ 1991, 32) or “Bichrome on Slipped and Burnished” (ZERNER 1993, 44).

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Based on an integrated use of archaeological, petrographic and geochemical data we try to argue below that there are presently six different kinds of more or less contemporary bichrome decorated vessels known under different names in the MBA I–LBA II Central Aegean. A combined evaluation suggests that they derived from an equal or larger number of production centres located on the islands of (i) Melos/Thera, (ii) Keos and (iii) Aegina and (iv) Boeotia, (v) the Argolid and (vi) Lakonia on the Greek Mainland. With various degrees of confidence it is possible to isolate and attribute most dark-on-light bichrome decorated vessels found in the Central Aegean to anyone of these production environments. By doing so they are anchored in different manufacturing traditions with only partly overlapping technological trajectories. Each section below includes a general but necessarily rather brief description of the taxonomy, chronology and distribution of the pottery as presently understood by us. Emphasis has been given on work which seeks to distinguish different kinds of bichrome pottery and, whenever possible, attribute them to specific production environments. Separate sections are devoted to recent relevant work carried out by the authors on ceramic deposits from Kolonna and Lerna.

It should be stressed that the bichrome vessels described here always constituted a minority of the full range of vessels manufactured within each potting tradition. Unpainted, monochrome matt or dull painted and/or solidly painted vessels constituted the bulk of the production. There are, however, two main reasons for assembling occurrences of bichrome vessels from different potting traditions. Firstly, it allows for a comparison of influences between various areas of the Central Aegean. There are clear similarities, but also some differences in the products of different workshops. Secondly, and perhaps more important for the subject of the present volume, there is overwhelming evidence that at least two categories of bichrome pottery, the Aeginetan and Boeotian varieties, have direct bearing on the relative chronology of the LBA I period in the Aegean.

2. CHRONOLOGY

The transition to the LBA I period in the Central Aegean is defined as the moment when Late Minoan (henceforth LM) IA ceramic shapes and motifs were first locally emulated in this area. On the Greek Mainland this process is foremost seen in the transformation of the Middle Helladic pottery known as Lustrous Decorated into Late Helladic I Mycenaean Decorated (Zerner 2008, 185–86; Dickinson 1974; Rutter and Rutter 1976, 53–58). On the Cycladic islands, the same process is best monitored at Phylakopi and Aiyia Irini where the local industries picked up new shapes and motifs (Davis 1986; Papagiannopoulos 1991; Davis and Cherry 2007). With the limited material at his disposal, Furumark (1941, 472–477) originally portrayed this process as fast and uniform. Increased knowledge of regional diversity, the gradual acceptance and subsequent spread of locally produced pots of ultimate LM IA derivation, however, makes it clear that Furumark’s original definition is too blunt a tool if we are going to make additional progress in understanding this complicated process (Zerner 2008; Davis and Cherry 2007). On the Greek Mainland, for instance, the ceramic definition of Late Helladic I relies too heavily on the Lustrous Mycenaean pottery. Although beyond the aims and scope of this chapter, there is good evidence that the spread of this pottery was protracted and by no means finished until later periods (Dickinson 1989; Mountjoy 1999: passim). In other words, those scholars who choose to define the period solely on the presence of this variety of pottery will find it lacking altogether in large inhabited areas of Southern and Central Greece. In this chapter LBA I is instead used to cover a period of time when a range of vessels from various production places were in
contemporary use in the Central Aegean. If properly used, evidence of bichrome decoration is an important parameter in this definition.

The excavators of several of the settlements from which relevant ceramic data derive, have devised internal ceramic sequences based solely on the development of pottery or in tandem with notable architectural changes. At Phylakopi on Melos there is a definition of three superimposed cities with subdivisions (Barber and MacGillivray 1980), subsequently supplanted by a system of capital letters for different phases (Renfrew 2007, 9–12). Lerna in the Argolid was divided by Caskey (1958, 143–144) into seven broad phases, most of which contain subdivisions (for the MBA-LBA I phases see particularly Zerner 2008, 559, Chart 14.1). The same system, but with other chronological boundaries, is in use too at Ayia Irini on Keos (Caskey 1979; Schofield 1984). At Kolonna, there is an architectural phasing of Stadt I–X (Walter and Felten 1981, 10) and a recently presented A–L ceramic sequence (Gauss and Smetana 2007). At Akrotiri the Middle Cycladic deposits have recently been sequenced into phases A–D (Nikolakopoulos et al. 2008). They are followed by the Seismic Destruction Level (SDL) early in the LBA I period (Marthari 1984) and the Volcanic Destruction Level (VDL) in a mature to late stage of the LBA I (Marthari 1982; 1987). In order to facilitate chronological comparisons for the non-specialist in Aegean MBA and LBA archaeology, we have assembled contemporary phases from several settlements (Fig. 1). Because of diverging opinions on the exact boundaries of individual phases and what deposits offer the best parallels at various settlements, it would surprise us if every scholar agrees with our conclusions. Our intent, however, is not to pass final judgement on the matter, but to help the non-specialist to digest relative chronological information derived from different excavations. Because our analysis includes ceramic data both from the Cyclades and the Greek Mainland, we make regular use of the terms MBA and LBA instead of the more cumbersome MC/MH and LC/LH. There are no accepted differences in the beginning and end of individual phases during the periods of relevance here and it can be debated whether the material culture at Kolonna and Ayia Irini is better described as Cycladic or Helladic in nature.

3. Thera/Melan Bichrome (“Cycladic Black and Red”)

The earliest bichrome decorated vessels in the MBA Cyclades were part of a larger set of shapes and decorative patterns which over time increasingly emulated contemporary Minoan pottery of the First and Second Palace periods on Crete (Dawkins and Droop 1911, 11–12; Papagiannopoulos 1991, 98; Marthari 1990a, 452). Much evidence points to Melos and/or Thera (modern Santorini) in the southern Cycladic arc as the source(s) of this pottery. The inhabitants at the principal settlements on these islands, Phylakopi and Akrotiri respectively, were increasingly influenced by material culture and customs on contemporary Crete at least until a mature stage of LM IA. It is not clear, however, why, of all the possible options available, the potters on these islands chose to decorate some of their vessels with red and black patterns on a light ground. Minoan influences on ceramic production never took this particular expression on Kythera (Coldstream and Huxley 1972) or in the SE Aegean (Vitale 2007, 76–193) where they were particularly strong felt. Although some of the Melian/Theran motifs are clearly Minoan in character, particularly during the MBA III and LBA I periods, the mode of decoration has instead closer affinities with different kinds of earlier and contemporaneous light-on-dark bichrome pottery produced on the Greek Mainland.
3.1. Description of pottery

The pottery is commonly referred to as “Cycladic Black and Red”. It is but one variety of an overarching pottery group christened “Cycladic White” by BARBER (1978, 375–76) which was produced as unpainted, monochrome and bichrome matt painted vessels. The fabric is usually fine to semi-fine grained although coarser examples exist as well. The fracture is often white but may also be light reddish brown, while the exterior surface was habitually slipped in a light colour. Unpainted portions of the exterior surface are normally unburnished and interiors of closed shapes are almost invariably roughly smoothed and pitted in a distinct manner. The paint is not lustrous in appearance, but also not so dull as the Aeginetan and Cycladic Black and Red Style pottery in particular are of interest. Based on elemental analysis by way of Optical Emission Spectroscopy (OES), JONES (1978; 1986, 429, 431–32, 433) argued that bichrome decoration could be found on vessels of both Mainland and Cycladic origin. It was not, however, possible to distinguish with any confidence the samples from Melos and Thera. KIKIKOGLOU et al. (1990) presented the results of Neutron Activation Analysis (NAA) on a set of 21 sherds from Akrotiri. While it was possible to separate chemically some samples of jugs from Akrotiri and Phylakopi by means of multivariate statistics, the overarching geological similarities between Thera and Melos were emphasised. Most of the jugs in Cycladic White, the authors argue, were probably of Theran manufacture, while a few were imported from Phylakopi. One of the co-authors of this article later stated in a separate study that it is still impossible to separate Melian and Theran Cycladic White clays (PAPAGIANNOpOULOU 1991, 43). Archaeologists’ inability to distinguish on visual grounds fabrics from the two islands has also been stressed recently by BARBER (2007, 206) and DAVIS and CHERRY (2007, 267). Among the vessels decorated with birds in a bichrome fashion it appears that Melian potters only depicted round-bodied birds, usually with red burnished discs inside, while the Theran potters also painted slender bodied swallows (cf. ATKINSON et al. 1904, Figs. 91 and 92; BARBER 1974, 35; PAPAGIANNOpOULOU 1991, 36). This observation, however, is just confined to one particular motif among several. So while commendable, observations of some differences in decorative motifs and syntax at workshops in operation is not enough to allow for a consistent distinction between bichrome decorated vessels produced on the two islands (e.g. BARBER 1974, 35; MARTHARI 1987, 370, n. 20; 1993, 252–53, n. 33). Additional studies which seek to define subtle differences in the volcanic geology of Thera and Melos are needed in order to make progress on the issue. VAUGHAN and WILLIAMS (2007, 124) present promising results for the Early Cycladic period and note that trachytic andesite seems to be absent in the Early Cycladic White sherds from Akrotiri, but present at Phylakopi.

The Theran/Melian bichrome pottery was mainly produced in shapes intended for drinking and pouring. Horizontal-rimmed and beaked jugs, bowls with thickened rim, panelled cups and rounded cups are attested, as are bridge-spouted and hole-mouthed jars (ATKINSON et al. 1904: Pls. 20–21, 23; DAVIS 1986, 83–84; NIKOLAKOPOULOU et al. 2008, 317–19). In Grave 8 at Ayia Irini a feeding bottle was found (OVERBECK 1989, 191 8–3, Pl. 92). According to PAPAGIANNOpOULOU (1991, 35–40) the most common motifs found at
Akrotiri are bird (including both round bodied and slender swallows), goat, pomegranate, ivy band, reed, crocus, chevrons, grape, wavy band, foliate band and filled circles. A detailed range of similar monochrome and bichrome motifs at LBA I Phylakopi is presented by DAVIS and CHERRY (2007, 268–69, Figs. 7.1–2). Interestingly, through detailed seriation of ceramics from five trenches at the 1974–77 excavations, the authors have convincingly shown that there is some internal development in the use of motifs within decorated Cycladic White pottery. There is a much wider range of spiraliform and floral motifs found in late LBA I levels and some motifs are even exclusively restricted to an early or late stage (DAVIS and CHERRY 2007, 301). The same development may, it appears, be found also at Akrotiri, although so far not presented in an equally detailed manner (MARTHARI 1984; 1990B).

3.2. Evidence from Kolonna and Lerna
KILIAN-DIRLMEIER (1997, 135, Pl. 12, Nos. 97–108) has published several pattern painted Melian/Theran imports at Kolonna, but they are all decorated in a monochrome fashion. There are, however, a handful of bichrome decorated sherds from the “Inner Settlement” and “South Hill” at the settlement (Fig. 2). Their provenance is so far only based on close visual inspections, but they show all characteristic traits of being imports from Melos/Thera. Detailed petrographic descriptions on the Melian/Theran fabrics attested at the settlement will be included in a separate study by GAUSS and KRIATZI (Forthc.). Based on present knowledge the bichrome variety first appears in phase I, exemplified by Q3/98-3 (GAUSS and SMETANA 2007, 64, Fig. 9). It is a horizontal-handled jar which preserves part of a horizontal handle outlined in black and covered with red paint on the belly. Also from securely dated and intensively investigated phase I deposits come the two shoulder fragments Q6/38-42 and Q6/139-25. They preserve a black and red horizontal band. From the succeeding phase J comes the largely preserved jug XL-01. The decoration consists of black circles filled with red which are framed by black joining semicircles (cf. WALTER and FELTEN 1981, 136–37, No 455, Pl. 123). It has an exact parallel at Ayia Irini V (DAVIS 1986, 64 AF-5, Pl. 64) which lends additional support to its date. Shoulder fragment Q6/102-3, decorated by bands in the same way, is from a slightly more complicated context but can be safely dated to either phase I or J. Four additional sherds were found in deposits Q6/197 and Q6/229 during the 2008 excavation. Preliminary studies suggest that the deposits are of phase J or possibly even K.

From Lerna there are also a few bichrome sherds which can be attributed to Melos/Thera with some confidence. DAVIS (1979A) included the settlement in his list of receivers of the pottery, but did not present any information on the quantities and nature of the imports. From phase V.6–7 deposits, there are five fragments known (ZERNER pers. comm.). Their fabrics are illustrated here with samples 145 and 147 (Fig. 10a-b). The former sample is from a nipped ewer found in a bothros while the latter fragment probably comes from a jug. Both samples contain subangular to rounded volcanic rock fragments and minerals (twinned and zoned plagioclase, amphibole, clinopyroxene and biotite) with limestone and white mica, measuring up to 1.6 mm, with a mode at about 0.4 mm. Sample 145 also contains common microfossils and rare phyllite and chert. These fabrics appear to be made of calcareous clays and are consistent with volcanic sources. Significantly, there is no evidence of this kind of pottery in the late LBA I shaft grave fills at Lerna VI, presently being prepared for publication by the main author.

3.3. Chronology and distribution
At Phylakopi, Melian/Theran bichrome occurs in deposits from Cities II-iii and III-i, equivalent to Phases C and D in the 1974–77 excavations (ATKINSON et al. 1904: 262, 264; RENFREW 2007, 9–13 and Table 2.2; VAUGHAN and WILLIAMS 2007, 101; BARBER 2007, 183). PAPAGIANNOPOULOU (1991, 35–40) reports that the pottery is found stratified below
LBA I floor levels at Akrotiri and Nikolakopoulos (2007, 347) similarly observes that the pottery belongs to “the advanced MC period” of the settlement. From early LBA I deposits of the Seismic Destruction Level several examples are known (Marthari 1984, Figs. 7c, 8b). At Ayia Irini sherds are attested from settlement deposits of phases IVa and IVc and from the late MBA II Tomb 31 (Barber 2007, 206; Caskey 1972, E24 and 385, Pl. 88; Overbeck 1984, 111; 1989, 76 Pl. 52, AG-10; 171 Pl. 83, CN-4). The pottery is best attested in phases I and J at Kolonna but, depending on the exact dates of the recently excavated deposits Q6/197 and Q6/229, some examples may also belong to phase K. MacGillivray has identified two Black and Red jugs in the Middle Minoan II koulouras at Knossos (Barber 2007, 206) and collected some later occurrences as well (MacGillivray 1984). At Ayia Irini most sherds are found in period V, but are also well represented in phase VI contexts (Davis 1986, 83; Cummer and Schofield 1984, 45). Thus, although it is reasonable to assume that roughly contemporary ceramic phases from published settlements in different parts of the Central Aegean do not begin and end at precisely the same time, several independent deposits nevertheless suggest that Melian/Theran bichrome pottery was first produced in the MBA II period. The earliest examples are known from Phylakopi II-iii (=Phase C), Ayia Irini IVa and MM IIB Knossos. There is evidence from Phylakopi (Davis and Cherry 2007, 279–89), Akrotiri (Marthari 1984, 129; Nikolakopoulos 2007, 352, Fig. 4b) and Ayia Irini VI (Cummer and Schofield 1984, Pl. 64, Nos. 838–839) that the pottery was being continuously produced into the mature stage of LC I. To our knowledge, however, there are no indications that the pottery outlived the LBA I period in the Aegean (cf. Cherry and Davis 1982, 335, N. 5; Davis and Cherry 2007, 266; Marthari 1984, 130, Table 1).

As always when one tries to trace the distribution in time and space of a particular set of ceramic parameters, in this case Thera/Melian fabrics with bichrome decoration, there is a marked unevenness in the quality and quantity of published data. Davis (1979a) and Dietz (1991, 298–99, Fig. 88) nevertheless assembled all reasonably certain occurrences known at their respective years of publication. Papagiannopoulos (1991, passim) also discusses a handful of probable occurrences from several of the Cycladic Islands. Walberg (2007, 103, No. 1280) has since then tentatively identified one sherd as Melian/Theran bichrome from Midea. The distribution area which emerges in Fig. 3 is larger than for Aeginetan bichrome and more oriented toward the south and west than Boeotian bichrome.

4. Keian Bichrome (“Yellow-Slipped Polychrome”)

Ayia Irini on Keos harbours one of the most valuable ceramic sequences for the Bronze Age Aegean. After a gap in occupation during the end of the MBA and beginning of the MBA, the construction of a fortification marks the beginning of phase IVa. There are common traits between the locally produced pottery at Ayia Irini and Melos/Thera respectively. However, judging by the frequency of imports and the appearance of shapes and motifs on local pottery, the potting tradition was also influenced by developments on the nearby island of Aegina and the Mainland.

4.1. Description of pottery

The fabric used by local potters on Keos during the MBA and early LBA is distinct in comparison with most others known to the authors. It is generally coarser and highly micaceous. Overbeck (1989, 9) rightly points out the characteristic fracture on freshly broken sherds: “whether coarse or relatively fine, the biscuit displays a distinctive raggedness,
with ridges and furrows parallel to the surface of the vessel”. The vessels are often poorly fired with a black core while the unpainted surface is reddish brown (5YR 5/4 to 2.5YR 5/4) to reddish gray (5YR 4/2). Davis and Williams have published petrographic analyses of Ayia Irini V pottery. Their results confirm a close mineralogical composition of the abundantly attested micaceous fabric of presumed local derivation and two Keian clay beds (DAVIS and WILLIAMS 1981, Group A, 292–95). They describe the fabric as containing small plates of mica and fragments of greenish gray schist, easily identifiable by eye. The samples appear uniform under the microscope and the main non-plastics are chlorite quartz-mica, quartz grains, iron oxide and mica.

Because of the dark-firing surface of the fabric, the Keian potters habitually gave vessels intended for dark-on-light decoration a solid coating of light paint or slip before dark patterns were added to the surface. The slip, which rubs off easily, is normally yellowish white but can occasionally also assume a pale brown or even orange tint. A vast majority of these vessels were decorated in a monochrome fashion but occasionally red paint was also added, mainly as filling or additional bands. While all dark-on-light pottery was lumped under the heading “Cycladic Matt-Painted Wares” by CASKEY (1972, 381), the bichrome examples were singled out as “Yellow-Slipped Polychrome” by OVERBECK (1989, 10). In DAVIS’ (1986, 4) study of period V, they are found under “Painted on Yellow Slip”. Because of the limited and fragmentary nature of published examples the range of shapes is poorly known but appears to be restricted in phase IV to hand-made small wide-mouthed barrel jars with everted rim, narrow-necked globular jars with a ledge rim and bowls with short, thick and rounded everted rim in descending order of frequency (OVERBECK 1989, passim; CASKEY 1972, 381, D65–67, Fig. 10, Pl. 84; 383 D139–142, Pl. 85). In the succeeding phase V, these shapes were replaced by the straight-sided and rounded cup thrown on the wheel (DAVIS 1986, 54, AA-1, Pls. 31, 59; 55, AA-9, Pls. 31, 60). The decoration ranges from vertical panels with dotted or filled lozenges or circles (OVERBECK 1989, 33, J-14, Pl. 39; 89, AO-13, Pl. 56; 98 AQ-17 Pl. 59; 101 AR-5 Pl. 61), rectilinear parallelograms with hatching or fillings (OVERBECK 2007, 346, Fig. 4: AQ-22), satires (OVERBECK 1989, 94), hatched circles with red filling (OVERBECK 1989, 74, AE-7) to more delicate motifs such as dotted, triple-spoked or plain circles (CASKEY 1972, 381, D68, Pl. 85; OVERBECK 1989, 99, AQ-25; 98, AQ-21 Pl. 60), and an encircled four petal flower (CASKEY 1972, 381, D69, Pl. 85). A comparison of Melian/Theran and Keian bichrome decoration immediately reveals an earlier and more distinct Middle Minoan IIIB–III influence on the former islands in the selection of motifs, while the Keian potters were more heavily influenced by patterns (though not bichrome decoration per se) in current use on the MBA II–III Greek Mainland and on the island of Aegina. In other words, at Ayia Irini IV the patterns appear more Helladic in syntax and choice of motifs than Minoan. This is partly, but not completely, explained by the disappearance of Keian bichrome sometime before the MBA III–LBA I transition, before LM IA motifs were being extensively emulated in the Melian/Theran and other potting traditions.

4.2. Evidence from Kolonna and Lerna

There are presently only three sherds of Keian bichrome known from Kolonna (Fig. 4). They were, however, found in excellent contexts. The first, Q06/170-12, is a white slipped body fragment decorated with a red and black band. It comes from a late phase H or early I context equivalent to phase IVa at Ayia Irini. The other two sherds, Q6/38-4 and Q6/38-5, were found in a phase I deposit and probably derive from the same vessel. Although they technically are not decorated in a dark-on-light fashion, they are clearly related and have thus been included. The vessel has a brick red and highly burnished surface which is partially coated with matt white paint. White paint has also been applied as broad vertical and diagonal bands,
presumably some kind of vertical panels with zigzag, onto which thinner lines of black paint have been added. ZERNER (pers.com.m.) has likewise identified a few bichrome sherds from Lerna of probable Keian origin. From Areas D and DE she has identified two body sherds of a red micaceous fabric solidly coated with a light paint and superimposed black and red patterns. Both are from phase V:7 deposits.

4.3. Chronology and distribution
Locally produced bichrome pottery appears from the outset of the re-colonized settlement of phase IVa at Ayia Irini (OVERBECK1989, 33, J-14a–c; 37, M-12). One sherd from Kolonna lends support to this early first appearance. Although still rare in the succeeding phase, published examples suggest that the pottery peaked in phase IVb–c (OVERBECK1989, e.g. deposit S and AE). From phase V, equivalent to MBA III, only two Keian cups with bichrome decoration have been published (DAVIS 1986, 54 AA-1; 55 AA-9) while they are absent in phase VI contexts from House A (CUMMER and SCHOFIELD 1984). A few analogous sherds exist from Lerna V:7 but none are known from the succeeding phase VI. Admittedly based on a rather slim material basis, all present evidence nevertheless suggests a MBA II–III span for this variety of pottery. It stands clear then that Keian bichrome pottery had an extremely limited distribution outside the island. While locally produced monochrome equivalents found their way in some quantities to other places, notably Kolonna I, no bichrome decorated sherds have to our knowledge been reported in the published literature until now. The three sherds from Kolonna described above together with the information shared by Zerner from the unpublished deposits at Lerna V constitute the full list. The bichrome rim and handle fragment of a goblet from the Lower Town in Asine, suggested by NORDQUIST (1987, 50, 166, Fig. 30:3) to be Keian, is instead of Argive origin and is included under sections 7.1–2 below. IMMERWAHR (1971, 82, Nos. 320, 322, Pls. 21, 71) noted a few Keian sherds from Athens, but they are not bichrome decorated.

5. AEGINETAN BICHROME (“AIGINA POLYCHROME”)

During the past three decades several studies have outlined the export industry of pottery emanating from the island of Aegina during the MBA and LBA (LINDBLOM 2001, with references). It is commonly assumed that most if not all vessels manufactured of this distinct volcanic fabric were produced inside or around the fortified settlement at Kolonna (WALTER and FELTEN 1981; GAUSS and SMETANA 2007).

5.1. Description of pottery

Through his work at Tiryns and in the sherd collection at the British School at Athens FRENCH (1972, 35) was able to isolate a type of bichrome pottery present at several sites on the Greek Mainland that he provisionally christened “Aigina Polychrome”. Subsequent studies have conclusively shown that he was right in the attribution. It stands clear that the variety constitutes only a very small portion of an industry dominated by dark surfaced cooking jars, monochrome matt painted and plain storage and drinking vessels as well as burnished unpainted gray or solidly painted red or black drinking cups and mixing bowls (cf. ZERNER 1986, 64–66; 1988, 1–5, Figs. 1–23; MARAN 1992B, 179–199). In addition to these hand-made vessels, a local production of wheel thrown drinking and pouring vessels of Minoan derivation is attested from phases I and J at Kolonna (GAUSS and SMETANA 2007, 63–64).
There are in principle only two local fabrics represented at MBA and LBA Kolonna (GAUSS and KIRIATZI, Forthc., Macroscopic groups 1–2): One dark surfaced with coarse to medium fine non-plastics used almost exclusively for cooking jars (ZERNER 1993, 49, Gold Mica Red) and one medium to semi-fine grained and pale surfaced fabric used for all other vessels (ZERNER 1993, 49, Gold Mica Green/Yellow). But common to all, coarse dark surfaced as well as semi fine grained pale surfaced, unpainted, solidly painted or pattern painted, hand-made or wheel thrown, are the overarching similarities in the mineralogical constituents of their volcanic clay (MOMMSEN et al. 1994; HEIN, MOMMSEN and MARAN 1999; HEIN, MOMMSEN and ZENDER 2004; DORAIS, LINDBLOM and SHRINER 2004). Petrographic and geochemical characteristics of the bichrome variety are also presented below, based on analyses of imported vessels from the filing of the Lerna VI shaft graves.

The fabric of Aeginetan bichrome is semi fine grained, pale surfaced with or without a pale yellow slip and carefully wiped rather than burnished. The vessels often carry a potter’s mark on the resting surface or lower body (LINDBLOM 2001, 36, 140 Class AB). The range of shapes is limited. With the notable exception of a handful of pieces, all published examples where the shape can be recognized are either kraters or narrow-necked jars with a varied number and alignment of handles. The kraters are essentially bridge-spouted bowls on ring or solid splaying bases. The only fully preserved examples which have been published are from the VDL at Akrotiri (MARTHARI 1982, Nos. 5335 and 5336). Both have horizontal loop handles on the shoulder. The everted rim is relatively short, thick and often elaborated by a slight hollow on the tip. Narrow-necked jars have cylindrical or flaring necks with a flaring rounded or squared rim. Some jars have a protruding ridge at the junction between the neck and shoulder. The ovoid or globular body features two horizontal belly and/or two vertical neck to shoulder handles which are round in section. Once again, three largely preserved specimens from Akrotiri nicely illustrate the appearance of the jars (MARSHARI 1982, Nos. 2481, 2553 and 2599). Except for these dominating shapes, there are a few known instances of the panelled cup (WOHLMAYR 2000, Figs. 3:5, 63; PRUCKNER, Forthc.), carinated cup and jug with cutaway neck (P576 and P604 respectively in Fig. 5b). A handleless bridge-spouted jar is also known (MARTHARI 1982, No. 3699).

The bichrome decorated vessels should not be confused with contemporary examples produced in the same potting tradition which carry either exclusively red patterns (e.g. LINDBLOM 2007, Fig. 14 bottom) or decoration in a semi-lustrous paint which shifts from black to red within individual strokes (MARAN 1992B, 195–198). The bichrome patterns represent an elaboration of the ones known on Aeginetan monochrome matt painted and those employed on the contemporary Southern and Central Greek Mainland. Only in a few instances is it possible to discern LM IA influences in the choice of motifs. Representations of birds or plants exist, but are rare (LINDBLOM 2001, 36 and N. 126). Instead the patterns are dominated by broad carelessly executed wavy bands in red and black, vertical and/or horizontal double lines with fillings of quirks, wavy lines, chevrons, cross-hatching or dashes. Monochrome or bichrome opposing or intersecting diagonals on the shoulders are also common as well as pendant semicircles. The krater rims are almost invariably painted red (usually) or black (seldom) on the interior and exterior with a band of a contrasting colour at the exterior junction of rim and shoulder. The bases of handles, both on kraters and jars, are usually surrounded by circles or figure-of-eight motifs while kraters have a horizontal band at or slightly above the junction between the lower body and base.

5.2. Evidence from Kolonna and Lerna

HILLER (1975, Nos. 4, 16, Pl. 1–2) presented two unstratified krater fragments of Aeginetan bichrome from Kolonna. Additional examples of kraters and narrow-necked jars from the old
excavations derive from phase K Rooms 7 and 10 adjoining the phase I fortification wall (WOHLMAYR 2000, Figs. 2.1–3, 3.5; 2007, Figs. 15a–b, 16a–b, 17, 18). Interesting initial results on early phase K bichrome pottery derive from a well from which roughly 600 kg of pottery was retrieved during excavation in 2001. PRUCKNER (Forthc.) estimates that around two per cent of all locally produced pottery from the deposit is bichrome decorated. Although all the usual shapes are attested, closed shapes are more dominant than open ones. Among the more interesting pieces, there are some fragments of panelled cups decorated with LM IA inspired rosettes, alternating spray of sacral ivy and pendant semicircles. There is also a bowl with raised loop handles decorated with a horizontal foliate band. These are, it must be stressed, rare examples but they show that the Aeginetan potting tradition exhibits Minoan and Cycladic influences in shapes and motifs also in phase K.

From the new excavations in the Q-trenches on the “South Hill” comes a 3.5 m thick continuous stratigraphic record which has been thoroughly studied by Gauss, Lindblom and Smetana since 2002. It spans ceramic phases D–L (EH III–LH II/III) from which a little over 25,000 sherds in well defined deposits were singled out and studied separately (GAUSS et al. 2008). Although bichrome sherds are rare in the investigated deposits, there is very strong support that the locally produced variety first appears in phase K. Two bichrome sherds, presumably of local production, from much earlier phase I deposits (Q6/141-024 and Q6/146-21) are isolated incidents which drown in the overall statistics. They may be intrusive, accidentally fired bichrome or represent isolated attempts to imitate MBA II Theran/Melian bichrome. No Aeginetan bichrome is so far attested from the following phase J, but is represented by around 25 sherds from phases K and L. The fragments derive mainly from kraters (Q3/102-10, Q3/165-58) but several sherds probably come from narrow-necked jars (e.g. Q6/18-16) as well (Fig. 5a).

Similar to the situation at Kolonna, there are two Aeginetan bichrome sherds from Lerna V which predate the LBA I (ZERNER pers. comm.). There is one bowl with an incurved rim from a mixed MBA I–II context and a MBA III wide-mouthed jar with everted rim. From the succeeding phase VI, however, very large amounts were retrieved in the fillings of the two shaft graves (Fig. 5b; LINDBLOM 2007, 124, Fig. 9, 131–34, Figs. 14–17; CASKEY 1955, 34, Pl. 17a, b top left; 1956, 155–157). In 2006 the authors sampled two monochrome and five bichrome decorated sherds for mineralogical and chemical characterization.

Under the polarising microscope these samples have fabrics belonging to the Gold Mica Green/Yellow class (ZERNER 1993, 49) or Macroscopic group 2 (GAUSS and KIRIATZI; Forthc.) mentioned above. There is variation in the quantities of coarser material present and in the occurrence of specific types of inclusions, but they clearly belong to the same fabric class. They are semi-fine grained, with rare subangular grains of volcanic rock, limestone and twinned or zoned plagioclase measuring up to 1.5 mm, exemplified here by sample P599 (Fig. 10c). There are occasional subangular grains of twinned or zoned plagioclase, limestone, microfossils and polycrystalline quartz, measuring about 0.1-0.5 mm. The matrix is calcareous and contains well sorted silt to very sand grains of monocristalline quartz, limestone, biotite, white mica and amphibole. The fabrics are consistent with an origin on the island of Aegina, but the geological similarities with Theran/Melian fabrics should also be noted.

A few bichrome decorated sherds from the Lerna shaft grave fills were also subjected to Neutron Activation Analysis at the Helmholtz-Institut für Strahlen und Kernphysik at Bonn. The procedure routinely applied for many years is a modified version of the one used in Berkeley (PERLMAN and ASARO 1969) and has been described at length in MOMMSEN et al. (1991). A powdered pottery sample of about 80 mg is needed. As standard the Bonn pottery standard calibrated with the Berkeley pottery standard is taken. The concentrations of about 30 minor and trace elements, if present above detection limits, can be...
measured with high precision. This set of concentration data, well accepted as an analytical tool today, represents the chemical composition of the clay paste prepared by the ancient potters using one or several clay beds and, therefore, is characteristic for the ceramic products of a workshop.

Sherd P533 was measured twice and has the composition of a large group of pottery from Aegina named AegA which is well known to us. It is assigned to a production centre on this island (Mommsen et al. 2001). The average concentration values of the two measurements and their spreads (root mean square deviations) are shown in column 2 and 3 of Table 1 and compared with the reference values of group AegA in column 4 and 5, adjusted with respect to this group with a best relative fit factor of 0.95. The advantages of such a best relative fit, often called “dilution correction”, when comparing concentration patterns have been demonstrated recently (Mommsen and Sjöberg 2007). The two solid dots in cluster AegA in Fig. 11 represent the two measurements of sherd P533. Two MBA bichrome sherds from Katsingri on Profitis Ilias near Tiryns, previously measured and stored in our databank, also show this pattern AegA and originated from Aegina (Mommsen et al. 1994, Nos. 34 and 36; for the provenance of a third bichrome sherd, No. 35, at the time a chemical single, see section 6.2 below).

The shapes of the Aeginetan bichrome vessels as encountered in the fills of the Lerna shaft graves correspond closely to those attested elsewhere, but occasionally carry some hitherto unknown or poorly attested decorative patterns. They will be fully presented in a separate study of Lerna VI and only a selection is included here (Fig. 5b). The carinated cup P576, possibly footed, is a rare shape. It is decorated with red zigzag between dark gray bands. Some narrow-necked jars, e.g. P616 and P621, feature quirks and filled lozenges on the shoulder. The handle and body fragment of jar P193 nicely illustrates the frequent use of two colours in opposing or intersecting diagonals. P606 has a red band on the interior rim and features the more or less mandatory circle around the base of the vertical handle. The body sherd of jar P623 has a decoration of vertical bands framed by joining semicircles which finds good parallels in the VDL at Akrotiri (Martthari 1982, Fig. 5e, στ; 1993, Pl. 31e–f). Together with a yet unpublished piece from Kolonna (Pruckner pers. comm.), the spout P604 shows that the jug with cutaway neck should be included in the known repertoire of shapes. It is, however, extremely rare. Most fragments from the Lerna shaft graves instead derive from kraters, illustrated here by P598 and P602. Most are decorated with wavy bands, but vertical and/or diagonal bands, sometimes with chevrons or quirks, are fairly common as well. The shape and motif of P599, confirmed by petrography to be Aeginetan, is unique so far. Its shape is perhaps best described as a deep bowl and it features bichrome pendant triangles below the rim.

5.3. Chronology and distribution

As described above, there is very good stratigraphic information on the chronology of Aeginetan bichrome pottery at Kolonna and Lerna. Except for four sherds in all known MBA deposits at these places, it is exclusively confined to LBA I levels at Kolonna K and Lerna VI; the two MBA sherds from the extremely well attested phase I levels at Kolonna should be compared with roughly 13 kg of bichrome pottery from less well represented phase K levels at the same settlement. The only previously published Aeginetan bichrome sherds from contexts suggested to predate LBA I are from the Lower Town at Asine (Dietz 1991, 84, Nos. 219–222, Fig. 24). This observation, however, hinges on exactly what ceramic parameters define Dietz’ MBA III in the Argolid and the purity of the deposits in question (cf. Rutter 1993b, Kramer 2004, 197–200). The sherds at MBA II–III Kolonna, Lerna and Asine are in any case so few that we do not hesitate to describe the regular circulation of
Aeginetan bichrome pottery in the Central Aegean as an LBA I–II phenomenon. At Akrotiri, the variety is absent in late MBA (NIKOLAKOPOULOU 2007) but present in the VDL (MARTHARI 1982, Nos. 2481, 2553, 2599, 3699, 5335, 5336). Only limited information is available on the ceramic composition of the intermediary SDL, but it is perhaps significant that MARTHARI (1984; 1990B: 60) does not mention this bichrome variety of which she is thoroughly familiar in connection with the vessels imported from the Greek Mainland. The pottery is also well represented in LBA I East Alley levels XII–XVI at Kourakou (DAVIS 1979B, Fig. 5.33, 39, 46–48, Pl. 73c:28, 48) and in deposits of the same date from the NE Cemetery at Asine (DEITZ 1980, Nos. 294–98). RUSSER and RUSSER (1976, 46, Nos. 723–25, Ill. 16, Fig. 26) identified a few fragments in deposit N at Ayios Stephanos, recently presented in additional detail and dated to LBA I/II (ZERNER 2008, 275). The lower chronological limit of the pottery, however, is not as well investigated. A newly excavated grave at Kolonna contained a large fragment of a krater with double wavy bands together with three early LBA II Mycenaean Decorated vessels (FELTEN et al. 2007, 99, Fig. 22.1–2). A narrow-necked jar comes from a securely dated mature LBA II deposit at Tsoungiza (RUSSER, Forthc., No. 65). Two krater fragments of late LBA II date have also been found in the fillings of Well Z on the south slope of the Acropolis in Athens (MOUNTJOY 1981, 35, 40, Nos. 280–81, probably erroneously claimed to be LBA I cast-ups). Finally, a packing below the entrance to the potter’s kiln on the “South Hill” at Kolonna contained a krater together with Late Helladic IIIA1 pottery (FELTEN et al. 2005, 26–7 and Fig. 23:8). These limited occurrences suggest that the pottery was fading out of circulation during the later stage of LBA II and ceased to be produced altogether at the transition to LBA III.

Since Aeginetan bichrome vessels were produced in much smaller quantities and for a considerably shorter period of time than most other varieties of pottery on the island, their known distribution is consequently more restricted (Fig. 6). The map can be compared to the accumulated evidence of Aeginetan MBA I–LBA I imports to settlements in the Aegean and even further away (ZERNER 1993, 56, N. 63; RUSSER 1993A, 777, Fig. 12; LINDBLOM 2001, 43–44, Table 9). Recently published Aeginetan bichrome vessels not mentioned by these authors come from Athens (GAUSS 2000, 171 and N. 38) and Mitrou (LIS 2008, 142, N. 11).
Polychrome”. The ceramic definition of this variety of pottery has developed from being inclusive and general (Blegen 1921, 28–30) to become ever more exclusive and specific (e.g. Dietz 1991, 32, 303–303; Zerner 1993, 48, Class IV:3). Since the mid 1970’s it is not used to signify all bichrome sherds thought to derive from the Mainland, but only a distinct group which on more or less solid grounds are believed to have originated somewhere in Central Greece. The label should therefore be replaced with one which reflects this usage. Based on our analyses presented below, we suggest the term Boeotian bichrome instead. Unlike Aeginetan bichrome, the attribution of this pottery is not based on similarities in geology and chemistry between fired vessel fabrics and naturally occurring clay beds. It is instead grounded in the known distribution and concentrations of pottery coupled with chemically homogenous control groups of analyzed sherds. A very sizable body of data exists on this type of finely burnished pottery with usually detailed execution of bichrome decoration. New but still unpublished data from Boeotia and Phoci, especially from settlements such as Mitrou, Thebes and Kirrha, will additionally improve our knowledge.

6.1. Description of pottery
Like many unpainted and monochrome matt painted vessels produced in Central Greece towards the end of the MBA and early LBA, most bichrome vessels were made of a very fine grained fabric. It often has some small to medium sized (0.5–2 mm) chalky white grits, sometimes exploded on the surface and visible only as small pockets. Small platelets of silver mica are also visible to the naked eye in many cases. The exterior surfaces are often reddish yellow or light red while the core can be considerably darker depending on its thickness and the firing temperatures. The surfaces generally assume a darker colour than the other varieties of bichrome pottery described here and are finely burnished to a high and even lustre. Small vessels were usually wheel thrown but hand-made specimens probably occur among large closed shapes (cf. Maran 1992B, 168–69).

There are several hundreds of published instances of Boeotian bichrome vessels. Mathioudaki (2009) illustrates a large number of unstratified sherds from the collections at the American School of Classical studies at Athens and the Leonardou storage facility of the archaeological museum in Nauplion. The range of shapes encountered in funerary assemblages on the NE Peloponnese has been summarized by Dietz (1991, 218–222). It includes the rounded and straight-sided cup, panelled cup, askos, horizontal-rimmed juglet, large jug with beaked and/or cutaway neck, amphoriskos and narrow-necked jar with horizontal belly handles and/or vertical shoulder handle(s). To these should foremost be added the commonly attested krater (e.g. Alden 2000, 551, No. 52-32, ARAVANTINOS 1988, 188, Pl. 1178; Wålberg 2007, Fig. 122:1363; Maran 1992B, Pl. 9:342) as well as a shallow footed bowl with raised horizontal handles (Goldman 1931, 170, Pl. 17.1; 172, Fig. 239). Unlike Aeginetan kraters but common to some Argive examples, the Boeotian ones often have a horizontal ledge rim, sometimes vertically flattened on the side and with a sloping tip, the so-called “hawk’s beak” rim (Davis 1979B, 243 Nos. 52–53, Fig. 5). The absence of kantharoi and goblets should be noted, especially since both shapes are securely attested among Argive (Fig. 9a-b) and Lakonian (Rutter and Rutter 1976, 10, 39) examples.

The decoration usually consists of a dark gray or gray and often fugitive paint supplemented by red or reddish brown paint. More so than on other varieties of bichrome pottery described here, the two colours work to supplement each other and are closely integrated in a structural division of large vessels by usually horizontal but sometimes also diagonal and/or vertical tripartite bands. Normally a thick red band is framed by at least two thinner black lines. Also very popular is the small zigzag in red or black framed by bands of a contrasting colour (Davis 1977, 270, No. 4, Figs. 1:4, 3:4; Jannoray and van Effenterre 1938, 124, No. 23, Pl. 22:6). Triple wavy bands, bichrome and very broad and deep
(ADRYMI-SISMANI 2004–2005, 4, Fig. 3 lower left; ARAVANTINOS 1988, 188, Pl. 117β), or single, thin and tight (MYLONAS 1972–1973, 123 K-109, Pl. 103β), occur as well. Outlined, filled or reserved pendant semicircles, hatched or cross-hatched lozenges, and dotted bands are also fairly common (DIEZ 1991, 223, Fig. 70). Similar to Thera/Melian bichrome and probably the main reason why the two varieties were often confused up until the 1970’s, birds are depicted on some vessels as well (MYLONAS 1972–1973, 123, Pl. 103β; CUMMER and SCHOFIELD 1984, Pl. 60a; YALOURIS 1965, Pl. 6a). A griffin is depicted on one narrow-necked jar from Grave VI in Circle A at Mycenae (KARO 1930, Pl. 174:948).

6.2. Evidence from Kolonna and Lerna

From the “South Hill” LBA I deposit Q6/18 at Kolonna (FELTEN et al. 2004, 124 and Fig. 30) come several bichrome sherds which show all characteristics of being Boeotian imports (Fig 7a). The complete profile of the wheel-thrown Vapehio cup Q6/18-6 is decorated with pendant and standing filled semicircles with five bands at the midrib. It finds a nice parallel, possibly the product of the same potter, in P464 from the floor of Shaft Grave 2 at Lerna (Fig. 7b). Two fragments from narrow-necked jars, Q6/18-12 and Q6/18-13, are also decorated with bichrome bands and have additional decoration in the form of zigzag and dots respectively.

There are no Boeotian bichrome vessels present in Lerna V deposits. The late LBA I Lerna shaft graves, however, contained numerous fragments, some of which are illustrated here (Fig. 7b) and discussed in greater detail below. Like P464, the rounded cup P465 was found on the floor of Shaft Grave 2 (LINDBLOM 2007, 117, Fig. 2). It is presumably wheel-thrown although fine burnishing has effectively removed all traces of possible wheel ridges. It is decorated with cross-hatched lozenges and has groups of vertical black strokes superimposed on red areas on the interior rim. Equally delicate in manufacture and appearance is the fragmentary rounded cup P56 and the small lid P476 with black zigzag framed by several bichrome bands. Two fragments of amphoras, P470 and the better preserved P471, are decorated with zigzag and filled pendant semicircles. Large narrow-necked jars are represented by P741 and P742. The first is decorated with a broad wavy band into which black tongues have been inserted while the second features part of a bird (water fowl?) above opposing diagonals with fills of wavy bands. Slightly surprisingly, no kraters from the Lerna shaft grave fills can be safely attributed to Boeotian bichrome. Instead, this shape appears to be exclusively of Aeginetan (section 5.2) or Argive (section 7.2) origin.

The fabrics of P741 (Fig. 10d) and P742 are fine grained with few distinguishing features. The coarsest inclusions are about 0.2 mm, consisting of subangular to rounded limestone. There are grains of monocristalline and polycristalline quartz measuring up to 0.1mm, but for the most part these fabrics contain well sorted silt-sized grains of monocristalline quartz, biotite and white mica. The matrix is calcareous in character with crystallitic calcareous material distributed in patches throughout. P742 is slightly coarser grained than P741, with a larger proportion of quartz of about 0.1 mm in size and fewer limestone inclusions. The compositions of the samples are consistent with many areas of Greece and chemical analysis is the key method for determining potential sources. According to the NAA results eight samples from the Lerna shaft grave fills can be attributed to Boeotia or Euboea. All of them have concentration profiles which are well attested in our databank. All of them, however, have not been produced with a chemically identical paste, but show different patterns. According to reference material at our disposal, some of these patterns can be assigned with high confidence to certain regions in Boeotia and/or Euboea.

Samples P56, P57, P741, and P742 (all but P57 illustrated in Fig. 7b) have compositions that statistically conform with a chemical pattern already attested as Thes
(SCHWEDT et al. 2006, Pattern P). The concentration data of these sherds are given in Table 2, columns 6–11, and, again after application of a best relative fit factor, compared with pattern Thep in column 12 and 13 (the slightly different values of group Thep compared to the published group P are caused by a re-evaluation of the data). Since nearly all members of this group belong to Hellenistic pottery from Tanagra, this clay paste, already exploited during the MBA period, points to an origin from this area with high probability.

Sample P471 (Fig. 7b) has the different pattern Thea published as pattern A in SCHWEDT et al. (2006) and before that as the first pattern a of Table 1 in MOMMSEN et al. (2002). The data of sample P471 and the comparison with its reference pattern Thea is given in Table 1, last four columns. This pattern represents the main Theban pattern during the Mycenaean palatial and post-palatial periods and occurs also in the Hellenistic period. Due to distribution arguments, since most members of this pattern come from Thebes, it can be assigned with some confidence to production workshops there.

A chemically clearly different pattern Thec is present in sample P740 (Table 1, columns 10–13). For example the Cs value of Thec is about twice as large as of Thea. This pattern, called D in SCHWEDT et al. (2006) and c in MOMMSEN et al. (2002) (Table 1, column-pair 3), probably originated from eastern Boeotia or Euboea, since most of the Bronze Age members of this group have been found at sites very close to the strait between Boeotia and Euboea.

Yet a different, but to Boeotia generally related, chemical pattern Theh is found in sample P753 (Table 2, column 2–5). The composition, published in Table 1 of MOMMSEN et al. (2002) as pattern h in column-pair 7, occurs mainly in Mycenaean sherds from Orchomenos, but since the number of members of this pattern is still small, only a general Boeotian provenance of this paste can be suggested.

Sample No. 35 from Profitis Ilias (section 5.2 above), at the time published as a chemical loner, also has a Boeotian composition. It is a member of group Theb (group B in SCHWEDT et al. 2006, group b in MOMMSEN et al. 2002, Table 1, column-pair 2). This group was assigned to the area Thebes/Boeotia due to distribution arguments of its members.

6.3. Chronology and distribution

Ceramic deposits at most LBA I settlements in Attica and Boeotia lack the chronologically sensitive Lustrous Decorated Mycenaean pottery (MOUNTJOY 1999, 491, 664). For unknown reasons, but probably due to large distances to the nearest production area of this pottery, only a handful of sherds are known. Its uneven distribution during the initial stage of the LBA complicates the establishment of a fine-tuned chronology for Boeotian bichrome. To give the two most extremes, the pottery may theoretically have first appeared in MBA III as presently defined on the NE Peloponnese, but with no or only sporadic appearances outside its core area in Boeotia. Alternatively it may in fact have a mature to late LBA I inception, based on its abundant occurrences at contemporary settlements and in tombs around the Argive Plain and at Kolonna on Aegina. A first and limited appearance in early LBA I, concurrent with Aeginetan bichrome and the first Lustrous Mycenaean in Lakonia, and peak of distribution in a late stage of the period is currently our best estimate. The risk of circular reasoning is however apparent; LBA I is defined by Boeotian bichrome while individual deposits are dated to the period because of its presence. Additional accounts of superimposed ceramic deposits from settlements in Boeotia are badly needed to resolve the issue. Preliminary results from the ongoing excavations at Mitrou, for instance, suggest that the settlement could provide important data of direct relevance (RUTTER pers. comm.). The pottery is present in LBA I and II deposits, presently under study by Olga Kiriatzi and Salvatore Vitale respectively.
As described above, there is good evidence of Boeotian bichrome from mature to late LBA I deposits at Kolonna and Lerna. Equally significant is the lack thereof at Lerna V and Kolonna J. A closed settlement deposit of LBA I date from Thebes contained at least two fragmentary vessels (ARAVANTINOS 1988, 188, Pl. 117γ–δ). The pottery is present at Ayia Irini VI (CUMMER and SCOFIELD 1984, 47, Nos. 835–36, Pl. 64; DAVIS and CHERRY 1990, Fig. 6b; CASKEY 1972, 392–93 G43, Pl. 93) but is apparently lacking in phase V (DAVIS 1986). Several examples are known from the VDL at Akrotiri (MARTHARI 1982, Nos. 1505–1507, 3589) but have not been reported from the scattered MBA deposits (NIKOLAKOPOULOU 2007). From both grave circles at Mycenae, especially Graves IV–VI in Circle A, there are 27 known vessels. Because of multiple interments and the small number of vessels in many graves, their phasing is not straightforward and liable to different conclusions by various scholars (contrast e.g. DICKINSON 1977, 50–51; GRAZIADIO 1988; and DIETZ 1991, 243–50). Suffice it to conclude that there are no particular reasons to suspect that Boeotian bichrome appeared before LBA I in the sequence of shaft graves in the two circles at Mycenae. The lower chronological limit for the pottery is appreciably later than Melian/Theran and Keian bichrome and similar or even slightly later than Aeginetan bichrome. From the ceramic content of late LBA II Well E on the south slope of the Acropolis comes a single sherd (MOUNTJOY 1981, 26, Fig. 11:107) and at the Mycenaean palace at Dimini there appear to be some sherds even from LBA II/III deposits (KRAMER 2004, 244 and N. 228).

Since much of what we here label as Boeotian bichrome is often assembled under the more general and potentially ambiguous heading of “Mainland Polychrome” it is difficult to grasp its distribution from published sources. New sites are continuously being added as well with the result that the map in Fig. 8 should only be seen as a qualified estimate based on published lists (FRENCH 1972, 33–34; DIETZ 1991, 302 and Fig. 90) and updated with later reports (e.g. ADRYMI-SISMANI 2004–2005, 4, Fig. 3, left top and bottom and middle in centre row [Dimini]; NORDQUIST 1995, Nos. 784–85, Fig. 42 [Southern Argolid]; MÜLLER-CELLKA pers. com. [Eretria]; SARRI 2007, 162, Fig. 7.1 [Ay. Konstantinos]; MARAN 1992B: 168–69 [Kiapha Thithi]; KRAMER-HAJOS and O’NEILL 2008, Fig. 24 D6–7 [Mitrou]). Outside the Aegean a few sherds have been reported at Filicudi in the Aeolian Islands (CAVALIER and VAGNETTI 1983, Figs. 1–3). Two clusters are apparent from the map, one in Boeotia and Phocis (A) and one on the NE Peloponnese (B). In between these there are only a few reported findings, probably due either to uneven exploration of prehistoric sites in Attica and/or because of a different access in this area to exchange networks during LBA I (MARAN 1992B, 168). One could hypothesize that the strong presence of this pottery on the NE Peloponnese was because it was actually manufactured there instead of in Central Greece. Four circumstances speak against this suggestion however: (i) based on chemical analysis of vessels in the Lerna shaft graves, the patterns are incompatible with a Peloponnesian origin, but find excellent parallels in well defined groups of pottery from Boeotia/Euboea; (ii) there is a striking similarity in shapes, surface finish and decoration between the Boeotian matt painted monochrome and the more sparsely but evenly occurring bichrome pottery; (iii) a marked overlap of Aeginetan and Boeotian bichrome pottery only occurs in the NE Peloponnese. This suggests to us that the LBA I inhabitants in this area sought to acquire several kinds of bichrome vessels because they had a very limited local production of their own (section 7 below) whereas the inhabitants in Central Greece, with close access to an excellent local repertoire of bichrome decorated shapes, were less eager to obtain Aeginetan equivalents; (iv) while few sites in the NE Peloponnese have been added to the known list of receivers since French’s initial list in 1972, it has been supplemented with several new ones from Central and Northern Greece. Continued exploration in the latter areas will most likely strengthen this picture further.
7. **Argive Bichrome (“Argive Red and Black”)**

The temporal and spatial definition of different kinds of Peloponnesian bichrome pottery poses more difficulties than the other groups described above. The reasons for this are partly contradictory. There is a marked unevenness in our knowledge of the MBA–LBA I ceramic repertoire from different areas of this vast land mass and there are still several virtually blank spots. At the same time some settlements, notably Lerna (Zerner 1978; 1986; 1988; 1993; Lindblom 2007), Argos (e.g. Deshayes 1966; Philippa-Touchais 2002; 2003; Kilkoglou et al. 2003), Asine (Frödin and Persson 1938; Nordquist 1987; Dietz 1991) and Tsoungiza in the Argolid (Rutter 1989; 1990), Ayios Stephanos in Lakonia (Rutter and Rutter 1976; Zerner 2008; Whitbread and Jones 2008) and Nichoria in Messenia (Howell 1992), have been intensively investigated. At some of these places a detailed and sometimes complex picture emerges. Based foremost on available petrographic and chemical data we have singled out two areas where it is presently possible to argue for a local production of bichrome pottery. Of these, the Argive bichrome variety is more widely attested than the Lakonian, which is described separately under section 8 below. Additional productions centres, e.g. in Messenia, may well have existed, but sufficient information to identify them is lacking (cf. Howell 1992, 68 P2822, N. 47, Fig 3-76 [Nichoria]; Valmin 1938, 299, 303, Pls. 4.20, 23.D.2 [Malthi]). Some bichrome decorated vessels from such an unidentified Mainland place presently appear under the name “Matt Painted Pink and White” or “Strawberries and Cream” (Zerner 1986, 68; 1993, 48). Sherds of this kind are represented in some quantities at MBA III–LBA I Lerna, but because of their unknown origin they are not included below.

It is probably best to understand many of the scattered references to Argive bichrome sherds in relation to the Boeotian variety outlined above, since they are presently defined more by their deviation from the latter rather than forming a well recognized and commonly accepted group in their own right. Bichrome sherds which for some reason could not be identified as either Aeginetan or Boeotian (sections 5–6 above) but were still judged to be Mainland products were partially left in the twilight during the 1970’s and 1980’s (cf. Kramer 2004, 163–72). Davis (1979B, 243) defined an “Other” (i.e. not Aeginetan or Boeotian) category of bichrome sherds at LH I Korakou. Rutter (1989, 11) suggested that there is a “related form of bichrome matt-painted decoration…with a better claim to being a local product” at LH I Tsoungiza. Dietz (1991, 80, Nos. 189–191, 193–195) defined “Argive Red and Black” based on pottery at Asine. Zerner (1993, 44) used the term “Argive Bichrome” for examples found at MBA–LBA I Lerna. Albeit still relatively few, there is thus a growing number of reported sherds which are dissimilar enough from other described varieties of bichrome pottery, especially the Boeotian, to have led several skilled ceramic analysts to more or less explicitly suggest an Argive place of origin. This material deserves more attention in the future. Since most vessels have been found at Lerna, we include also the few examples known from other settlements under the same section.

7.1. Evidence from Kolonna, Lerna and other settlements

There are so far no known examples of Argive bichrome sherds at Kolonna. At Lerna, on the other hand, Zerner (1993, 44) has identified a limited but nevertheless unbroken use from the outset of the MBA into LBA I. We elaborate on the chronology below. For the moment it is enough to note that the very long time during which this pottery was manufactured together with the few instances actually known from each period, especially during the MBA, make all attempts to summarize the development very sketchy.
A magnificent jar with a narrow, tall cylindrical neck, flaring rim and four evenly spaced spool lugs comes from a transitional EBA–MBA layer at Lerna (ZERNER 1978, 52–53 D563/7, Pl. VII). The body is smoothed while the neck and rim is burnished. The vessel carries an elaborate pattern of grainy red and matt brown paint with alternating vertical panels and multiple standing triangles on the body. From the same transitional phase comes a less assuming shoulder fragment of a rounded cup with part of an everted rim and vertical strap handle preserved (ZERNER 1978, 52 D563/5, Fig. 1). It has a red and brown horizontal band above what appears to be standing multiple triangles. Two shoulder fragments from rounded bowls were found in a phase V:1 deposit (ZERNER 1978, 59 D596/3–4, Pl. IX). They are decorated with red and dark brown multiple and cross-hatched triangles and vertical bars respectively. Also from the same period is a bowl with incurving rim (ZERNER 1978, 67 D600/4, Pl. X, Fig. 4). The exterior is lightly burnished and smoothed. The grainy red and matt brown decoration consists of horizontal bands with vertical bars below. From the succeeding MBA II there is a bichrome one-handed carinated cup from Area BE which may well be Argive (ZERNER 1987, 21 top left; pers. comm.). It is decorated with multiple black and red opposing diagonals in two registers on the body and has alternating black and red vertical strokes on the interior rim.

Three MBA I bichrome sherds from Lerna V have been analysed petrographically (samples 69–70 and 72). They consist of semi-fine to coarse mudstone, limestone and sandstone fabrics (Fig. 10). These grains are subangular to rounded and can be as large as 2–3 mm, with a mode at about 0.5 mm. They are accompanied with lesser quantities of mudstone breccia and chert, and very fine sand to silt-sized mono- and polycrystalline quartz and biotite, all set in a calcareous matrix. Sample 69 is considerably coarser than 70 and 72.

NORDQUIST (1987, 50, Fig. 30:3) published an early MBA III bichrome decorated goblet from the Lower Town in Asine as a possible Keian import. After a close visual re-examination of the fragment, we suggest that it is of Argive origin instead (Fig. 9a). The fabric is medium coarse grained and contains some subangular to rounded black and white as well as a few medium to small rounded dark red grits. The surfaces are slightly burnished and the interior is covered by a thin streaky semi-transparent brown slip, similar to many MBA–LBA I sherds from Mycenae and Berbati. The exterior is decorated with matt light gray multiple opposing diagonals above a red and light gray horizontal band. Its fabric, surface treatment, shape and decorative pattern strongly favour an Argive origin (cf. DIETZ 1991, 60, Nos. 79–80, Fig. 15).

From late MBA III and LBA I a considerably larger number of bichrome vessels are known. The upper body of a kantharos, probably a local product by virtue of its shape and decoration, comes from a late MBA III deposit at Argos (PHILIPPA-TOUCHAIS 2002, 12–14, No. 35, Fig. 7). It is decorated with a single chain between red and black wavy bands (Fig. 9b). A cup from Area B, Lot 1461, at Lerna has been examined under the polarising microscope (sample 84). The fabric is composed of well sorted fine sand-sized grains of quartz (up to about 0.25 mm), with lesser quantities of chert, mica, limestone and plagioclase (Fig. 10f). Similar to the early MBA samples, the matrix is calcareous in character. Additionally, six sherds from Asine have been published by DIETZ (1991, 80, Nos. 189–91, 193–95, Fig. 22). The shapes include a jug with cutaway neck, a jar, possibly spouted, with incurving and horizontally flattened rim, a wide-mouthed jar and a basin. DAVIS (1979B, 243 Nos. 69–71, Fig. 6) lists three sherds from LBA I Korakou. While his No. 69 is probably Aeginetan rather than Argive (cf. DIETZ 1991, Fig. 24.219), the other two derive from closed vessels with burnished surfaces. The known patterns include horizontal zigzag and wavy bands, a flower, pendant semicircles, and cross-hatched circles (e.g. DAVIS 1979B, 243, No. 70, Fig. 6; DIETZ 1991, 78, Fig. 22).
From the Lerna shaft grave fills, finally, we suggest that there is a handful of pieces of Argive manufacture as well (Fig. 9c). The contention is partly based on characteristic traits in their visual appearance and mineralogical constituents under the microscope, but relies predominantly on the geochemistry of the clays used for their manufacture. The shoulder and neck fragment P472 comes from a jug and has part of a vertical, thickened strap handle preserved. According to our NAA results it was manufactured somewhere on the NE Peloponnese. It is of the well known chemical composition MYBE (Mycenae/Berbati) as shown in Table 1, columns 6–9 and Fig. 11. This pattern was originally assigned to the Potter’s Quarter at Mastos in the Berbati Valley because of reference wasters from there (MOMMSEN et al. 2002, 621). Together with its sub-groups, the chemical pattern is abundantly attested in pottery found on the Peloponnese as well as in vessels exported to other settlements in Greece and the whole eastern Mediterranean area. In Table 1 the core MYBE reference group of 297 samples is formed only with sherds found at Argive sites, while the whole group including export pieces presently holds about 1050 sherds. Since sherds postdating Late Helladic IIIB, the assumed demise of the Berbati workshop (SCHALLIN 2002), also have pattern MYBE, we now tend to assign this group to one or several workshops around the Argive plain or in other areas of the NE Peloponnese. The fabric of P472 is fine grained with a few small sized reddish brown grits. The fracture, exterior and interior is pale yellow (2.5Y 8/2). The vessel was wheel-thrown and the exterior is polished to high lustre except for the area under the handle. The interior neck, which was separately attached to the shoulder, preserves deep wheel-marks. The horizontal band with dots below combines yellowish red (5YR 5/6) and gray (5YR 4/1) paint.

The krater’s rim P468 has a chemical pattern which is previously attested as well and provisionally labeled U120 (unlocated group No. 20; Table 2, last four columns; Fig. 11). Several other unpublished sherds from Lerna V display the same chemical composition, but it is also found in single sherds from other settlements in the Argolid (Aspis in Argos, Kandia, Katsingri on Profitis Ilias and Midea). A provenance determination is still not possible, but because of the currently known distribution of its group members we tentatively suggest that the vessels derived from a Peloponnesian workshop. Petrography reveals that krater P468 from Lerna VI is composed predominantly of well sorted, subangular to rounded, limestone grains up to about 0.1mm, and rarely reaching 0.7 mm (Fig. 10g). There are very few monocrystalline quartz (up to 0.1 mm), rare grains of orange serpentinite and sandstone (up to 0.2 mm), and quartz, biotite and white mica silt. A few small sparkling platelets of silver mica are visible on the surface. While the fracture is very pale brown (10YR 7/3), the exterior and interior surfaces are pink (7.5YR 7/4). The vessel was hand-made and while the exterior is slightly burnished the interior is finely wiped. The decoration was painted in weak red (10R 4/4) and very deep wheel-marks. The horizontal band with dots below combines yellowish red (5YR 5/6) and gray (5YR 4/1) paint.

The krater P467 is a well and provisionally labeled U120 (unlocated group No. 20; Table 2, last four columns; Fig. 11). Several other unpublished sherds from Lerna VI are composed predominantly of well sorted, subangular to rounded, limestone grains up to about 0.1mm, and rarely reaching 0.7 mm (Fig. 10g). There are very few monocrystalline quartz (up to 0.1 mm), rare grains of orange serpentinite and sandstone (up to 0.2 mm), and quartz, biotite and white mica silt. A few small sparkling platelets of silver mica are visible on the surface. While the fracture is very pale brown (10YR 7/3), the exterior and interior surfaces are pink (7.5YR 7/4). The vessel was hand-made and while the exterior is slightly burnished the interior is finely wiped. The decoration was painted in weak red (10R 4/4) and very deep wheel-marks.

The rim P467 from a second krater and the shoulder fragment P473 from a narrow-necked jar have not been subjected to chemical analysis. Their fabrics are, however, indistinguishable to the naked eye from the abundantly attested unpainted and monochrome matt painted sherds in the Lerna shaft graves which we believe to be at home on the Argive Plain. Their paler surfaces and slightly different colours in the decoration compared to most Boeotian bichrome lend some additional support to the attribution (cf. RUTTER 1976, 51; 1989, 11). We readily acknowledge, however, the difficulties in distinguishing the two varieties based only on ocular inspection. The krater P467 has a fine grained fabric with a few medium and some small sized reddish brown grits. Its fracture is light gray (10YR 7/2) and the exterior and interior is very pale brown (10YR 7/4). The fragment is too small to determine the manufacturing technique, but it appears to be hand-made. The exterior and interior are burnished and the decoration is gray (5YR 5/1) and reddish brown (2.5YR 5/4). The jar P473 is of a semi-fine grained fabric with some medium to small sized dark gray as
well as an occasional white grit. The fracture is pink (7.5YR 7/4) and the surfaces assume a very pale brown (10YR 7/4) colour. The exterior is slipped and slightly polished while the interior is smoothed.

7.2. Chronology and distribution

The manufacture of Argive bichrome vessels started in the earliest MBA at one or several yet unknown places. Examples predating MBA III are so far only attested at Lerna, but additional ones, especially from Argos and Asine, may still be hiding in store rooms. The re-examined goblet from Asine and the kantharos from Argos suggest some use of the pottery at these settlements as well from MBA III onwards. There are possibly two spatially (and chronologically?) discrete groups of Argive bichrome pottery, perhaps unrelated to each other when it comes to the location(s) of manufacture in the Argolid; one so far only attested at MBA I–II Lerna and a second MBA III–LBA I represented also at Asine, Argos, Tsoungiza and Korakou. Could it be that the first group was produced at Lerna itself? We are inclined to see the transitional EBA III/MBA I and early MBA I vessels as a continuation of EBA III traditions at Lerna in the use of a red firing iron-based paint coupled with the addition of the newly discovered matt manganese based paint (cf. Zerner 1978, 151). The knowledge of bichrome decoration was always kept alive at this settlement, but only seldom used for several generations after early MBA I. Vessels of the second and more widely attested MBA III-LBA I group should perhaps best be seen as regionally confined alternatives to other contemporaneous bichrome vessels in the Central Aegean. None of the rather dissimilar MBA I–LBA I Argive bichrome fabrics analysed by petrography (Fig. 10e–g) is especially characteristic of any particular district in that the rocks represented by the inclusions occur in many regions of Greece. While this does not rule out the possibility of establishing associations between specific fabric types and particular styles of pottery, NAA offers better indications of various production areas for fine grained samples. The chemical compositions of P468 and P472 indicate that manufacture took place at minimally two different places during LBA I. The geochemistry of selected Lerna V pottery samples to be presented by Richard Jones may shed additional light on the subject.

8. LAKONIAN BICHROME

The last group of Central Aegean bichrome vessels described here comes from Lakonia. It is best attested at MBA-LBA II Ayios Stephanos, but may well occur also at other settlements in the area (cf. Banou 2000, 196 and Fig. 1).

8.1. Description of pottery

Already in the 1970’s, Rutter noted the presence of bichrome vessels among his “Fine White-Slipped Matt-painted” class in MBA III deposits at Ayios Stephanos (Rutter and Rutter 1976, 10, 39, Nos. 297–308). Five sherds were subjected to Optical Emission Spectroscopy and their chemical compositions were found to be atypical to other reference samples from the site (Jones 1986, 424; Whitbread and Jones 2008, CD-89, CD-115). The vessels probably derived from a yet unknown production centre on the Greek Mainland or elsewhere and are not considered any further here. However, four additional LBA I-II bichrome sherds from the “Local Fine Matt-painted” (Rutter and Rutter 1976, 51, Nos. 714, 718, 720, ill. 16) were also analysed, three of which were found to fit well with a local or regional manufacture (Jones 1986, 421, Table 5.1, Nos. 48–51, 424). Rutter and Rutter (1976, 9, N.
10) described the group of bichrome vessel as “a local version of French’s [1972] Mainland Polychrome Matt-Painted...”.

The recent publication of the complete MBA–LBA I ceramic sequence at Ayios Stephanos (ZERNER 2008) together with additional petrographic and chemical analyses (WHITBREAD and JONES 2008) offers additional evidence. One bichrome sherd, No. 2321, was discussed from an integrated archaeological, petrographic and geochemical perspective (ZERNER 2008, 295, No. 2321; WHITBREAD and JONES 2008, CD-90, 94, 100–101, 114, Fig. A2.5, Pl. A2.1e). The sherd is of a gritty fabric from a closed, white slipped vessel with matt bichrome decoration. It is dated on typological grounds to MBA–LBA I. The fabric contains well sorted, subangular to rounded grains of quartz, quartz-white mica-biotite schist, phyllite, limestone, microfossils and chert, plagioclase and argillaceous rock fragments, set in a fine-grained, calcareous matrix (Fig. 10h). The mineralogy on its own is not specific to a particular area, but may be distinctive if taken into account with stylistic properties and potters’ preferences for raw materials. Based on the percentage of nine elements measured by Atomic Absorption Spectrometry (AAS), Jones concluded that the vessel has a chemical composition “that can be accommodated within the ranges of the ‘canonical local’ composition type (WHITBREAD and JONES 2008, CD-115 and Table A2.4). It is difficult to compare the AAS data presented by Jones with NAA data at our disposal. Since only five elements agree between the two sets and a good interlaboratory study of possible offsets in concentration values of single elements does not exist, we cannot compare sherd 2321 with our Boeotian and Argive bichrome samples from Lerna VI in a meaningful way.

There is thus good analytical work to support the archaeological definition of Lakonian bichrome pottery. The fabrics of published examples from Ayios Stephanos are described as either gritty or fine. The more fine grained fabric is only common in LBA II (ZERNER 2008, 187). The shapes include one bowl with incurved rim (ZERNER 2008, 220, No. 1069), rounded cups (ZERNER 2008, 243, No. 1428, 252–53, Nos. 1594–1603, Figs. 5.22, 5.27), small rounded goblets (RUTTER1976, 51–52, Nos. 714, 718, 720, III. 16; ZERNER 2008, 253, No. 1604, Fig. 5.27), a krater with a ledge rim (ZERNER 2008, 258, No. 1695, Fig. 5.31) as well as some squat narrow-necked jars (ZERNER 2008, 253, Nos. 1605–06, Fig. 5.27). The surfaces are burnished and the paint used to decorate them is either dark brown or black in combination with red (10R 6/8 to 10R 4/6) or yellowish red (5YR 5/6). On some examples auxiliary white paint has been added as well. The most common patterns are the horizontal band, zigzag and wavy band, but different single or multiple pendant or standing semicircles occur as well. Interior rims often have groups of vertical bars. (ZERNER 2008, 196).

8.2. Chronology and distribution

Similar to the Argive variety described above, there is evidence for a very early but limited manufacture of Lakonian bichrome pottery. There is the single published bowl from an early MBA I deposit at Ayios Stephanos (ZERNER 2008, 220, No. 1069). After a possible gap in manufacture, it (re)appears together with the first Mycenaean Decorated sherd in early LBA I deposits (ZERNER 2008, 185, Nos. R249, R293). It rises in popularity during LBA II (ZERNER 2008, 187) after which no published examples exist (MOUNTJOY 2008). As stated above, the distribution of this pottery is virtually unknown.

9. DISCUSSION

It would certainly be a mistake to claim that all bichrome sherds in the MBA I–LBA II Central Aegean derived only from the regionally confined potting traditions described above.
We maintain, however, that these are the six areas from which robust empirical evidence of published and analyzed bichrome pottery presently exist. We would like to consider this chapter as a summary of our current understanding of the topic and as a challenge for colleagues to convince us that we have oversimplified or overlooked important bodies of data. We have pleaded for the complete abandonment of the misleading term “Mainland Polychrome” simply because there were demonstrably several workshops on the Greek Mainland which manufactured bichrome pottery and with only partly overlapping technological and chronological trajectories. If the term is used to signify only Boeotian bichrome pottery, why not call it by its appropriate name? Argive bichrome pottery, on the other hand, is poorly known despite a century of intensive research of the MBA–LBA ceramic sequence in the area. This suggests to us that the local production was always very limited and that Aeginetan or Boeotian equivalents were regularly used instead. It is nevertheless likely that several Argive and possibly also some Lakonian bichrome vessels are hiding among already published examples under the inclusive heading of “Mainland Polychrome”. There are a fair number of published sherds from settlements in the Argolid, Corinthia, Lakonia and Messenia, but more examples characterized by way of chemical analysis are needed.

Among the potting traditions outlined above, the Argive was the first to experiment with bichrome decoration, quite possibly at Lerna. The decorative mode was picked up and used on shapes by Melian/Theran and Keian workshops in MBA II. The volcanic eruption on Thera in the mature LBA I put a halt to the local production of vessels on the island. On Melos bichrome pottery continued to be manufactured more or less throughout the period. Interestingly, Melian/Theran bichrome stopped reaching Lerna with the close of the MBA III period and the same may apply for Kolonna. In the Mycenaean shaft graves, Cycladic imports are likewise mainly found in graves predating LH I (Dietz 1991, 297–298). At Ayia Irini only a few sherds are known from phase VI deposits. On Keos, the local production of bichrome pottery continued in very limited amounts into phase V while no examples exist from phase VI. Keian bichrome vessels were apparently never appreciated outside the island. Only a handful of sherds are known from Kolonna and Lerna and they are all from MBA II–III contexts. The decline and disappearance of Melian/Theran and Keian bichrome on the MBA III–LBA I Greek Mainland should perhaps be explained in the light of the emergence of several workshops early in LBA I which produced attractive equivalents within shorter reach. For a short period, probably not lasting much more than a generation, Melian/Theran, Aeginetan, Boeotian and Argive bichrome appeared side by side in the Central Aegean, best exemplified by LBA I deposits from Ayia Irini, Akrotiri, Lerna and Kolonna. In relative chronological terms, the Aeginetan and Boeotian varieties are excellent tools to isolate LBA I in excavation contexts because of their distinct appearance and relatively widespread distribution. This was suggested already by Davis (1979B, 256-259), but holds true after three decades of continued excavations and a broad spectrum of ceramic analyses. With a few notable exceptions from Asine, all published examples in deposits containing other chronologically sensitive and/or restricted varieties of pottery show unambiguously that their first appearance should be considered a hallmark of LBA I.

While the latest Argive bichrome pottery is presently known from LBA I deposits, the Lakonian variety was produced at least into an early stage of LBA II. The Aeginetan and Boeotian classes continue to appear in limited quantities to a late stage of LBA II. The latter kind may possibly have lasted even into the earliest stage of LBA III.

Anyone who has handled MBA or early LBA Central Aegean pottery will know that bichrome decorated vessels stick out among others in ceramic deposits. There are several reasons to believe that this was also the case in their original use. Special care had been taken by their potters to accomplish a visually striking effect between black and red elements in their decoration. In most cases the surfaces had been carefully burnished and painted with
motifs which were usually paralleled on monochrome painted vessels, but, we would argue, exhibited a higher degree of non-local elements than the monochrome ones. The vessels always constituted a minority of the products from the six areas described above. Among the 600 kg of pottery discarded in a well at early LBA I Kolonna, for instance, roughly two such vessels occurred in a hundred (PRUCKNER pers. comm.). The shapes were almost exclusively intended for the preparation, serving and consumption of beverages, arguably at special occasions. At such events rare bichrome decorated cups, jugs and mixing bowls from different places could be used selectively to make various social and cultural statements (cf. LINDBLOM 2007). Additional studies which seek to identify and interpret such situations and strategies would be welcome. Although many bichrome vessels ended up in high status contexts, especially in the NE Peloponnese, more mundane ceramic assemblages should not be excluded from such analyses.

The demise of manufacture in Central Aegean of bichrome pottery was part of a larger change when vessels decorated with monochrome matt paint vanished as well. From a ceramic perspective, but arguably also culturally and politically, one should view this process as the gradual “Mycenaeanization” of the Southern and Central Greek Mainland, probably from an original core area in early LBA I Lakonia or on Kythera where Minoan influence had been particularly strong for many generations already (JANKO 2008, 566–589). Much of the fine tableware produced on the Greek Mainland and on Aegina was a compromise between familiar and essentially late MBA ideas on shapes and decorative patterns coupled with an ever increasing awareness of and wish to acknowledge and emulate Minoan and Cycladic traditions of ceramic manufacture and consumption. In the end, Lustrous Mycenaean cups and jugs were considered better than bichrome varieties to signify these sentiments. It was probably not a coincidence that the gradual disappearance of Aeginetan and Boeotian bichrome pottery went hand in hand with the spread of Lustrous Mycenaean vessels in the NE Peloponnese, on Aegina and in Central Greece.

**FIGURE CAPTIONS**

Fig. 1. Relative chronology and phases at Kolonna G–L, Lerna V–VI, Ayia Irini IV–VII, Phylakopi I-iii–III-ii and Akrotiri A–D in the MBA I–LBA II Central Aegean.

Fig. 2. Melian/Theran bichrome pottery from Kolonna I–J.

Fig. 3. Approximate distribution of MBA–LBA Melian/Theran bichrome pottery in the Aegean.

Fig. 4. Keian bichrome pottery from Kolonna late phase H–I.

Fig. 5. Aeginetan bichrome pottery from (a) Kolonna K, and (b) the Lerna shaft grave fills.

Fig. 6. Approximate distribution of LBA I–II Aeginetan bichrome pottery in the Aegean.

Fig. 7. Boeotian bichrome pottery from (a) Kolonna K, and (b) the Lerna shaft grave fills.

Fig. 8. Approximate distribution of Boeotian LBA I–II bichrome pottery in the Aegean.

Fig. 9. Argive bichrome pottery from (a) the Lower Town in Asine, (b) Aspis in Argos, and (c) the Lerna shaft grave fills. Courtesy of G. Nordquist (Asine) and Anna Philippa-Touchais (Argos). The photograph of 75.1267-3 was taken by I. Mathioudaki.

Fig. 10. Photomicrographs taken under crossed polars. Width of field for each is 5.5 mm. (a) Lerna V sample 145 (SS11), nippled ewer. Fragments of grey and black banded plagioclase occur throughout the field, as do the rounded tests of microfossils. (b) Lerna V sample 147
(MP28), jug(?). Fragments of grey and black banded plagioclase occur throughout the field, top right is a volcanic rock fragment of plagioclase. (c) Lerna VI sample P599, deep bowl. Bottom left is a dark grey inclusion of volcanic rock. Top right and bottom centre are fragments of microfossils. (d) Lerna VI sample P741, narrow-necked jar. The calcareous matrix contains quartz and mica silt, with sparse grains of limestone. The large inclusion at top right is a clay pellet. Note the patches of crystallitic calcareous material distributed through the matrix. (e) Lerna V sample 69 (MP4). A large mudstone grain dominates the centre, with smaller grains of sandstone and mudstone breccia situated below it. (f) Lerna V sample 84 (MP19). Well sorted quartz grains are scattered through the fabric, as is the yellowish calcareous crystallitic material. The dark, round structure on the right is a ferruginous concretion. (g) Lerna VI sample P468, krater. Note the large limestone grain to the right and the white sandstone grain in the centre. (h) Ayios Stephanos sample 2321, closed vessel. Note the large, well sorted, grey to white grains of quartz, schist, phyllite, feldspar and chert. The large yellowish rounded grains are limestone. The cellular structure at the upper right is a microfossil.

Fig. 11. Result of a discriminant analysis of 249 samples, corrected for dilution, assuming 7 clusters using all elements given in the data tables except As, Ba, Na and Zr. Plotted are the discriminant functions W1 and W2, which cover 95.5 % and 2.4 % of the between-group variance. The ellipses drawn are the 2σ boundaries of the groups. The bichrome samples of this study are shown as filled symbols and all are good members of their groups. The different chemical groups originating from Aegina (AegA), Boeotia (Thea, Theh, Thep), Boeotia/Euboea (Thec), the NE Peloponnese (Mycenae/Berbati: MYBE), and the unlocated but suspected Argive group UI20 are well separated.

TABLE CAPTIONS

Table 1. Comparison of concentrations of single samples from Lerna with the pattern of the matching group. Given are the concentrations C or averages M of elements measured by NAA in (ppm), if not indicated otherwise, and exp. errors δ or spreads σ in percent. Averages are calculated with dilution corrected values of individual samples. ‘factor’ is the best relative factor (dilution factor) applied to match the group average.

Table 2. Comparison of concentrations of single samples from Lerna with the pattern of the matching group. Given are the concentrations C or averages M of elements measured by NAA in (ppm), if not indicated otherwise, and exp. errors δ or spreads σ in percent. Averages are calculated with dilution corrected values of individual samples. ‘factor’ is the best relative factor (dilution factor) applied to match the group average.

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**List of Abbreviated Journals or Series**

- **AA**  Archäologischer Anzeiger
- **AAA**  Archaiologika analekta ex Athenon (Athens Annals of Archaeology)
- ActaAth-4º  Skrifter utgivna av Svenska institutet i Athen, Series prima in 4º
- ActaAth-8º  Skrifter utgivna av Svenska institutet i Athen, Series prima in 8º
- Agora  Athenian Agora (Princeton 1953–)
- AJA  American Journal of Archaeology. The Journal of the Archaeological Institute of America
- ArchDelt  Arkaiologikon Deltion
- ArchEph  Archaiologike Ephemeris
- BAR-IS  British Archaeological Reports, International Series
- BCH  Bulletin de correspondance hellénique
- BSA  Annual of the British School at Athens
- Hesperia  Hesperia. The Journal of the American School of Classical Studies at Athens
- JAS  Journal of Archaeological Science
- JHS  Journal of Hellenic Studies
- MarbWPr  Marburger Winckelmann-Programm
- MÉFRA  Mélanges de l'École française de Rome, Antiquité
- ÖJh  Jahreshefte des Österreichischen archäologischen Instituts in Wien
SIMA  Studies in Mediterranean Archaeology
SIMA-PB Studies in Mediterranean Archaeology and Literature. Pocketbook
SMEA Studi micenei ed egeo-anatolici
UCLAMon University of California at Los Angeles, Institute of Archaeology, Monograph
Table 1. Comparison of concentrations of single samples from Lerna with the pattern of the matching group. Given are the concentrations C or averages M of elements measured by NAA in (ppm), if not indicated otherwise, and exp. errors δ or spreads σ in percent. Averages are calculated with dilution corrected values of individual samples. 'factor' is the best relative factor (dilution factor) applied to match the group average.

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<th>P471</th>
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<td>152 samples</td>
<td>1 sample</td>
<td>297 samples</td>
<td>1 sample</td>
<td>63 samples</td>
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<td>M ± σ (%)</td>
<td>C ± δ (%)</td>
<td>M ± σ (%)</td>
<td>C ± δ (%)</td>
<td>M ± σ (%)</td>
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<td>6.72 (3.6)</td>
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<td>228. (13)</td>
<td>153. (0.9)</td>
<td>149. (5.9)</td>
<td>432. (0.4)</td>
<td>458. (12)</td>
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<td>Eu</td>
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<td>1.13 (4.4)</td>
<td>1.35 (2.5)</td>
<td>1.37 (3.4)</td>
<td>0.97 (2.4)</td>
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<td>5.16 (0.5)</td>
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<td>3.22 (1.8)</td>
<td>3.19 (6.2)</td>
<td>2.01 (2.2)</td>
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<td>195. (28)</td>
<td>95.2 (31)</td>
<td>166. (19)</td>
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</table>
Table 2. Comparison of concentrations of single samples from Lerna with the pattern of the matching group. Given are the concentrations C or averages M of elements measured by NAA in (ppm), if not indicated otherwise, and exp. errors δ or spreads σ in percent. Averages are calculated with dilution corrected values of individual samples. ‘factor’ is the best relative factor (dilution factor) applied to match the group average.

<table>
<thead>
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<th>Element</th>
<th>C ± δ (%)</th>
<th>M ± σ (%)</th>
<th>Factor</th>
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<td>490. (53.)</td>
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C ± δ: Concentration ± relative error in percent
M ± σ: Average ± standard deviation in percent

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*Previously unpublished data on Aegean bichrome pottery*
A. Lower Town in Asine

B. Aspis in Argos

B. Lerna shaft graves